

# Compact Cylinder

New

*Remodeled with a new body to get more flexibility!*

**Can mount small auto switches on 4 surfaces.**

Auto switches can be mounted on any of the 4 surfaces, depending on the installation conditions. (ø12 to ø25: 2 surfaces) Improved flexibility of system design.

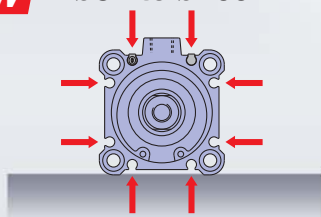


**Auto switch mounting rail removed  
A round slot for mounting small auto switches  
is provided on 4 surfaces.**

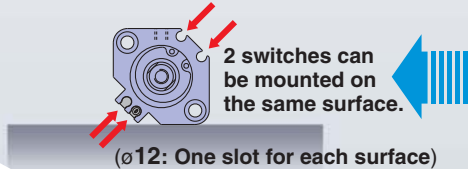
**NEW**

**Available up to ø200**

**NEW** ø32 to ø200

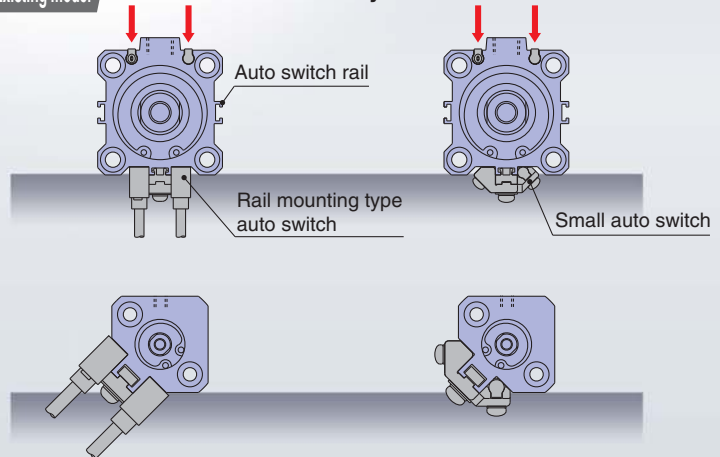


ø12 to ø25: Mountable on 2 surfaces



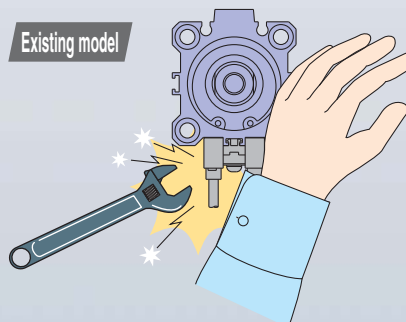
Existing model

ø32 to ø50: Only one surface



## No protrusion of auto switch

- Prevention of damage to auto switch
- Sleeves cannot get caught in the auto switch and its mounting rail.
- ➡ Improved ease of work and safety
- Reduction in labour for design  
There is no need to check for interference with a machine, because the outer dimensions of the cylinder do not change when the auto switch is mounted.



**NEW**

**Exclusive bodies (-XB10) for ø32 to ø100 intermediate strokes (50 mm or more) now kept in inventory\*, enabling shorter delivery times.** \* Formerly produced upon receipt of order

Bore size (mm)	Stroke										
	50	55	60	65	70	75	80	85	90	95	100
ø32 to ø100	◆	●	●	●	●	◆	●	●	●	●	◆

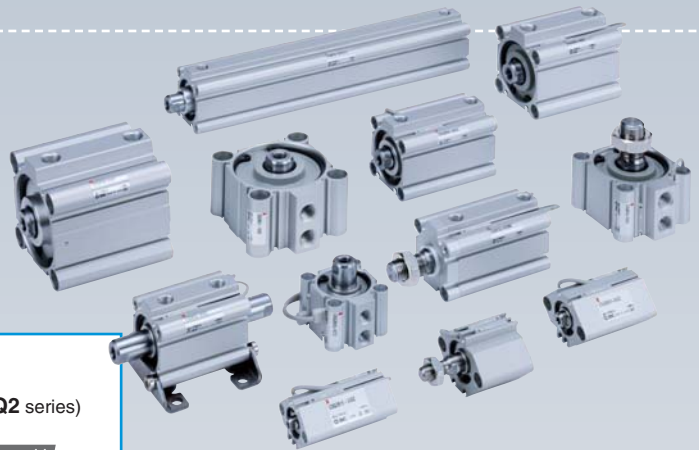
◆ Standard stroke ● Currently stocked intermediate stroke

**Series CQ2**



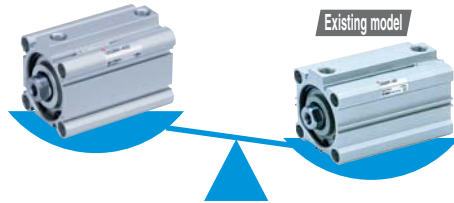
CAT.EUS20-205B-UK

**NEW**  
Series **CQ2 Compact Cylinder**



Lighter weight

Reduced by **5 to 13%**  
**NEW** (Compared with SMC CQ2 series)



The body strength (kinetic energy, allowable load, withstand pressure, etc.) is the same as the existing product.

**Contribution to environment and ecology**  
**Reduction of CO<sub>2</sub> discharge by 1300 t by less use of aluminum**

**Weight**

(Stroke 50 mm, built-in magnet, female thread and with rubber bumper) (g)

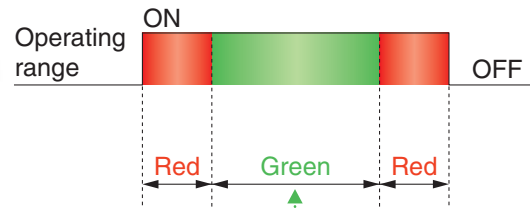
Bore size – Stroke	ø40-50 st
<b>NEW CQ2</b>	<b>456(483)</b>
Existing model CQ2	483(527)

( ): With male thread

Small auto switch

**2-colour indication solid state auto switch**

◎ Appropriate setting of the mounting position can be performed without mistakes.

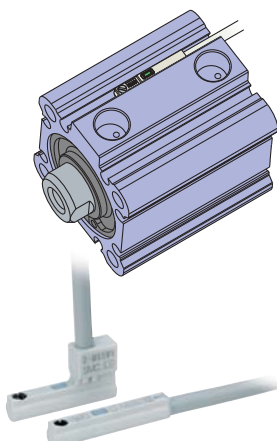


A **green** light illuminates up at the optimum operating range.

**Optimum operating range**

Even if 2-colour indication solid state auto switches are fixed at the optimum operating range (the green light illuminates up), the operation may become unstable depending on the installation environment or magnetic field disturbance. (Magnetic body, external magnetic field, proximal installation of cylinders with built-in magnet and actuators, temperature change, other factors for magnetic force fluctuation during operation, etc.)

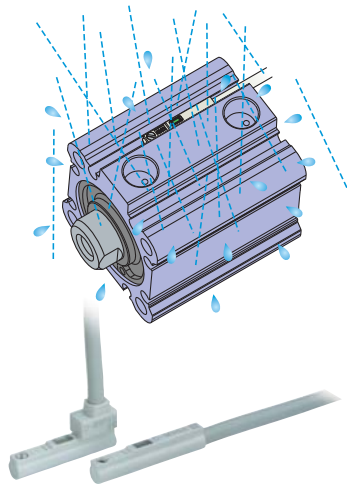
**For general environments**



**D-M9□W(V)**

**Water resistant type**

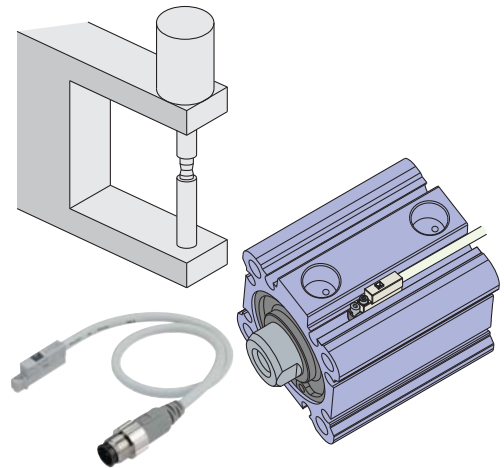
For environments exposed to water and coolant



**D-M9□A(V)**

**Magnetic field resistant type**

For use with AC spot welders, which generate strong magnetic field

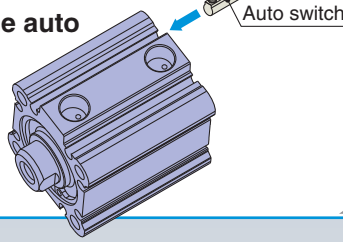


**D-P3DW**

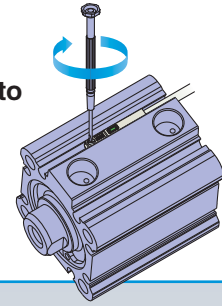
Reduction  
in labour  
for work

- Reduction in number of components **NEW**
- No loss of components

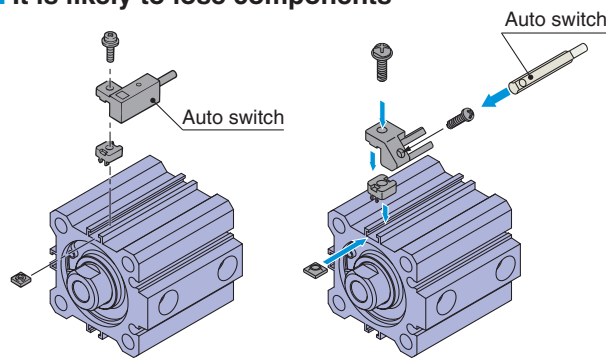
1 Insert the auto switch.



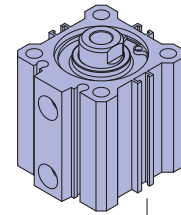
2 Fix the auto switch.



- Takes more labour and time because there are many components. **Existing model**
- It is likely to lose components



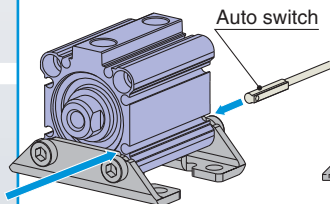
The nuts and screws may fall out when installed vertically.



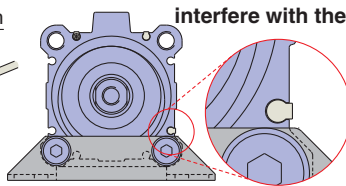
The nut falls out!

- The auto switch can be replaced with the foot brackets mounted.

**NEW**

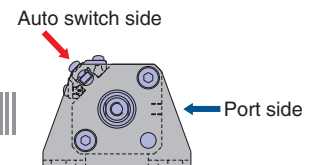
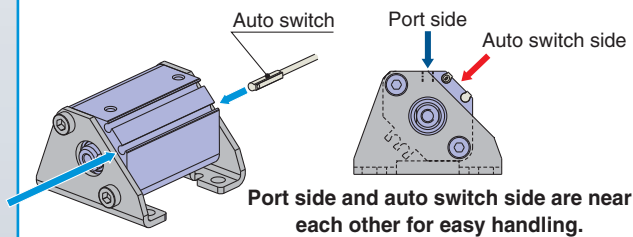
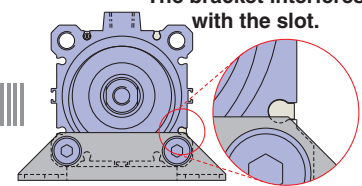


The bracket does not interfere with the slot.



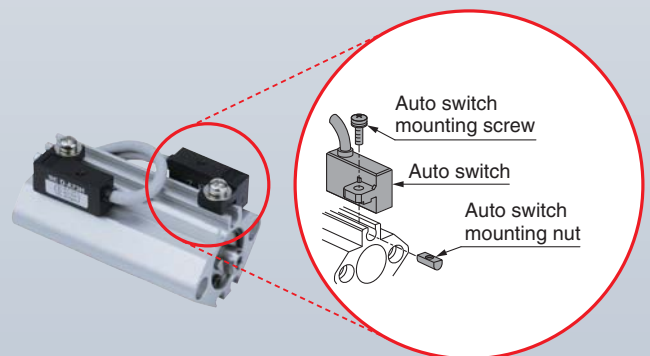
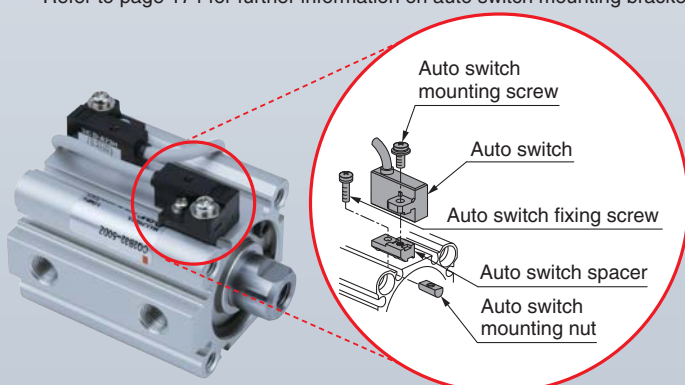
**Existing model**

The bracket interferes with the slot.



● The rail mounting type auto switch can be mounted.

Refer to page 174 for further information on auto switch mounting bracket.




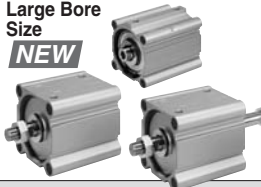


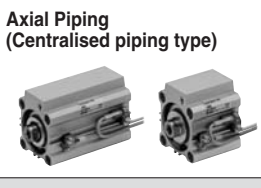







# Compact Cylinder *Series CQ2*

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø140, ø160, ø180, ø200

With a short overall length, the space-saving cylinder helps to make various jigs and equipment more compact.

## Series Variations

Series	Action	Type	Bore size (mm)	Standard stroke (mm)	Page
<b>Standard</b> 	Double acting	Single rod <b>CQ2</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100 ● 125 ● 140 ● 160 ● 180 ● 200	ø12, ø16: 5 to 30 ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50 to ø100: 10 to 100	1
		Double rod <b>CQ2W</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø12, ø16: 5 to 30 ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50 to ø100: 10 to 100	22
	Single acting	Spring return/ Spring extend <b>CQ2</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50	ø12 to ø40: 5, 10 ø50: 10, 20	38
<b>Large Bore Size</b> 	Double acting	Single rod <b>CQ2</b>	● 125 ● 140 ● 160 ● 180 ● 200	10 to 300	57
		Double rod <b>CQ2W</b>	● 125 ● 140 ● 160 ● 180 ● 200	10 to 300	63
<b>Long Stroke</b> 	Double acting	Single rod <b>CQ2</b>	● 125 ● 140 ● 160 ● 180 ● 200	125 to 300	69
<b>Non-rotating Rod</b> 	Double acting	Single rod <b>CQ2K</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø12, ø16: 5 to 30 ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50, ø63: 10 to 100	78
		Double rod <b>CQ2KW</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø12, ø16: 5 to 30 ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50, ø63: 10 to 100	92
<b>Axial Piping (Centralised piping type)</b> 	Double acting	Single rod <b>CQP2</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø12, ø16: 5 to 30 ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50 to ø100: 10 to 100	103
	Single acting	Spring return/ Spring extend <b>CQP2</b>	● 12 ● 16 ● 20 ● 25 ● 32 ● 40 ● 50	ø12 to ø40: 5, 10 ø50: 10, 20	112
<b>Anti-lateral Load</b> 	Double acting	Single rod <b>CQ2□S</b>	● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø32 to ø40: 5 to 100 ø50 to ø100: 10 to 100	128
<b>With End Lock</b> 	Double acting	Single rod <b>CBQ2</b>	● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø20 to ø63: 10 to 100 ø80, ø100: 25 to 100	140
<b>Water Resistant</b> 	Double acting	Single rod <b>CQ2□<sup>W</sup></b>	● 20 ● 25 ● 32 ● 40 ● 50 ● 63 ● 80 ● 100	ø20, ø25: 5 to 50 ø32, ø40: 5 to 100 ø50 to ø100: 10 to 100	156
<b>Smooth Cylinder (Low friction)</b> <b>CQ2Y</b> 	Refer to Best Pneumatics No. 3.				
			<b>Low-speed Cylinder</b> <b>CQ2X</b> 		
				Refer to Best Pneumatics No. 3.	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Combinations of Standard Products and Made

## Series CQ2

- : Standard
- ◎ : Made to Order
- : Special product (For details, please contact SMC.)
- : Not available

Made to Order: For details, refer to pages 177 to 207.

Symbol	Specifications	Applicable bore size	CQ2 (Standard)				CQ2 (Large Bore Size)	
			Double acting		Single acting		Double acting	
			Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod
			ø12 to ø100	ø12 to ø50		ø125 to ø200		
Standard	Standard product	ø12 to ø100	●	●	●	●	●	●
D	Built-in magnet		●	●	●	●	●	●
CQ2□A	Both ends tapped		●	●	●	●	●	●
CQ2□-□M	Rod end male thread		●	●	●	●	●	●
CQ2□-□C	With rubber bumper		●	●	○	○	● Note 2)	● Note 2)
CQ2□-□F	With boss on head end		●	—	●	●	○	—
CQ2□F	With one-touch fittings		ø32 to ø63	●	●	●	●	○
CQ2 <sup>L</sup> <sub>G</sub> F	Foot/Flange	ø12 to ø100	●	●	●	●	○	
CQ2D	Double clevis		●	—	●	●	○	—
CQ2□H	Air-hydro type	ø20 to ø100	●	●	—	—	○	
10-, 11-	Clean series	ø12 to ø100	●	○	○	○	○	
20-	Copper and fluorine-free series		●	●	●	●	○	○
CQ2□ <sup>R</sup>	Water resistant	ø20 to ø100	●	● Note 6)	○	○	○	
CQ2□M	Cylinder with Stable Lubrication Function (Lube-retainer) <sup>Note 13)</sup>	ø32 to ø100	●	○	○	○	—	
XB6	Heat resistant cylinder (-10 to 150°C)	ø12 to ø100	◎	◎	○	○	○	
XB7	Cold resistant cylinder (-40 to 70°C)	ø12 to ø40	◎	◎	○	○	○	
XB9	Low-speed cylinder (10 to 50 mm/s)	ø12 to ø100	◎	◎	○	○	○	
XB10	Intermediate stroke (Exclusive body type)	ø12 to ø200	◎	◎	◎	◎	◎	
XB10A	Intermediate stroke (Spacer-installed type)	ø32 to ø100	◎	○	○	○	○	
XB11	Long stroke (Air-hydro type only)	ø20 to ø100	◎	—	—	—	—	
XB13	Low-speed cylinder (5 to 50 mm/s)	ø12 to ø100	◎	◎	○	○	○	
XB14 <sup>Note 12)</sup>	Cylinder with heat resistant auto switch	ø16 to ø63	◎	○	○	○	○	
XC4	With heavy-duty scraper	ø20 to ø100	◎	◎ Note 6)	○	○	○	
XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel	ø12 to ø100	◎	◎	◎	◎	○	
XC8	Adjustable stroke cylinder/Adjustable extension type		◎	—	○	○	○	—
XC9	Adjustable stroke cylinder/Adjustable retraction type		◎	—	○	○	○	—
XC10	Dual stroke cylinder/Double rod		◎	—	○	○	○	—
XC11	Dual stroke cylinder/Single rod		◎	—	○	○	○	—
XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers		◎	—	◎	◎	○	○
XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304		◎	○	◎	◎	○	○
XC35	With coil scraper	ø32 to ø100	◎	◎	○	○	○	
XC36	With boss on rod side	ø12 to ø100	◎	◎	◎	◎	○	
X144	Special port location	ø12 to ø25	◎	◎	◎	◎	—	
X202	Full length dimension is the same as Series CQ1.	ø12 to ø100	◎	—	◎	◎	—	
X203	L dimension from rod cover is the same as Series CQ1.	ø12 to ø32	◎	—	◎	◎	—	
X235	Special rod end for double rod cylinder	ø12 to ø200	—	◎	—	—	◎	
X271	Fluororubber seals	ø12 to ø160	◎	◎	◎	◎	◎ Note 11)	
X293	Full length dimension is the same as Series CQ1W.	ø12 to ø100	—	◎	—	—	—	
X525	Long stroke of adjustable extension stroke cylinder (-XC8)		◎	—	○	○	○	—
X526	Long stroke of adjustable retraction stroke cylinder (-XC9)		◎	—	○	○	○	—
X633	Intermediate stroke of double rod cylinder	ø12 to ø200	—	◎	—	—	◎	
X636	Long stroke of dual stroke single rod cylinder	ø12 to ø100	◎	—	○	—	○	
X1876	Cylinder tube: With concave boss on head side	ø20 to ø100	◎	—	◎	◎	—	

Note 1) ø12 with auto switch: With rubber bumper (Standard)

Note 2) With rubber bumper (Standard)

Note 3) ø12 to ø16: (○), for ø20 to ø100 only (up to ø50 for single acting type)

Note 4) ø12 to ø32: (○), for ø40 to ø63 only

Note 5) ø12: (—)

Note 6) ø20 to ø32: (○), for ø40 to ø100 only

# to Order Specifications

Series CQ2

	CQ2 (Long Stroke)	CQ2K (Non-rotating Rod)		CQP2 <sup>Note 12)</sup> (Axial Piping)			CQ2□S (Anti-lateral Load)	CBQ2 <sup>Note 12)</sup> (With End Lock)
	Double acting	Double acting		Double acting	Single acting		Double acting	Double acting
	Single rod	Single rod	Double rod	Single rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Single rod
	ø32 to ø100	ø12 to ø63		ø12 to ø100	ø12 to ø50		ø32 to ø100	ø20 to ø100
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	● Note 4)	● Note 4)	○	○	○	●	●
	●	●	●	●	●	●	●	●
	● Note 2)	○ Note 1)	○ Note 1)	●	○	○	● Note 2)	● Note 2)
	○	●	—	● Note 3)	● Note 3)	● Note 3)	●	○
	●	●	●	○	○	○	●	○
	●	● Note 4)	● Note 4)	○	○	○	●	●
	●	● Note 4)	—	○	○	○	●	●
	○	—	—	●	—	—	○	—
	○	○	○	○	○	○	○	○
	●	● Note 5)	● Note 5)	●	●	●	●	○
	○	—	—	● Note 7)	○	○	○	○
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	◎	◎ Note 4)	◎ Note 4)	○	○	○	◎	○
	○	○	○	○	○	○	○	○
	○	○	○	◎	○	○	○	○
	◎	—	—	◎ Note 7)	○	○	○	○
	◎	○	○	◎	◎	◎	◎	○
	○	◎	—	○	○	○	○	○ Note 8)
	○	◎	—	○	○	○	○	○ Note 9)
	○	◎	—	○	○	○	○	○
	○	◎	—	○	○	○	○	○
	◎	◎ Note 4)	—	○	○	○	◎	◎
	◎	◎	○	○	○	○	◎	○
	○	—	—	◎	○	○	○	○
	◎ Note 10)	◎ Note 10)	◎ Note 10)	◎	◎	◎	○	○
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	—	—	○	—	—	—	—	—
	◎	○	○	◎	◎	◎	◎	○
	—	—	—	—	—	—	—	—
	○	○	—	○	○	○	○	○ Note 8)
	○	○	—	○	○	○	○	○ Note 9)
	—	—	◎	—	—	—	—	—
	○	○	—	○	○	—	○	○
	—	◎	—	—	—	—	◎	○

Note 7) ø20 to ø25: (○), for ø32 to ø100 only  
 Note 8) Rod end lock: (—), for head end lock only  
 Note 9) Head end lock: (—), for rod end lock only

Note 10) With boss on rod end (Standard)  
 Note 11) ø180 to ø200: (○), for ø125 to ø160 only  
 Note 12) The body shape is the same as the existing product.  
 Note 13) Only the products with an auto switch and without rubber bumper are compatible.

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order



# 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

<input type="checkbox"/>	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

<input type="checkbox"/>	M thread	ø12 to ø25
<input type="checkbox"/>	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

Without auto switch

\* 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

<input type="checkbox"/>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

Made to Order

Refer to the next page for details.

Body option

<input type="checkbox"/>	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

**D** Double acting

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.  
Refer to the individual catalogue (ES20-201) for the D-P3DW type.

### Applicable 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 (—)	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>	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○			
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	●	●	○	—	○			
				3-wire (NPN)				<b>M9NWV</b>	<b>M9NW</b>	●	●	●	○	—	○			
	Diagnostic indication (2-colour indication)			3-wire (PNP)				<b>M9PWV</b>	<b>M9PW</b>	●	●	●	○	—	○		IC circuit	
				2-wire				<b>M9BWB</b>	<b>M9BW</b>	●	●	●	○	—	○			
				3-wire (NPN)				<b>M9NAV**</b>	<b>M9NA**</b>	○	○	●	○	—	○			IC circuit
				3-wire (PNP)				<b>M9PAV**</b>	<b>M9PA**</b>	○	○	●	○	—	○			
Water resistant (2-colour indication)	2-wire	<b>M9BAV**</b>	<b>M9BA**</b>	○	○	●	○	—	○	—								
	2-wire (Non-polar)	<b>P3DW</b>		●	—	●	—	—	○									
Reed auto switch	—	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	
								<b>A90V</b>	<b>A90</b>	●	—	●	—	—	—			

\* 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 ..... — (Example) M9NV  
1 m ..... M (Example) M9NW  
3 m ..... L (Example) M9NL  
5 m ..... Z (Example) M9NZ

\* 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.

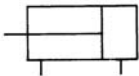


# Compact Cylinder: Standard Double Acting, Single Rod *Series CQ2*



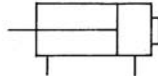
Symbol

Double acting,  
Single rod



Symbol

With boss on  
head end



## Made to Order

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

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

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

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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

### 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 temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)										
Lubrication	Not required (Non-lube)										
Piston speed	50 to 500 mm/s										
Allowable kinetic energy (J)	Standard	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 (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
Action	Double acting, Single rod							
Fluid	Turbine oil (Note)							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.18 MPa				0.1 MPa			
Ambient and fluid temperature	5 to 60°C							
Piston speed	5 to 50 mm/s							
Cushion	None							
Stroke length tolerance	+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
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

- 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
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 Brackets/Part No.

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

## Manufacture of Intermediate Strokes (Except air-hydro type)

### 1. Spacer-installed type 1: Standard model number

Intermediate stroke with ◉: Available in 1 mm intervals

A spacer is installed on tubes with a stroke longer than the specified stroke (◆).

◆: Standard stroke

Bore size (mm)	Stroke range	Type	Stroke																	
			5	10	15	20	25	30	35	40	45	50	75	100						
12, 16	1 to 29	Spacer-installed type 1	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆		
20, 25	1 to 49		◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆		
32, 40	1 to 99		◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆		
50 to 100	1 to 99		◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆	◉	◆		

Ordering example (when ordering ø32-57 mm stroke (with through-hole (standard), without switch)

Type	1. Spacer-installed type 1
Part no.	Standard model number
Order no.	<b>CQ2B32-57DZ</b> (uses 75 mm stroke tube) • CQ2B32-75DZ with 18 mm width spacer inside • The B dimension is 108 mm.

### 2. Spacer-installed type 2: Suffix “-XB10A”

Intermediate stroke with ◉: Available in 1 mm intervals

A spacer is installed on tubes with a stroke longer than the specified stroke (●).

◆: Standard stroke ●: Stroke in stock

Bore size (mm)	Stroke range	Type	Stroke													
			55	60	65	70	* 75	80	85	90	95	* 100				
32, 40	51 to 94	Spacer-installed type 2	◉	●	◉	●	◉	●	◉	●	◉	●	◉	●	◉	●
50 to 100	51 to 94		◉	●	◉	●	◉	●	◉	●	◉	●	◉	●	◉	●

Note) Specify a spacer-installed type 1 with standard model number for ordering an intermediate stroke with a \* mark. Refer to page 186 for details.

Ordering example (when ordering ø32-57 mm stroke (with through-hole (standard), without switch)

Type	2. Spacer-installed type 2
Part no.	Suffix “-XB10A” to the end of model number.
Order no.	<b>CQ2B32-57DZ-XB10A</b> (uses 60 mm stroke tube) • CQ2B32-60DZ-XB10 with 3 mm width spacer inside • The B dimension is 93 mm.

### 3. Exclusive body type: Suffix “-XB10”

Available in 1 mm intervals

Exclusive body can be manufactured for specified stroke upon request.

Bore size (mm)	Stroke range	Type
12, 16	6 to 29	Exclusive body
20, 25	6 to 49	
32, 40	6 to 99	
50 to 100	11 to 99	

Note) In the case of exclusive body type with ø32 to ø100 (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension (A/B dimension) will be the same as those with auto switch. Refer to page 185 for details.

Ordering example

(when ordering ø32-57 mm stroke (with through-hole (standard), without switch)

Type	3. Exclusive body type
Part no.	Suffix “-XB10” to the end of model number.
Order no.	<b>CQ2B32-57DZ-XB10</b> (uses 57 mm stroke tube) • Makes 57 mm stroke tube. • The B dimension is 90 mm.

For 55, 60, 65, 70, 80, 85, 90, and 95 stroke, exclusive bodies are kept in inventory, enabling shorter delivery times.

#### Retaining Ring Installation/Removal

##### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

#### Mounting

##### ⚠ Caution

The CQ2 series compact cylinders are designed to create compact mechanical equipment and promote space saving. Thus, if it is used in the same manner as conventional cylinders such as tie-rod cylinders, it may degrade the performance. Paysufficientattention to the operating conditions when using.

#### Mounting

##### ⚠ Caution

##### 1. Allowable lateral load

Lateral load that can apply to the piston rod end is limited. If a cylinder is used with lateral load over the limit, it may cause air leakage due to abnormal friction of seals, galling of cylinder tubes and pistons, or abnormal friction of the bearing part. The lateral load applied to the piston rod must be within the allowable range indicated in this catalogue. When the load exceeds the limit, use a double rod cylinder, install a guide, or change the bore size to suit the load in order to make the load within the allowable range. As a standard product, an anti-lateral load type cylinder that is resistant to approx. 2 times more than the conventional compact CQ2 series is also available (page 128).

##### 2. Connection with a work piece

When a work piece is mounted on the piston rod end, connect them aligning the center of piston rod and a work piece. If they are off-center, lateral load is generated and phenomena mentioned in (1) may occur. In order not to apply the off-center load, use of a floating joint or simple joint is recommended.

##### 3. Simultaneous use of multiple cylinders

It is difficult to control the speed of pneumatic cylinders. The following conditions cause speed change: change in supply pressure, load, temperature and lubrication, performance difference of each cylinder, deterioration of each part over time, etc. As speed controller can be used to control the speed of multiple cylinders simultaneously for a short period of time, but depending on conditions, it may not work as desired. If multiple cylinders cannot operate simultaneously, unreasonable force is applied to the piston rod because cylinder positions may not be the same. This may cause abnormal friction of seals and bearings, and galling of cylinder tubes and pistons. Do not use an application to operate several cylinders simultaneously by adjusting cylinder speed. If this is inevitable, use a high rigid guide against load, so that the cylinder is not damaged even when the each cylinder output is slightly different.

### Allowable Kinetic Energy

#### Load Weight and Piston Speed (J)

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Standard/ Allowable kinetic energy: Ea	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
With rubber bumper/ Allowable kinetic energy: Eb	0.043	0.075	0.110	0.18	0.29	0.52	0.91	1.54	2.71	4.54

$$\text{Kinetic energy } E \text{ (J)} = \frac{(m1+m2) V^2}{2}$$

**m1:** Weight of cylinder movable parts kg  
**m2:** Load weight kg  
**V:** Piston speed m/s

#### Weight of Cylinder Movable Parts/Without Built-in Magnet (g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	5	6	7	8	10	11	—	—	—	—	—	—
16	9	11	13	15	17	19	—	—	—	—	—	—
20	15	18	21	24	27	31	34	37	40	44	—	—
25	24	28	33	37	42	46	51	55	60	64	—	—
32	45	52	60	68	76	84	92	100	107	115	170	209
40	64	72	80	88	96	104	112	119	127	135	190	229
50	—	117	129	141	153	166	178	190	202	214	300	361
63	—	153	165	177	190	202	214	226	239	251	337	398
80	—	270	289	308	327	347	366	385	404	423	557	653
100	—	487	515	543	570	598	625	653	681	708	901	1038

#### Weight of Cylinder Movable Parts/With Built-in Magnet (g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	8	9	10	11	12	13	—	—	—	—	—	—
16	16	18	20	22	24	26	—	—	—	—	—	—
20	28	31	34	37	40	44	47	50	53	56	—	—
25	44	48	53	57	62	66	71	75	80	84	—	—
32	78	86	93	101	109	117	125	133	140	148	187	227
40	109	117	125	133	140	148	156	164	172	180	219	258
50	—	187	199	211	223	236	248	260	272	285	346	407
63	—	254	266	278	290	303	315	327	339	352	413	474
80	—	433	453	472	491	510	530	549	568	587	683	778
100	—	741	768	796	823	851	879	906	934	962	1099	1236

#### Additional Weight of Cylinder Movable Parts (g)

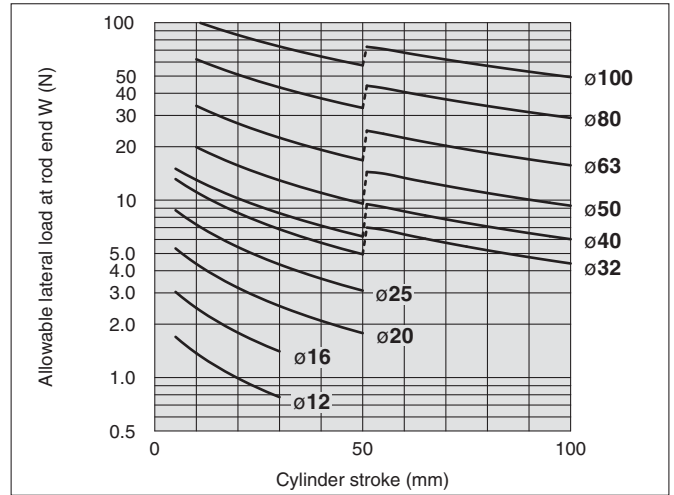
Bore size (mm)		12	16	20	25	32	40	50	63	80	100
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53	120	175
	Nut	1	2	4	8	17	17	32	32	49	116
With rubber bumper		0	0	-2	-3	-3	-7	-9	-18	-31	-56

Calculation: (Example) **CDQ2B32-20DCMZ**

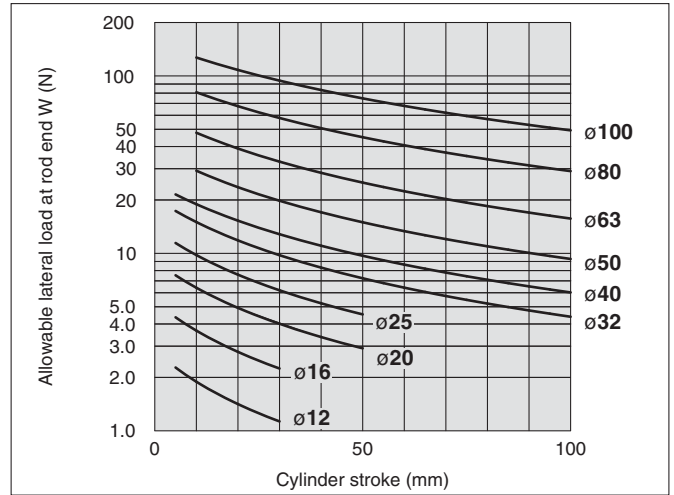
- Basic weight: CDQ2B32-20DCMZ.....101 g
  - Additional weight: Rod end male thread.....43 g
  - With rubber bumper.....-3 g
- 141 g

### Allowable Lateral Load at Rod End

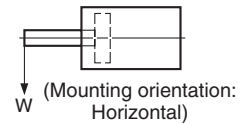
#### Without Auto Switch



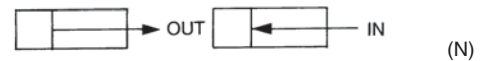
#### With Auto Switch



If an allowable lateral load at rod end is exceeding the value in the graph, we recommend anti-lateral load type cylinder be used.



### Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
12	IN	25	42	59
	OUT	34	57	79
16	IN	45	75	106
	OUT	60	101	141
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Weight

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	29	35	41	47	54	60	—	—	—	—	—	—
16	42	50	59	67	76	84	—	—	—	—	—	—
20	63	75	88	101	114	127	140	152	165	178	—	—
25	86	100	115	129	144	158	173	187	202	216	—	—
32	125	145	165	184	204	224	244	263	283	303	448	547
40	187	208	230	251	273	294	315	337	358	380	552	664
50	—	339	372	405	438	471	504	537	570	603	872	1043
63	—	480	518	556	594	632	670	708	746	784	1112	1308
80	—	916	976	1036	1097	1157	1217	1277	1338	1398	1917	2215
100	—	1608	1688	1768	1849	1929	2010	2090	2170	2251	2982	3391

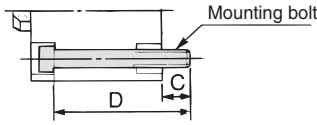
## Additional Weight

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Both ends tapped	2	2	6	6	6	6	6	19	45	45
Rod end male thread	1.5	3	6	12	26	27	53	53	120	175
male thread Nut	1	2	4	8	17	17	32	32	49	116
With boss on head end	0.7	1.3	2	3	5	7	13	25	45	96
With rubber bumper	0	0	-2	-3	-3	-7	-9	-18	-31	-56
Built-in one-touch fittings	—	—	—	—	12	12	21	21	—	—
Foot (Including mounting bolts)	55	67	164	186	142	154	243	317	683	1052
Rod flange (Including mounting bolts)	57	69	139	161	180	214	373	559	1056	1365
Head flange (Including mounting bolts)	54	65	133	152	165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)	32	39	88	123	151	196	393	554	1109	1887

Calculation: (Example) CQ2D32-20DCMZ

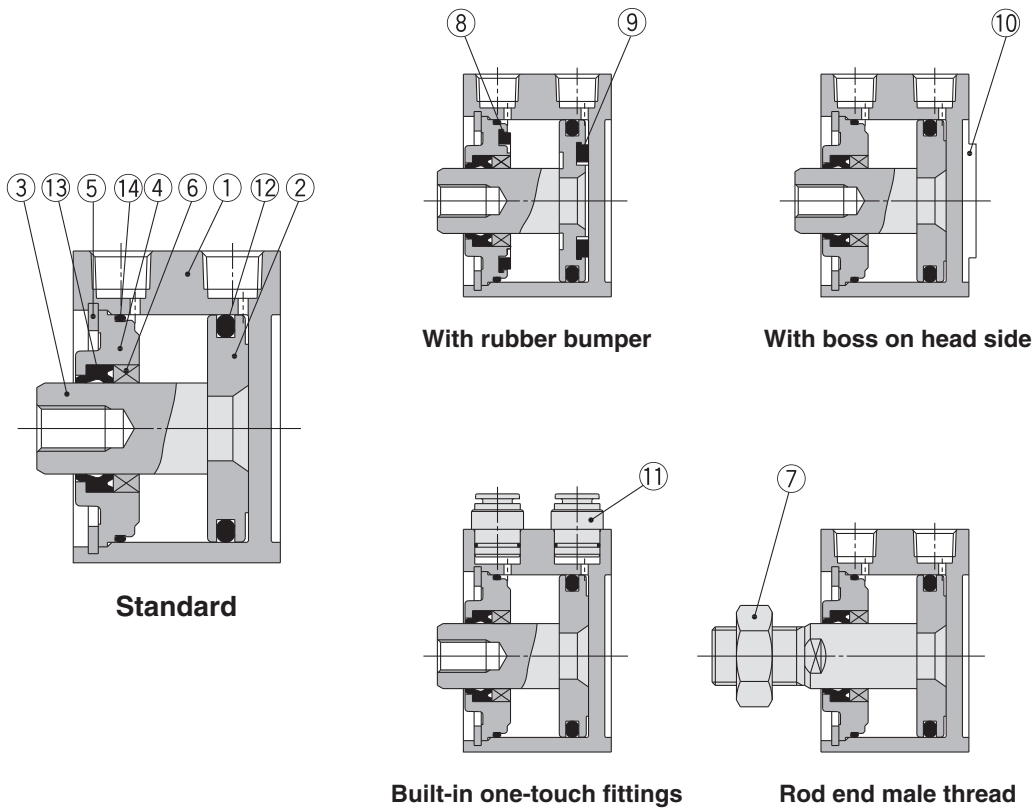
- Basic weight: CQ2B32-20DZ ..... 184 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - With rubber bumper ..... -3 g
  - Double clevis ..... 151 g
- 381 g

## Mounting Bolt for CQ2B/Without Auto Switch



Cylinder model	C	D	Mounting bolt	Cylinder model	C	D	Mounting bolt	Cylinder model	C	D	Mounting bolt
CQ2B12-5D	6.5	25	M3X25L	CQ2B40-5DZ	7.5	35	M5X35L	CQ2B80-10DZ	15	55	M10X55L
CQ2B12-10D		30	M3X30L	CQ2B40-10DZ		40	M5X40L	CQ2B80-15DZ		60	M10X60L
CQ2B12-15D		35	M3X35L	CQ2B40-15DZ		45	M5X45L	CQ2B80-20DZ		65	M10X65L
CQ2B12-20D		40	M3X40L	CQ2B40-20DZ		50	M5X50L	CQ2B80-25DZ		70	M10X70L
CQ2B12-25D		45	M3X45L	CQ2B40-25DZ		55	M5X55L	CQ2B80-30DZ		75	M10X75L
CQ2B12-30D	50	M3X50L	CQ2B40-30DZ	60		M5X60L	CQ2B80-35DZ	80		M10X80L	
CQ2B16-5D	5	25	M3X25L	CQ2B40-35DZ		65	M5X65L	CQ2B80-40DZ		85	M10X85L
CQ2B16-10D		30	M3X30L	CQ2B40-40DZ		70	M5X70L	CQ2B80-45DZ		90	M10X90L
CQ2B16-15D		35	M3X35L	CQ2B40-45DZ		75	M5X75L	CQ2B80-50DZ		95	M10X95L
CQ2B16-20D		40	M3X40L	CQ2B40-50DZ		80	M5X80L	CQ2B80-55DZ-XB10		110	M10X110L
CQ2B16-25D		45	M3X45L	CQ2B40-55DZ-XB10	95	M5X95L	CQ2B80-60DZ-XB10	115		M10X115L	
CQ2B16-30D	50	M3X50L	CQ2B40-60DZ-XB10	100	M5X100L	CQ2B80-65DZ-XB10	120	M10X120L			
CQ2B20-5D	7.5	25	M5X25L	CQ2B40-65DZ-XB10	105	M5X105L	CQ2B80-70DZ-XB10	125		M10X125L	
CQ2B20-10D		30	M5X30L	CQ2B40-70DZ-XB10	110	M5X110L	CQ2B80-75DZ	130		M10X130L	
CQ2B20-15D		35	M5X35L	CQ2B40-75DZ	115	M5X115L	CQ2B80-80DZ-XB10	135		M10X135L	
CQ2B20-20D		40	M5X40L	CQ2B40-80DZ-XB10	120	M5X120L	CQ2B80-85DZ-XB10	140		M10X140L	
CQ2B20-25D		45	M5X45L	CQ2B40-85DZ-XB10	125	M5X125L	CQ2B80-90DZ-XB10	145	M10X145L		
CQ2B20-30D		50	M5X50L	CQ2B40-90DZ-XB10	130	M5X130L	CQ2B80-95DZ-XB10	150	M10X150L		
CQ2B20-35D		55	M5X55L	CQ2B40-95DZ-XB10	135	M5X135L	CQ2B80-100DZ	155	M10X155L		
CQ2B20-40D		60	M5X60L	CQ2B40-100DZ	140	M5X140L	CQ2B100-10DZ	65	M10X65L		
CQ2B20-45D		65	M5X65L	CQ2B50-10DZ	45	M6X45L	CQ2B100-15DZ	70	M10X70L		
CQ2B20-50D		70	M5X70L	CQ2B50-15DZ	50	M6X50L	CQ2B100-20DZ	75	M10X75L		
CQ2B25-5D	9.5	30	M5X30L	CQ2B50-20DZ	55	M6X55L	CQ2B100-25DZ	80	M10X80L		
CQ2B25-10D		35	M5X35L	CQ2B50-25DZ	60	M6X60L	CQ2B100-30DZ	85	M10X85L		
CQ2B25-15D		40	M5X40L	CQ2B50-30DZ	65	M6X65L	CQ2B100-35DZ	90	M10X90L		
CQ2B25-20D		45	M5X45L	CQ2B50-35DZ	70	M6X70L	CQ2B100-40DZ	95	M10X95L		
CQ2B25-25D		50	M5X50L	CQ2B50-40DZ	75	M6X75L	CQ2B100-45DZ	100	M10X100L		
CQ2B25-30D		55	M5X55L	CQ2B50-45DZ	80	M6X80L	CQ2B100-50DZ	105	M10X105L		
CQ2B25-35D		60	M5X60L	CQ2B50-50DZ	85	M6X85L	CQ2B100-55DZ-XB10	120	M10X120L		
CQ2B25-40D		65	M5X65L	CQ2B50-55DZ-XB10	100	M6X100L	CQ2B100-60DZ-XB10	125	M10X125L		
CQ2B25-45D		70	M5X70L	CQ2B50-60DZ-XB10	105	M6X105L	CQ2B100-65DZ-XB10	130	M10X130L		
CQ2B25-50D		75	M5X75L	CQ2B50-65DZ-XB10	110	M6X110L	CQ2B100-70DZ-XB10	135	M10X135L		
CQ2B32-5DZ	9	30	M5X30L	CQ2B50-70DZ-XB10	115	M6X115L	CQ2B100-75DZ	140	M10X140L		
CQ2B32-10DZ		35	M5X35L	CQ2B50-75DZ	120	M6X120L	CQ2B100-80DZ-XB10	145	M10X145L		
CQ2B32-15DZ		40	M5X40L	CQ2B50-80DZ-XB10	125	M6X125L	CQ2B100-85DZ-XB10	150	M10X150L		
CQ2B32-20DZ		45	M5X45L	CQ2B50-85DZ-XB10	130	M6X130L	CQ2B100-90DZ-XB10	155	M10X155L		
CQ2B32-25DZ		50	M5X50L	CQ2B50-90DZ-XB10	135	M6X135L	CQ2B100-95DZ-XB10	160	M10X160L		
CQ2B32-30DZ		55	M5X55L	CQ2B50-95DZ-XB10	140	M6X140L	CQ2B100-100DZ	165	M10X165L		
CQ2B32-35DZ		60	M5X60L	CQ2B50-100DZ	145	M6X145L					
CQ2B32-40DZ		65	M5X65L	CQ2B63-10DZ	50	M8X50L					
CQ2B32-45DZ		70	M5X70L	CQ2B63-15DZ	55	M8X55L					
CQ2B32-50DZ		75	M5X75L	CQ2B63-20DZ	60	M8X60L					
CQ2B32-55DZ-XB10		90	M5X90L	CQ2B63-25DZ	65	M8X65L					
CQ2B32-60DZ-XB10		95	M5X95L	CQ2B63-30DZ	70	M8X70L					
CQ2B32-65DZ-XB10		100	M5X100L	CQ2B63-35DZ	75	M8X75L					
CQ2B32-70DZ-XB10		105	M5X105L	CQ2B63-40DZ	80	M8X80L					
CQ2B32-75DZ		110	M5X110L	CQ2B63-45DZ	85	M8X85L					
CQ2B32-80DZ-XB10		115	M5X115L	CQ2B63-50DZ	90	M8X90L					
CQ2B32-85DZ-XB10		120	M5X120L	CQ2B63-55DZ-XB10	105	M8X105L					
CQ2B32-90DZ-XB10		125	M5X125L	CQ2B63-60DZ-XB10	110	M8X110L					
CQ2B32-95DZ-XB10		130	M5X130L	CQ2B63-65DZ-XB10	115	M8X115L					
CQ2B32-100DZ		135	M5X135L	CQ2B63-70DZ-XB10	120	M8X120L					
				CQ2B63-75DZ	125	M8X125L					
				CQ2B63-80DZ-XB10	130	M8X130L					
				CQ2B63-85DZ-XB10	135	M8X135L					
			CQ2B63-90DZ-XB10	140	M8X140L						
			CQ2B63-95DZ-XB10	145	M8X145L						
			CQ2B63-100DZ	150	M8X150L						

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
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, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	For ø50 or more only
7	Rod end nut	Carbon steel	Nickel plated
8	Bumper A	Urethane	

### Replacement Parts/Seal Kit (Pneumatic type)

Bore size (mm)	Kit no.	Contents
12	CQ2B12-PS	Kits include items ⑫, ⑬, ⑭ from the table.
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	

\* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.  
\* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

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

### Replacement Parts/Seal Kit (Air-hydro type)

Bore size (mm)	Kit no.	Contents
20	CQ2BH20-PS	Kits include items ⑫, ⑬, ⑭ from the table.
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.  
\* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Clean Series

**10** - C□Q2B Bore size - Stroke **D(M)Z**



• Clean series

10	Relief type
11	Vacuum type

•  $\phi 12, \phi 16, \phi 20, \phi 25, \phi 32$   
 $\phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

Applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

### Specifications

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod									
<b>Proof pressure</b>	1.5 MPa									
<b>Maximum operating pressure</b>	1.0 MPa									
<b>Cushion</b>	None <sup>Note)</sup>									
<b>Piston speed</b>	30 to 400 mm/s								30 to 300 mm/s	
<b>Mounting</b>	Through-hole									

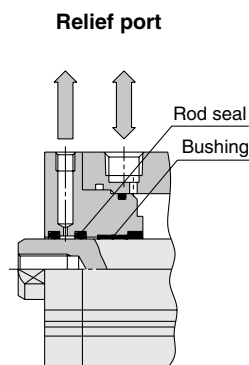
Note)  $\phi 12$  with auto switch: With rubber bumper (Standard)

For details, refer to the separate catalogue (CAT.E02-23), "Pneumatics Equipment for Clean Room."

### Construction

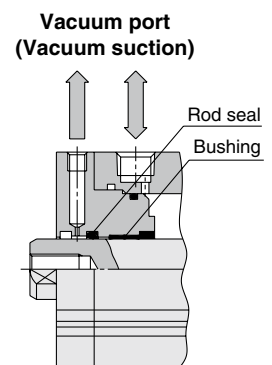
#### 10-CQ2 series (Double seal)

A relief port is provided in the area between the double rod seals to discharge the exhaust air outside of the clean room. Thus, the amount of dust generated has been reduced to 1/20 of that of an ordinary cylinder.



#### 11-CQ2 series (Single seal, Vacuum suction)

Structurally identical to the "10-" series, the outer rod seal has been removed to evacuate through the vacuum port. This draws out any external air from the clearance between the rod and the cover to practically eliminate the generation of external dust. This should be used in an application that requires an even higher level of cleanliness than the 10- series.



## Copper and Fluorine-free Series (For CRT Manufacturing Process)

**20** - C□Q2B Bore size - Stroke **D(C)(M)Z**



• Copper and fluorine-free series

•  $\phi 12, \phi 16, \phi 20, \phi 25, \phi 32$   
 $\phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

### Specifications

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod									
<b>Proof pressure</b>	1.5 MPa									
<b>Maximum operating pressure</b>	1.0 MPa									
<b>Cushion</b>	None/Rubber bumper									
<b>Piston speed</b>	50 to 500 mm/s									
<b>Mounting</b>	Through-hole/Both ends tapped									

**Water Resistant**

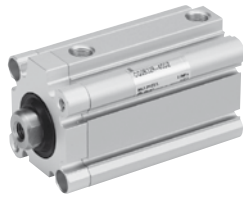
Refer to pages 156 to 168 for details.

**CDQ2** **Mounting** **Bore size** **R** - **Stroke** **D** **Option** **Z** - **M9BAL** - **XC6** **Suffix**

- With auto switch (Built-in magnet)
- Water resistant cylinder
 

<b>R</b>	NBR seals (Nitrile rubber)
<b>V</b>	FKM seals (Fluororubber)
- Water resistant 2-colour indication solid state auto switch
- Made to Order

Ideal for use under the atmosphere having coolant for machine tools, etc. Compatible for the environment, where waterdrops are splashed around the food processing machinery and the car washers, etc.



—	Piston rod/Retaining ring/Rod end nut material: Stainless steel
<b>A</b>	Piston rod/Rod end nut/Cover holding bolt material: Stainless steel

Note) -XC6A: ø20 to ø32 only

**Specifications**

Bore size (mm)	<b>20</b>	<b>25</b>	<b>32</b>	<b>40</b>	<b>50</b>	<b>63</b>	<b>80</b>	<b>100</b>
Action	Double acting, Single rod							
Cushion	None							
Made to Order	Piston rod/Retaining ring/Rod end nut material: Stainless steel (-XC6)							

\* The specifications other than above are the same as those of the standard. Some dimensions may vary from those of the standard. Refer to page 156 for details.

**Compact Cylinder with Stable Lubrication Function (Lube-retainer)**

**CDQ2** **Mounting style** **Bore size** **M** - **Stroke** **D** **Body option** **Z** **Mounting bolt** **Rod end thread** - **Auto switch**

- With auto switch (Built-in magnet)
- With stable lubrication function (Lube-retainer)
- \* Available only for with auto switch.

**Specifications**

Bore size (mm)	<b>32, 40, 50, 63, 80, 100</b>
Action	Double acting, Single rod
Minimum operating pressure	0.1 MPa
Piston speed	50 to 500 mm/s
Cushion	None

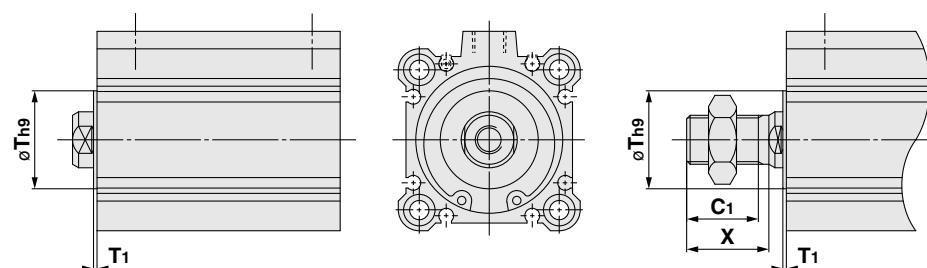
\* Specifications other than those shown above are the same as the standard model.



**Dimensions** (Dimensions other than those shown below are the same as the standard model.)

ø32 to ø100

DMZ: Rod end male thread



Bore size	T	T1	C1	X
<b>32</b>	22	1	20.5	23.5
<b>40</b>	28	1	20.5	23.5
<b>50</b>	35	2	24	26.5
<b>63</b>	35	2	24	26.5
<b>80</b>	—	—	32.5	35.5
<b>100</b>	—	—	32.5	35.5

\* The mounting dimensions of the mounting bracket are the same as the standard model.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Standard: Double Acting, Single Rod Series CDQ2 With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.169 to 175
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Weight

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	43	49	55	61	67	73	—	—	—	—	—	—
16	64	71	79	87	95	102	—	—	—	—	—	—
20	94	106	118	131	143	155	167	179	191	203	—	—
25	134	149	164	180	195	210	226	241	256	272	—	—
32	182	202	222	241	261	281	300	320	340	359	459	558
40	269	290	312	333	355	376	398	420	441	463	575	687
50	—	455	488	521	554	587	620	653	686	719	891	1062
63	—	627	665	703	741	779	817	855	893	931	1129	1326
80	—	1162	1222	1282	1342	1403	1463	1524	1584	1644	1941	2237
100	—	1966	2047	2127	2208	2288	2368	2449	2529	2610	3018	3426

### Additional Weight

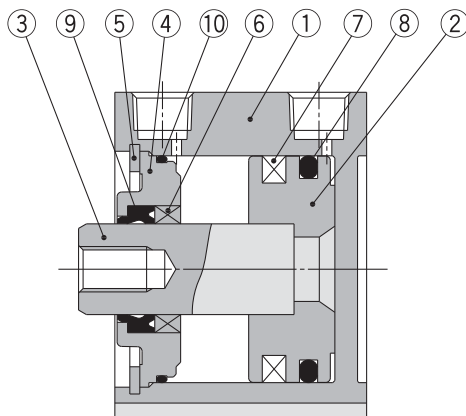
Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Both ends tapped	1	1	3	3	6	6	6	19	45	45
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53	120
	Nut	1	2	4	8	17	17	32	32	49
With boss on head end	0.7	1.3	2	3	5	7	13	25	45	96
With rubber bumper	0	0	-2	-3	-3	-7	-9	-18	-31	-56
Built-in one-touch fittings	—	—	—	—	12	12	21	21	—	—
Foot (Including mounting bolts)	49	62	147	169	142	154	243	317	683	1052
Rod flange (Including mounting bolts)	54	67	131	153	180	214	373	559	1056	1365
Head flange (Including mounting bolts)	52	63	124	144	165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)	29	35	78	114	151	196	393	554	1109	1887

Calculation: (Example) **CDQ2D32-20DCMZ**

- Basic weight: CDQ2B32-20DZ..... 241 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - With rubber bumper ..... -3 g
  - Double clevis ..... 151 g
- 438 g

Add each weight of auto switches when auto switches are mounted.

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
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, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	For ø50 or more only
7	Magnet	—	
8	Piston seal	NBR	
9	Rod seal	NBR	
10	Gasket	NBR	

### Replacement Parts/Seal Kit (Pneumatic type)

Bore size (mm)	Kit no.	Contents
12	CQ2B12-PS	Kits include items ⑧, ⑨, ⑩ from the table.
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	

### Replacement Parts/Seal Kit (Air-hydro type)

Bore size (mm)	Kit no.	Contents
20	CQ2BH20-PS	Kits include items ⑧, ⑨, ⑩ from the table.
25	CQ2BH25-PS	
32	CQ2BH32-PS	
40	CQ2BH40-PS	
50	CQ2BH50-PS	
63	CQ2BH63-PS	
80	CQ2BH80-PS	
100	CQ2BH100-PS	

- \* Seal kit includes ⑧, ⑨, ⑩. Order the seal kit, based on each bore size.
- \* Since the seal kit does not include a grease pack, order it separately.

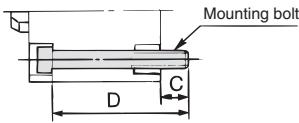
Grease pack part no.: GR-S-010 (10 g)

- \* Seal kit includes ⑧, ⑨, ⑩. Order the seal kit, based on each bore size.
- \* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)



### Mounting Bolt for CDQ2B/With Auto Switch



Cylinder model	C	D	Mounting bolt	Cylinder model	C	D	Mounting bolt	Cylinder model	C	D	Mounting bolt
CDQ2B12-5DZ	5.5	35	M3X35L	CDQ2B40-5DZ	7.5	45	M5X45L	CDQ2B80-10DZ	15	65	M10X65L
CDQ2B12-10DZ		40	M3X40L	CDQ2B40-10DZ		50	M5X50L	CDQ2B80-15DZ		70	M10X70L
CDQ2B12-15DZ		45	M3X45L	CDQ2B40-15DZ		55	M5X55L	CDQ2B80-20DZ		75	M10X75L
CDQ2B12-20DZ		50	M3X50L	CDQ2B40-20DZ		60	M5X60L	CDQ2B80-25DZ		80	M10X80L
CDQ2B12-25DZ		55	M3X55L	CDQ2B40-25DZ		65	M5X65L	CDQ2B80-30DZ		85	M10X85L
CDQ2B12-30DZ		65	M3X60L	CDQ2B40-30DZ		70	M5X70L	CDQ2B80-35DZ		90	M10X90L
CDQ2B16-5DZ	8	40	M3X40L	CDQ2B40-35DZ	75	M5X75L	CDQ2B80-40DZ	95	M10X95L		
CDQ2B16-10DZ		45	M3X45L	CDQ2B40-35DZ	80	M5X80L	CDQ2B80-45DZ	100	M10X100L		
CDQ2B16-15DZ		50	M3X50L	CDQ2B40-40DZ	85	M5X85L	CDQ2B80-50DZ	105	M10X105L		
CDQ2B16-20DZ		55	M3X55L	CDQ2B40-45DZ	90	M5X90L	CDQ2B80-55DZ-XB10	110	M10X110L		
CDQ2B16-25DZ		60	M3X60L	CDQ2B40-50DZ	95	M5X95L	CDQ2B80-60DZ-XB10	115	M10X115L		
CDQ2B16-30DZ		65	M3X65L	CDQ2B40-55DZ-XB10	100	M5X100L	CDQ2B80-65DZ-XB10	120	M10X120L		
CDQ2B20-5DZ	10.5	40	M5X40L	CDQ2B40-60DZ-XB10	105	M5X105L	CDQ2B80-70DZ-XB10	125	M10X125L		
CDQ2B20-10DZ		45	M5X45L	CDQ2B40-65DZ-XB10	110	M5X110L	CDQ2B80-75DZ	130	M10X130L		
CDQ2B20-15DZ		50	M5X50L	CDQ2B40-70DZ-XB10	115	M5X115L	CDQ2B80-80DZ-XB10	135	M10X135L		
CDQ2B20-20DZ		55	M5X55L	CDQ2B40-75DZ	120	M5X120L	CDQ2B80-85DZ-XB10	140	M10X140L		
CDQ2B20-25DZ		60	M5X60L	CDQ2B40-80DZ-XB10	125	M5X125L	CDQ2B80-90DZ-XB10	145	M10X145L		
CDQ2B20-30DZ		65	M5X65L	CDQ2B40-85DZ-XB10	130	M5X130L	CDQ2B80-95DZ-XB10	150	M10X150L		
CDQ2B20-35DZ	9.5	70	M5X70L	CDQ2B40-90DZ-XB10	135	M5X135L	CDQ2B80-100DZ	155	M10X155L		
CDQ2B20-40DZ		75	M5X75L	CDQ2B40-95DZ-XB10	140	M5X140L	CDQ2B100-10DZ	75	M10X75L		
CDQ2B20-45DZ		80	M5X80L	CDQ2B40-100DZ	145	M5X145L	CDQ2B100-15DZ	80	M10X80L		
CDQ2B20-50DZ		85	M5X85L	CDQ2B50-10DZ	55	M6X55L	CDQ2B100-20DZ	85	M10X85L		
CDQ2B25-5DZ		9	40	M5X40L	CDQ2B50-15DZ	60	M6X60L	CDQ2B100-25DZ	90	M10X90L	
CDQ2B25-10DZ			45	M5X45L	CDQ2B50-20DZ	65	M6X65L	CDQ2B100-30DZ	95	M10X95L	
CDQ2B25-15DZ	50		M5X50L	CDQ2B50-25DZ	70	M6X70L	CDQ2B100-35DZ	100	M10X100L		
CDQ2B25-20DZ	55		M5X55L	CDQ2B50-30DZ	75	M6X75L	CDQ2B100-40DZ	105	M10X105L		
CDQ2B25-25DZ	60		M5X60L	CDQ2B50-35DZ	80	M6X80L	CDQ2B100-45DZ	110	M10X110L		
CDQ2B25-30DZ	65		M5X65L	CDQ2B50-40DZ	85	M6X85L	CDQ2B100-50DZ	115	M10X115L		
CDQ2B25-35DZ	12.5	70	M5X70L	CDQ2B50-45DZ	90	M6X90L	CDQ2B100-55DZ-XB10	120	M10X120L		
CDQ2B25-40DZ		75	M5X75L	CDQ2B50-50DZ	95	M6X95L	CDQ2B100-60DZ-XB10	125	M10X125L		
CDQ2B25-45DZ		80	M5X80L	CDQ2B50-55DZ-XB10	100	M6X100L	CDQ2B100-65DZ-XB10	130	M10X130L		
CDQ2B25-50DZ		85	M5X85L	CDQ2B50-60DZ-XB10	105	M6X105L	CDQ2B100-70DZ-XB10	135	M10X135L		
CDQ2B32-5DZ		9	40	M5X40L	CDQ2B50-65DZ-XB10	110	M6X110L	CDQ2B100-75DZ	140	M10X140L	
CDQ2B32-10DZ			45	M5X45L	CDQ2B50-70DZ-XB10	115	M6X115L	CDQ2B100-80DZ-XB10	145	M10X145L	
CDQ2B32-15DZ	50		M5X50L	CDQ2B50-75DZ	120	M6X120L	CDQ2B100-85DZ-XB10	150	M10X150L		
CDQ2B32-20DZ	55		M5X55L	CDQ2B50-80DZ-XB10	125	M6X125L	CDQ2B100-90DZ-XB10	155	M10X155L		
CDQ2B32-25DZ	60		M5X60L	CDQ2B50-85DZ-XB10	130	M6X130L	CDQ2B100-95DZ-XB10	160	M10X160L		
CDQ2B32-30DZ	65		M5X65L	CDQ2B50-90DZ-XB10	135	M6X135L	CDQ2B100-100DZ	165	M10X165L		
CDQ2B32-35DZ	14.5	70	M5X70L	CDQ2B50-95DZ-XB10	140	M6X140L					
CDQ2B32-40DZ		75	M5X75L	CDQ2B50-100DZ	145	M6X145L					
CDQ2B32-45DZ		9	80	M5X80L	CDQ2B63-10DZ	60	M8X60L				
CDQ2B32-50DZ			85	M5X85L	CDQ2B63-15DZ	65	M8X65L				
CDQ2B32-55DZ-XB10			90	M5X90L	CDQ2B63-20DZ	70	M8X70L				
CDQ2B32-60DZ-XB10			95	M5X95L	CDQ2B63-25DZ	75	M8X75L				
CDQ2B32-65DZ-XB10	100		M5X100L	CDQ2B63-30DZ	80	M8X80L					
CDQ2B32-70DZ-XB10	105		M5X105L	CDQ2B63-35DZ	85	M8X85L					
CDQ2B32-75DZ	14.5	110	M5X110L	CDQ2B63-40DZ	90	M8X90L					
CDQ2B32-80DZ-XB10		115	M5X115L	CDQ2B63-45DZ	95	M8X95L					
CDQ2B32-85DZ-XB10		120	M5X120L	CDQ2B63-50DZ	100	M8X100L					
CDQ2B32-90DZ-XB10		125	M5X125L	CDQ2B63-55DZ-XB10	105	M8X105L					
CDQ2B32-95DZ-XB10		130	M5X130L	CDQ2B63-60DZ-XB10	110	M8X110L					
CDQ2B32-100DZ		135	M5X135L	CDQ2B63-65DZ-XB10	115	M8X115L					
			CDQ2B63-70DZ-XB10	120	M8X120L						
			CDQ2B63-75DZ	125	M8X125L						
			CDQ2B63-80DZ-XB10	130	M8X130L						
			CDQ2B63-85DZ-XB10	135	M8X135L						
			CDQ2B63-90DZ-XB10	140	M8X140L						
			CDQ2B63-95DZ-XB10	145	M8X145L						
			CDQ2B63-100DZ	150	M8X150L						

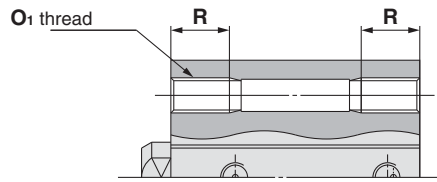
Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Dimensions

### Ø12 to Ø25/Without Auto Switch

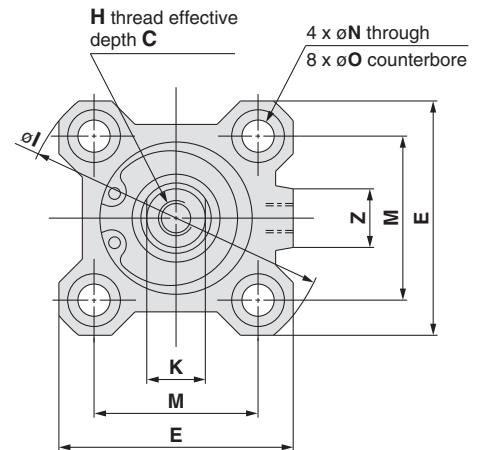
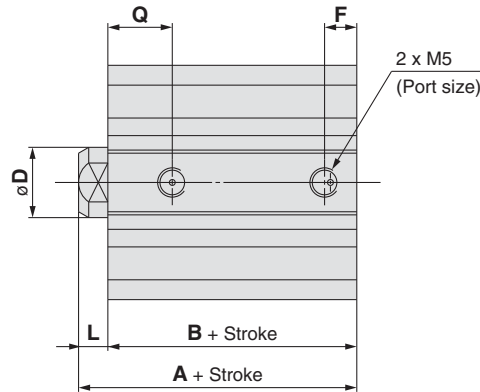
#### Both ends tapped: CQ2A



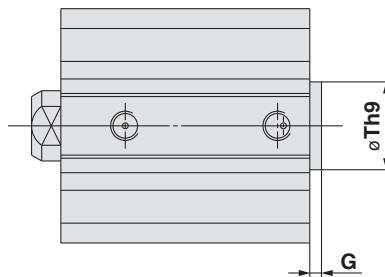
#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CQ2B



#### With boss on head side

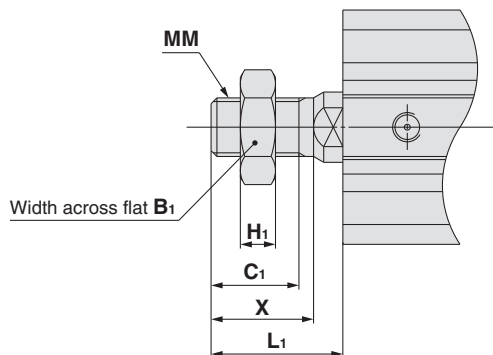


#### With Boss on Head side (mm)

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note 1) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

#### Standard

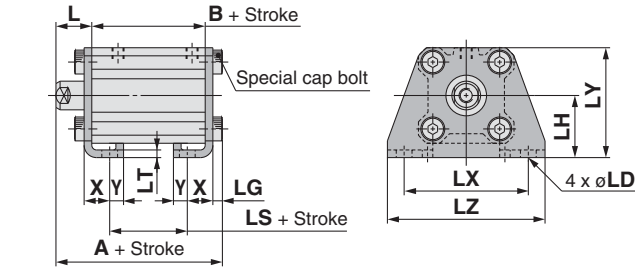
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	K	L	M	N	O	Q	Z
12	5 to 30	20.5	17	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	7.5	-
16	5 to 30	22	18.5	8	8	29	5.5	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	8	10
20	5 to 50	24	19.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	9	10
25	5 to 50	27.5	22.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.5	9 depth 7	11	10

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

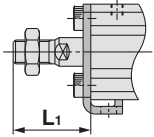
\* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of intermediate strokes, refer to page 3.

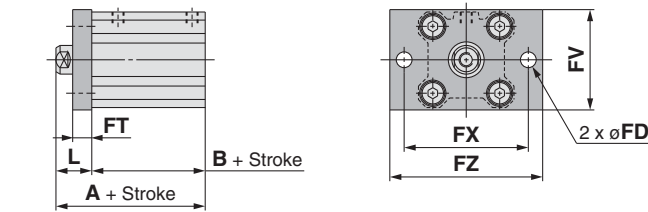
**Foot: CQ2L**



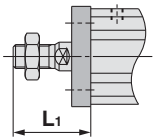
**Rod end male thread**



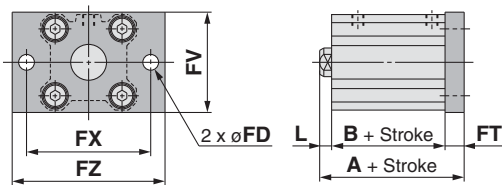
**Rod flange: CQ2F**



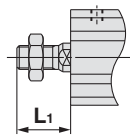
**Rod end male thread**



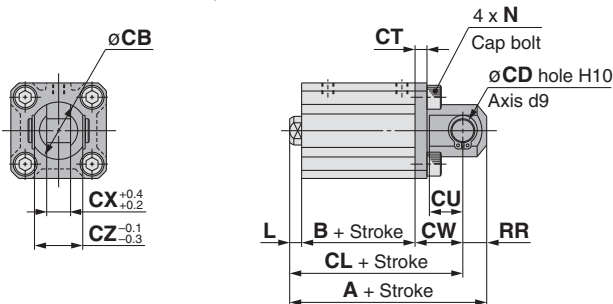
**Head flange: CQ2G**



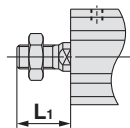
**Rod end male thread**



**Double clevis: CQ2D**



**Rod end male thread**



**Foot**

Bore size (mm)	Stroke range (mm)	A	B	L	L <sub>1</sub>	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	35.3	17	13.5	24	4.5	2.8	17	5	2	34	29.5	44	8	4.5
16	5 to 30	36.8	18.5	13.5	25.5	4.5	2.8	19	6.5	2	38	33.5	48	8	5
20	5 to 50	41.2	19.5	14.5	28.5	6.6	4	24	7.5	3.2	48	42	62	9.2	5.8
25	5 to 50	44.7	22.5	15	32.5	6.6	4	26	7.5	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L	L <sub>1</sub>
12	5 to 30	30.5	17	4.5	5.5	25	45	55	13.5	24
16	5 to 30	32	18.5	4.5	5.5	30	45	55	13.5	25.5
20	5 to 50	34	19.5	6.6	8	39	48	60	14.5	28.5
25	5 to 50	37.5	22.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	Stroke range (mm)	A	L	L <sub>1</sub>
12	5 to 30	26	3.5	14
16	5 to 30	27.5	3.5	15.5
20	5 to 50	32	4.5	18.5
25	5 to 50	35.5	5	22.5

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis**

Bore size (mm)	Stroke range (mm)	A	B	CB	CD	CL	CT	CU	CW	CX	CZ	L	L <sub>1</sub>	N	RR
12	5 to 30	40.5	17	12	5	34.5	4	7	14	5	10	3.5	14	M4 x 0.7	6
16	5 to 30	43	18.5	14	5	37	4	10	15	6.5	12	3.5	15.5	M4 x 0.7	6
20	5 to 50	51	19.5	20	8	42	5	12	18	8	16	4.5	18.5	M6 x 1.0	9
25	5 to 50	57.5	22.5	24	10	47.5	5	14	20	10	20	5	22.5	M6 x 1.0	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

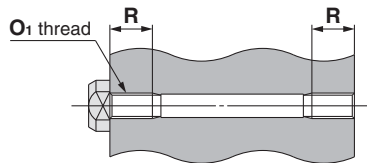
Made to Order

# Series CQ2

## Dimensions

### Ø12 to Ø25/With Auto Switch

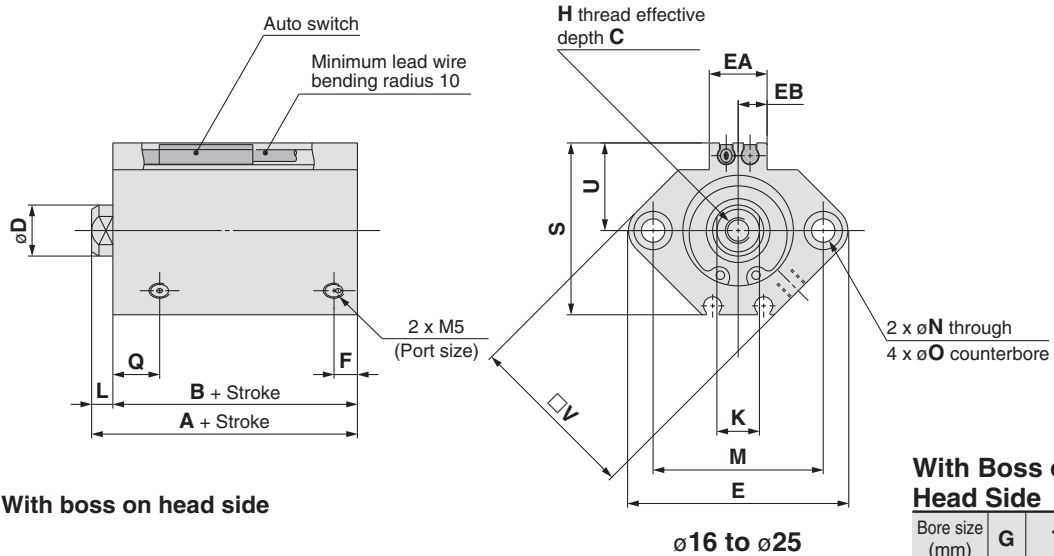
#### Both ends tapped: CDQ2A



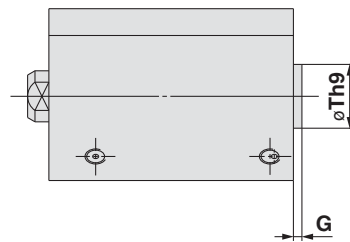
#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CDQ2B



#### With boss on head side

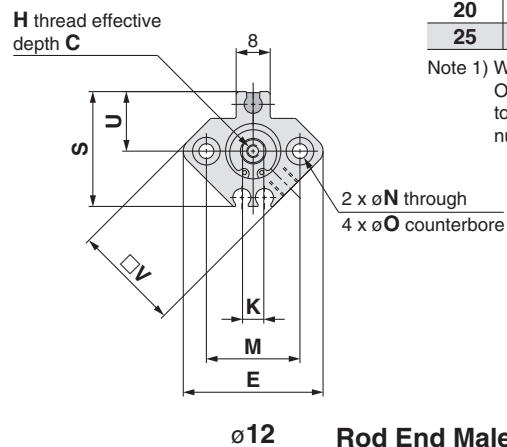
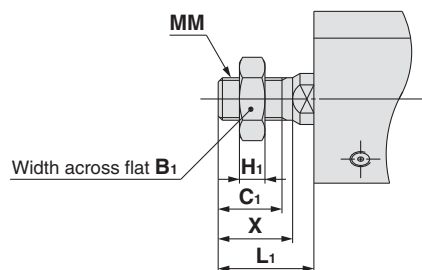


#### With Boss on Head Side (mm)

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note 1) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

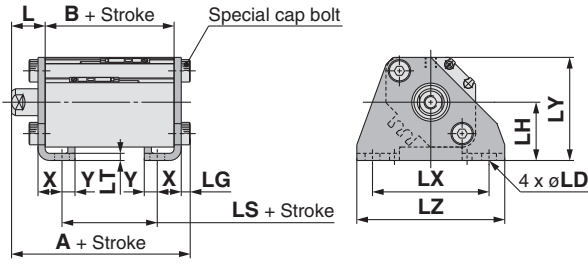
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	H	K	L	M	N	O	Q	S	U	V
12	5 to 30	31.5	28	6	6	33	—	—	6.5	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
16	5 to 30	34	30.5	8	8	37	13.2	6.6	5.5	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
20	5 to 50	36	31.5	7	10	47	13.6	6.8	5.5	M5 x 0.8	8	4.5	36	5.5	9 depth 7	10.5	35.5	18	36
25	5 to 50	37.5	32.5	12	12	52	13.6	6.8	5.5	M6 x 1.0	10	5	40	5.5	9 depth 7	11	40.5	21	40

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of intermediate strokes, refer to page 3.

**Foot: CDQ2L**

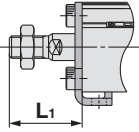


**Foot**

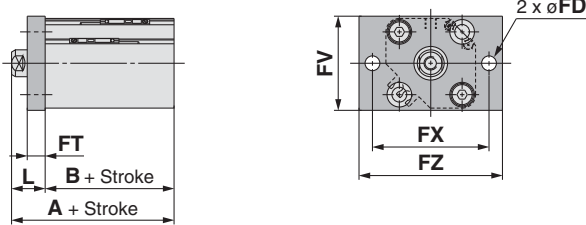
Bore size (mm)	Stroke range (mm)	A	B	L	L <sub>1</sub>	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	46.3	28	13.5	24	4.5	2.8	17	16	2	34	29.5	44	8	4.5
16	5 to 30	48.8	30.5	13.5	25.5	4.5	2.8	19	18.5	2	38	33.5	48	8	5
20	5 to 50	53.2	31.5	14.5	28.5	6.6	4	24	19.5	3.2	48	42	62	9.2	5.8
25	5 to 50	54.7	32.5	15	32.5	6.6	4	26	17.5	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod end male thread**



**Rod flange: CDQ2F**

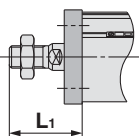


**Rod Flange**

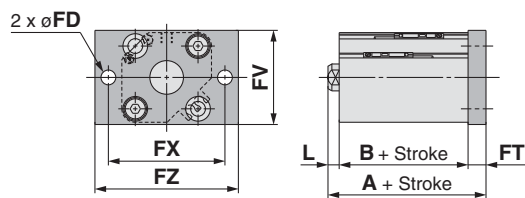
Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L	L <sub>1</sub>
12	5 to 30	41.5	28	4.5	5.5	25	45	55	13.5	24
16	5 to 30	44	30.5	4.5	5.5	30	45	55	13.5	25.5
20	5 to 50	46	31.5	6.6	8	39	48	60	14.5	28.5
25	5 to 50	47.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod end male thread**



**Head flange: CDQ2G**



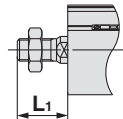
**Head Flange**

Bore size (mm)	Stroke range (mm)	A	L	L <sub>1</sub>
12	5 to 30	37	3.5	14
16	5 to 30	39.5	3.5	15.5
20	5 to 50	44	4.5	18.5
25	5 to 50	45.5	5	22.5

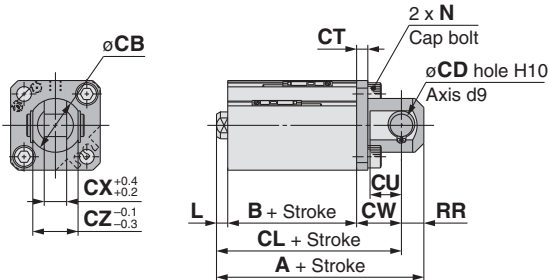
(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod end male thread**



**Double clevis: CDQ2D**



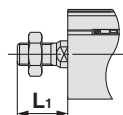
**Double Clevis**

Bore size (mm)	Stroke range (mm)	A	B	CB	CD	CL	CT	CU	CW	CX	CZ	L	L <sub>1</sub>	N	RR
12	5 to 30	51.5	28	12	5	45.5	4	7	14	5	10	3.5	14	M4 x 0.7	6
16	5 to 30	55	30.5	14	5	49	4	10	15	6.5	12	3.5	15.5	M4 x 0.7	6
20	5 to 50	63	31.5	20	8	54	5	12	18	8	16	4.5	18.5	M6 x 1.0	9
25	5 to 50	67.5	32.5	24	10	57.5	5	14	20	10	20	5	22.5	M6 x 1.0	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

**Rod end male thread**



Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

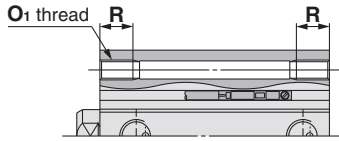
# Series CQ2

## Dimensions

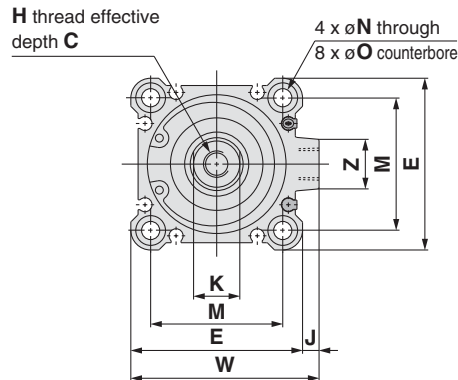
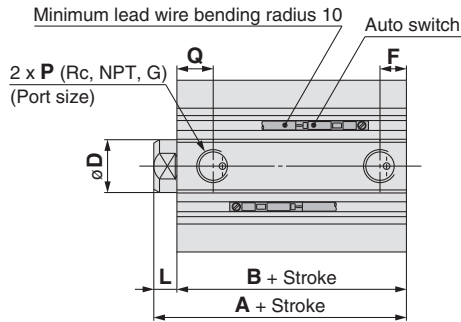
### Ø32 to Ø50/With Auto Switch

(In the case of without auto switches, the A, B, F, P and Q dimensions will be only changed. Refer to the dimension table.)

#### Both ends tapped: CQ2A/CDQ2A



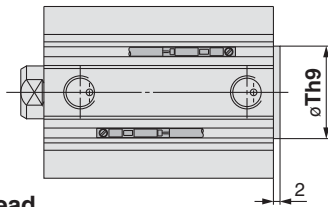
#### Standard (Through-hole): CQ2B/CDQ2B



#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

#### With boss on head side

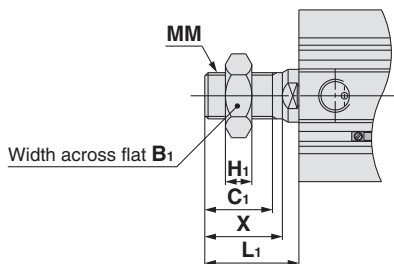


#### With Boss on Head Side (mm)

Bore size (mm)	Th9
32	21 <sup>0</sup> <sub>-0.052</sub>
40	28 <sup>0</sup> <sub>-0.052</sub>
50	35 <sup>0</sup> <sub>-0.062</sub>

Note 1) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

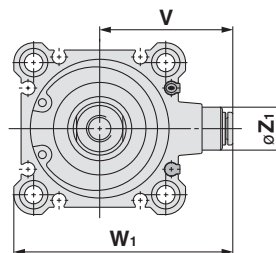
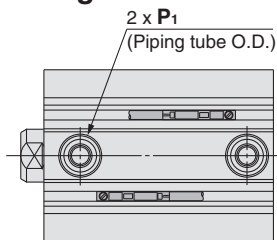
#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

#### Built-in one-touch fittings: Ø32 to Ø50



#### Built-in One-touch Fittings (mm)

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
32	13	6	36.5	59
40	13	6	40.5	66
50	16	8	50	82

#### Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	Without auto switch					With auto switch					C	D	E	H	J	K	L	M	N
		A	B	F	P	Q	A	B	F	P	Q									
32	5	30	23	5.5	M5 x 0.8	11.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
	10 to 50	40	33	7.5	1/8	10.5														
	75, 100	40	33	7.5	1/8	10.5														
40	5 to 50	36.5	29.5	8	1/8	11	46.5	39.5	8	1/8	11	13	16	52	M8 x 1.25	5	14	7	40	5.5
	75, 100	46.5	39.5																	
	10 to 50	38.5	30.5																	
50	10 to 50	38.5	30.5	10.5	1/4	10.5	48.5	40.5	10.5	1/4	10.5	15	20	64	M10 x 1.5	7	17	8	50	6.6
	75, 100	48.5	40.5																	

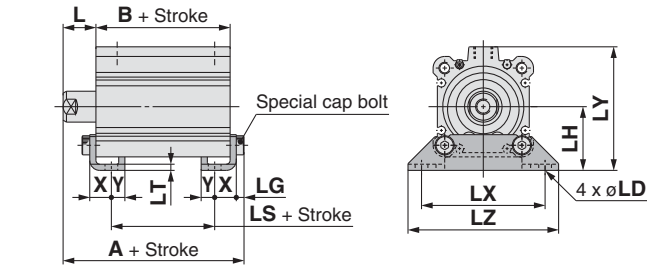
Bore size (mm)	O	W	Z
32	9 depth 7	49.5	14
40	9 depth 7	57	15
50	11 depth 8	71	19

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

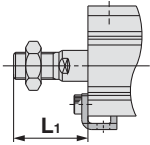
\* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of intermediate strokes, refer to page 3. The spacer-installed type (Standard, -XB10A) and the exclusive body type (-XB10) are available.

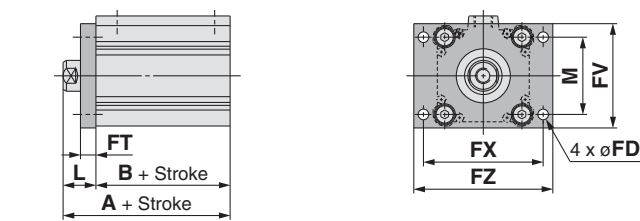
**Foot: CQ2L/CDQ2L**



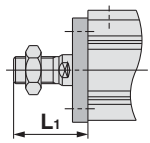
**Rod end male thread**



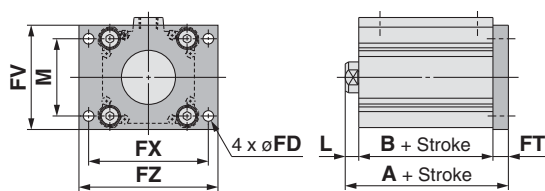
**Rod flange: CQ2F/CDQ2F**



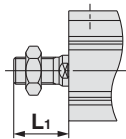
**Rod end male thread**



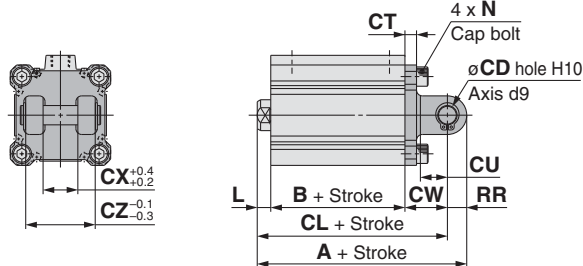
**Head flange: CQ2G/CDQ2G**



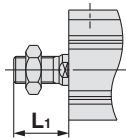
**Rod end male thread**



**Double clevis: CQ2D/CDQ2D**



**Rod end male thread**



**Foot**

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD	LG	LH	LT	LX	LY
		A	B	LS	A	B	LS								
32	5 to 50	47.2	23	7	57.2	33	17	17	38.5	6.6	4	30	3.2	57	57
	75, 100	57.2	33	17											
40	5 to 50	53.7	29.5	13.5	63.7	39.5	23.5	17	38.5	6.6	4	33	3.2	64	64
	75, 100	63.7	39.5	23.5											
50	10 to 50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	9	5	39	3.2	79	78
	75, 100	66.7	40.5	17.5											

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

Bore size (mm)	LZ	X	Y
32	71	11.2	5.8
40	78	11.2	7
50	95	14.7	8

**Rod Flange**

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
		A	B	A	B								
32	5 to 50	40	23	50	33	5.5	8	48	56	65	17	38.5	34
	75, 100	50	33										
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72	17	38.5	40
	75, 100	56.5	39.5										
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89	18	43.5	50
	75, 100	58.5	40.5										

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		L	L <sub>1</sub>
		A	B	A	B		
32	5 to 50	38		48		7	28.5
	75, 100	48					
40	5 to 50	44.5		54.5		7	28.5
	75, 100	54.5					
50	10 to 50	47.5		57.5		8	33.5
	75, 100	57.5					

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis**

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU	CW	CX	CZ	L	L <sub>1</sub>
		A	B	CL	A	B	CL								
32	5 to 50	60	23	50	70	33	60	10	5	14	20	18	36	7	28.5
	75, 100	70	33	60											
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14	22	18	36	7	28.5
	75, 100	78.5	39.5	68.5											
50	10 to 50	80.5	30.5	66.5	90.5	40.5	76.5	14	7	20	28	22	44	8	33.5
	75, 100	90.5	40.5	76.5											

Double clevis bracket material: Cast iron  
Surface treatment: Painted

Bore size (mm)	N	RR
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

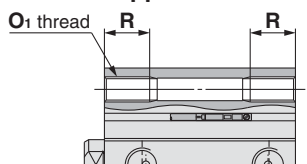
# Series CQ2

## Dimensions

### Ø63 to Ø100/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

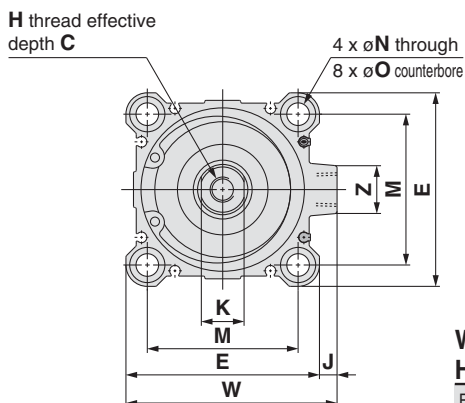
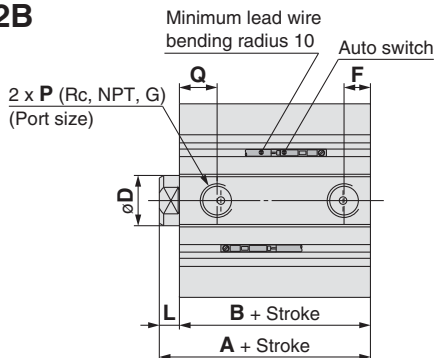
#### Both ends tapped: CQ2A/CDQ2A



#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

#### Standard (Through-hole): CQ2B/CDQ2B

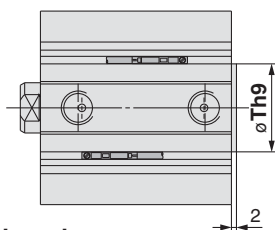


#### With Boss on Head Side (mm)

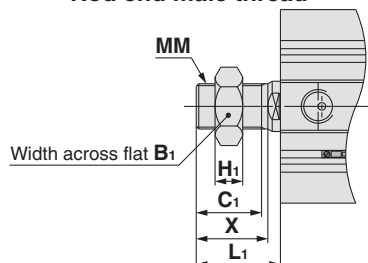
Bore size (mm)	Th9
63	35 <sup>0</sup> <sub>-0.062</sub>
80	43 <sup>0</sup> <sub>-0.062</sub>
100	59 <sup>0</sup> <sub>-0.074</sub>

Note 1) With boss on rod end:  
Option (Suffix "-XC36" to the end of model number.)

#### With boss on head side



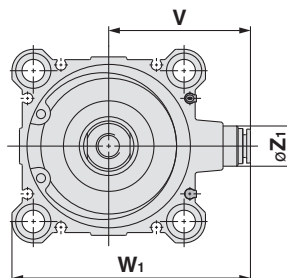
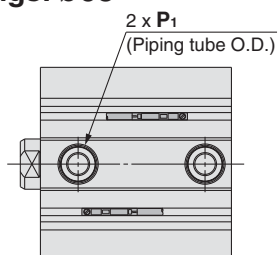
#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

#### Built-in one-touch fittings: Ø63



#### Built-in One-touch Fittings (mm)

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
63	16	8	56.5	95

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B															
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	7	17	8	60	9	14 depth 10.5	1/4	15	84	19
	75, 100	54	46																	
80	10 to 50	53.5	43.5	63.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	10	77	11	17.5 depth 13.5	3/8	16	104	25
	75, 100	63.5	53.5																	
100	10 to 50	65	53	75	63	27	30	117	13	M20 x 2.5	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	123.5	25
	75, 100	75	63																	

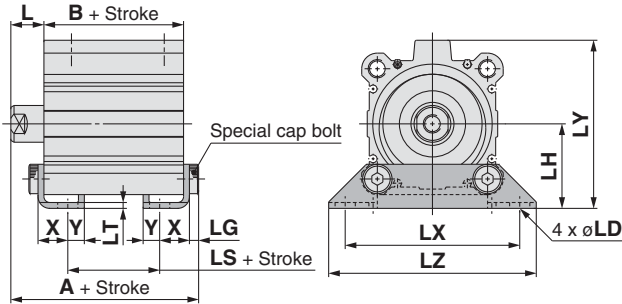
Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to page 19.

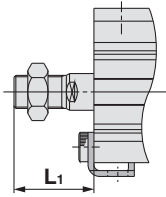
Note 3) For calculation on the longitudinal dimension of intermediate strokes, refer to page 3.



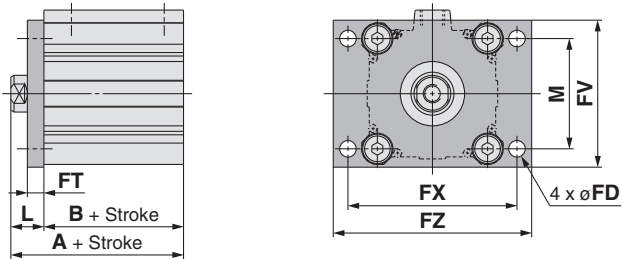
**Foot: CQ2L/CDQ2L**



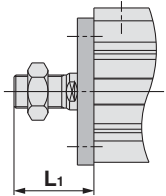
Rod end male thread



**Rod flange: CQ2F/CDQ2F**



Rod end male thread



**Foot** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD	LG	LH	LT
		A	B	LS	A	B	LS						
63	10 to 50	62.2	36	10	72.2	46	20	18	43.5	11	5	46	3.2
	75, 100	72.2	46	20									
80	10 to 50	75	43.5	13.5	85	53.5	23.5	20	53.5	13	7	59	4.5
	75, 100	85	53.5	23.5									
100	10 to 50	88	53	19	98	63	29	22	53.5	13	7	71	6
	75, 100	98	63	29									

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

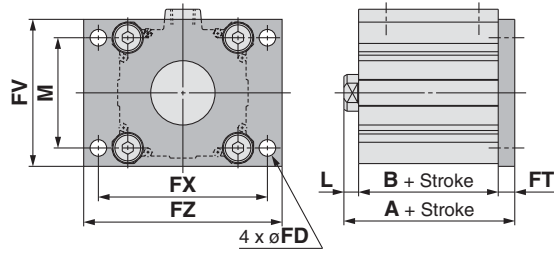
Bore size (mm)	Stroke range (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

**Rod Flange** (mm)

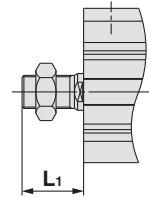
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
		A	B	A	B								
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63	11	11	117	136	154	22	53.5	94
	75, 100	85	63										

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

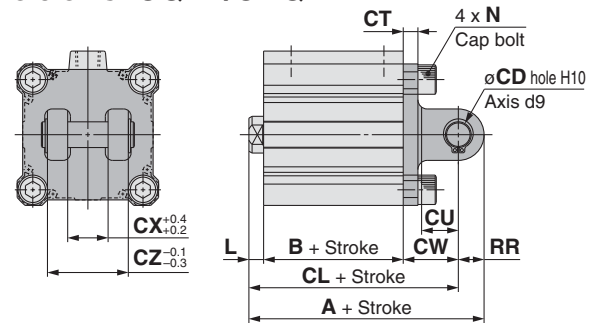
**Head flange: CQ2G/CDQ2G**



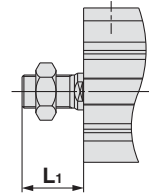
Rod end male thread



**Double clevis: CQ2D/CDQ2D**



Rod end male thread



**Head Flange** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		L	L <sub>1</sub>
		A	A	A	A		
63	10 to 50	53	63	63	8	33.5	
	75, 100	63					
80	10 to 50	64.5	74.5	74.5	10	43.5	
	75, 100	74.5					
100	10 to 50	76	86	86	12	43.5	
	75, 100	86					

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel Surface treatment: Nickel plated

**Double Clevis** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU	CW	CX
		A	B	CL	A	B	CL					
63	10 to 50	88	36	74	98	46	84	14	8	20	30	22
	75, 100	98	46	84								
80	10 to 50	109.5	43.5	91.5	119.5	53.5	101.5	18	10	27	38	28
	75, 100	119.5	53.5	101.5								
100	10 to 50	132	53	110	142	63	120	22	13	31	45	32
	75, 100	142	63	120								

Double clevis bracket material: Cast iron  
Surface treatment: Painted

Bore size (mm)	Stroke range (mm)	CZ	L	L <sub>1</sub>	N	RR
63	10 to 50	44	8	33.5	M10 x 1.5	14
	75, 100					
80	10 to 50	56	10	43.5	M12 x 1.75	18
	75, 100					
100	10 to 50	64	12	43.5	M12 x 1.75	22
	75, 100					

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

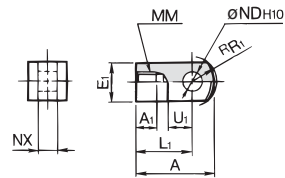
Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Accessory Brackets

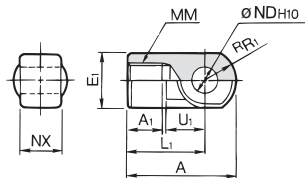
### Single Knuckle Joint

I-G012, I-Z015A  
I-G02, I-G03



Material: Carbon steel  
Surface treatment: Nickel plated

I-G04, I-G05  
I-G08, I-G10



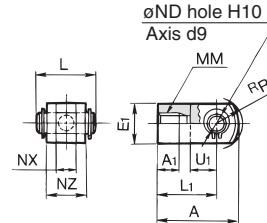
Material: Cast iron  
Surface treatment: Nickel plated

(mm)

Part no.	Applicable bore size (mm)	A	A <sub>1</sub>	E <sub>1</sub>	L <sub>1</sub>	MM	R <sub>R1</sub>	U <sub>1</sub>	ND <sub>H10</sub>	NX
I-G012	12	21.5	6	□10	16	M5 x 0.8	6.3	7	5 <sup>+0.048</sup> <sub>0</sub>	5 <sup>-0.2</sup> <sub>-0.4</sub>
I-Z015A	16	32	8	□12	25	M6 x 1	8.1	14	5 <sup>+0.048</sup> <sub>0</sub>	6.4 <sup>-0.1</sup> <sub>-0.3</sub>
I-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 <sup>+0.058</sup> <sub>0</sub>	8 <sup>-0.2</sup> <sub>-0.4</sub>
I-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 <sup>+0.058</sup> <sub>0</sub>	10 <sup>-0.2</sup> <sub>-0.4</sub>
I-G04	32, 40	42	14	∅22	30	M14 x 1.5	12	14	10 <sup>+0.058</sup> <sub>0</sub>	18 <sup>-0.3</sup> <sub>-0.5</sub>
I-G05	50, 63	56	18	∅28	40	M18 x 1.5	16	20	14 <sup>+0.070</sup> <sub>0</sub>	22 <sup>-0.3</sup> <sub>-0.5</sub>
I-G08	80	71	21	∅38	50	M22 x 1.5	21	27	18 <sup>+0.070</sup> <sub>0</sub>	28 <sup>-0.3</sup> <sub>-0.5</sub>
I-G10	100	79	21	∅44	55	M26 x 1.5	24	31	22 <sup>+0.084</sup> <sub>0</sub>	32 <sup>-0.3</sup> <sub>-0.5</sub>

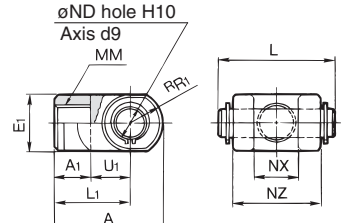
### Double Knuckle Joint

Y-G012, Y-Z015A  
Y-G02, Y-G03



Material: Carbon steel  
Surface treatment: Nickel plated

Y-G04, Y-G05  
Y-G08, Y-G10



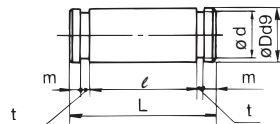
Material: Cast iron  
Surface treatment: Nickel plated

(mm)

Part no.	Applicable bore size (mm)	A	A <sub>1</sub>	E <sub>1</sub>	L <sub>1</sub>	MM	R <sub>R1</sub>	U <sub>1</sub>	ND <sub>H10</sub>	NX	NZ	L	Applicable pin part no.
Y-G012	12	21.5	6	□10	16	M5 x 0.8	6.3	7	5 <sup>+0.048</sup> <sub>0</sub>	5 <sup>+0.4</sup> <sub>-0.2</sub>	10	14.6	IY-G012
Y-Z015A	16	28	11	□12	21	M6 x 1	8.1	10	5 <sup>+0.048</sup> <sub>0</sub>	6.5 <sup>+0.2</sup> <sub>0</sub>	12	16.6	IY-J015
Y-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 <sup>+0.058</sup> <sub>0</sub>	8 <sup>+0.4</sup> <sub>+0.2</sub>	16	21	IY-G02
Y-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 <sup>+0.058</sup> <sub>0</sub>	10 <sup>+0.4</sup> <sub>+0.2</sub>	20	25.6	IY-G03
Y-G04	32, 40	42	16	∅22	30	M14 x 1.5	12	14	10 <sup>+0.058</sup> <sub>0</sub>	18 <sup>+0.5</sup> <sub>+0.3</sub>	36	41.6	IY-G04
Y-G05	50, 63	56	20	∅28	40	M18 x 1.5	16	20	14 <sup>+0.070</sup> <sub>0</sub>	22 <sup>+0.5</sup> <sub>+0.3</sub>	44	50.6	IY-G05
Y-G08	80	71	23	∅38	50	M22 x 1.5	21	27	18 <sup>+0.070</sup> <sub>0</sub>	28 <sup>+0.5</sup> <sub>+0.3</sub>	56	64	IY-G08
Y-G10	100	79	24	∅44	55	M26 x 1.5	24	31	22 <sup>+0.084</sup> <sub>0</sub>	32 <sup>+0.5</sup> <sub>+0.3</sub>	64	72	IY-G10

\* Knuckle pin and retaining rings are included.

### Knuckle Pin (Common with double clevis pin)

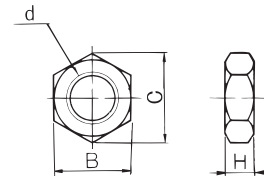


Material: Carbon steel  
(mm)

Part no.	Applicable bore size (mm)	Dd9	L	d	ℓ	m	t	Applicable retaining ring
IY-G012	12	5 <sup>-0.030</sup> <sub>-0.060</sub>	14.6	4.8	10.2	1.5	0.7	Type C5 for axis
IY-J015	16	5 <sup>-0.030</sup> <sub>-0.060</sub>	16.6	4.8	12.2	1.5	0.7	Type C5 for axis
IY-G02	20	8 <sup>-0.040</sup> <sub>-0.076</sub>	21	7.6	16.2	1.5	0.9	Type C8 for axis
IY-G03	25	10 <sup>-0.040</sup> <sub>-0.076</sub>	25.6	9.6	20.2	1.55	1.15	Type C10 for axis
IY-G04	32, 40	14 <sup>-0.050</sup> <sub>-0.093</sub>	41.6	9.6	36.2	1.55	1.15	Type C10 for axis
IY-G05	50, 63	14 <sup>-0.050</sup> <sub>-0.093</sub>	50.6	13.4	44.2	2.05	1.15	Type C14 for axis
IY-G08	80	18 <sup>-0.050</sup> <sub>-0.093</sub>	64	17	56.2	2.55	1.35	Type C18 for axis
IY-G10	100	22 <sup>-0.065</sup> <sub>-0.117</sub>	72	21	64.2	2.55	1.35	Type C22 for axis

\* Type C retaining rings for axis are included.

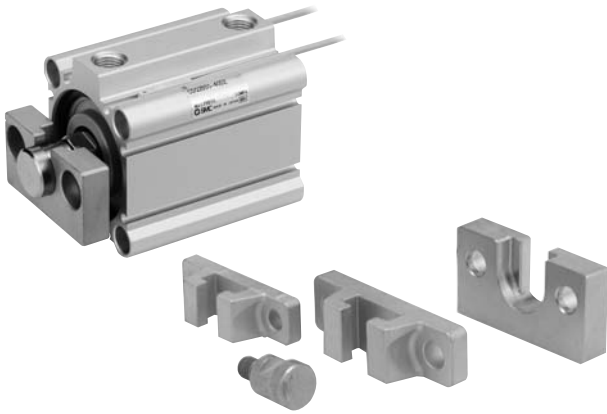
### Rod End Nut



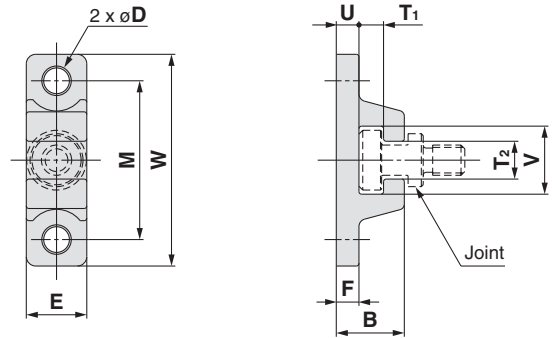
Material: Carbon steel  
Surface treatment: Nickel plated  
(mm)

Part no.	Applicable bore size (mm)	d	H	B	C
NTJ-015A	12	M5 x 0.8	4	8	9.2
NT-015A	16	M6 x 1	5	10	11.5
NT-02	20	M8 x 1.25	5	13	15.0
NT-03	25	M10 x 1.25	6	17	19.6
NT-04	32, 40	M14 x 1.5	8	22	25.4
NT-05	50, 63	M18 x 1.5	11	27	31.2
NT-08	80	M22 x 1.5	13	32	37.0
NT-10	100	M26 x 1.5	16	41	47.3

**Simple Joint (CQ2):  $\phi 32$  to  $\phi 100$**



**Type A Mounting Bracket**



Material: Chromium molybdenum steel (Nickel plated) (mm)

Part no.	Bore size (mm)	B	D	E	F	M	T <sub>1</sub>	T <sub>2</sub>
YA-03	32, 40	18	6.8	16	6	42	6.5	10
YA-05	50, 63	20	9	20	8	50	6.5	12
YA-08	80	26	11	25	10	62	8.5	16
YA-10	100	31	14	30	12	76	10.5	18

Part no.	Bore size (mm)	U	V	W	Weight (g)
YA-03	32, 40	6	18	56	55
YA-05	50, 63	8	22	67	100
YA-08	80	10	28	83	195
YA-10	100	12	36	100	340

**Joint/Mounting Bracket (Type A/B)/Part No.**

**YA - 03**

• Applicable air cylinder bore size

<b>03</b>	For $\phi 32, \phi 40$
<b>05</b>	For $\phi 50, \phi 63$
<b>08</b>	For $\phi 80$
<b>10</b>	For $\phi 100$

• Mounting bracket

<b>YA</b>	Type A mounting bracket
<b>YB</b>	Type B mounting bracket
<b>YU</b>	Joint

**Allowable Eccentricity** (mm)

Bore size (mm)	32	40	50	63	80	100
Eccentricity tolerance	±1			±1.5		±2
Backlash	0.5					

<Ordering>

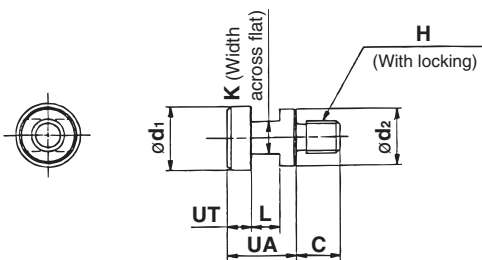
- Joints are not included with type A or B mounting brackets. Order them separately.

(Example)

- Bore size  $\phi 40$  Part no.
- Type A mounting bracket ..... YA-03
- Joint ..... YU-03

**Joint/Mounting Bracket (Type A/B)/Part No.**

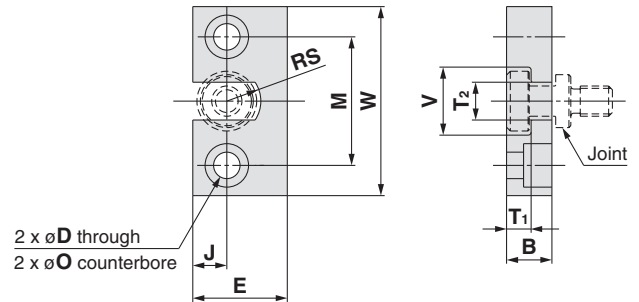
Bore size (mm)	Joint	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
<b>32, 40</b>	YU-03	YA-03	YB-03
<b>50, 63</b>	YU-05	YA-05	YB-05
<b>80</b>	YU-08	YA-08	YB-08
<b>100</b>	YU-10	YA-10	YB-10



Material: Chromium molybdenum steel (Nickel plated) (mm)

Part no.	Applicable bore size (mm)	UA	C	d <sub>1</sub>	d <sub>2</sub>	H	K	L	UT	Weight (g)
<b>YU-03</b>	<b>32, 40</b>	17	11	15.8	14	M8 x 1.25	8	7	6	25
<b>YU-05</b>	<b>50, 63</b>	17	13	19.8	18	M10 x 1.5	10	7	6	40
<b>YU-08</b>	<b>80</b>	22	20	24.8	23	M16 x 2	13	9	8	90
<b>YU-10</b>	<b>100</b>	26	26	29.8	28	M20 x 2.5	14	11	10	160

**Type B Mounting Bracket**



Material: Stainless steel (mm)

Part no.	Bore size (mm)	B	D	E	J	M	$\phi O$
<b>YB-03</b>	<b>32, 40</b>	12	7	25	9	34	11.5 depth 7.5
<b>YB-05</b>	<b>50, 63</b>	12	9	32	11	42	14.5 depth 8.5
<b>YB-08</b>	<b>80</b>	16	11	38	13	52	18 depth 12
<b>YB-10</b>	<b>100</b>	19	14	50	17	62	21 depth 14

Part no.	Bore size (mm)	T <sub>1</sub>	T <sub>2</sub>	V	W	RS	Weight (g)
<b>YB-03</b>	<b>32, 40</b>	6.5	10	18	50	9	80
<b>YB-05</b>	<b>50, 63</b>	6.5	12	22	60	11	120
<b>YB-08</b>	<b>80</b>	8.5	16	28	75	14	230
<b>YB-10</b>	<b>100</b>	10.5	18	36	90	18	455

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order



# Compact Cylinder: Standard Double Acting, Double Rod Series CQ2W

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

## How to Order

Without auto switch  
ø12 to ø25

CQ2W B [ ] 20 [ ] - 30 D [ ] - [ ]

Without auto switch  
ø32 to ø100

CQ2W B [ ] 32 [ ] - 30 D [ ] Z - [ ]

With auto switch

CDQ2W B [ ] 32 [ ] - 30 D [ ] Z - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

<b>B</b>	Through-hole (Standard)	<b>L</b>	Foot
<b>A</b>	Both ends tapped	<b>F</b>	Flange

\* Mounting brackets are shipped together, (but not assembled).  
\* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for C(D)Q2WB" on pages 25 and 28.

### Mounting

### Type

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

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

—	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 <sup>Note 2)</sup>	

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 the air-hydro type.

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

### Auto switch

— Without auto switch

\* 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

### Number of auto switches

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

### Made to Order

Refer to the next page for details.

### Body option

—	Standard (Rod end female thread)
<b>C</b>	With rubber bumper <sup>Note 4)</sup>
<b>M</b>	Rod end male thread

\* Combination of body options ("CM") is available.

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

### Action

**D** Double acting

### Cylinder stroke (mm)

Refer to the next page for standard 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) CDQ2WL32-25DZ

## Applicable Auto Switches

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

Refer to the individual catalogue (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 (—)	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>	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○			
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	●	●	○	—	○			
	3-wire (NPN)			<b>M9NWV</b>				<b>M9NW</b>	●	●	●	○	—	○	IC circuit			
	3-wire (PNP)			<b>M9PWV</b>				<b>M9PW</b>	●	●	●	○	—	○				
	2-wire			<b>M9B WV</b>				<b>M9B W</b>	●	●	●	○	—	○	—		○	—
	3-wire (NPN)			<b>M9NAV**</b>				<b>M9NA**</b>	○	○	●	○	—	○				
	3-wire (PNP)			<b>M9PAV**</b>				<b>M9PA**</b>	○	○	●	○	—	○	IC circuit			
	2-wire			<b>M9BAV**</b>				<b>M9BA**</b>	○	○	●	○	—	○				
	2-wire (Non-polar)			—				<b>P3DW</b>	●	—	●	●	—	○	—		○	—
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	<b>A96V</b>	<b>A96</b>	●	—	●	—	—	—	IC circuit	—	
				2-wire				<b>A93V</b>	<b>A93</b>	●	—	●	—	—	—	—	—	Relay, PLC
								<b>A90V</b>	<b>A90</b>	●	—	●	—	—	—	—	—	—

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

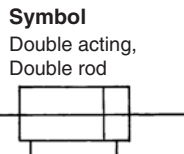
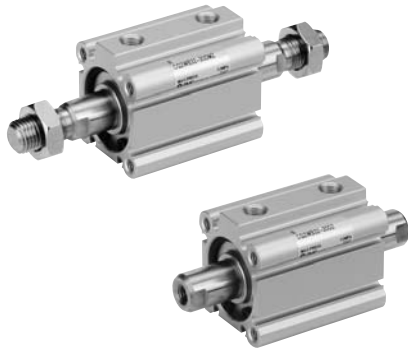
\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NLW  
5 m ..... Z (Example) M9NZW

\* 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.

# Series CQ2W



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XA□	Special rod end shape
-XB6	Heat resistant cylinder (-10 to 150°C) w/o auto switch only
-XB7	Heat 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)
-XC4	With heavy-duty scraper, ø40 to ø100 only
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC35	With coil scraper, ø32 to ø100 only
-XC36	With boss on rod side
-X144	Special port location, with auto switch ø12 to ø25 only
-X235	Special rod end for double rod cylinder
-X271	Fluororubber seals
-X293	Full length dimension is the same as Series CQ1W.
-X633	Intermediate stroke of double rod cylinder

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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

### Pneumatic type

Bore size (mm)	12	16	20	25	32	40	50	63	80	100	
<b>Action</b>	Double acting, Double 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, Double 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 (Non-lube) (mm)

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

### Air-hydro type (mm)

Bore size	Standard stroke
<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</b>	10, 15, 20, 25, 30
<b>80, 100</b>	35, 40, 45, 50, 75, 100

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body. (5 mm intervals)	A spacer is installed in the standard stroke body. (1 mm intervals)	Exclusive body (-XB10)			
<b>Part no.</b>	Refer to "How to Order" for the standard model number. (P. 22)	Suffix "-X633" (P. 205) to the end of standard model number. (P. 22)	Suffix "-XB10" to the end of standard model number. (P. 22)			
<b>Description</b>	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.			
<b>Stroke range</b>	Bore size	Stroke range	Bore size	Stroke range	Bore size	Stroke range
	—	—	12, 16	6 to 29	12, 16	6 to 29
	—	—	20, 25	6 to 49	20, 25	6 to 49
	32 to 100	55 to 95	32, 40	6 to 99	32, 40	6 to 99
—	—	50 to 100	11 to 99	50 to 100	11 to 99	
<b>Example</b>	Part no.: CQ2WB50-65DZ CQ2WB50-75DZ with 10 mm width spacer inside The B dimension is 125.5 mm.	Part no.: CQ2WB50-72DZ-X633 CQ2WB50-75DZ with 3 mm width spacer inside The B dimension is 125.5 mm.	Part no.: CQ2WB50-65DZ-XB10 Makes 65 mm stroke tube. The B dimension is 115.5 mm.			

- Except air-hydro type
- In the case of spacer type, intermediate strokes with bumper for ø40 to ø100, "-X633" is not available.
- In the case of exclusive body type with ø32 to ø100 (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension will be changed.  
Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.

## Type

Bore size (mm)		12	16	20	25	32	40	50	63	80	100		
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●	●	●		
		Both ends tapped	●	●	●	●	●	●	●	●	●		
	Built-in magnet		●	●	●	●	●	●	●	●	●		
	Piping	Pipe thread	—	M5	M5	M5	M5	Note 1) M5 Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
		TF	—	—	—	—	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	
		Built-in one-touch fittings Note 3)	—	—	—	—	ø6/4 Note 2)	ø6/4	ø8/6	ø8/6	—	—	
	Rod end male thread		●	●	●	●	●	●	●	●	●	●	
	With rubber bumper		●	●	●	●	●	●	●	●	●	●	
	Air-hydro	Mounting	Through-hole (Standard)	—	—	●	●	●	●	●	●	●	
Both ends tapped			—	—	●	●	●	●	●	●	●		
Built-in magnet		—	—	●	●	●	●	●	●	●			
Piping		Pipe thread	—	—	—	M5	M5	Note 1) M5 Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
Rod end male thread		—	—	●	●	●	●	●	●	●	●		

Note 1) ø32 without auto switch: M5 is used for 5 mm stroke/piping dimension.  
Thus, do not enter a symbol for the port thread type.

Note 2) The dimension of the ø32-5 mm stroke with built-in one-touch fittings is the same as that of the 10 mm stroke cylinder tube.

Note 3) One-touch fittings cannot be replaced.

### Retaining Ring Installation/Removal

#### ⚠ Caution

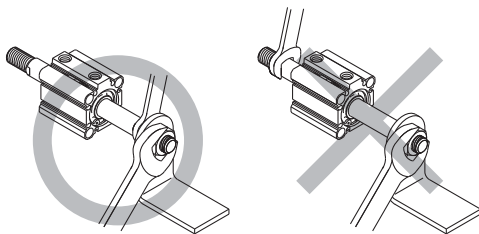
- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

### Mounting

#### ⚠ Warning

Do not apply reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction.

Install or remove loads while the piston rod width across flat is secured. Do not fix the other side of the piston rod width across flat and apply reverse torque.



## Mounting Brackets/Part No.

Bore size (mm)	Model	Foot Note 4)	Flange	
12	Without switch	CQ2□□-□D	CQ-L012	CQ-F012
	With switch	CQ2□□-□DZ	CQ-LZ12	
16	Without switch	CQ2□□-□D	CQ-L016	CQ-F016
	With switch	CQ2□□-□DZ	CQ-LZ16	
20	Without switch	CQ2□□-□D	CQ-L020	CQ-F020
	With switch	CQ2□□-□DZ	CQ-LZ20	
25	Without switch	CQ2□□-□D	CQ-L025	CQ-F025
	With switch	CQ2□□-□DZ	CQ-LZ25	
32	CQ2□□-□DZ	CQ-L032	CQ-F032	
40	CQ2□□-□DZ	CQ-L040	CQ-F040	
50	CQ2□□-□DZ	CQ-L050	CQ-F050	
63	CQ2□□-□DZ	CQ-L063	CQ-F063	
80	CQ2□□-□DZ	CQ-L080	CQ-F080	
100	CQ2□□-□DZ	CQ-L100	CQ-F100	

Note 4) 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)

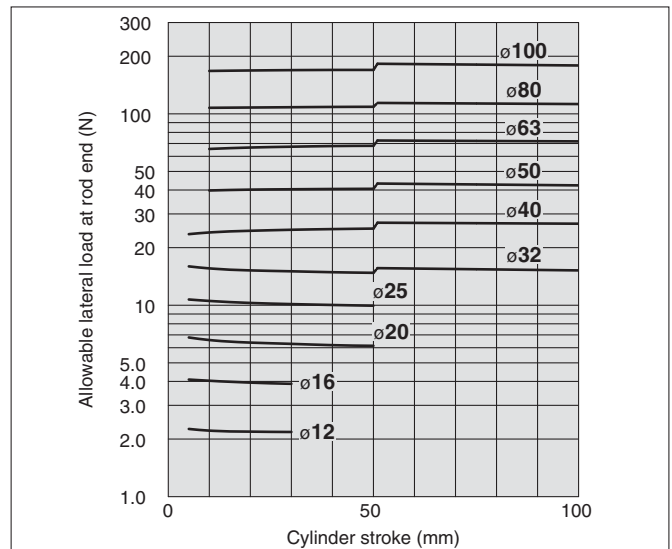
ø32 to ø100:

- Order 2 pieces per cylinder.

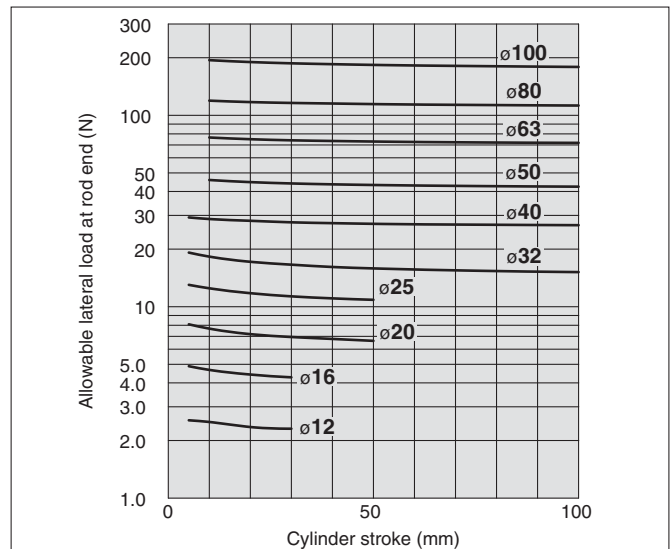
Note 5) Parts belonging to each bracket are as follows.  
Foot or Flange: Body mounting bolts

## Allowable Lateral Load at Rod End

### Without Auto Switch



### With Auto Switch



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2W

## Theoretical Output

Bore size (mm)	Operating pressure (MPa)		
	0.3	0.5	0.7
12	25	42	59
16	45	75	106
20	71	118	165
25	113	189	264
32	181	302	422
40	317	528	739
50	495	825	1150
63	841	1400	1960
80	1360	2270	3170
100	2140	3570	5000

## Weight

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	42	49	56	63	70	77	—	—	—	—	—	—
16	59	68	77	86	95	104	—	—	—	—	—	—
20	89	104	119	134	149	164	179	194	209	224	—	—
25	119	136	153	170	187	204	221	238	255	272	—	—
32	185	212	235	257	280	303	326	349	372	395	555	670
40	279	308	337	367	396	426	455	484	514	543	749	896
50	—	497	538	580	622	664	705	747	789	830	1122	1331
63	—	646	682	718	754	790	826	862	899	935	1187	1368
80	—	1149	1225	1302	1378	1455	1531	1608	1684	1760	2296	2678
100	—	1960	2068	2177	2286	2394	2503	2612	2720	2829	3589	4132

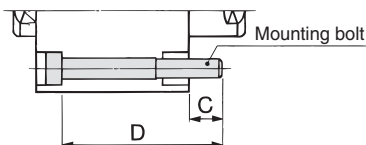
## Additional Weight

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Both ends tapped	2	2	6	6	6	6	6	19	45	45
Rod end male thread	Male thread	3	6	12	24	52	54	106	106	240
	Nut	2	4	8	16	34	34	64	64	98
With rubber bumper	0	0	-2	-2	-3	-7	-12	-20	-34	-57
Built-in one-touch fittings	—	—	—	—	12	12	21	21	—	—
Foot (Including mounting bolts)	57	71	170	195	158	170	267	342	722	1107
Flange (Including mounting bolts)	57	69	139	161	180	214	373	559	1056	1365

Calculation: (Example) **CQ2WF32-20DCMZ**

- Basic weight: CQ2WB32-20DZ ..... 257 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 86 g
  - With rubber bumper ..... -3 g
  - Flange ..... 180 g
- 526 g

## Mounting Bolt for CQ2WB/Without Auto Switch



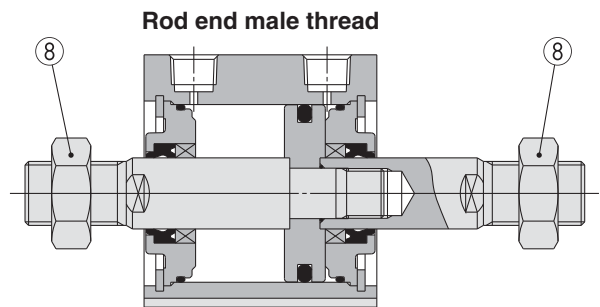
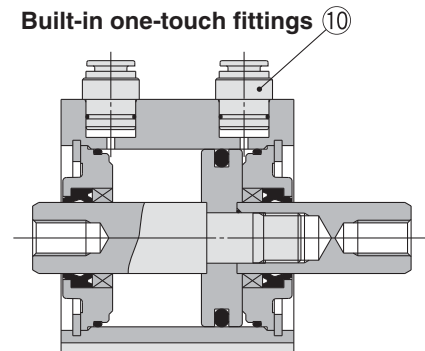
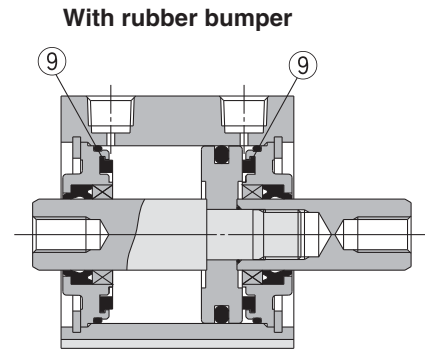
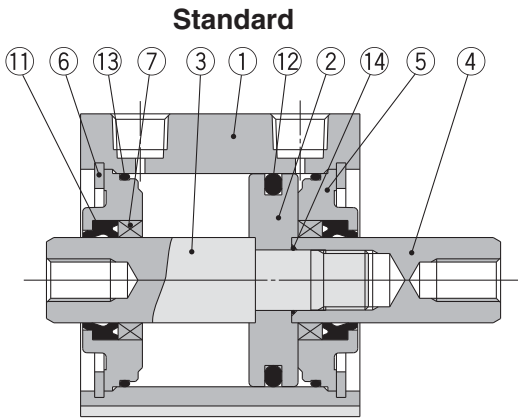
Cylinder model	C	D	Mounting bolt
CQ2WB12-5D	8.3	35	M3X35L
CQ2WB12-10D		40	M3X40L
CQ2WB12-15D		45	M3X45L
CQ2WB12-20D		50	M3X50L
CQ2WB12-25D		55	M3X55L
CQ2WB12-30D		60	M3X60L
CQ2WB16-5D	7.5	35	M3X35L
CQ2WB16-10D		40	M3X40L
CQ2WB16-15D		45	M3X45L
CQ2WB16-20D		50	M3X50L
CQ2WB16-25D		55	M3X55L
CQ2WB16-30D		60	M3X60L
CQ2WB20-5D	6	30	M5X30L
CQ2WB20-10D		35	M5X35L
CQ2WB20-15D		40	M5X40L
CQ2WB20-20D		45	M5X45L
CQ2WB20-25D		50	M5X50L
CQ2WB20-30D		55	M5X55L
CQ2WB20-35D	60	M5X60L	
CQ2WB20-40D	65	M5X65L	
CQ2WB20-45D	70	M5X70L	
CQ2WB20-50D	75	M5X75L	
CQ2WB25-5D	8	35	M5X35L
CQ2WB25-10D		40	M5X40L
CQ2WB25-15D		45	M5X45L
CQ2WB25-20D		50	M5X50L
CQ2WB25-25D		55	M5X55L
CQ2WB25-30D		60	M5X60L
CQ2WB25-35D		65	M5X65L
CQ2WB25-40D		70	M5X70L
CQ2WB25-45D		75	M5X75L
CQ2WB25-50D		80	M5X80L

Cylinder model	C	D	Mounting bolt
CQ2WB32-5DZ	6.5	35	M5X35L
CQ2WB32-10DZ		40	M5X40L
CQ2WB32-15DZ		45	M5X45L
CQ2WB32-20DZ		50	M5X50L
CQ2WB32-25DZ		55	M5X55L
CQ2WB32-30DZ		60	M5X60L
CQ2WB32-35DZ	7	65	M5X65L
CQ2WB32-40DZ		70	M5X70L
CQ2WB32-45DZ		75	M5X75L
CQ2WB32-50DZ		80	M5X80L
CQ2WB32-75DZ		115	M5X115L
CQ2WB32-100DZ		140	M5X140L
CQ2WB40-5DZ	7	45	M5X45L
CQ2WB40-10DZ		50	M5X50L
CQ2WB40-15DZ		55	M5X55L
CQ2WB40-20DZ		60	M5X60L
CQ2WB40-25DZ		65	M5X65L
CQ2WB40-30DZ		70	M5X70L
CQ2WB40-35DZ		75	M5X75L
CQ2WB40-40DZ		80	M5X80L
CQ2WB40-45DZ		85	M5X85L
CQ2WB40-50DZ		90	M5X90L
CQ2WB40-75DZ	12.5	125	M5X125L
CQ2WB40-100DZ		150	M5X150L
CQ2WB50-10DZ		55	M6X55L
CQ2WB50-15DZ		60	M6X60L
CQ2WB50-20DZ		65	M6X65L
CQ2WB50-25DZ		70	M6X70L
CQ2WB50-30DZ	75	M6X75L	
CQ2WB50-35DZ	80	M6X80L	
CQ2WB50-40DZ	85	M6X85L	
CQ2WB50-45DZ	90	M6X90L	
CQ2WB50-50DZ	95	M6X95L	
CQ2WB50-75DZ	130	M6X130L	
CQ2WB50-100DZ	155	M6X155L	

Cylinder model	C	D	Mounting bolt
CQ2WB63-10DZ	13.5	55	M8X55L
CQ2WB63-15DZ		60	M8X60L
CQ2WB63-20DZ		65	M8X65L
CQ2WB63-25DZ		70	M8X70L
CQ2WB63-30DZ		75	M8X75L
CQ2WB63-35DZ		80	M8X80L
CQ2WB63-40DZ	12.5	85	M8X85L
CQ2WB63-45DZ		90	M8X90L
CQ2WB63-50DZ		95	M8X95L
CQ2WB63-75DZ		130	M8X130L
CQ2WB63-100DZ		155	M8X155L
CQ2WB80-10DZ		12.5	60
CQ2WB80-15DZ	65		M10X65L
CQ2WB80-20DZ	70		M10X70L
CQ2WB80-25DZ	75		M10X75L
CQ2WB80-30DZ	80		M10X80L
CQ2WB80-35DZ	85		M10X85L
CQ2WB80-40DZ	90		M10X90L
CQ2WB80-45DZ	95		M10X95L
CQ2WB80-50DZ	100		M10X100L
CQ2WB80-75DZ	135		M10X135L
CQ2WB80-100DZ	160	M10X160L	
CQ2WB100-10DZ	13	70	M10X70L
CQ2WB100-15DZ		75	M10X75L
CQ2WB100-20DZ		80	M10X80L
CQ2WB100-25DZ		85	M10X85L
CQ2WB100-30DZ		90	M10X90L
CQ2WB100-35DZ		95	M10X95L
CQ2WB100-40DZ		100	M10X100L
CQ2WB100-45DZ		105	M10X105L
CQ2WB100-50DZ		110	M10X110L
CQ2WB100-75DZ		145	M10X145L
CQ2WB100-100DZ	170	M10X170L	



## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod A	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Piston rod B	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
5	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bushing	Bearing alloy	For ø50 or more only
8	Rod end nut	Carbon steel	Nickel plated
9	Bumper	Urethane	
10	One-touch fitting	—	ø32 to ø63
11*	Rod seal	NBR	
12*	Piston seal	NBR	
13*	Tube gasket	NBR	
14	Piston gasket	NBR	

### Replacement Parts/Seal Kit (Pneumatic type)

Bore size (mm)	Kit no.	Contents
12	CQ2WB12-PS	Kits include items ⑪, ⑫, ⑬ from the table.
16	CQ2WB16-PS	
20	CQ2WB20-PS	
25	CQ2WB25-PS	
32	CQ2WB32-PS	
40	CQ2WB40-PS	
50	CQ2WB50-PS	
63	CQ2WB63-PS	
80	CQ2WB80-PS	
100	CQ2WB100-PS	

\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit, based on each bore size.  
\* Since the seal kit does not include a grease pack, order it separately.  
Grease pack part no.: GR-S-010 (10 g)

### Replacement Parts/Seal Kit (Air-hydro type)

Bore size (mm)	Kit no.	Contents
20	CQ2WBH20-PS	Kits include items ⑪, ⑫, ⑬ from the table.
25	CQ2WBH25-PS	
32	CQ2WBH32-PS	
40	CQ2WBH40-PS	
50	CQ2WBH50-PS	
63	CQ2WBH63-PS	
80	CQ2WBH80-PS	
100	CQ2WBH100-PS	

\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit, based on each bore size.  
\* Since the seal kit does not include a grease pack, order it separately.  
Grease pack part no.: GR-S-010 (10 g)

## Copper and Fluorine-free Series (For CRT Manufacturing Process)

20 — CQ2WB Bore size — Stroke D(C)(M)(Z)

• Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32  
ø40, ø50, ø63, ø80, ø100

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

### Specifications

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Action	Double acting, Double rod									
Proof pressure	1.5 MPa									
Max. operating pressure	1.0 MPa									
Rubber bumper	None									
Piping	Pipe thread									
Piston speed	50 to 500 mm/s									
Mounting	Through-hole									
Auto switch	Mountable									

# Standard: Double Acting, Double Rod Series **CDQ2W** With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.169 to 175
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Weight (g)

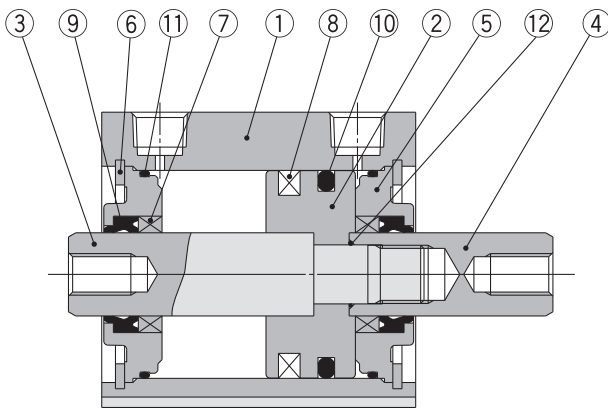
Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	50	58	65	73	80	87	—	—	—	—	—	—
16	77	87	96	106	115	125	—	—	—	—	—	—
20	120	136	151	166	182	197	212	228	243	258	—	—
25	170	185	201	216	232	247	263	279	294	310	—	—
32	238	260	283	306	329	352	375	398	421	444	558	673
40	353	383	412	442	471	500	530	559	589	618	765	912
50	—	609	645	681	716	752	788	823	859	895	1073	1252
63	—	798	840	882	924	966	1008	1051	1093	1135	1346	1556
80	—	1393	1469	1546	1622	1699	1775	1851	1928	2004	2387	2769
100	—	2334	2443	2551	2660	2769	2877	2986	3094	3203	3746	4289

### Additional Weight (g)

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Both ends tapped	1	1	3	3	6	6	6	19	45	45
Rod end male thread	Male thread	3	6	12	24	52	54	106	106	240
	Nut	2	4	8	16	34	34	64	64	98
With rubber bumper	0	0	-2	-2	-3	-7	-12	-19	-34	-54
Built-in one-touch fittings	—	—	—	—	12	12	21	21	—	—
Foot (Including mounting bolts)	52	65	153	177	158	170	267	342	722	1107
Flange (Including mounting bolts)	54	67	131	153	180	214	373	559	1056	1365

Calculation: (Example) **CDQ2WF32-20DCMZ**  
 • Basic weight: CDQ2WB32-20DZ ..... 306 g  
 • Additional weight: Both ends tapped ..... 6 g  
 Rod end male thread ..... 86 g  
 With rubber bumper ..... -3 g  
 Rod flange ..... 180 g  
 Add each weight of auto switches when auto switches are mounted.  
 575 g

## Construction



## Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod A	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Piston rod B	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
5	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bushing	Bearing alloy	For ø50 or more only
8	Magnet	—	—
9*	Rod seal	NBR	
10*	Piston seal	NBR	
11*	Tube gasket	NBR	
12	Piston gasket	NBR	

## Replacement Parts/Seal Kit (Pneumatic type)

Bore size (mm)	Kit no.	Contents
12	CQ2WB12-PS	Kits include items ⑨, ⑩, ⑪ from the table.
16	CQ2WB16-PS	
20	CQ2WB20-PS	
25	CQ2WB25-PS	
32	CQ2WB32-PS	
40	CQ2WB40-PS	
50	CQ2WB50-PS	
63	CQ2WB63-PS	
80	CQ2WB80-PS	
100	CQ2WB100-PS	

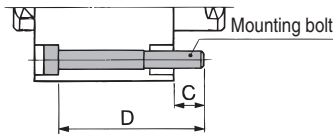
\* Seal kit includes ⑨, ⑩, ⑪. Order the seal kit, based on each bore size.  
 \* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

## Replacement Parts/Seal Kit (Air-hydro type)

Bore size (mm)	Kit no.	Contents
20	CQ2WBH20-PS	Kits include items ⑨, ⑩, ⑪ from the table.
25	CQ2WBH25-PS	
32	CQ2WBH32-PS	
40	CQ2WBH40-PS	
50	CQ2WBH50-PS	
63	CQ2WBH63-PS	
80	CQ2WBH80-PS	
100	CQ2WBH100-PS	

\* Seal kit includes ⑨, ⑩, ⑪. Order the seal kit, based on each bore size.  
 \* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

**Mounting Bolt for CDQ2WB/With Auto Switch**



Cylinder model	C	D	Mounting bolt
CDQ2WB12-5DCZ	6.1	40	M3X40L
CDQ2WB12-10DCZ		45	M3X45L
CDQ2WB12-15DCZ		50	M3X50L
CDQ2WB12-20DCZ		55	M3X55L
CDQ2WB12-25DCZ		60	M3X60L
CDQ2WB12-30DCZ		65	M3X65L
CDQ2WB16-5DZ	7.5	45	M3X45L
CDQ2WB16-10DZ		50	M3X50L
CDQ2WB16-15DZ		55	M3X55L
CDQ2WB16-20DZ		60	M3X60L
CDQ2WB16-25DZ		65	M3X65L
CDQ2WB16-30DZ		70	M3X70L
CDQ2WB20-5DZ	9	45	M5X45L
CDQ2WB20-10DZ		50	M5X50L
CDQ2WB20-15DZ		55	M5X55L
CDQ2WB20-20DZ		60	M5X60L
CDQ2WB20-25DZ		65	M5X65L
CDQ2WB20-30DZ		70	M5X70L
CDQ2WB20-35DZ		75	M5X75L
CDQ2WB20-40DZ		80	M5X80L
CDQ2WB20-45DZ		85	M5X85L
CDQ2WB20-50DZ		90	M5X90L
CDQ2WB25-5DZ	8	45	M5X45L
CDQ2WB25-10DZ		50	M5X50L
CDQ2WB25-15DZ		55	M5X55L
CDQ2WB25-20DZ		60	M5X60L
CDQ2WB25-25DZ		65	M5X65L
CDQ2WB25-30DZ		70	M5X70L
CDQ2WB25-35DZ		75	M5X75L
CDQ2WB25-40DZ		80	M5X80L
CDQ2WB25-45DZ		85	M5X85L
CDQ2WB25-50DZ		90	M5X90L

Cylinder model	C	D	Mounting bolt	
CDQ2WB32-5DZ	6.5	45	M5X45L	
CDQ2WB32-10DZ		50	M5X50L	
CDQ2WB32-15DZ		55	M5X55L	
CDQ2WB32-20DZ		60	M5X60L	
CDQ2WB32-25DZ		65	M5X65L	
CDQ2WB32-30DZ		70	M5X70L	
CDQ2WB32-35DZ		75	M5X75L	
CDQ2WB32-40DZ		80	M5X80L	
CDQ2WB32-45DZ		85	M5X85L	
CDQ2WB32-50DZ		90	M5X90L	
CDQ2WB32-75DZ	7	115	M5X115L	
CDQ2WB32-100DZ		140	M5X140L	
CDQ2WB40-5DZ		7	55	M5X55L
CDQ2WB40-10DZ			60	M5X60L
CDQ2WB40-15DZ			65	M5X65L
CDQ2WB40-20DZ			70	M5X70L
CDQ2WB40-25DZ			75	M5X75L
CDQ2WB40-30DZ			80	M5X80L
CDQ2WB40-35DZ			85	M5X85L
CDQ2WB40-40DZ			90	M5X90L
CDQ2WB40-45DZ	95		M5X95L	
CDQ2WB40-50DZ	100		M5X100L	
CDQ2WB40-75DZ	12.5	125	M5X125L	
CDQ2WB40-100DZ		150	M5X150L	
CDQ2WB50-10DZ		12.5	65	M6X65L
CDQ2WB50-15DZ			70	M6X70L
CDQ2WB50-20DZ			75	M6X75L
CDQ2WB50-25DZ			80	M6X80L
CDQ2WB50-30DZ			85	M6X85L
CDQ2WB50-35DZ			90	M6X90L
CDQ2WB50-40DZ			95	M6X95L
CDQ2WB50-45DZ			100	M6X100L
CDQ2WB50-50DZ	105		M6X105L	
CDQ2WB50-75DZ	130		M6X130L	
CDQ2WB50-100DZ	155	M6X155L		

Cylinder model	C	D	Mounting bolt
CDQ2WB63-10DZ	13.5	65	M8X65L
CDQ2WB63-15DZ		70	M8X70L
CDQ2WB63-20DZ		75	M8X75L
CDQ2WB63-25DZ		80	M8X80L
CDQ2WB63-30DZ		85	M8X85L
CDQ2WB63-35DZ		90	M8X90L
CDQ2WB63-40DZ		95	M8X95L
CDQ2WB63-45DZ		100	M8X100L
CDQ2WB63-50DZ		105	M8X105L
CDQ2WB63-75DZ		130	M8X130L
CDQ2WB80-10DZ	12.5	70	M10X70L
CDQ2WB80-15DZ		75	M10X75L
CDQ2WB80-20DZ		80	M10X80L
CDQ2WB80-25DZ		85	M10X85L
CDQ2WB80-30DZ		90	M10X90L
CDQ2WB80-35DZ		95	M10X95L
CDQ2WB80-40DZ		100	M10X100L
CDQ2WB80-45DZ		105	M10X105L
CDQ2WB80-50DZ		110	M10X110L
CDQ2WB80-75DZ		135	M10X135L
CDQ2WB100-10DZ	13	80	M10X80L
CDQ2WB100-15DZ		85	M10X85L
CDQ2WB100-20DZ		90	M10X90L
CDQ2WB100-25DZ		95	M10X95L
CDQ2WB100-30DZ		100	M10X100L
CDQ2WB100-35DZ		105	M10X105L
CDQ2WB100-40DZ		110	M10X110L
CDQ2WB100-45DZ		115	M10X115L
CDQ2WB100-50DZ		120	M10X120L
CDQ2WB100-75DZ		145	M10X145L
CDQ2WB100-100DZ	170	M10X170L	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

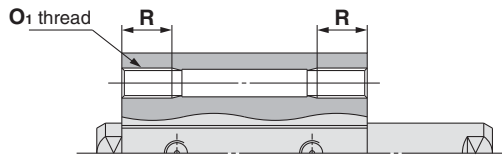
Made to Order

# Series CQ2W

## Dimensions

### Ø12 to Ø25/Without Auto Switch

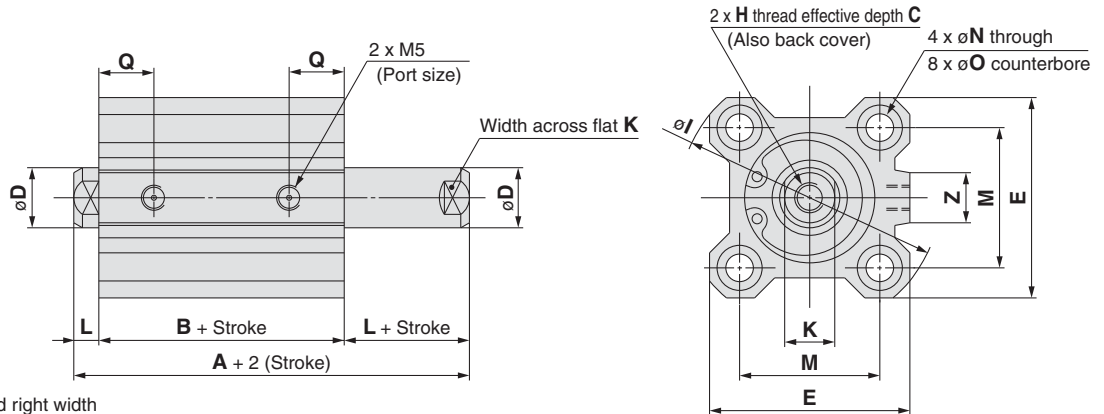
#### Both ends tapped: CQ2WA



#### Both Ends Tapped

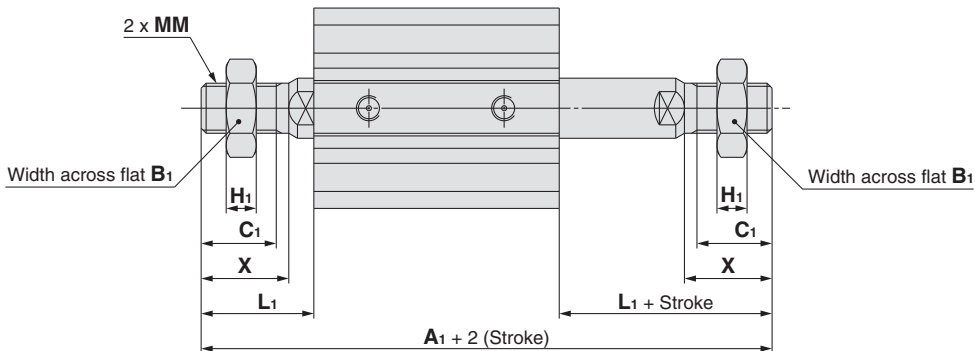
Bore size (mm)	(mm)	
	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CQ2WB



Note 1) The positions of left and right width across flats are not constant.

#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	(mm)						
	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	53.2	8	9	4	14	M5 x 0.8	10.5
16	57	10	10	5	15.5	M6 x 1.0	12
20	63	13	12	5	18.5	M8 x 1.25	14
25	74	17	15	6	22.5	M10 x 1.25	17.5

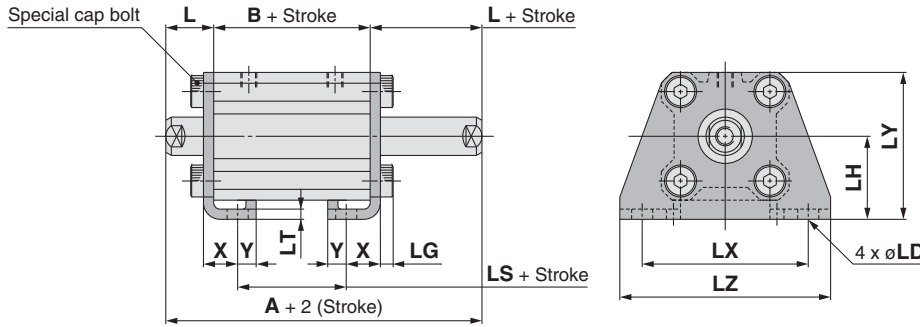
#### Standard

Bore size (mm)	Stroke range (mm)	(mm)														
		A	B	C	D	E	H	I	K	L	M	N	O	Q	Z	
12	5 to 30	32.2	25.2	6	6	25	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	10	—	
16	5 to 30	33	26	8	8	29	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	10	10	
20	5 to 50	35	26	7	10	36	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	9.5	10	
25	5 to 50	39	29	12	12	40	M6 x 1.0	52	10	5	28	5.5	9 depth 7	11	10	

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

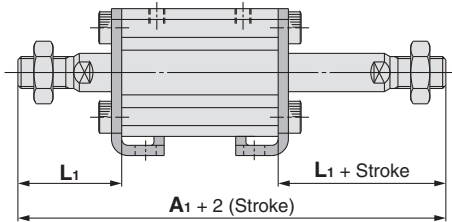
\* For details about the rod end nut and accessory brackets, refer to page 19.

**Foot: CQ2WL**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

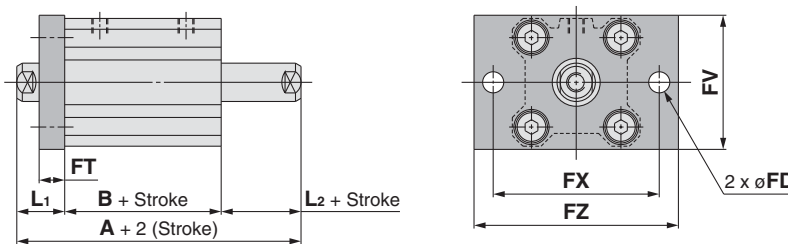
Bore size (mm)	A <sub>1</sub>	L <sub>1</sub>
12	73.2	24
16	77	25.5
20	83	28.5
25	94	32.5

**Foot** (mm)

Bore size (mm)	Stroke range (mm)	A	B	L	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	52.2	25.2	13.5	4.5	2.8	17	13.2	2	34	29.5	44	8	4.5
16	5 to 30	53	26	13.5	4.5	2.8	19	14	2	38	33.5	48	8	5
20	5 to 50	55	26	14.5	6.6	4	24	14	3.2	48	42	62	9.2	5.8
25	5 to 50	59	29	15	6.6	4	26	14	3.2	52	46	66	10.7	5.8

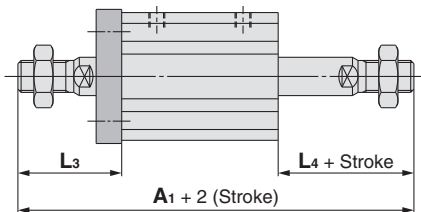
Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Flange: CQ2WF**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	A <sub>1</sub>	L <sub>3</sub>	L <sub>4</sub>
12	63.2	24	14
16	67	25.5	15.5
20	73	28.5	18.5
25	84	32.5	22.5

**Flange** (mm)

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L <sub>1</sub>	L <sub>2</sub>
12	5 to 30	42.2	25.2	4.5	5.5	25	45	55	13.5	3.5
16	5 to 30	43	26	4.5	5.5	30	45	55	13.5	3.5
20	5 to 50	45	26	6.6	8	39	48	60	14.5	4.5
25	5 to 50	49	29	6.6	8	42	52	64	15	5

\* For details about the rod end nut and accessory brackets, refer to page 19.

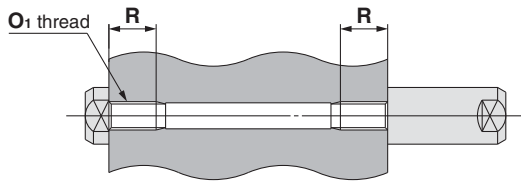
Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

# Series CQ2W

## Dimensions

### ∅12 to ∅25/With Auto Switch

#### Both ends tapped: CDQ2WA

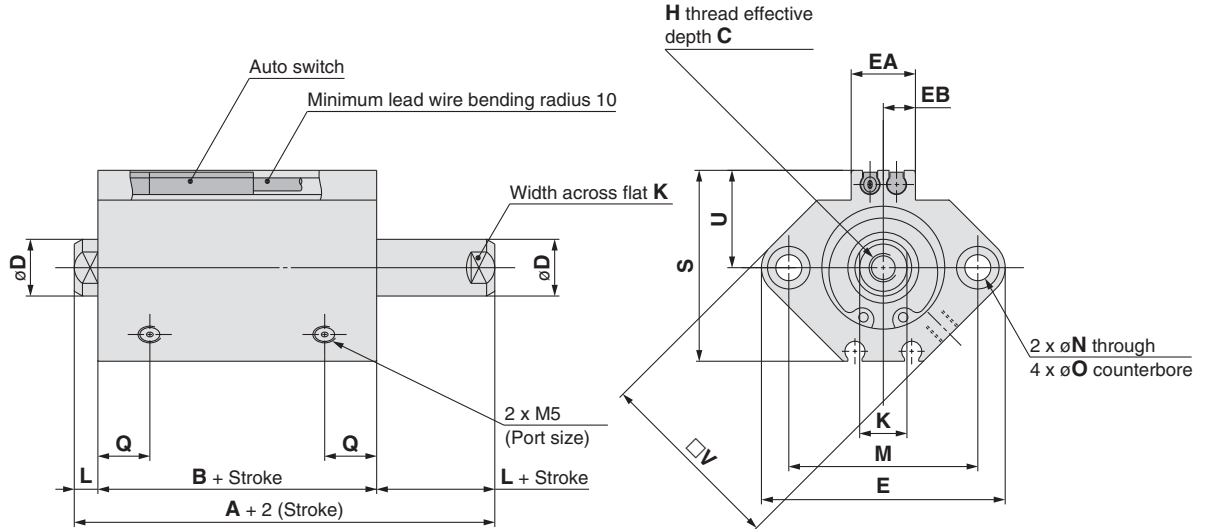


#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

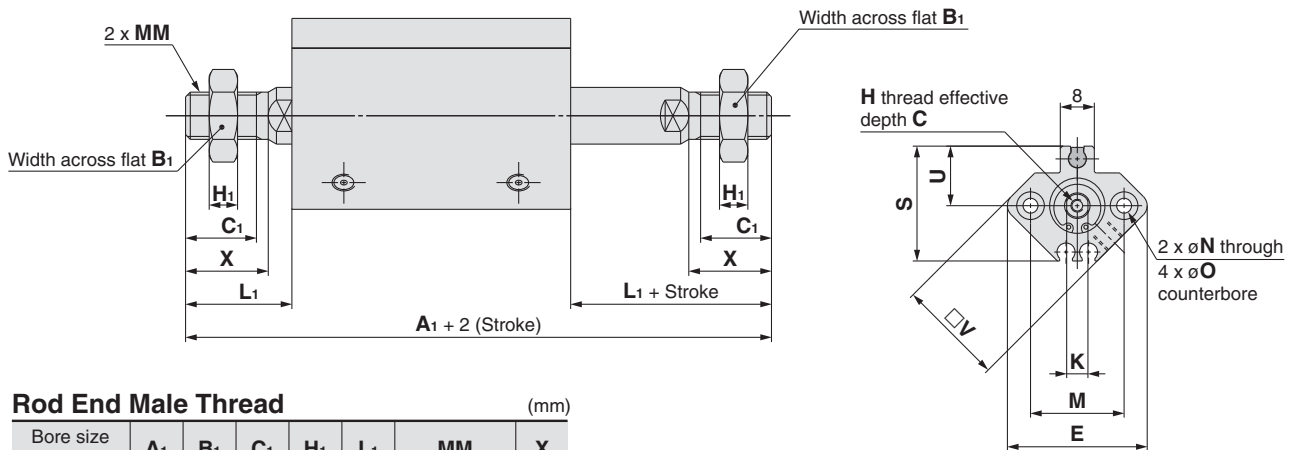
#### Standard (Through-hole): CDQ2WB

Note 1) The positions of left and right width across flats are not constant.



∅16 to ∅25

#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	60.4	8	9	4	14	M5 x 0.8	10.5
16	67	10	10	5	15.5	M6 x 1.0	12
20	75	13	12	5	18.5	M8 x 1.25	14
25	84	17	15	6	22.5	M10 x 1.25	17.5

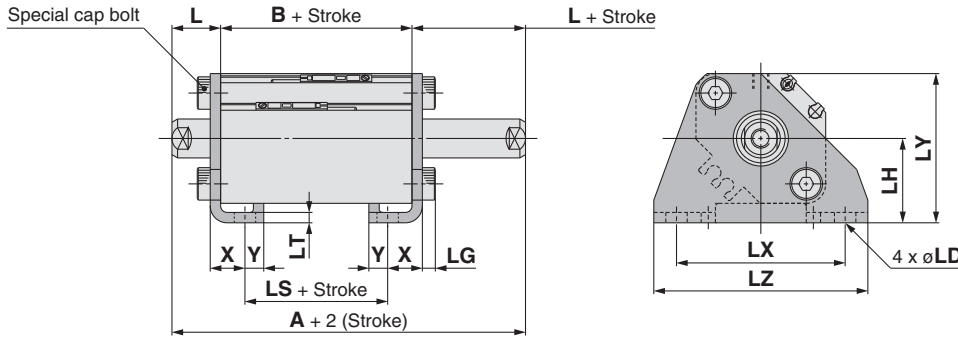
#### Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	H	K	L	M	N	O	Q	S	U	V
12	5 to 30	39.4	32.4	6	6	33	—	—	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	10.5	27.5	14	25
16	5 to 30	43	36	8	8	37	13.2	6.6	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
20	5 to 50	47	38	7	10	47	13.6	6.8	M5 x 0.8	8	4.5	36	5.5	9 depth 7	10.5	35.5	18	36
25	5 to 50	49	39	12	12	52	13.6	6.8	M6 x 1.0	10	5	40	5.5	9 depth 7	11	40.5	21	40

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

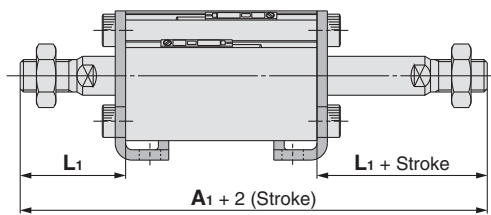
\* For details about the rod end nut and accessory brackets, refer to page 19.

**Foot: CDQ2WL**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

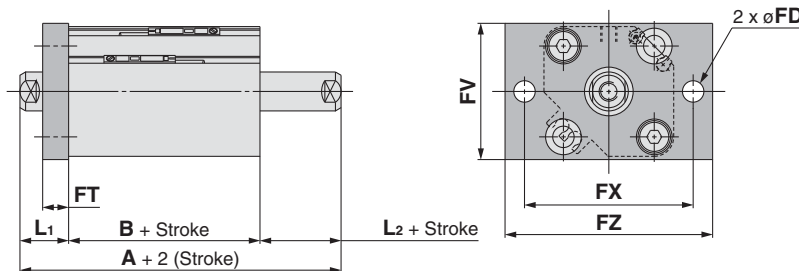
Bore size (mm)	A <sub>1</sub>	L <sub>1</sub>
12	80.4	24
16	87	25.5
20	95	28.5
25	104	32.5

**Foot**

Bore size (mm)	Stroke range (mm)	A	B	L	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	59.4	32.4	13.5	4.5	2.8	17	20.4	2	34	29.5	44	8	4.5
16	5 to 30	63	36	13.5	4.5	2.8	19	24	2	38	33.5	48	8	5
20	5 to 50	67	38	14.5	6.6	4	24	26	3.2	48	42	62	9.2	5.8
25	5 to 50	69	39	15	6.6	4	26	24	3.2	52	46	66	10.7	5.8

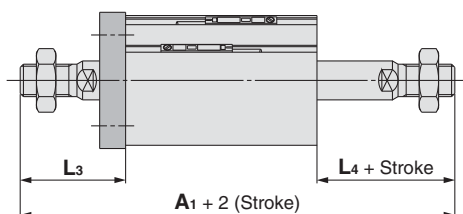
Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Flange: CDQ2WF**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	A <sub>1</sub>	L <sub>3</sub>	L <sub>4</sub>
12	70.4	24	14
16	77	25.5	15.5
20	85	28.5	18.5
25	94	32.5	22.5

**Flange**

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L <sub>1</sub>	L <sub>2</sub>
12	5 to 30	49.4	32.4	4.5	5.5	25	45	55	13.5	3.5
16	5 to 30	53	36	4.5	5.5	30	45	55	13.5	3.5
20	5 to 50	57	38	6.6	8	39	48	60	14.5	4.5
25	5 to 50	59	39	6.6	8	42	52	64	15	5

\* For details about the rod end nut and accessory brackets, refer to page 19.

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

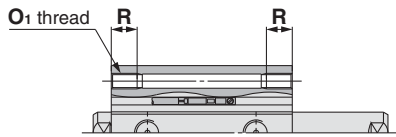
# Series CQ2W

## Dimensions

### ∅32 to ∅50/With Auto Switch

(In the case of without auto switches, the A, B and P dimensions will be only changed. Refer to the dimension table.)

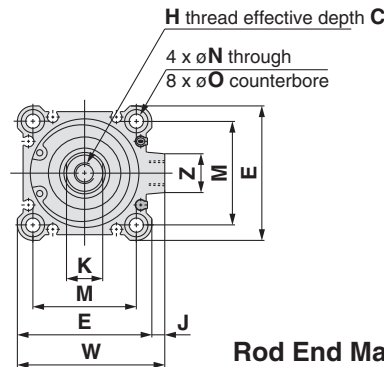
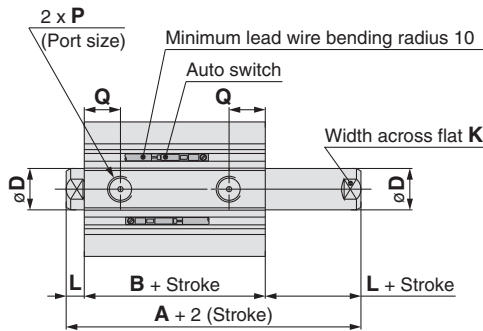
#### Both ends tapped: CQ2WA/CDQ2WA



#### Both Ends Tapped

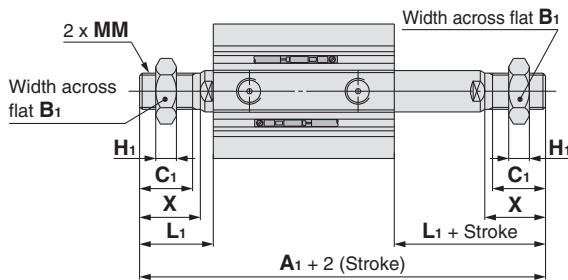
Bore size (mm)	O <sub>1</sub>	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

#### Standard (Through-hole): CQ2WB/CDQ2WB



Note 1) The positions of left and right width across flats are not constant.

#### Rod end male thread

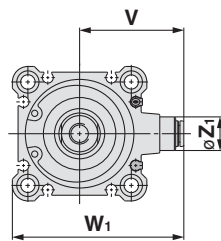
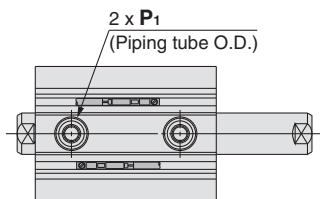


#### Rod End Male Thread

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A <sub>1</sub>		A <sub>1</sub>	
32	5	87.5		97.5	
	10 to 50	87.5		97.5	
	75, 100	97.5		97.5	
40	5 to 50	97		107	
	75, 100	107		107	
50	10 to 50	107.5		117.5	
	75, 100	117.5		117.5	

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

#### Built-in one-touch fittings: ∅32 to ∅50



#### Built-in One-touch Fittings

Bore size (mm)	Without auto switch		With auto switch		Z <sub>1</sub>	P <sub>1</sub>
	V	W <sub>1</sub>	V	W <sub>1</sub>		
32	38	60.5	36.5	59	13	6
40	42	68	40.5	66.5	13	6
50	50	82	50	82	16	8

#### Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	P	A	B	P
32	5	44.5	30.5	M5	54.5	40.5	1/8
	10 to 50	44.5	30.5	M5			
	75, 100	54.5	40.5	1/8	54.5	40.5	1/8
40	5 to 50	54	40	1/8	64	50	1/8
	75, 100	64	50				
50	10 to 50	56.5	40.5	1/4	66.5	50.5	1/4
	75, 100	66.5	50.5				

Bore size (mm)	C	D	E	H	J	K	L	M	N	O	Q	W	Z
32	13	16	45	M8 x 1.25	4.5	14	7	34	5.5	9 depth 7	12.5	49.5	14
40	13	16	52	M8 x 1.25	5	14	7	40	5.5	9 depth 7	14	57	15
50	15	20	64	M10 x 1.5	7	17	8	50	6.6	11 depth 8	14	71	19

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

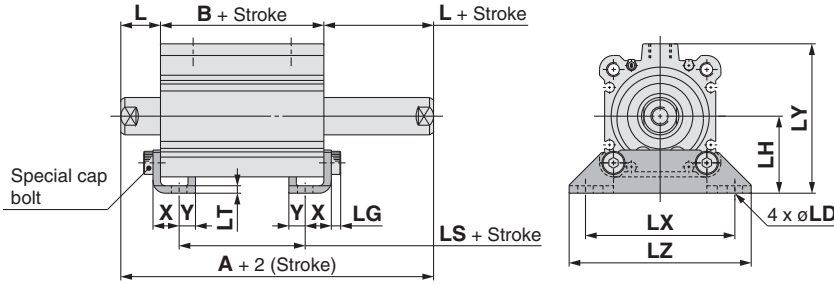
\* For details about the rod end nut and accessory brackets, refer to page 19.



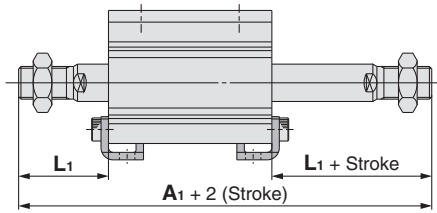
# Compact Cylinder: Standard Double Acting, Double Rod *Series CQ2W*

## Foot: CQ2WL/CDQ2WL

Note) The positions of left and right width across flats are not constant.



### Rod end male thread



### Rod End Male Thread

Bore size (mm)	Stroke range (mm)	(mm)		
		Without auto switch A <sub>1</sub>	With auto switch A <sub>1</sub>	L <sub>1</sub>
32	5 to 50	107.5	117.5	38.5
	75, 100	117.5		
40	5 to 50	117	127	38.5
	75, 100	127		
50	10 to 50	127.5	137.5	43.5
	75, 100	137.5		

### Foot

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
32	5 to 50	64.5	30.5	14.5	74.5	40.5	24.5
	75, 100	74.5	40.5	24.5			
40	5 to 50	74	40	24	84	50	34
	75, 100	84	50	34			
50	10 to 50	76.5	40.5	17.5	86.5	50.5	27.5
	75, 100	86.5	50.5	27.5			

Foot bracket material: Carbon steel

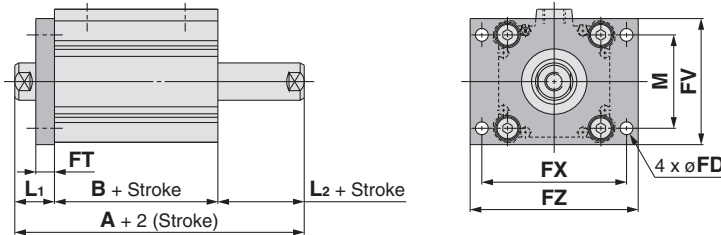
Surface treatment:

Nickel plated

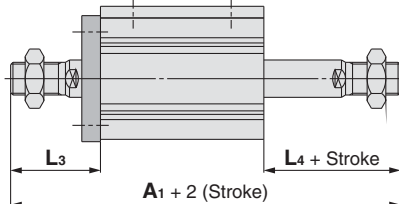
Bore size (mm)	L	LD	LG	LH	LT	LX	LY	LZ	X	Y
32	17	6.6	4	30	3.2	57	57	71	11.2	5.8
40	17	6.6	4	33	3.2	64	64	78	11.2	7
50	18	9	5	39	3.2	79	78	95	14.7	8

## Flange: CQ2WF/CDQ2WF

Note) The positions of left and right width across flats are not constant.



### Rod end male thread



### Rod End Male Thread

(mm)

Bore size (mm)	Stroke range (mm)	(mm)			
		Without auto switch A <sub>1</sub>	With auto switch A <sub>1</sub>	L <sub>3</sub>	L <sub>4</sub>
32	5 to 50	97.5	107.5	38.5	28.5
	75, 100	107.5			
40	5 to 50	107	117	38.5	28.5
	75, 100	117			
50	10 to 50	117.5	127.5	43.5	33.5
	75, 100	127.5			

### Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L <sub>1</sub>	L <sub>2</sub>	M
		A	B	A	B								
32	5 to 50	54.5	30.5	64.5	40.5	5.5	8	48	56	65	17	7	34
	75, 100	64.5	40.5										
40	5 to 50	64	40	74	50	5.5	8	54	62	72	17	7	40
	75, 100	74	50										
50	10 to 50	66.5	40.5	76.5	50.5	6.6	9	67	76	89	18	8	50
	75, 100	76.5	50.5										

Flange bracket material: Carbon steel

Surface treatment: Nickel plated

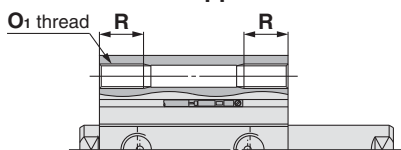
# Series CQ2W

## Dimensions

### ∅63 to ∅100/With Auto Switch

(In the case of without auto switches, the A and B dimensions will be only changed. Refer to the dimension table.)

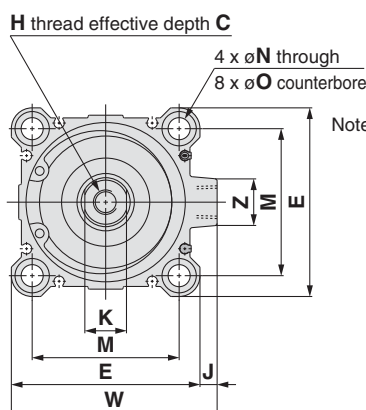
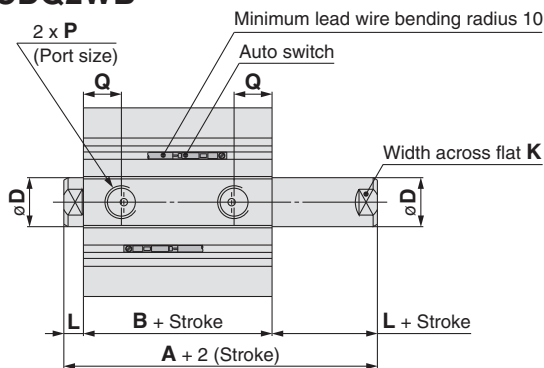
#### Both ends tapped: CQ2WA/CDQ2WA



#### Both Ends Tapped

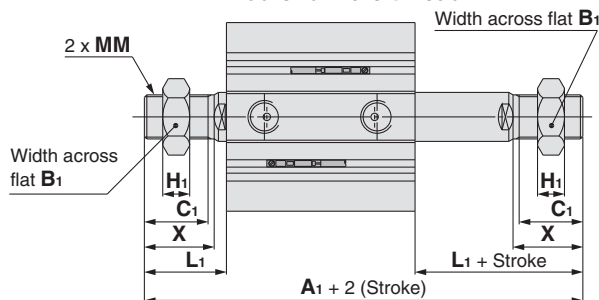
Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

#### Standard (Through-hole): CQ2WB/CDQ2WB



Note 1) The positions of left and right width across flats are not constant.

#### Rod end male thread



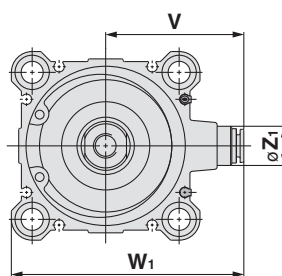
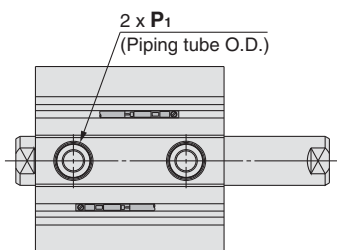
#### Rod End Male Thread

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>
63	10 to 50	109			119
	75, 100	119			
80	10 to 50	138			148
	75, 100	148			
100	10 to 50	147.5			157.5
	75, 100	157.5			

(mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

#### Built-in one-touch fittings



#### Built-in One-touch Fittings

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
63	16	8	56.5	95

\* The dimension of the ∅32-5 mm stroke with built-in one-touch fittings is the same as that of the 10 mm stroke cylinder tube.

For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

#### Standard

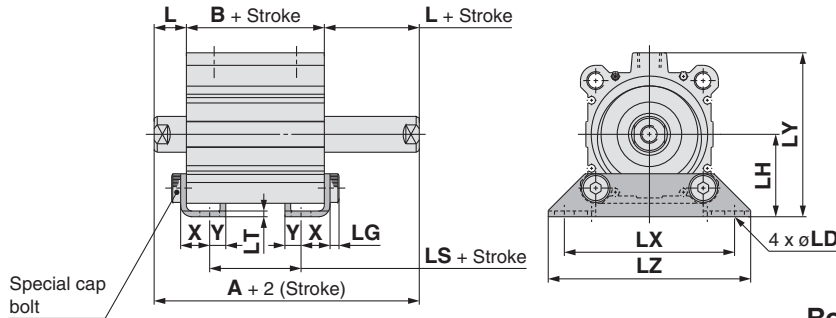
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
63	10 to 50	58	42	68	52
	75, 100	68	52		
80	10 to 50	71	51	81	61
	75, 100	81	61		
100	10 to 50	84.5	60.5	94.5	70.5
	75, 100	94.5	70.5		

Bore size (mm)	C	D	E	H	J	K	L	M	N	O	P	Q	W	Z
63	15	20	77	M10 x 1.5	7	17	8	60	9	14 depth 10.5	1/4	15.5	84	19
80	21	25	98	M16 x 2.0	6	22	10	77	11	17.5 depth 13.5	3/8	18	104	25
100	27	30	117	M20 x 2.5	6.5	27	12	94	11	17.5 depth 13.5	3/8	22	123.5	25

Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.

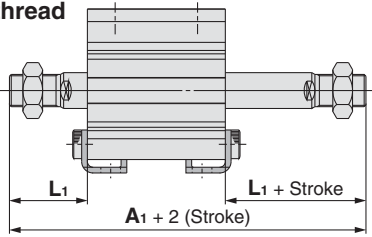
\* For details about the rod end nut and accessory brackets, refer to page 19.

**Foot: CQ2WL/CDQ2WL**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch	L <sub>1</sub>
		A <sub>1</sub>	A <sub>1</sub>	
63	10 to 50	129	139	43.5
	75, 100	139		
80	10 to 50	158	168	53.5
	75, 100	168		
100	10 to 50	167.5	177.5	53.5
	75, 100	177.5		

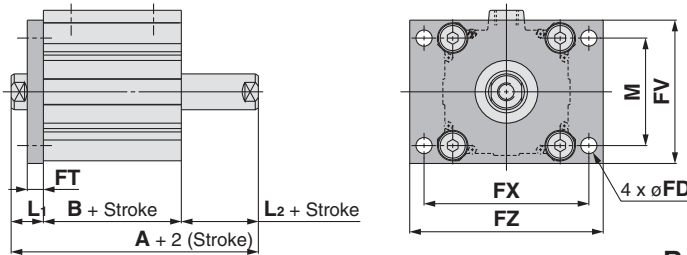
**Foot**

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
63	10 to 50	78	42	16	88	52	26
	75, 100	88	52	26			
80	10 to 50	91	51	21	101	61	31
	75, 100	101	61	31			
100	10 to 50	104.5	60.5	26.5	114.5	70.5	36.5
	75, 100	114.5	70.5	36.5			

Bore size (mm)	L	LD	LG	LH	LT	LX	LY	LZ	X	Y
63	18	11	5	46	3.2	95	91.5	113	16.2	9
80	20	13	7	59	4.5	118	114	140	19.5	11
100	22	13	7	71	6	137	136	162	23	12.5

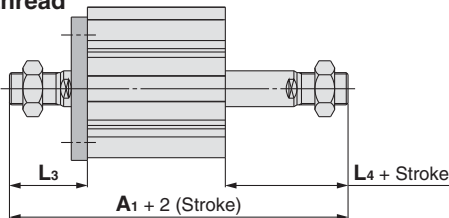
Foot bracket material:  
Carbon steel  
Surface treatment:  
Nickel plated

**Flange: CQ2WF/CDQ2WF**



Note) The positions of left and right width across flats are not constant.

**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch	L <sub>3</sub>	L <sub>4</sub>
		A <sub>1</sub>	A <sub>1</sub>		
63	10 to 50	119	129	43.5	33.5
	75, 100	129			
80	10 to 50	148	158	53.5	43.5
	75, 100	158			
100	10 to 50	157.5	167.5	53.5	43.5
	75, 100	167.5			

**Flange**

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L <sub>1</sub>	L <sub>2</sub>	M
		A	B	A	B								
63	10 to 50	68	42	78	52	9	9	80	92	108	18	8	60
	75, 100	78	52										
80	10 to 50	81	51	91	61	11	11	99	116	134	20	10	77
	75, 100	91	61										
100	10 to 50	94.5	60.5	104.5	70.5	11	11	117	136	154	22	12	94
	75, 100	104.5	70.5										

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated



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

ø12, ø16, ø20, ø25, ø32, ø40, ø50

## How to Order

Without auto switch  
ø12 to ø25

CQ2 B 20 - 10 S

Without auto switch  
ø32 to ø50

CQ2 B 32 - 10 S Z

With auto switch

CDQ2 B 32 - 10 S 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 41 and 44.

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm

Port thread type

—	M thread	ø12 to ø25
	Rc	
<b>TN</b>	NPT	ø32 to ø50
<b>TF</b>	G	
<b>F</b>	Built-in one-touch fittings (Note)	

Note) Bore sizes available with one-touch fittings are ø32 to ø50.

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

### 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) CDQ2L32-10SZ

Number of auto switches

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

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

<b>Z</b>	ø12 to ø25	2 surfaces
	ø32 to ø50	4 surfaces

Made to Order

Refer to the next page for details.

Body option

—	Standard
<b>F</b>	With boss on head end
<b>M</b>	Rod end male thread

\* Combination of body options ("FM") is available.

Action

<b>S</b>	Single acting, Spring return
<b>T</b>	Single acting, Spring extend

Cylinder stroke (mm)

Refer to the next page for standard strokes.

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NV</b>	<b>M9N</b>	●	●	●	○	—	○	IC circuit	Relay, PLC			
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○					
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	●	●	○	—	○					
	Diagnostic indication (2-colour indication)			3-wire (NPN)				5 V, 12 V	<b>M9NWV</b>	<b>M9NW</b>	●	●	●	○	—			○	IC circuit	
				3-wire (PNP)					<b>M9PWV</b>	<b>M9PW</b>	●	●	●	○	—			○		
				2-wire					<b>M9B WV</b>	<b>M9B W</b>	●	●	●	○	—			○		
	Water resistant (2-colour indication)			3-wire (NPN)					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>	○	○	●	○			—	○	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—			<b>A96V</b>	<b>A96</b>	●	—	●	—	—	—	IC circuit	—	
				2-wire						<b>A93V</b>	<b>A93</b>	●	—	●	—	—	—	—	Relay, PLC	
										<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. Consult with SMC regarding water resistant types with the above model numbers.

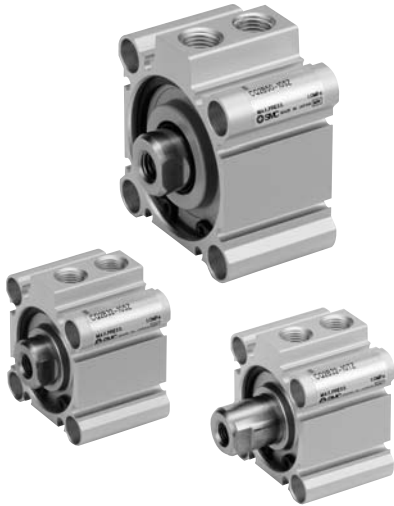
\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWV  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

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

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

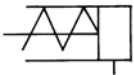
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Series CQ2



## Symbol

Single acting,  
Spring return



Single acting,  
Spring extend



## Made to Order

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

Symbol	Specifications
-XA□	Special rod end shape, spring return type only
-XB10	Intermediate stroke (Exclusive body type), Spring return type only
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
-XC36	With boss on rod side
-X144	Special port location, with auto switch $\phi 12$ to $\phi 25$ only
-X202	Full length dimension is the same as Series CQ1, Except $\phi 12$ , $\phi 16$ , $\phi 25$ .
-X203	L dimension from rod cover is the same as Series CQ1, $\phi 20$ , $\phi 32$ only.
-X271	Fluororubber seals
-X1876	Cylinder tube: With concave boss on head side

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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)	12	16	20	25	32	40	50
Action	Single acting, Single rod						
Fluid	Air						
Proof pressure	1.5 MPa						
Maximum operating pressure	1.0 MPa						
Minimum operating pressure (MPa)	0.25	0.25	0.18	0.18	0.17	0.15	0.13
Ambient and fluid temperature	Without auto switch: $-10$ to $70^{\circ}\text{C}$ (No freezing) With auto switch: $-10$ to $60^{\circ}\text{C}$ (No freezing)						
Lubrication	Not required (Non-lube)						
Piston speed	50 to 500 mm/s						
Allowable kinetic energy (J)	0.022	0.038	0.055	0.09	0.15	0.26	0.46
Stroke length tolerance	$+1.0\text{ mm}$ 0						

## Standard Strokes

Bore size	Standard stroke
12, 16, 20, 25, 32, 40	5, 10
50	10, 20

## Manufacture of Intermediate Strokes

(Except single acting, spring return type)

Type	A spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model number. (P. 38)	
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	
Stroke range	Bore size	Stroke range
	12 to 40	1 to 9
	50	1 to 19
Example	Part no.: CQ2B20-3T CQ2B20-5T with 2 mm width spacer inside The B dimension is 24.5 mm.	

## Type

		Bore size (mm)	12	16	20	25	32	40	50	
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●	
		Both ends tapped	●	●	●	●	●	●	●	
	Built-in magnet		●	●	●	●	●	●	●	
	Piping	Pipe thread	—	M5	M5	M5	M5	Note 1) M5 Rc1/8	Rc1/8	Rc1/4
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4
			TF	—	—	—	—	G1/8	G1/8	G1/4
	Built-in one-touch fittings Note 2)		—	—	—	—	$\phi 6/4$	$\phi 6/4$	$\phi 8/6$	
	Rod end male thread		●	●	●	●	●	●	●	
	With boss on head end		●	●	●	●	●	●	●	

Note 1)  $\phi 32$  without auto switch: M5 is used for 5 mm stroke/piping dimension.

Thus, do not enter a symbol for the port thread type.

Note 2) One-touch fittings cannot be replaced.

**Retaining Ring Installation/Removal**

**⚠ Caution**

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

**Spring Force**

**Single Acting, Spring Return (N)**

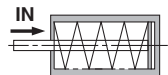
Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	13	8.6
	10	13	3.9
16	5	15	10.3
	10	15	5.9
20	5	15	10
	10	15	5.9
25	5	20	16
	10	20	11
32	5	30	23
	10	30	16
40	5	30	13
	10	39	21
50	10	50	30
	20	54	24

**Single Acting, Spring Extend (N)**

Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	11	2.9
	10	9.7	2.8
16	5	20	3.9
	10	20	3.9
20	5	27	5.3
	10	27	5.9
25	5	29	9.8
	10	29	9.8
32	5	29	20
	10	29	20
40	5	29	20
	10	29	20
50	10	83	24
	20	83	24

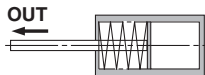
**Single acting, Spring return**

Spring state with first mounting load



When spring is set in cylinder

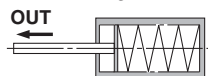
Spring state with second mounting load



When spring is compressed with air

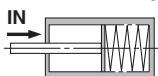
**Single acting, Spring extend**

Spring state with first mounting load



When spring is set in cylinder

Spring state with second mounting load



When spring is compressed with air

**Mounting Brackets/Part No.**

Bore size (mm)	Model	Foot <sup>Note 1)</sup>	Flange	Double clevis
12	Without switch CQ2□□-□□	CQ-L012	CQ-F012	CQ-D012
	With switch CQ2□□-□□Z	CQ-LZ12		
16	Without switch CQ2□□-□□	CQ-L016	CQ-F016	CQ-D016
	With switch CQ2□□-□□Z	CQ-LZ16		
20	Without switch CQ2□□-□□	CQ-L020	CQ-F020	CQ-D020
	With switch CQ2□□-□□Z	CQ-LZ20		
25	Without switch CQ2□□-□□	CQ-L025	CQ-F025	CQ-D025
	With switch CQ2□□-□□Z	CQ-LZ25		
32	CQ2□□-□□Z	CQ-L032	CQ-F032	CQ-D032
40	CQ2□□-□□Z	CQ-L040	CQ-F040	CQ-D040
50	CQ2□□-□□Z	CQ-L050	CQ-F050	CQ-D050

- Note 1) When ordering a foot bracket, the required quantity will be different depending on the bore size.
- $\phi 12$  to  $\phi 25$ :  
 • Without switch: Order 2 pieces per cylinder.  
 • With switch: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)  
 $\phi 32$  to  $\phi 100$ :  
 • 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

**Theoretical Output (N)**

Action	Bore size (mm)	Operating pressure (MPa)		
		0.3	0.5	0.7
Spring return	12	21	44	66
	16	45	86	126
	20	79	142	205
	25	126	224	323
	32	211	372	533
	40	338	589	841
Spring extend	12	14	31	48
	16	24	54	85
	20	44	91	138
	25	84	160	235
	32	152	273	393
	40	288	499	710
50	412	742	1072	

**Weight**

**Weight (g)**

Action	Bore size (mm)	Cylinder stroke (mm)			
		5	10	15	20
Spring return	12	29	35	—	—
	16	42	51	—	—
	20	63	76	—	—
	25	87	101	—	—
	32	125	145	—	—
	40	196	217	—	—
Spring extend	12	—	357	—	426
	16	29	35	—	—
	20	43	50	—	—
	25	67	78	—	—
	32	92	104	—	—
	40	135	151	—	—
50	206	223	—	—	
50	—	374	—	429	

**Additional Weight (g)**

Bore size (mm)		12	16	20	25	32	40	50
Both ends tapped		2	2	6	6	6	6	6
Rod end male thread	Male thread	1.5	3	6	12	26	27	53
	Nut	1	2	4	8	17	17	32
With boss on head side		0.7	1.3	2	3	5	7	13
Built-in one-touch fittings		—	—	—	—	6	6	10.5
Foot (Including mounting bolts)		55	67	164	186	142	154	243
Rod flange (Including mounting bolts)		57	69	139	161	180	214	373
Head flange (Including mounting bolts)		54	65	133	152	165	198	348
Double clevis (Including pin, retaining rings, bolts)		32	39	88	123	151	196	393

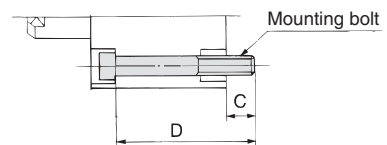
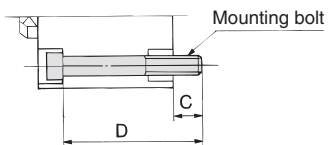
Calculation: (Example) **CQ2D32-10SMZ**

- Basic weight: CQ2B32-10SZ ..... 145 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 345 g

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Mounting Bolt for CQ2B/Without Auto Switch



### Spring Return

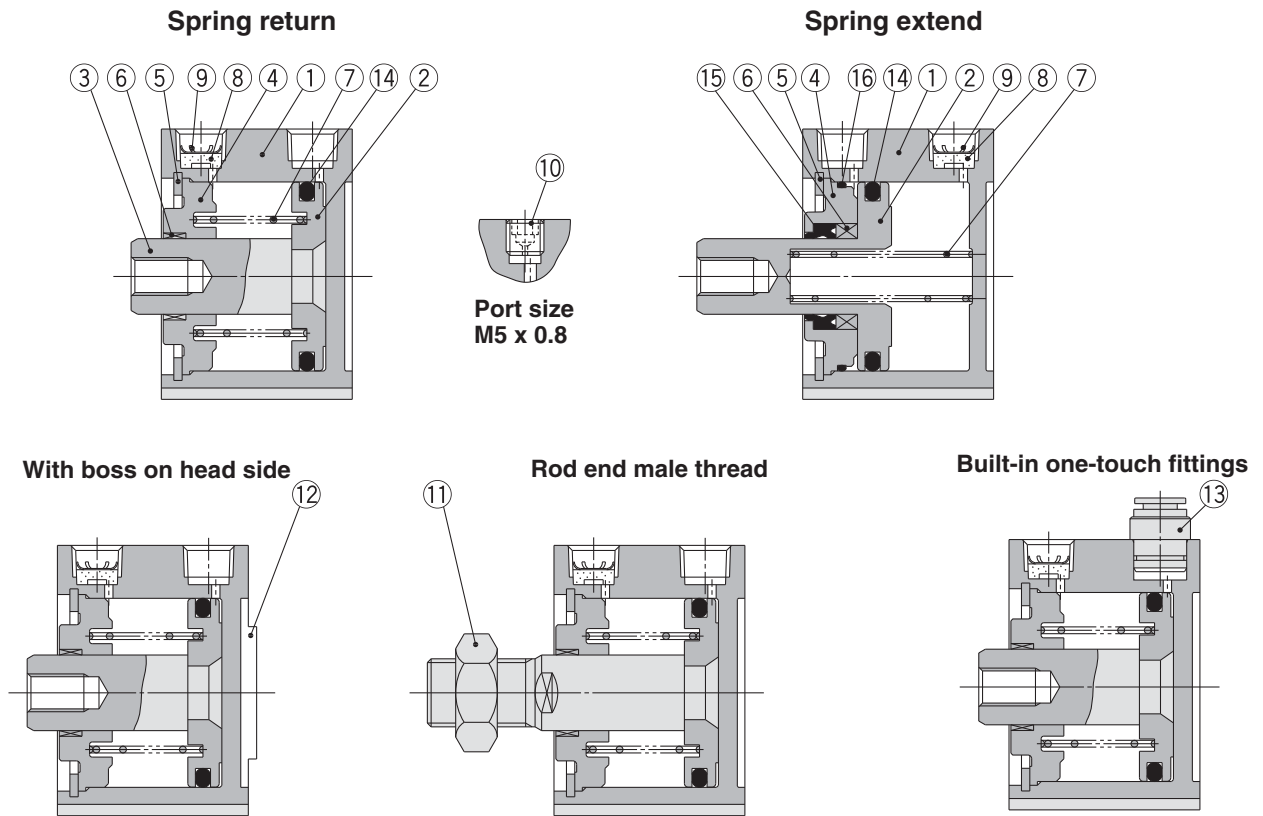
Cylinder model	C	D	Mounting bolt
CQ2B12-5S	6.5	25	M3X25L
CQ2B12-10S		30	M3X30L
CQ2B16-5S	5	25	M3X25L
CQ2B16-10S		30	M3X30L
CQ2B20-5S	7.5	25	M5X25L
CQ2B20-10S		30	M5X30L
CQ2B25-5S	9.5	30	M5X30L
CQ2B25-10S		35	M5X35L
CQ2B32-5SZ	9	30	M5X30L
CQ2B32-10SZ		35	M5X35L
CQ2B40-5SZ	7.5	35	M5X35L
CQ2B40-10SZ		40	M5X40L
CQ2B50-10SZ	12.5	45	M6X45L
CQ2B50-20SZ		55	M6X55L

### Spring Extend

Cylinder model	C	D	Mounting bolt
CQ2B12-5T	6.5	25	M3X25L
CQ2B12-10T		30	M3X30L
CQ2B16-5T	5	25	M3X25L
CQ2B16-10T		30	M3X30L
CQ2B20-5T	7.5	25	M5X25L
CQ2B20-10T		30	M5X30L
CQ2B25-5T	9.5	30	M5X30L
CQ2B25-10T		35	M5X35L
CQ2B32-5TZ	9	30	M5X30L
CQ2B32-10TZ		35	M5X35L
CQ2B40-5TZ	7.5	35	M5X35L
CQ2B40-10TZ		40	M5X40L
CQ2B50-10TZ	12.5	45	M6X45L
CQ2B50-20TZ		55	M6X55L



**Construction**



**Component Parts**

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2*	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	ø50
7	Return spring	Piano wire	Zinc chromated
8	Bronze element	Sintered metallic BC	Port size Rc1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5
11	Rod end nut	Carbon steel	Nickel plated
12	Centering location ring	Aluminum alloy	ø20 to ø50, Anodised
13	One-touch fitting	—	ø32 to ø50

\* On spring extend (Type T), piston and piston rod are integrated (stainless steel). (Except ø12 and ø16 of built-in magnet type)

**Replacement Parts**

No.	Description	Material	Note
14	Piston seal	NBR	
15	Rod seal	NBR	
16	Gasket	NBR	

**Replacement Parts/Seal Kit**

Bore size (mm)	Single acting/Spring return	Single acting/Spring extend
12	CQ2B12-S-PS	CQ2B12-T-PS
16	CQ2B16-S-PS	CQ2B16-T-PS
20	CQ2B20-S-PS	CQ2B20-T-PS
25	CQ2B25-S-PS	CQ2B25-T-PS
32	CQ2B32-S-PS	CQ2B32-T-PS
40	CQ2B40-S-PS	CQ2B40-T-PS
50	CQ2B50-S-PS	CQ2B50-T-PS
Contents	Kits include item 14 from the above table.	Kits include items 14, 15, 16 from the above table.
How to Order	* Seal kit includes 14. Order the seal kit, based on each bore size.	* Seal kit includes 14, 15, 16. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately. Grease pack part no.: GR-S-010 (10 g)

**Copper and Fluorine-free Series (For CRT Manufacturing Process)**

20 — C□Q2B — Bore size — Stroke  $\frac{S}{T}(M)Z$   
 • Copper and fluorine-free series      • ø12, ø16, ø20, ø25, ø32, ø40, ø50

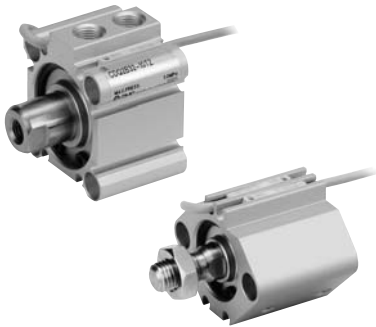
For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

**Specifications**

Bore size (mm)	12	16	20	25	32	40	50
Action	Single acting, Single rod						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Pipe thread						
Piston speed	50 to 500 mm/s						
Mounting	Through-hole						
Auto switch	Mountable						

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

# Standard: Single Acting, Single Rod Series CDQ2 With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.169 to 175
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Weight

(g)

Action	Bore size (mm)	Cylinder stroke (mm)			
		5	10	15	20
Spring return	12	44	49	—	—
	16	64	72	—	—
	20	97	109	—	—
	25	135	150	—	—
	32	182	202	—	—
	40	269	290	—	—
	50	—	456	—	521
Spring extend	12	49	65	—	—
	16	63	71	—	—
	20	110	119	—	—
	25	149	163	—	—
	32	192	208	—	—
	40	279	296	—	—
50	—	486	—	540	

### Additional Weight

(g)

Bore size (mm)	12	16	20	25	32	40	50
Both ends tapped	1	1	3	3	6	6	6
Rod end male thread	Male thread	1.5	3	6	12	26	53
	Nut	1	2	4	8	17	32
With boss on head side	0.7	1.3	2	3	5	7	13
Built-in one-touch fittings	—	—	—	—	6	6	10.5
Foot (Including mounting bolts)	49	62	147	169	142	154	243
Rod flange (Including mounting bolts)	54	67	131	153	180	214	373
Head flange (Including mounting bolts)	52	63	124	144	165	198	348
Double clevis (Including pin, retaining rings, bolts)	29	35	78	114	151	196	393

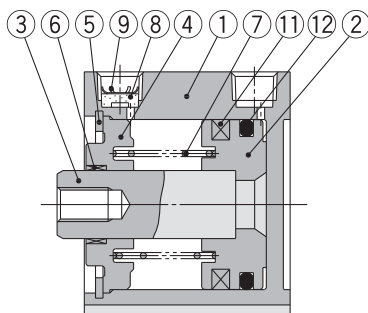
Calculation: (Example) **CDQ2D32-10SMZ**

- Basic weight: CDQ2B32-10SZ ..... 202 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 402 g

Add each weight of auto switches when auto switches are mounted.

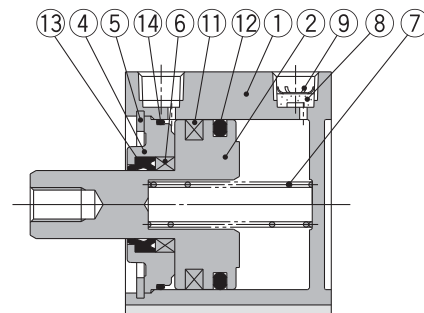
## Construction

### Spring return



Port size  
M5

### Spring extend



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	ø50
7	Return spring	Piano wire	Zinc chromated
8	Bronze element	Sintered metallic BC	Port size Rc1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5
11	Magnet	—	

No.	Description	Material	Note
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Gasket	NBR	

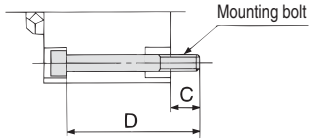


### Replacement Parts/Seal Kit

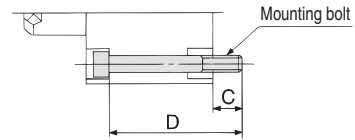
Since the same as those of the standard, single acting, single rod, refer to page 42.

## Mounting Bolt for CDQ2B/With Auto Switch

### Spring return



### Spring extend



### Spring Return

Cylinder model	C	D	Mounting bolt
CDQ2B12-5SZ	5.5	35	M3X35L
CDQ2B12-10SZ		40	M3X40L
CDQ2B16-5SZ	8	40	M3X40L
CDQ2B16-10SZ		45	M3X45L
CDQ2B20-5SZ	10.5	40	M5X40L
CDQ2B20-10SZ		45	M5X45L
CDQ2B25-5SZ	9.5	40	M5X40L
CDQ2B25-10SZ		45	M5X45L
CDQ2B32-5SZ	9	40	M5X40L
CDQ2B32-10SZ		45	M5X45L
CDQ2B40-5SZ	7.5	45	M5X45L
CDQ2B40-10SZ		50	M5X50L
CDQ2B50-10SZ	12.5	55	M6X55L
CDQ2B50-20SZ		65	M6X65L

### Spring Extend

Cylinder model	C	D	Mounting bolt
CDQ2B12-5TZ	6.1	40	M3X40L
CDQ2B12-10TZ		45	M3X45L
CDQ2B16-5TZ	8	40	M3X40L
CDQ2B16-10TZ		45	M3X45L
CDQ2B20-5TZ	10.5	40	M5X40L
CDQ2B20-10TZ		45	M5X45L
CDQ2B25-5TZ	9.5	40	M5X40L
CDQ2B25-10TZ		45	M5X45L
CDQ2B32-5TZ	9	40	M5X40L
CDQ2B32-10TZ		45	M5X45L
CDQ2B40-5TZ	7.5	45	M5X45L
CDQ2B40-10TZ		50	M5X50L
CDQ2B50-10TZ	12.5	55	M6X55L
CDQ2B50-20TZ		65	M6X65L

Standard

Large Bore  
Size

Long Stroke

Non-rotating  
Rod

Axial Piping

Anti-lateral  
Load

With End Lock

Water  
Resistant

With Auto  
Switch

Auto Switch

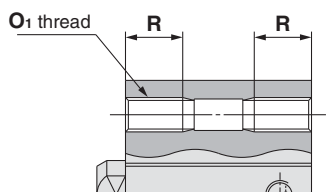
Made to Order

# Series CQ2

## Dimensions

### Ø12 to Ø25/Spring Return Without Auto Switch

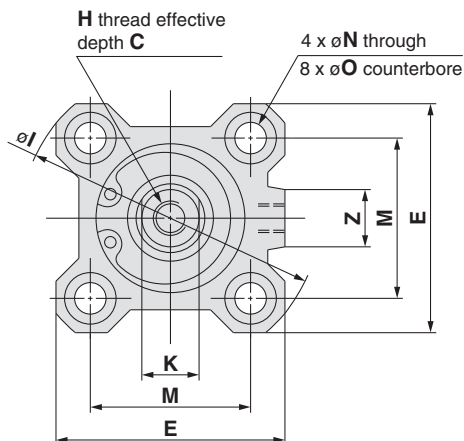
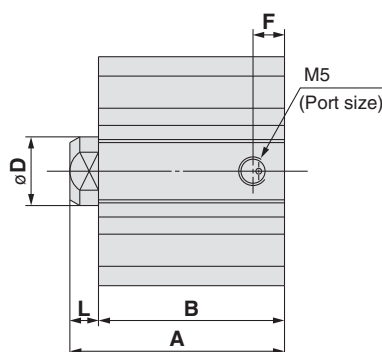
#### Both ends tapped: CQ2A



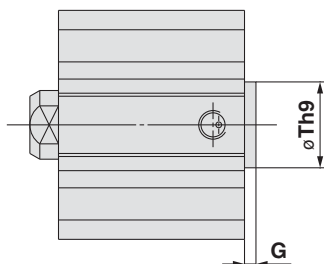
#### Both Ends Tapped (mm)

Bore size (mm)	O1	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CQ2B



#### With boss on head side

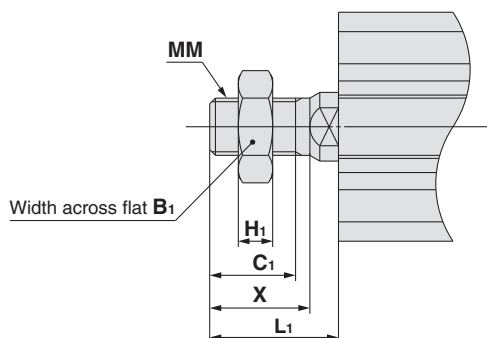


#### With Boss on Head Side (mm)

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13.5 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note) With boss on rod cover side:  
Option (Suffix "-XC36" to the end of model number.)

#### Rod end male thread



#### Rod End Male Thread (mm)

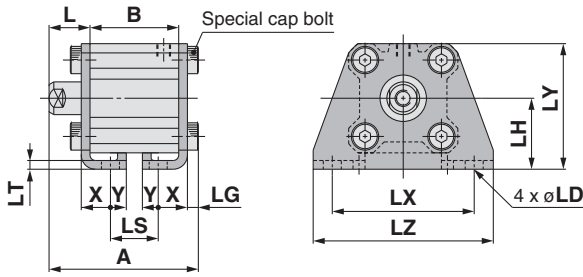
Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

#### Standard

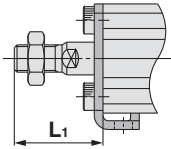
Bore size (mm)	Stroke (mm)	A	B	C	D	E	F	H	I	K	L	M	N	O	Z
12	5	25.5	22	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	—
	10	30.5	27												
16	5	27	23.5	8	8	29	5.5	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	10
	10	32	28.5												
20	5	29	24.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	10
	10	34	29.5												
25	5	32.5	27.5	12	12	40	5.5	M6 x 1.0	52	10	5	28	5.5	9 depth 7	10
	10	37.5	32.5												

\* For details about the rod end nut and accessory brackets, refer to page 19.

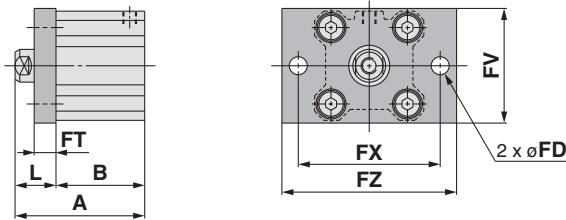
**Foot: CQ2L**



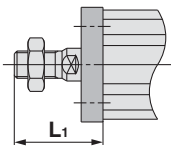
**Rod end male thread**



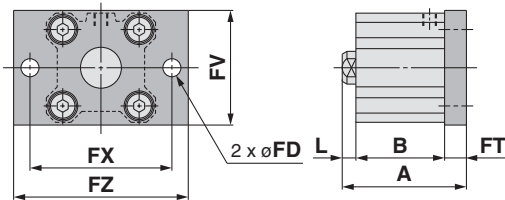
**Rod flange: CQ2F**



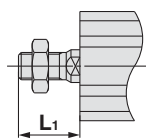
**Rod end male thread**



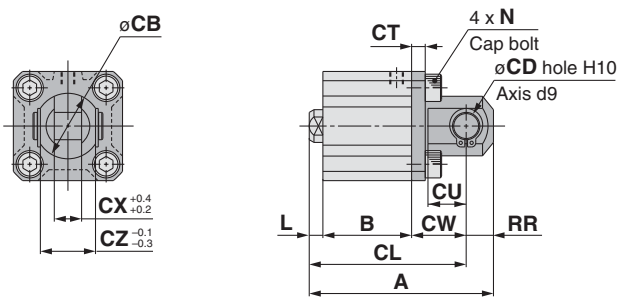
**Head flange: CQ2G**



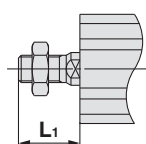
**Rod end male thread**



**Double clevis: CQ2D**



**Rod end male thread**



**Foot**

Bore size (mm)	A		B		L	L <sub>1</sub>	LD	LG	LH	LS	
	5st	10st	5st	10st						5st	10st
12	40.3	45.3	22	27	13.5	24	4.5	2.8	17	10	15
16	41.8	46.8	23.5	28.5	13.5	25.5	4.5	2.8	19	11.5	16.5
20	46.2	51.2	24.5	29.5	14.5	28.5	6.6	4	24	12.5	17.5
25	49.7	54.7	27.5	32.5	15	32.5	6.6	4	26	12.5	17.5

Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L	L <sub>1</sub>
	5st	10st	5st	10st							
12	35.5	40.5	22	27	4.5	5.5	25	45	55	13.5	24
16	37	42	23.5	28.5	4.5	5.5	30	45	55	13.5	25.5
20	39	44	24.5	29.5	6.6	8	39	48	60	14.5	28.5
25	42.5	47.5	27.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	A		L	L <sub>1</sub>
	5st	10st		
12	31	36	3.5	14
16	32.5	37.5	3.5	15.5
20	37	42	4.5	18.5
25	40.5	45.5	5	22.5

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis**

Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW
	5st	10st	5st	10st							
12	45.5	50.5	22	27	12	5	39.5	44.5	4	7	14
16	48	53	23.5	28.5	14	5	42	47	4	10	15
20	56	61	24.5	29.5	20	8	47	52	5	12	18
25	62.5	67.5	27.5	32.5	24	10	52.5	57.5	5	14	20

Bore size (mm)	CX	CZ	L	L <sub>1</sub>	N	RR
12	5	10	3.5	14	M4 x 0.7	6
16	6.5	12	3.5	15.5	M4 x 0.7	6
20	8	16	4.5	18.5	M6 x 1.0	9
25	10	20	5	22.5	M6 x 1.0	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

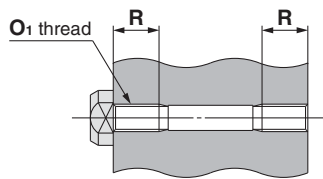
Made to Order

# Series CQ2

## Dimensions

### ∅12 to ∅25/Spring Return With Auto Switch

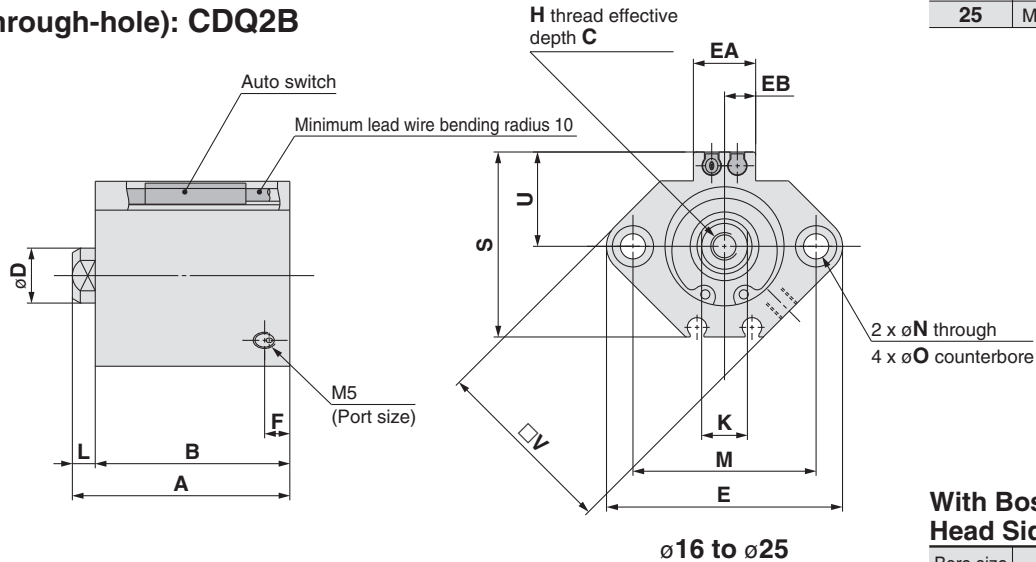
Both ends tapped: CDQ2A



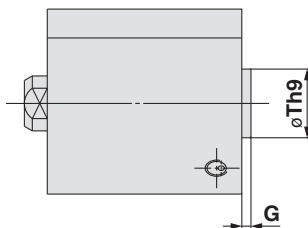
Both Ends Tapped

Bore size (mm)	(mm)	
	O1	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

Standard (Through-hole): CDQ2B



With boss on head side

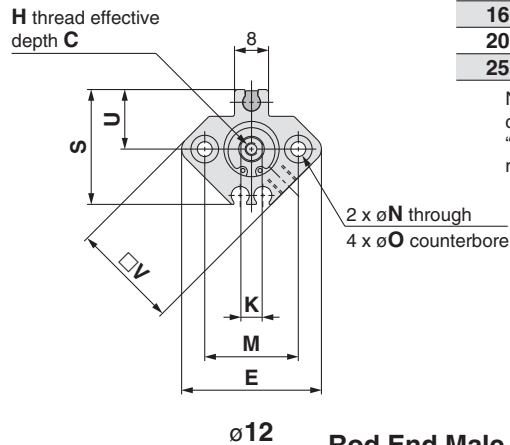
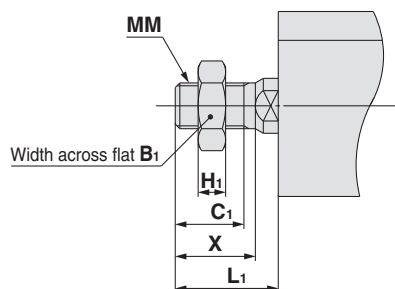


With Boss on Head Side

Bore size (mm)	(mm)	
	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note) With boss on rod cover side: Option (Suffix "-XC36" to the end of model number.)

Rod end male thread



Rod End Male Thread

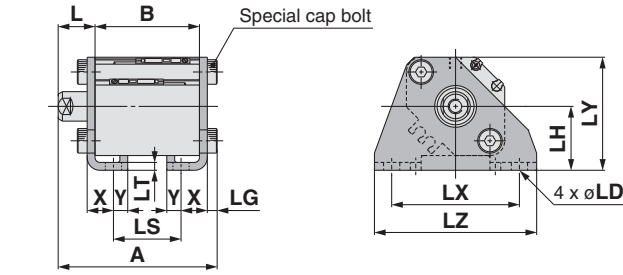
Bore size (mm)	(mm)					
	B1	C1	H1	L1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

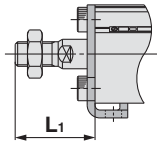
Bore size (mm)	Stroke (mm)	A	B	C	D	E	EA	EB	F	H	K	L	M	N	O	S	U	V
12	5	36.5	33	6	6	33	—	—	6.5	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	27.5	14	25
	10	41.5	38	6	6	33	—	—	6.5	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	27.5	14	25
16	5	39	35.5	8	8	37	13.2	6.6	5.5	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	29.5	15	29
	10	44	40.5	8	8	37	13.2	6.6	5.5	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	29.5	15	29
20	5	41	36.5	7	10	47	13.6	6.8	5.5	M5 x 0.8	8	4.5	36	5.5	9 depth 7	35.5	18	36
	10	46	41.5	7	10	47	13.6	6.8	5.5	M5 x 0.8	8	4.5	36	5.5	9 depth 7	35.5	18	36
25	5	42.5	37.5	12	12	52	13.6	6.8	5.5	M6 x 1.0	10	5	40	5.5	9 depth 7	40.5	21	40
	10	47.5	42.5	12	12	52	13.6	6.8	5.5	M6 x 1.0	10	5	40	5.5	9 depth 7	40.5	21	40

\* For details about the rod end nut and accessory brackets, refer to page 19.

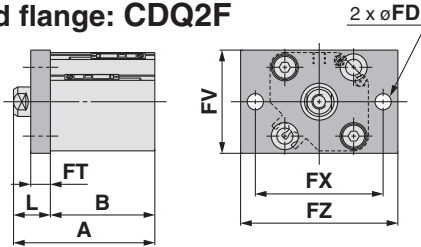
Foot: CDQ2L



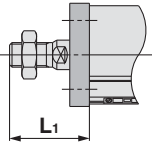
Rod end male thread



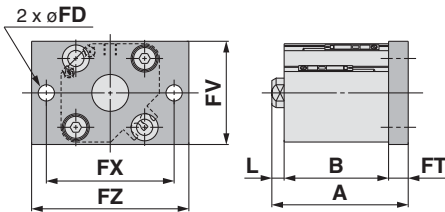
Rod flange: CDQ2F



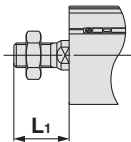
Rod end male thread



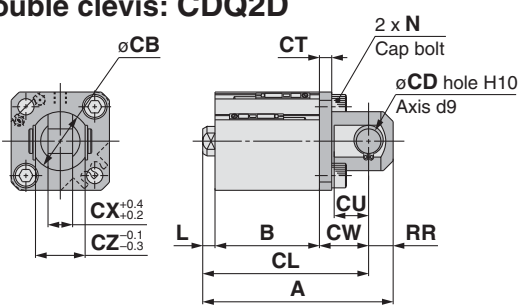
Head flange: CDQ2G



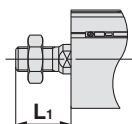
Rod end male thread



Double clevis: CDQ2D



Rod end male thread



Foot

Bore size (mm)	A		B		L	L <sub>1</sub>	LD	LG	LH	LS	
	5st	10st	5st	10st						5st	10st
12	51.3	56.3	33	38	13.5	24	4.5	2.8	17	21	26
16	53.8	58.8	35.5	40.5	13.5	25.5	4.5	2.8	19	23.5	28.5
20	58.2	63.2	36.5	41.5	14.5	28.5	6.6	4	24	24.5	29.5
25	59.7	64.7	37.5	42.5	15	32.5	6.6	4	26	22.5	27.5

Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

Rod Flange

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L	L <sub>1</sub>
	5st	10st	5st	10st							
12	46.5	51.5	33	38	4.5	5.5	25	45	55	13.5	24
16	49	54	35.5	40.5	4.5	5.5	30	45	55	13.5	25.5
20	51	56	36.5	41.5	6.6	8	39	48	60	14.5	28.5
25	52.5	57.5	37.5	42.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

Head Flange

Bore size (mm)	A		L	L <sub>1</sub>
	5st	10st		
12	46.4	51.4	3.5	14
16	44.5	49.5	3.5	15.5
20	49	54	4.5	18.5
25	50.5	55.5	5	22.5

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

Double Clevis

Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW
	5st	10st	5st	10st			5st	10st			
12	56.5	61.5	33	38	12	5	50.5	55.5	4	7	14
16	60	65	35.5	40.5	14	5	54	59	4	10	15
20	68	73	36.5	41.5	20	8	59	64	5	12	18
25	72.5	77.5	37.5	42.5	24	10	62.5	67.5	5	14	20

Bore size (mm)	CX	CZ	L	L <sub>1</sub>	N	RR
12	5	10	3.5	14	M4 x 0.7	6
16	6.5	12	3.5	15.5	M4 x 0.7	6
20	8	16	4.5	18.5	M6 x 1.0	9
25	10	20	5	22.5	M6 x 1.0	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

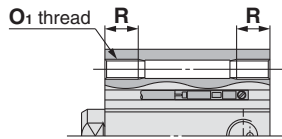
# Series CQ2

## Dimensions

### ø32 to ø50/Spring Return With Auto Switch

(In the case of without auto switches, the A, B, F and P dimensions will be only changed. Refer to the dimension table.)

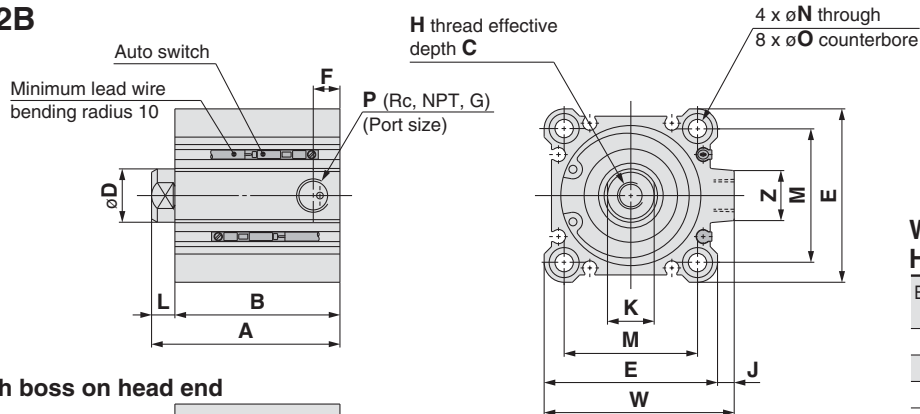
#### Both ends tapped: CQ2A/CDQ2A



#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

#### Standard (Through-hole): CQ2B/CDQ2B

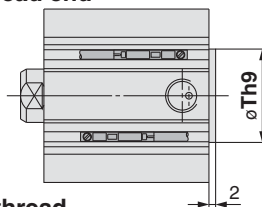


#### With Boss on Head End (mm)

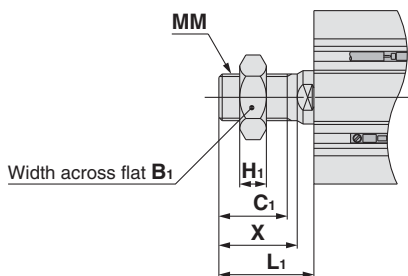
Bore size (mm)	Th9
32	21 <sup>0</sup> <sub>-0.052</sub>
40	28 <sup>0</sup> <sub>-0.052</sub>
50	35 <sup>0</sup> <sub>-0.062</sub>

Note 1) With boss on rod end:  
Option (Suffix "-XC36" to the end of model number.)

#### With boss on head end



#### Rod end male thread

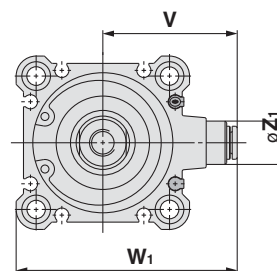
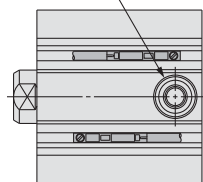


#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

#### Built-in one-touch fittings: ø32 to ø50

P<sub>1</sub>  
(Piping tube O.D.)



#### Built-in One-touch Fittings (mm)

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
32	13	6	36.5	59
40	13	6	40.5	66.5
50	16	8	50	82

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

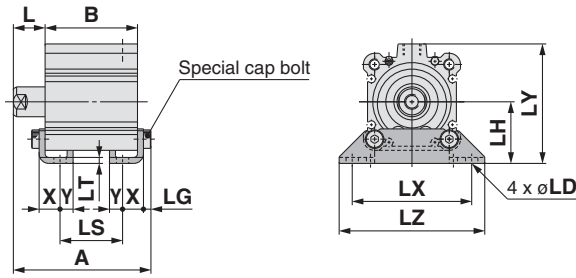
Bore size (mm)	Stroke (mm)	Without auto switch				With auto switch				C	D	E	H	J	K	L	M	N	O	W	Z
		A	B	F	P	A	B	F	P												
32	5	35	28	5.5	M5 x 0.8	45	38	7.5	1/8	13	16	45	M8 x 1.25	4.5	14	7	34	5.5	9 depth 7	49.5	14
	10	40	33	7.5	1/8	50	43														
40	5	41.5	34.5	8	1/8	51.5	44.5	8	1/8	13	16	52	M8 x 1.25	5	14	7	40	5.5	9 depth 7	57	15
	10	46.5	39.5	8		56.5	49.5														
50	10	48.5	40.5	10.5	1/4	58.5	50.5	10.5	1/4	15	20	64	M10 x 1.5	7	17	8	50	6.6	11 depth 8	71	19
	20	58.5	50.5	10.5		68.5	60.5														

Note 2) The A, B dimensions of the ø32-5 mm stroke with built-in one-touch fittings without auto switch are the same as those of the ø32-10 mm stroke without auto switch.

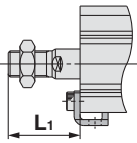
\* For details about the rod end nut and accessory brackets, refer to page 19.



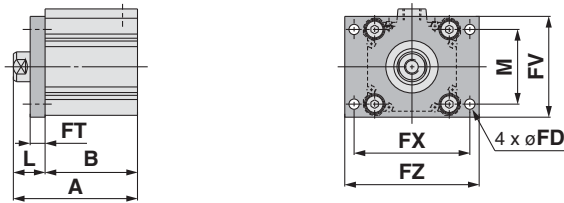
**Foot: CQ2L/CDQ2L**



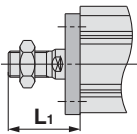
Rod end male thread



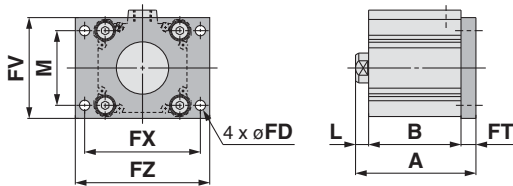
**Rod flange: CQ2F/CDQ2F**



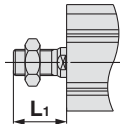
Rod end male thread



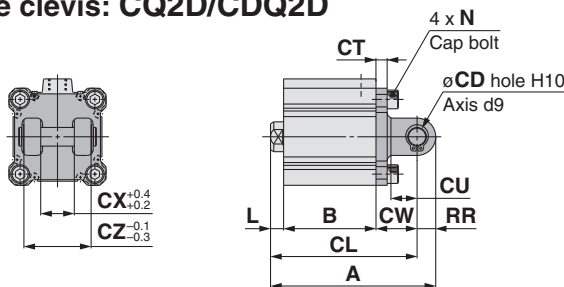
**Head flange: CQ2G/CDQ2G**



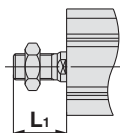
Rod end male thread



**Double clevis: CQ2D/CDQ2D**



Rod end male thread



**Foot**

(mm)

Bore size (mm)	Without auto switch						With auto switch											
	A		B		LS		A		B		LS							
32	52.2	57.2	—	28	33	—	12	17	—	62.2	67.2	—	38	43	—	22	27	—
40	58.7	63.7	—	34.5	39.5	—	18.5	23.5	—	68.7	73.7	—	44.5	49.5	—	28.5	33.5	—
50	—	66.7	76.7	—	40.5	50.5	—	17.5	27.5	—	76.7	86.7	—	50.5	60.5	—	27.5	37.5

Bore size (mm)	L	L <sub>1</sub>	LD	LG	LH	LX	LT	LY	LZ	X	Y
32	17	38.5	6.6	4	30	57	3.2	57	71	11.2	5.8
40	17	38.5	6.6	4	33	64	3.2	64	78	11.2	7
50	18	43.5	9	5	39	79	3.2	78	95	14.7	8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

(mm)

Bore size (mm)	Without auto switch						With auto switch					
	A		B		A		B		A		B	
32	45	50	—	28	33	—	55	60	—	38	43	—
40	51.5	56.5	—	34.5	39.5	—	61.5	66.5	—	44.5	49.5	—
50	—	58.5	68.5	—	40.5	50.5	—	68.5	78.5	—	50.5	60.5

Bore size (mm)	FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
32	5.5	8	48	56	65	17	38.5	34
40	5.5	8	54	62	72	17	38.5	40
50	6.6	9	67	76	89	18	43.5	50

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

(mm)

Bore size (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>
	A	A	A	A	A	A		
32	43	48	—	53	58	—	7	28.5
40	49.5	54.5	—	59.5	64.5	—	7	28.5
50	—	57.5	67.5	—	67.5	77.5	8	33.5

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis**

(mm)

Bore size (mm)	Without auto switch						With auto switch											
	A		B		CL		A		B		CL							
32	65	70	—	28	33	—	55	60	—	75	80	—	38	43	—	65	70	—
40	73.5	78.5	—	34.5	39.5	—	63.5	68.5	—	83.5	88.5	—	44.5	49.5	—	73.5	78.5	—
50	—	90.5	100.5	—	40.5	50.5	—	76.5	86.5	—	100.5	110.5	—	50.5	60.5	—	86.5	96.5

Bore size (mm)	CD	CT	CU	CW	CX	CZ	L	L <sub>1</sub>	N	RR
32	10	5	14	20	18	36	7	28.5	M6 x 1.0	10
40	10	6	14	22	18	36	7	28.5	M6 x 1.0	10
50	14	7	20	28	22	44	8	33.5	M8 x 1.25	14

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

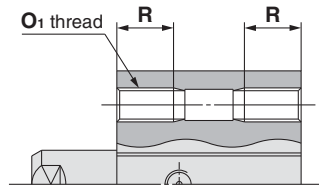
Made to Order

# Series CQ2

## Dimensions

### Ø12 to Ø25/Spring Extend Without Auto Switch

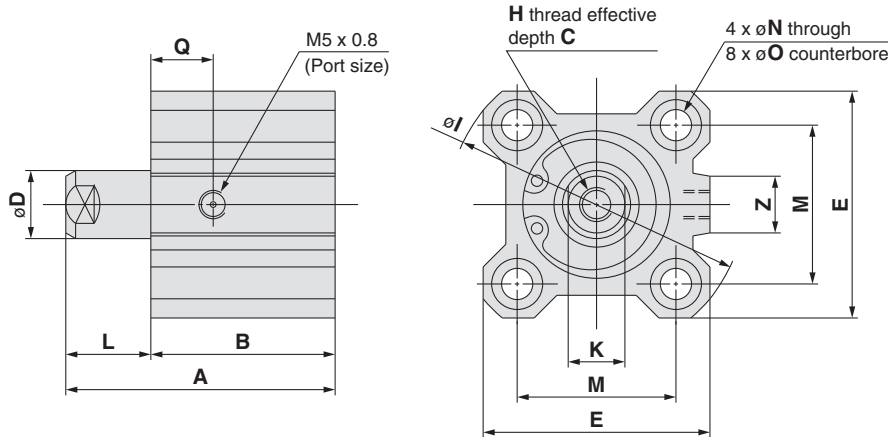
#### Both ends tapped: CQ2A



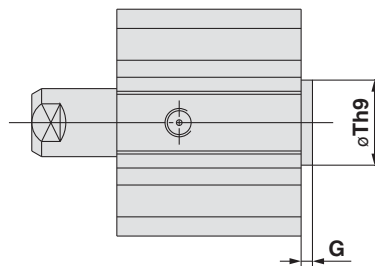
#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CQ2B



#### With boss on head side

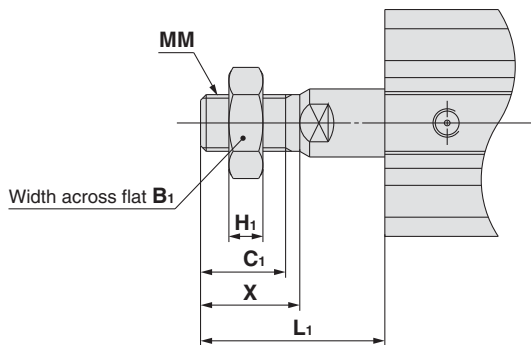


#### With Boss on Head Side

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.062</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note) With boss on rod cover side: Option (Suffix "-XC36" to the end of model number.)

#### Rod end male thread



#### Rod End Male Thread

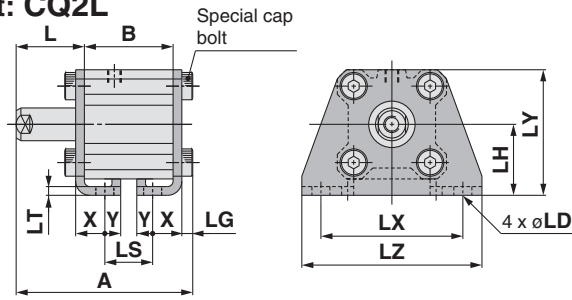
Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

#### Standard

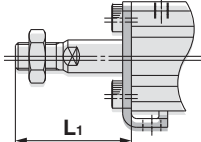
Bore size (mm)	Stroke (mm)	(mm)													
		A	B	C	D	E	H	I	K	L	M	N	O	Q	Z
12	5	30.5	22	6	6	25	M3 x 0.5	32	5	8.5	15.5	3.5	6.5 depth 3.5	7.5	—
	10	40.5	27							13.5					
16	5	32	23.5	8	8	29	M4 x 0.7	38	6	8.5	20	3.5	6.5 depth 3.5	8	10
	10	42	28.5							13.5					
20	5	34	24.5	7	10	36	M5 x 0.8	47	8	9.5	25.5	5.5	9 depth 7	9	10
	10	44	29.5							14.5					
25	5	37.5	27.5	12	12	40	M6 x 1.0	52	10	10	28	5.5	9 depth 7	11	10
	10	47.5	32.5							15					

\* For details about the rod end nut and accessory brackets, refer to page 19.

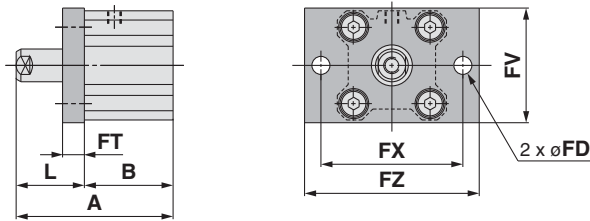
**Foot: CQ2L**



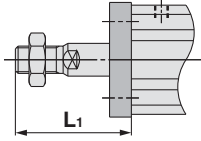
Rod end male thread



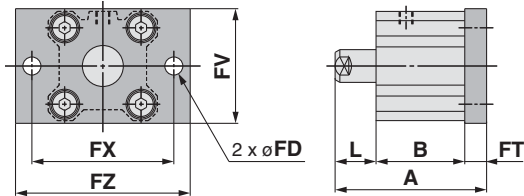
**Rod flange: CQ2F**



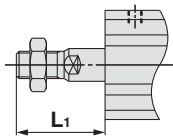
Rod end male thread



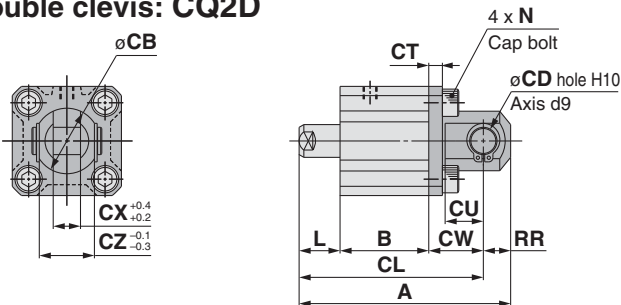
**Head flange: CQ2G**



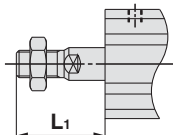
Rod end male thread



**Double clevis: CQ2D**



Rod end male thread



**Foot**

Bore size (mm)	A		B		L		L <sub>1</sub>		LD	LG	LH	LS	
	5st	10st	5st	10st	5st	10st	5st	10st				5st	10st
12	45.3	55.3	22	27	18.5	23.5	29	34	4.5	2.8	17	10	15
16	46.8	56.8	23.5	28.5	18.5	23.5	30.5	35.5	4.5	2.8	19	11.5	16.5
20	51.2	61.2	24.5	29.5	19.5	24.5	33.5	38.5	6.6	4	24	12.5	17.5
25	54.7	64.7	27.5	32.5	20	25	37.5	42.5	6.6	4	26	12.5	17.5

Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L		L <sub>1</sub>	
	5st	10st	5st	10st						5st	10st	5st	10st
12	40.5	50.5	22	27	4.5	5.5	25	45	55	18.5	23.5	29	34
16	42	52	23.5	28.5	4.5	5.5	30	45	55	18.5	23.5	30.5	35.5
20	44	54	24.5	29.5	6.6	8	39	48	60	19.5	24.5	33.5	38.5
25	47.5	57.5	27.5	32.5	6.6	8	42	52	64	20	25	37.5	42.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	A		L		L <sub>1</sub>	
	5st	10st	5st	10st	5st	10st
12	36	46	8.5	13.5	19	24
16	37.5	47.5	8.5	13.5	20.5	25.5
20	42	52	9.5	14.5	23.5	28.5
25	45.5	55.5	10	15	27.5	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

**Double Clevis**

Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW	CX	CZ
	5st	10st	5st	10st			5st	10st					
12	50.5	60.5	22	27	12	5	44.5	54.5	4	7	14	5	10
16	53	63	23.5	28.5	14	5	47	57	4	10	15	6.5	12
20	61	71	24.5	29.5	20	8	52	62	5	12	18	8	16
25	67.5	77.5	27.5	32.5	24	10	57.5	67.5	5	14	20	10	20

Bore size (mm)	L		L <sub>1</sub>		N	RR
	5st	10st	5st	10st		
12	8.5	13.5	19	24	M4 x 0.7	6
16	8.5	13.5	20.5	25.5	M4 x 0.7	6
20	9.5	14.5	23.5	28.5	M6 x 1.0	9
25	10	15	27.5	32.5	M6 x 1.0	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

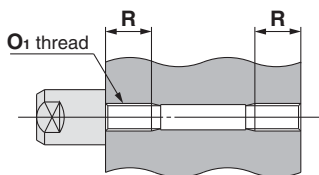
Made to Order

# Series CQ2

## Dimensions

### ∅12 to ∅25/Spring Extend With Auto Switch

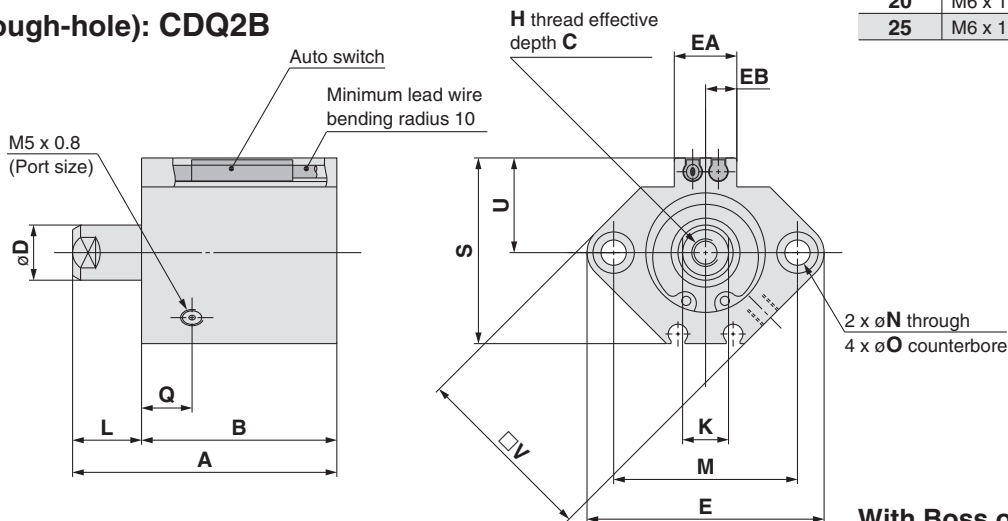
#### Both ends tapped: CDQ2A



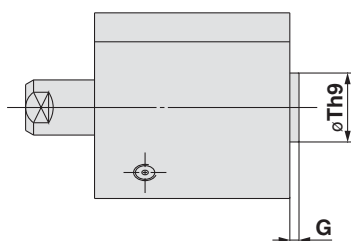
#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

#### Standard (Through-hole): CDQ2B



#### With boss on head end



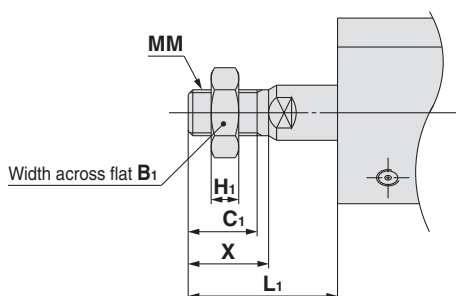
#### ∅16 to ∅25

#### With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

Note) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

#### Rod end male thread



#### ∅12 Rod End Male Thread (mm)

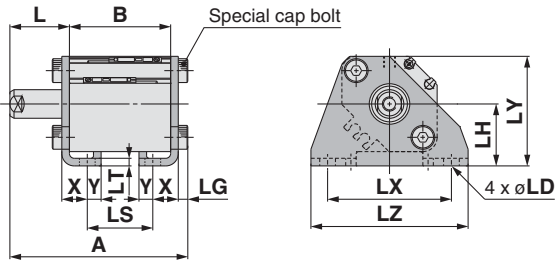
Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

#### Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

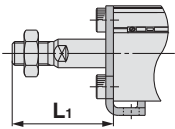
Bore size (mm)	Stroke (mm)	A	B	C	D	E	EA	EB	H	K	L	M	N	O	Q	S	U	V
12	5	45.9	37.4	6	6	33	—	—	M3 x 0.5	5	8.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
	10	55.9	42.4								13.5							
16	5	44	35.5	8	8	37	13.2	6.6	M4 x 0.7	6	8.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
	10	54	40.5								13.5							
20	5	46	36.5	7	10	47	13.6	6.8	M5 x 0.8	8	9.5	36	5.5	9 depth 7	10.5	35.5	18	36
	10	56	41.5								14.5							
25	5	47.5	37.5	12	12	52	13.6	6.8	M6 x 1.0	10	10	40	5.5	9 depth 7	11	40.5	21	40
	10	57.5	42.5								15							

\* For details about the rod end nut and accessory brackets, refer to page 19.

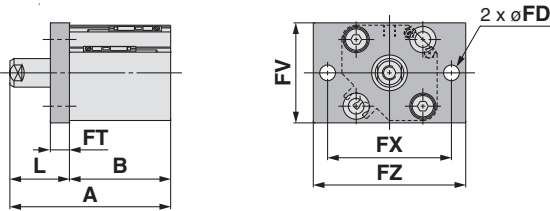
**Foot: CDQ2L**



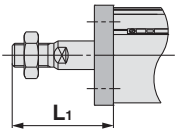
Rod end male thread



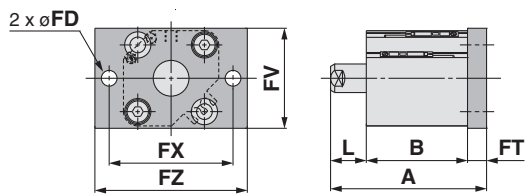
**Rod flange: CDQ2F**



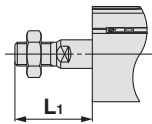
Rod end male thread



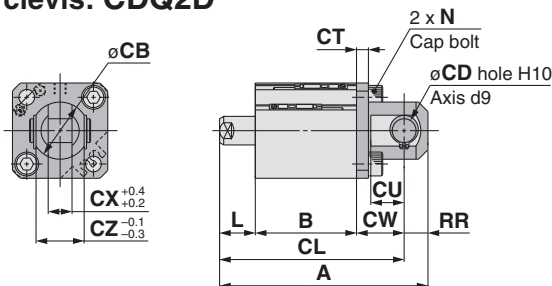
**Head flange: CDQ2G**



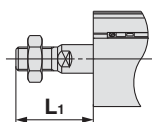
Rod end male thread



**Double clevis: CDQ2D**



Rod end male thread



**Foot**

Bore size (mm)	A		B		L		L <sub>1</sub>		LD	LG	LH	LS	
	5st	10st	5st	10st	5st	10st	5st	10st				5st	10st
12	60.7	70.7	37.4	42.4	18.5	23.5	29	34	4.5	2.8	17	25.4	30.4
16	58.8	68.8	35.5	40.5	18.5	23.5	30.5	35.5	4.5	2.8	19	23.5	28.5
20	63.2	73.2	36.5	41.5	19.5	24.5	33.5	38.5	6.6	4	24	24.5	29.5
25	64.7	74.7	37.5	42.5	20	25	37.5	42.5	6.6	4	26	22.5	27.5

Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L		L <sub>1</sub>	
	5st	10st	5st	10st						5st	10st	5st	10st
12	55.9	65.9	37.4	42.4	4.5	5.5	25	45	55	18.5	23.5	29	34
16	54	64	35.5	40.5	4.5	5.5	30	45	55	18.5	23.5	30.5	35.5
20	56	66	36.5	41.5	6.6	8	39	48	60	19.5	24.5	33.5	38.5
25	57.5	67.5	37.5	42.5	6.6	8	42	52	64	20	25	37.5	42.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	A		L		L <sub>1</sub>	
	5st	10st	5st	10st	5st	10st
12	51.4	61.4	8.5	13.5	19	24
16	49.5	59.5	8.5	13.5	20.5	25.5
20	54	64	9.5	14.5	23.5	28.5
25	55.5	65.5	10	15	27.5	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.

**Double Clevis**

Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW	CX	CZ
	5st	10st	5st	10st			5st	10st					
12	65.9	75.9	37.4	42.4	12	5	59.9	69.9	4	7	14	5	10
16	65	75	35.5	40.5	14	5	59	69	4	10	15	6.5	12
20	73	83	36.5	41.5	20	8	64	74	5	12	18	8	16
25	77.5	87.5	37.5	42.5	24	10	67.5	77.5	5	14	20	10	20

Bore size (mm)	L		L <sub>1</sub>		N	RR
	5st	10st	5st	10st		
12	8.5	13.5	19	24	M4 x 0.7	6
16	8.5	13.5	20.5	25.5	M4 x 0.7	6
20	9.5	14.5	23.5	28.5	M6 x 1.0	9
25	10	15	27.5	32.5	M6 x 1.0	10

Double clevis bracket material:  
Carbon steel  
Surface treatment:  
Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

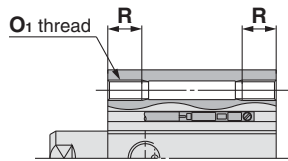
# Series CQ2

## Dimensions

### Ø32 to Ø50/Spring Extend With Auto Switch

(In the case of without auto switches, the A, B, P and Q dimensions will be only changed. Refer to the dimension table.)

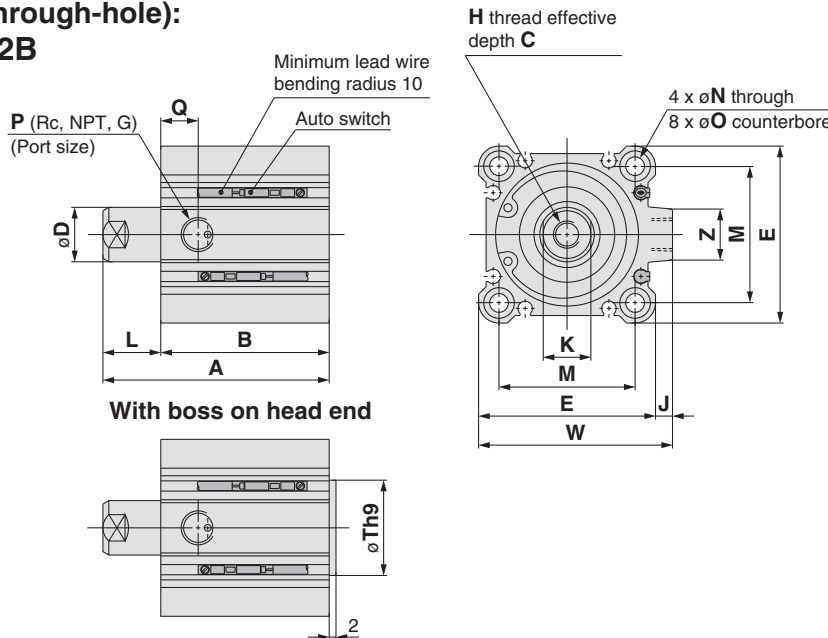
#### Both ends tapped: CQ2A/CDQ2A



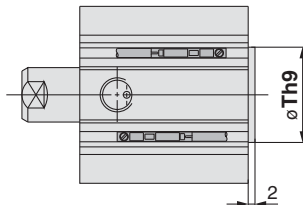
#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14

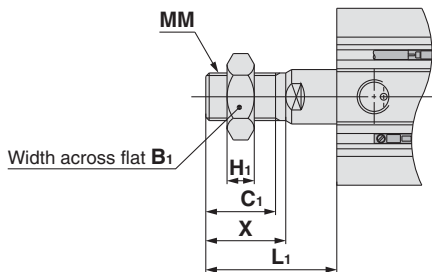
#### Standard (Through-hole): CQ2B/CDQ2B



#### With boss on head end



#### Rod end male thread



#### With Boss on Head End (mm)

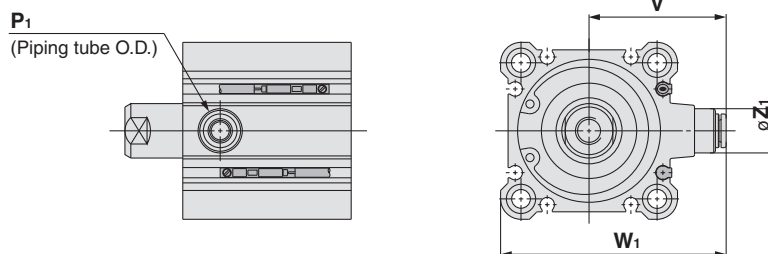
Bore size (mm)	Th9
32	21 <sup>0</sup> <sub>-0.052</sub>
40	28 <sup>0</sup> <sub>-0.052</sub>
50	35 <sup>0</sup> <sub>-0.052</sub>

Note) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>			MM	X
				5st	10st	20st		
32	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
40	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
50	27	26	11	—	43.5	53.5	M18 x 1.5	28.5

#### Built-in one-touch fittings: Ø32 to Ø50



#### Built-in One-touch Fittings (mm)

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
32	13	6	36.5	59
40	13	6	40.5	66.5
50	16	8	50	82

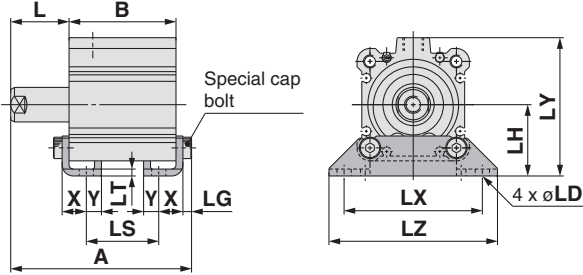
**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke (mm)	Without auto switch				With auto switch				C	D	E	H	J	K	L	M	N	O	W	Z
		A	B	P	Q	A	B	P	Q												
32	5	40	28	M5 x 0.8	11.5	50	38	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	12	34	5.5	9 depth 7	49.5	14
	10	50	33	1/8	10.5	60	43														
40	5	46.5	34.5	1/8	11	56.5	44.5	1/8	11	13	16	52	M8 x 1.25	5	14	12	40	5.5	9 depth 7	57	15
	10	56.5	39.5			66.5	49.5									17					
50	10	68.5	40.5	1/4	10.5	68.5	50.5	1/4	10.5	15	20	64	M10 x 1.5	7	17	18	50	6.6	11 depth 8	71	19
	20	78.5	50.5			88.5	60.5									28					

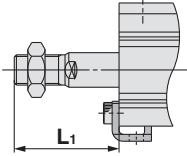
\* For details about the rod end nut and accessory brackets, refer to page 19.

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

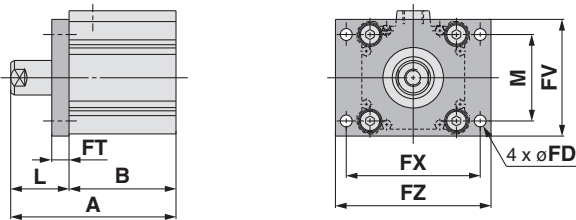
## Foot: CQ2L/CDQ2L



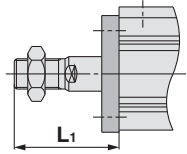
### Rod end male thread



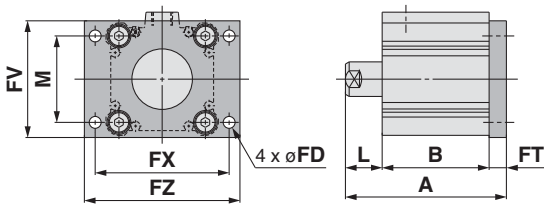
## Rod flange: CQ2F/CDQ2F



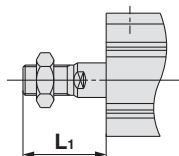
### Rod end male thread



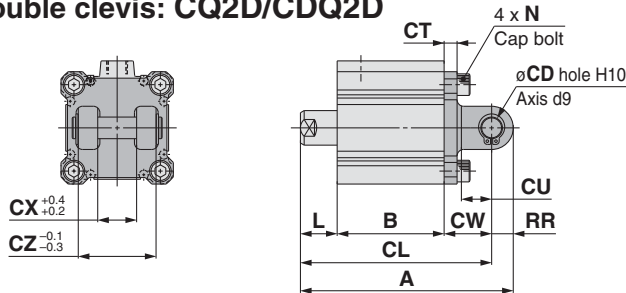
## Head flange: CQ2G/CDQ2G



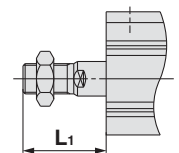
### Rod end male thread



## Double clevis: CQ2D/CDQ2D



### Rod end male thread



## Foot

Bore size (mm)	Without auto switch									With auto switch									
	A			B			LS			A			B			LS			
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	
32	57.2	67.2	-	28	33	-	12	17	-	67.2	77.2	-	38	43	-	22	27	-	
40	63.7	73.7	-	34.5	39.5	-	18.5	23.5	-	73.7	83.7	-	44.5	49.5	-	28.5	33.5	-	
50	-	76.7	96.7	-	40.5	50.5	-	17.5	27.5	-	86.7	106.7	-	50.5	60.5	-	27.5	37.5	-

Bore size (mm)	L			L1			LD	LG	LH	LT	LX	LY	LZ	X	Y
	5st	10st	20st	5st	10st	20st									
	32	22	27	-	43.5	48.5									
40	22	27	-	43.5	48.5	-	6.6	4	33	3.2	64	64	78	11.2	7
50	-	28	38	-	53.5	63.5	9	5	39	3.2	79	78	95	14.7	8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod Flange

Bore size (mm)	Without auto switch						With auto switch										
	A			B			A			B			FD	FT	FV	FX	FZ
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st					
32	50	60	-	28	33	-	60	70	-	38	43	-	5.5	8	45	56	65
40	56.5	66.5	-	34.5	39.5	-	66.5	76.5	-	44.5	49.5	-	5.5	8	54	62	72
50	-	68.5	88.5	-	40.5	50.5	-	78.5	98.5	-	50.5	60.5	6.6	9	67	76	89

Bore size (mm)	L			L1			M
	5st	10st	20st	5st	10st	20st	
	32	22	27	-	43.5	48.5	
40	22	27	-	43.5	48.5	-	40
50	-	28	38	-	53.5	63.5	50

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Head Flange

Bore size (mm)	Without auto switch			With auto switch			L			L1			
	A			A			L			L1			
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	
32	48	58	-	58	68	-	12	17	-	33.5	38.5	-	
40	54.5	64.5	-	64.5	74.5	-	12	17	-	33.5	38.5	-	
50	-	67.5	87.5	-	77.5	97.5	-	18	28	-	43.5	53.5	-

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

(\* The dimensions except A, L and L1 are the same as those of the rod flange.)

## Double Clevis

Bore size (mm)	Without auto switch									With auto switch									
	A			B			CL			A			B			CL			
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	
32	70	80	-	28	33	-	60	70	-	80	90	-	38	43	-	70	80	-	
40	78.5	88.5	-	34.5	39.5	-	68.5	78.5	-	88.5	98.5	-	44.5	49.5	-	78.5	88.5	-	
50	-	100.5	120.5	-	40.5	50.5	-	86.5	106.5	-	110.5	130.5	-	50.5	60.5	-	96.5	116.5	-

Bore size (mm)	CD	CT	CU	CW	CX	CZ	L			L1			N	RR
							5st	10st	20st	5st	10st	20st		
							32	10	5	14	20	18		
40	10	6	14	22	18	36	12	17	-	33.5	38.5	-	M6 x 1.0	10
50	14	7	20	28	22	44	-	18	28	-	43.5	53.5	M8 x 1.25	14

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

# Compact Cylinder: Large Bore Size Double Acting, Single Rod

## Series CQ2

ø125, ø140, ø160, ø180, ø200

### How to Order

Without auto switch

CQ2B 125 - 30 DC Z -

With auto switch

CDQ2B 125 - 30 DC Z - M9BW -

With auto switch  
(Built-in magnet)

Mounting

**B** Through-hole/Both ends tapped common (Standard)

\* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQ2B" on page 59.

Bore size

125	125 mm
140	140 mm
160	160 mm
180	180 mm
200	200 mm

Port thread type

—	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

Refer to the next page for standard strokes.

Action

**D** Double acting

Made to Order  
Refer to the next page for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

**Z** ø125 to ø200 4 surfaces

Body option

—	Standard (Rod end female thread)
M	Rod end male thread

Cushion

**C** Rubber bumper

### 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) CDQ2B140-30DCZ

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC		
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	●	●	●	○	—	○			
	Diagnostic indication (2-colour indication)			3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○			IC circuit
				3-wire (PNP)				M9PVV	M9PV	●	●	●	○	—	○			
				2-wire				M9BVV	M9BV	●	●	●	○	—	○			
	Water resistant (2-colour indication)			3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○			IC circuit
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○			
				2-wire				M9BAV**	M9BA**	○	○	●	○	—	○			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—		
				2-wire				12 V	100 V	A93V	A93	●	—	●	—	—	—	Relay, PLC
								5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

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

\* 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.

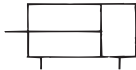


# Compact Cylinder: Large Bore Size Double Acting, Single Rod *Series CQ2*

## Specifications



**Symbol**  
Double acting,  
Single rod



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XB10	Intermediate stroke (Exclusive body type)
-X271	Fluororubber seals, ø125 to ø160 only

Bore size (mm)	125	140	160	180	200
<b>Action</b>	Double acting, Single rod				
<b>Fluid</b>	Air				
<b>Proof pressure</b>	1.5 MPa			1.05 MPa	
<b>Maximum operating pressure</b>	1.0 MPa			0.7 MPa	
<b>Minimum operating pressure</b>	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			20 to 400 mm/s	
<b>Allowable kinetic energy (J)</b>	7.4	9.8	12.4		
<b>Stroke length tolerance</b>	+1.4 mm Note) 0				

Note) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size (mm)	Standard stroke (mm)
125, 140, 160 180, 200	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300

## Manufacture of Intermediate Strokes

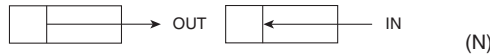
Type	A spacer is installed in the standard stroke body.	Exclusive body (-XB10)		
Part no.	Refer to "How to Order" for the standard model number. (P. 57)	Suffix "-XB10" to the end of standard model number. (P. 57)		
Description	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.		
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	125 to 200	5 to 295	125 to 160	11 to 299
Example	Part no.: CQ2B160-165DCZ CQ2B160-175DCZ with 10 mm width spacer inside The B dimension is 266 mm.	Part no.: CQ2B160-165DCZ-XB10 Makes 165 mm stroke tube. The B dimension is 256 mm.		

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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.

# Series CQ2

## Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
125	IN	3376	5627	7878
	OUT	3682	6136	8590
140	IN	4313	7188	10063
	OUT	4618	7697	10776
160	IN	5655	9425	13195
	OUT	6032	10053	14074
180	IN	7257	12095	16933
	OUT	7634	12724	17813
200	IN	9048	15080	21112
	OUT	9425	15708	21991

## Weight

### Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.24	5.48	5.71	5.94	6.18	6.76	7.35	7.93	8.52	9.10	9.69	10.86	12.03
140	6.19	6.44	6.71	6.98	7.25	7.90	8.57	9.23	9.90	10.56	11.23	12.55	13.88
160	8.57	8.88	9.20	9.52	9.84	10.64	11.44	12.25	13.05	13.85	14.65	16.26	17.85
180	11.54	11.92	12.31	12.70	13.09	14.05	15.03	16.00	16.97	17.93	18.90	20.84	22.78
200	14.56	15.07	15.49	15.92	16.34	17.41	18.47	19.54	20.60	21.67	22.82	24.85	26.99

### With Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.30	5.54	5.77	6.01	6.24	6.83	7.40	7.99	8.58	9.16	9.75	10.92	12.09
140	6.26	6.51	6.78	7.05	7.32	7.97	8.64	9.30	9.97	10.63	11.30	12.62	13.95
160	8.65	8.96	9.28	9.60	9.92	10.72	11.52	12.33	13.13	13.93	14.73	16.34	17.93
180	11.62	12.00	12.39	12.78	13.17	14.13	15.11	16.08	17.05	18.01	18.98	20.92	22.86
200	14.64	15.15	15.57	16.00	16.42	17.49	18.55	19.62	20.68	21.75	22.90	24.93	27.07

### Additional Weight

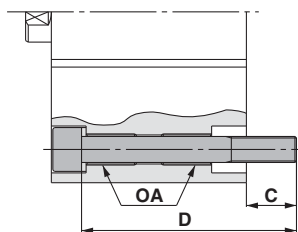
Bore size (mm)		125	140	160 180 200
Rod end male thread	Male thread	0.31	0.31	0.48
	Nut	0.16	0.16	0.26

Calculation: (Example) **CDQ2B125-30DCMZ**

- Basic weight: CDQ2B125-30DCZ..... 5.77 kg
- Additional weight: Rod end male thread... 0.47 kg  
6.24 kg

## Mounting Bolt for CQ2B

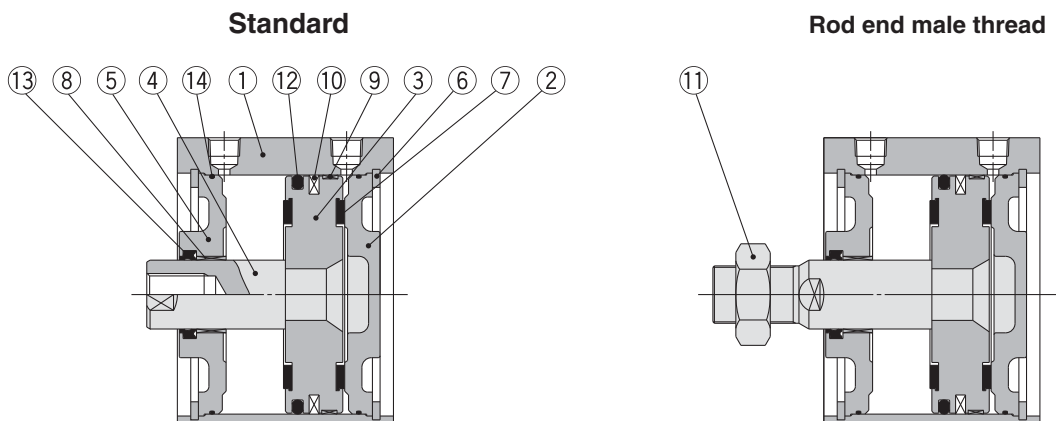
For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.



Cylinder model	C	D	Mounting bolt
C□Q2B125/140-10DCZ	22.9	100	M12X100L
C□Q2B125/140-20DCZ		110	M12X110L
C□Q2B125/140-30DCZ		120	M12X120L
C□Q2B125/140-40DCZ		130	M12X130L
C□Q2B125/140-50DCZ		140	M12X140L
C□Q2B125/140-75DCZ		165	M12X165L
C□Q2B125/140-100DCZ		190	M12X190L
C□Q2B160-10DCZ	27.7	110	M14X110L
C□Q2B160-20DCZ		120	M14X120L
C□Q2B160-30DCZ		130	M14X130L
C□Q2B160-40DCZ		140	M14X140L
C□Q2B160-50DCZ		150	M14X150L
C□Q2B160-75DCZ		175	M14X175L
C□Q2B160-100DCZ		200	M14X200L

Cylinder model	C	D	Mounting bolt
C□Q2B180-10DCZ	36	125	M18X125L
C□Q2B180-20DCZ		135	M18X135L
C□Q2B180-30DCZ		145	M18X145L
C□Q2B180-40DCZ		155	M18X155L
C□Q2B180-50DCZ		165	M18X165L
C□Q2B180-75DCZ		190	M18X190L
C□Q2B180-100DCZ		215	M18X215L
C□Q2B200-10DCZ	39	135	M18X135L
C□Q2B200-20DCZ		145	M18X145L
C□Q2B200-30DCZ		155	M18X155L
C□Q2B200-40DCZ		165	M18X165L
C□Q2B200-50DCZ		175	M18X175L
C□Q2B200-75DCZ		200	M18X200L
C□Q2B200-100DCZ		225	M18X225L

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Head cover	Carbon steel	Nickel plated
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	Urethane	
8	Bushing	Bearing alloy	
9	Wear ring	Resin	
10	Magnet	—	For CDQ2B□ only
11	Rod end nut	Carbon steel	Nickel plated
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Tube gasket	NBR	

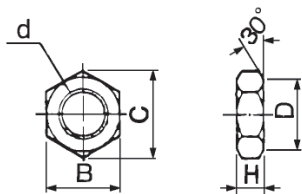
### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
125	CQ2B125-PS	Kits include items ⑫, ⑬, ⑭ from the table.
140	CQ2B140-PS	
160	CQ2B160-PS	
180	CQ2B180-PS	
200	CQ2B200-PS	

\* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.  
\* Since the seal kit does not include a grease pack, order it separately.

**Grease pack part no.: GR-S-010 (10 g)**

### Rod End Nut



Material: Carbon steel  
Surface treatment: Nickel plated

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-12	125, 140	M30 x 1.5	18	46	53.1	44
NT-16	160, 180, 200	M36 x 1.5	21	55	63.5	53

### Retaining Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

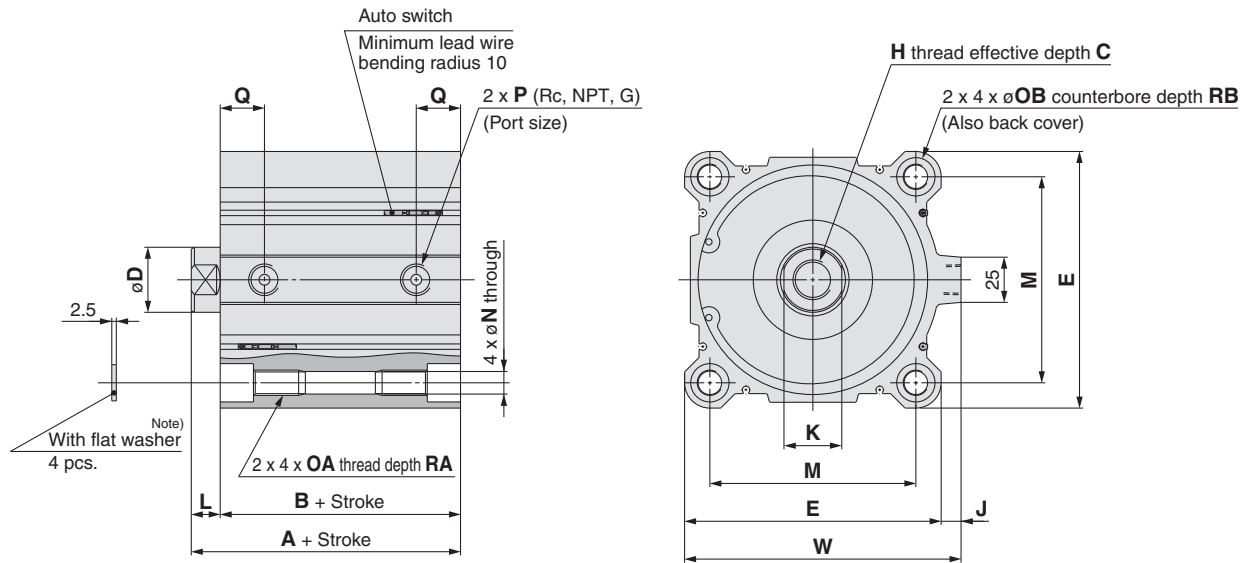
# Series CQ2

## Dimensions

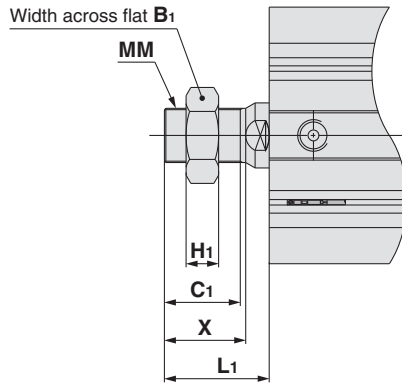
### Ø125 to Ø160

The dimensions are the same with or without an auto switch.

Standard (Through-hole): C□Q2B



#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	$B_1$	$C_1$	$H_1$	$L_1$	$MM$	$X$
125	46	42	18	58	M30 x 1.5	45
140	46	42	18	58	M30 x 1.5	45
160	55	47	21	64	M36 x 1.5	50

Bore size (mm)	Standard stroke	A	B	C	D	E	H	J	K	L	M	N	OA	OB	P	Q	RA	RB	W
125	10, 20, 30, 40, 50	99	83	30	36	142	M22 x 2.5	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
140	75, 100, 125, 150	99	83	30	36	158	M22 x 2.5	10	32	16	128	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	168
160	175, 200, 250, 300	108	91	33	40	178	M24 x 3	10	36	17	144	14.5	M16 x 2	24.2	3/8	27.5	28	21.2	188

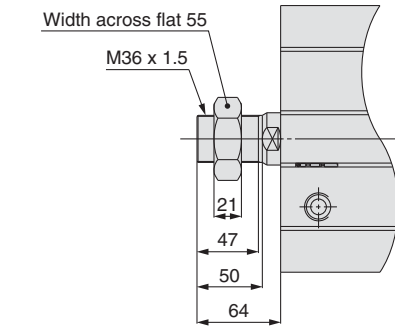
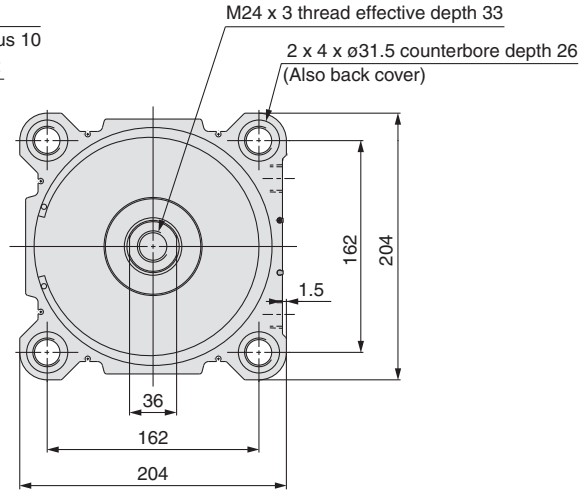
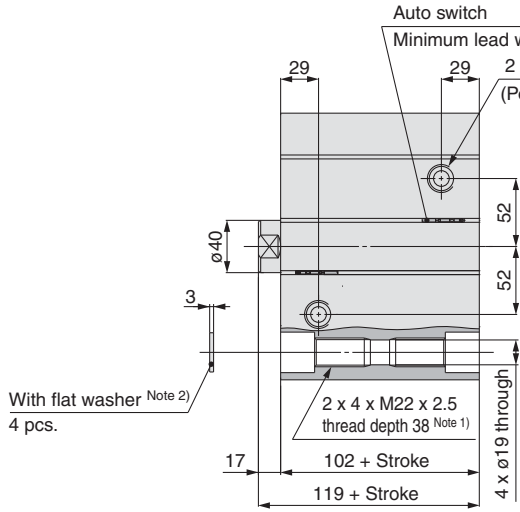
Note) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Dimensions

**∅180, ∅200**

**∅180**

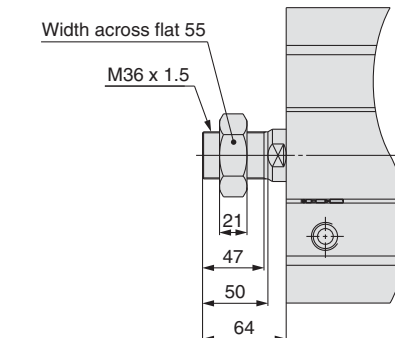
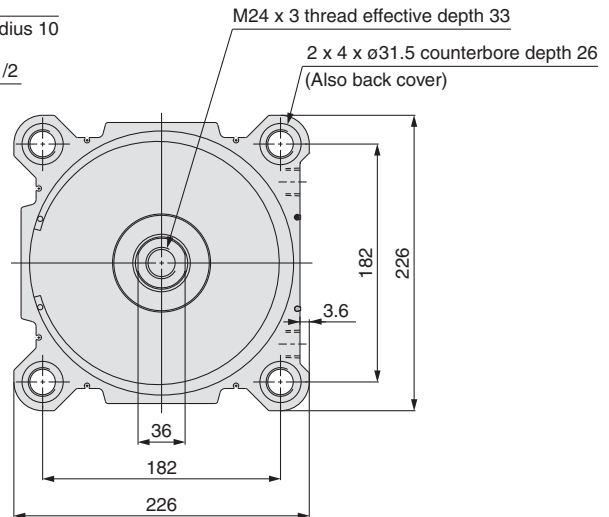
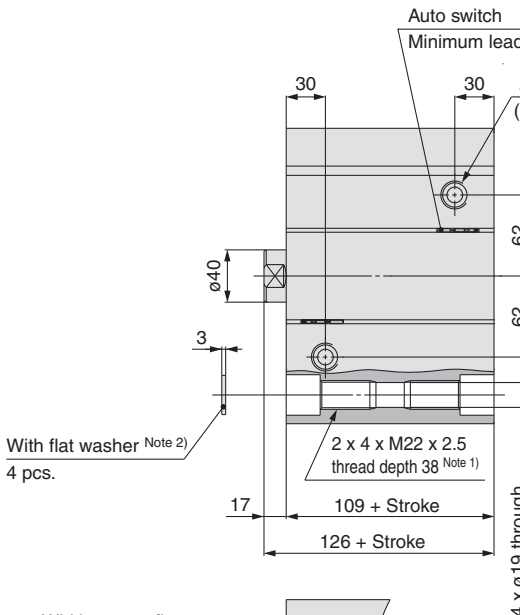
The dimensions are the same with or without an auto switch.



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

**∅200**



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Compact Cylinder: Large Bore Size Double Acting, Double Rod Series CQ2W

ø125, ø140, ø160, ø180, ø200

## How to Order

Without auto switch

CQ2WB 125 [ ] - 30 DC [ ] Z - [ ]

With auto switch

CDQ2WB 125 [ ] - 30 DC [ ] Z - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

Type  
W Double rod

Mounting

B Through-hole/Both ends tapped common (Standard)

\* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQ2WB" on page 66.

Bore size

125	125 mm
140	140 mm
160	160 mm
180	180 mm
200	200 mm

Port thread type

—	Rc
TN	NPT
TF	G

### 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) CDQ2WB140-30DCZ

Cylinder stroke (mm)

Refer to the next page for standard strokes.

Made to Order  
Refer to the next page for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z ø125 to ø200 4 surfaces

Body option

—	Standard (Rod end female thread)
M	Rod end male thread

Cushion

C Rubber bumper

Action

D Double acting

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC		
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	●	●	●	○	—	○			
	Diagnostic indication (2-colour indication)			3-wire (NPN)				M9NV	M9N	●	●	●	○	—	○			IC circuit
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○			
				2-wire				M9BV	M9B	●	●	●	○	—	○			
	Water resistant (2-colour indication)			3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○			IC circuit
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○			
				2-wire				M9BAV**	M9BA**	○	○	●	○	—	○			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	
				2-wire				A93V	A93	●	—	●	—	—	—	—	—	Relay, PLC
								A90V	A90	●	—	●	—	—	—	—	—	IC circuit

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

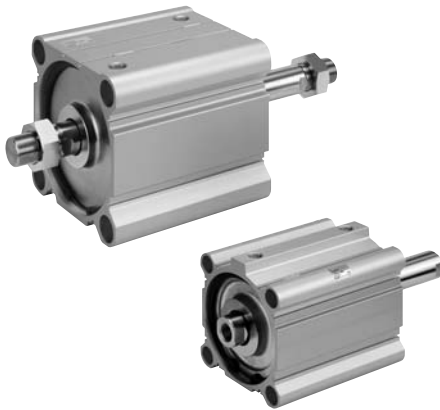
\* Solid state auto switches marked with "○" are produced upon receipt of order.

\* 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.

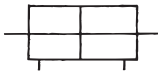
# Compact Cylinder: Large Bore Size Double Acting, Double Rod *Series CQ2W*

## Specifications



### Symbol

Double acting,  
Double rod



### Made to Order

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

Symbol	Specifications
-XB10	Intermediate stroke (Exclusive body type)
-X235	Special rod end for double rod cylinder
-X271	Fluororubber seals, $\phi 125$ to $\phi 160$ only
-X633	Intermediate stroke of double rod cylinder, $\phi 125$ to $\phi 160$ only

\* -X633: Intermediate stroke in 5 mm intervals only

Bore size (mm)	125	140	160	180	200
Action	Double acting, Double rod				
Fluid	Air				
Proof pressure	1.5 MPa			1.05 MPa	
Maximum operating pressure	1.0 MPa			0.7 MPa	
Minimum operating pressure	0.05 MPa				
Ambient and fluid temperature	Without auto switch: $-10$ to $70^{\circ}\text{C}$ (No freezing) With auto switch: $-10$ to $60^{\circ}\text{C}$ (No freezing)				
Lubrication	Not required (Non-lube)				
Piston speed	50 to 500 mm/s			20 to 400 mm/s	
Allowable kinetic energy (J)	7.4	9.8	12.4		
Stroke length tolerance	+1.4 mm (Note) 0				

Note) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size (mm)	Standard stroke (mm)
125, 140, 160 180, 200	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.		Exclusive body (-XB10)	
Part no.	Suffix "-X633" to the end of standard model number. (P. 63)		Suffix "-XB10" to the end of standard model number. (P. 63)	
Description	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.		Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	125 to 160	5 to 295	125 to 160	11 to 299
Example	Part no.: CQ2WB160-165DCZ-X633 CQ2WB160-175DCZ with 10 mm width spacer inside The B dimension is 266 mm.		Part no.: CQ2WB160-165DCZ-XB10 Makes 165 mm stroke tube. The B dimension is 256 mm.	

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2W

## Retaining Ring Installation/Removal

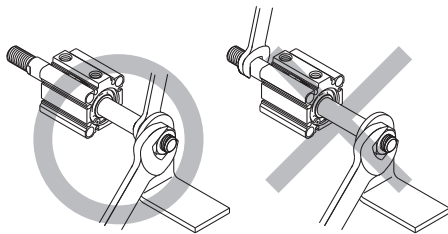
### ⚠ Caution

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Mounting

### ⚠ Warning

Do not apply reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction. Install or remove loads while the piston rod width across flat is secured. Do not fix the other side of the piston rod width across flat and apply reverse torque.



## Theoretical Output

Bore size (mm)	Operating pressure (MPa)		
	0.3	0.5	0.7
<b>125</b>	3376	5627	7878
<b>140</b>	4313	7188	10063
<b>160</b>	5655	9425	13195
<b>180</b>	7257	12095	16933
<b>200</b>	9048	15080	21112

## Weight

### Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
<b>125</b>	5.47	5.76	6.05	6.37	6.68	7.47	8.24	9.03	9.82	10.60	11.39	12.96	14.52
<b>140</b>	6.43	6.73	7.06	7.40	7.75	8.61	9.47	10.33	11.20	12.06	12.92	14.64	16.37
<b>160</b>	8.87	9.26	9.65	10.07	10.49	11.53	12.58	13.63	14.68	15.72	16.77	18.87	20.96
<b>180</b>	11.75	12.23	12.73	13.21	13.70	14.91	16.13	17.34	18.56	19.77	20.99	23.42	25.86
<b>200</b>	14.89	15.42	15.94	16.47	16.98	18.30	19.61	20.92	21.23	23.54	24.85	27.47	30.10

### With Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
<b>125</b>	5.53	5.82	6.11	6.43	6.74	7.53	8.30	9.09	9.88	10.66	11.45	13.02	14.58
<b>140</b>	6.50	6.80	7.13	7.47	7.82	8.68	9.54	10.40	11.27	12.13	12.99	14.71	16.44
<b>160</b>	8.95	9.34	9.73	10.15	10.57	11.61	12.66	13.71	14.76	15.80	16.85	18.95	21.04
<b>180</b>	11.83	12.31	12.81	13.29	13.78	14.99	16.21	17.42	18.64	19.85	21.07	23.50	25.94
<b>200</b>	14.97	15.50	16.02	16.55	17.06	18.38	19.69	21.00	21.31	23.62	24.93	27.55	30.18

### Additional Weight

Bore size (mm)		<b>125</b>	<b>140</b>	<b>160, 180, 200</b>
Rod end male thread	Male thread	0.62	0.62	0.96
	Nut	0.32	0.32	0.52

Calculation: (Example) **CDQ2WB125-30DCMZ**

• Basic weight: CDQ2WB125-30DCZ .....6.11 kg

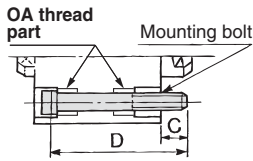
• Additional weight: Rod end male thread .....0.94 kg

7.05 kg



## Mounting Bolt for CQ2WB

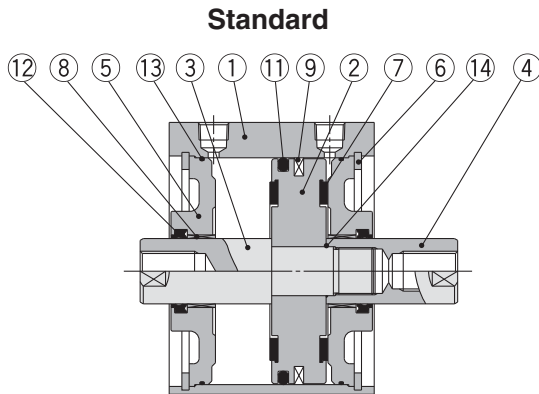
For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.



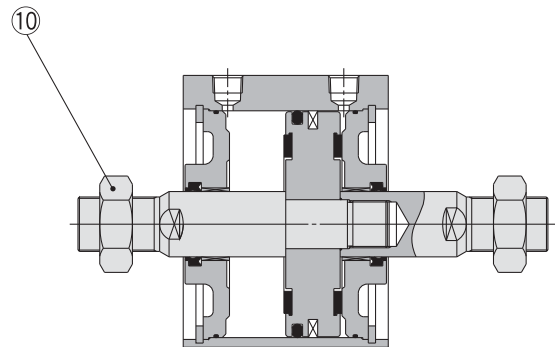
Cylinder model	C	D	Mounting bolt part no.
C□Q2WB125/140-10DCZ	22.9	100	M12X100L
C□Q2WB125/140-20DCZ		110	M12X110L
C□Q2WB125/140-30DCZ		120	M12X120L
C□Q2WB125/140-40DCZ		130	M12X130L
C□Q2WB125/140-50DCZ		140	M12X140L
C□Q2WB125/140-75DCZ		165	M12X165L
C□Q2WB125/140-100DCZ		190	M12X190L
C□Q2WB160-10DCZ	27.7	110	M14X110L
C□Q2WB160-20DCZ		120	M14X120L
C□Q2WB160-30DCZ		130	M14X130L
C□Q2WB160-40DCZ		140	M14X140L
C□Q2WB160-50DCZ		150	M14X150L
C□Q2WB160-75DCZ		175	M14X175L
C□Q2WB160-100DCZ		200	M14X200L

Cylinder model	C	D	Mounting bolt part no.
C□Q2WB180-10DCZ	36	125	M18X125L
C□Q2WB180-20DCZ		135	M18X135L
C□Q2WB180-30DCZ		145	M18X145L
C□Q2WB180-40DCZ		155	M18X155L
C□Q2WB180-50DCZ		165	M18X165L
C□Q2WB180-75DCZ		190	M18X190L
C□Q2WB180-100DCZ		215	M18X215L
C□Q2WB200-10DCZ	39	135	M18X135L
C□Q2WB200-20DCZ		145	M18X145L
C□Q2WB200-30DCZ		155	M18X155L
C□Q2WB200-40DCZ		165	M18X165L
C□Q2WB200-50DCZ		175	M18X175L
C□Q2WB200-75DCZ		200	M18X200L
C□Q2WB200-100DCZ		225	M18X225L

## Construction



Rod end male thread



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod A	Carbon steel	Hard chrome plated
4	Piston rod B	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	Resin	
8	Bushing	Bearing alloy	
9	Magnet	—	For CDQ2WB□ only
10	Rod end nut	Carbon steel	Nickel plated
11	Piston seal	NBR	
12	Rod seal	NBR	
13	Tube gasket	NBR	
14	Piston gasket	NBR	

### Replacement Parts/Seal Kit

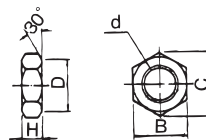
Bore size (mm)	Kit no.	Contents
125	CQ2WB125-PS	Kits include items ⑪, ⑫, ⑬ from the table.
140	CQ2WB140-PS	
160	CQ2WB160-PS	
180	CQ2WB180-PS	
200	CQ2WB200-PS	

\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

### Rod End Nut



Material: Carbon steel  
Surface treatment: Nickel plated

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-12	125, 140	M30 x 1.5	18	46	53.1	44
NT-16	160, 180, 200	M36 x 1.5	21	55	63.5	53

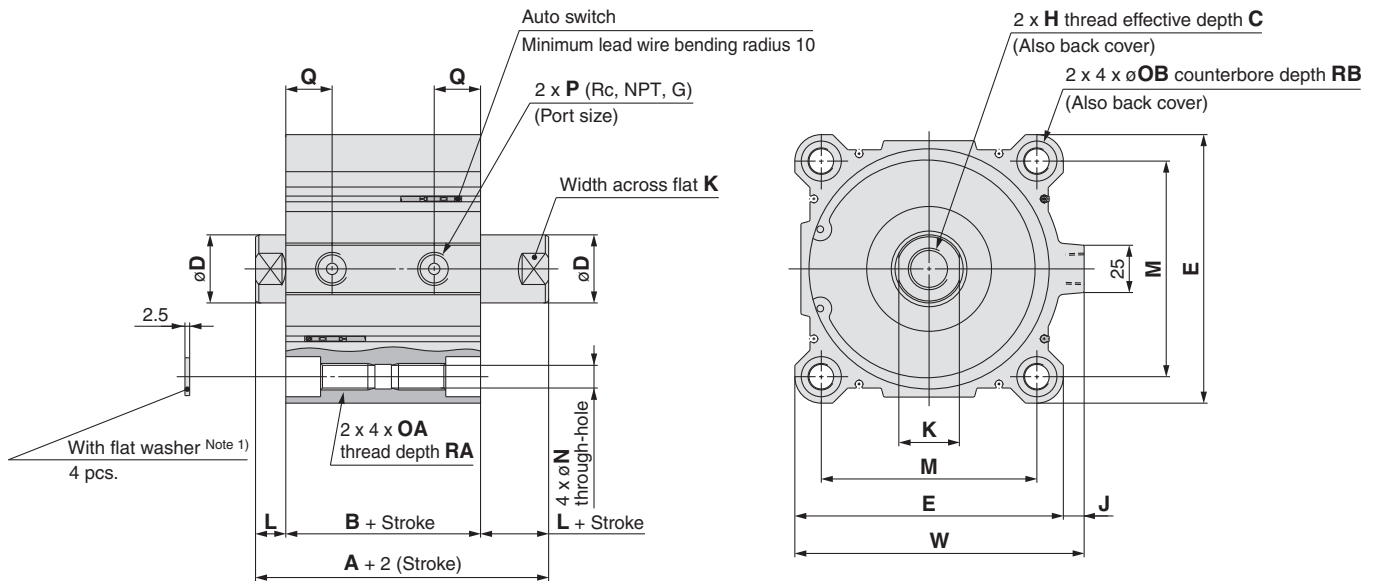
# Series CQ2W

## Dimensions

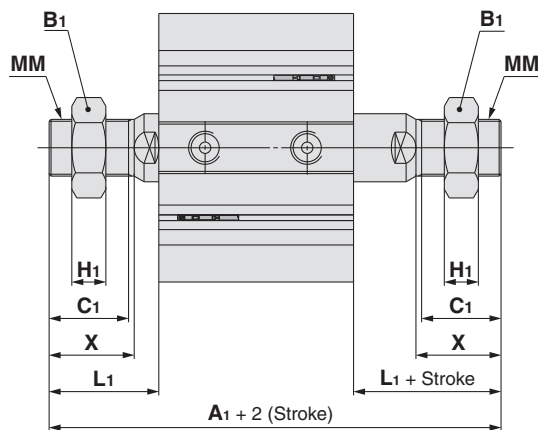
### ∅125 to ∅160

The dimensions are the same with or without an auto switch.

#### Standard (Through-hole): C□Q2WB



#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
125	199	46	42	18	58	M30 x 1.5	45
140	199	46	42	18	58	M30 x 1.5	45
160	219	55	47	21	64	M36 x 1.5	50

Bore size (mm)	Standard stroke	A	B	C <sup>Note 2)</sup>	D	E	H	J	K	L	M	N	OA	OB	P	Q	RA	RB	W
125	10, 20, 30, 40, 50	115	83	30 (22.5)	36	142	M22 x 2.5	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
	75, 100, 125, 150	115	83	30 (22.5)	36	158	M22 x 2.5	10	32	16	128	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	168
160	175, 200, 250, 300	125	91	33 (26.5)	40	178	M24 x 3	10	36	17	144	14.5	M16 x 2	24.2	3/8	27.5	28	21.2	188

Note 1) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Note 2) ( ): Values of effective length in one side, only for 10 mm stroke model

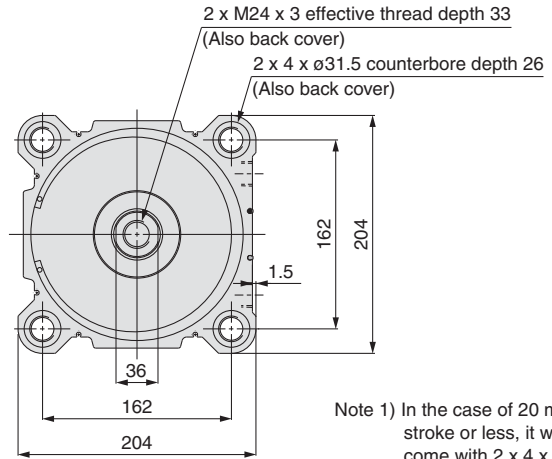
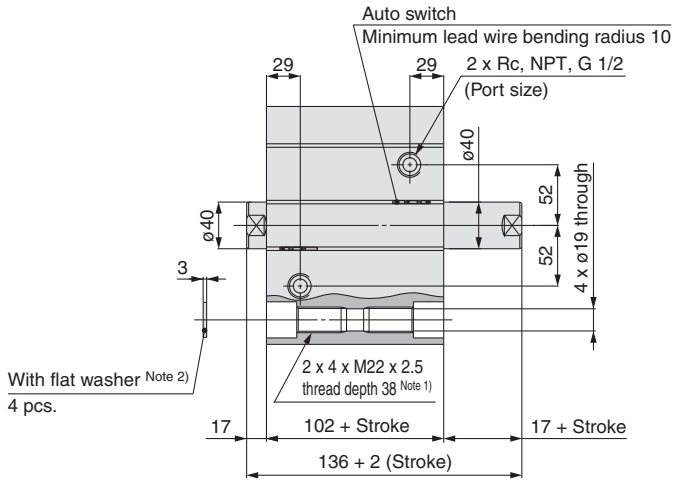
\* The positions of double rod width across flats are not the same.

Dimensions

**∅180, ∅200**

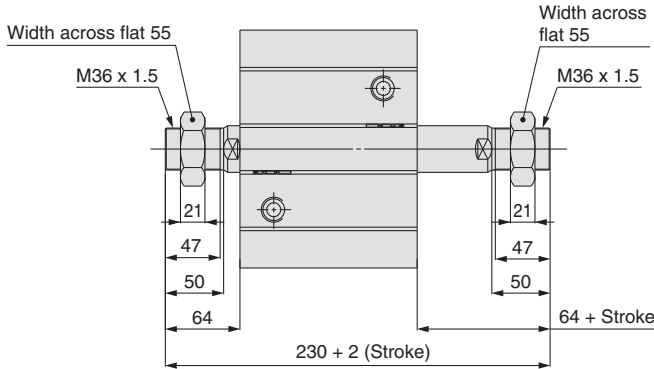
**∅180**

The dimensions are the same with or without an auto switch.

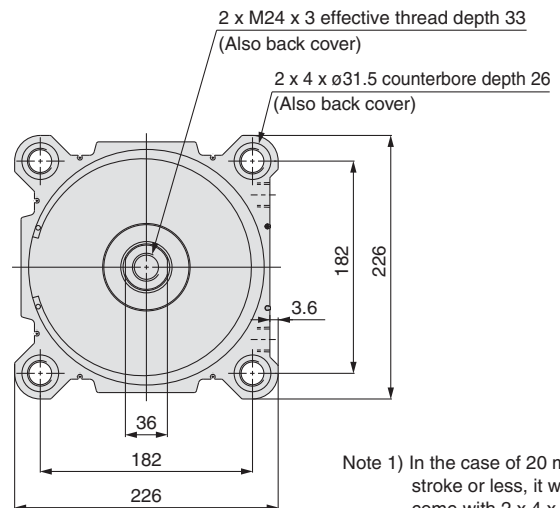
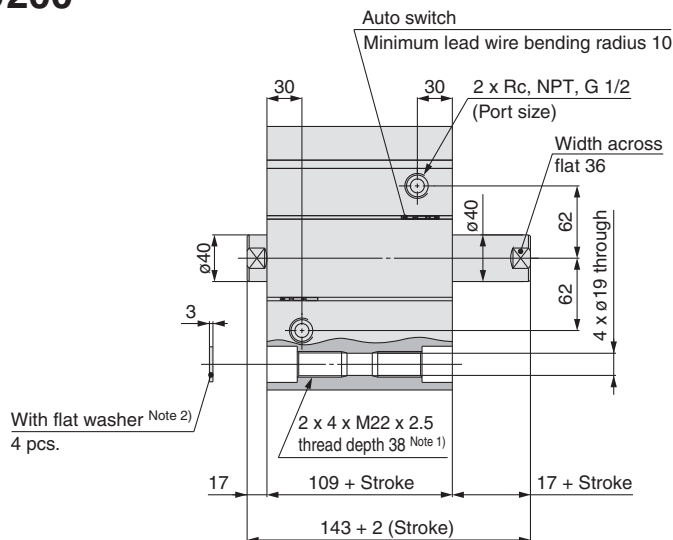


Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

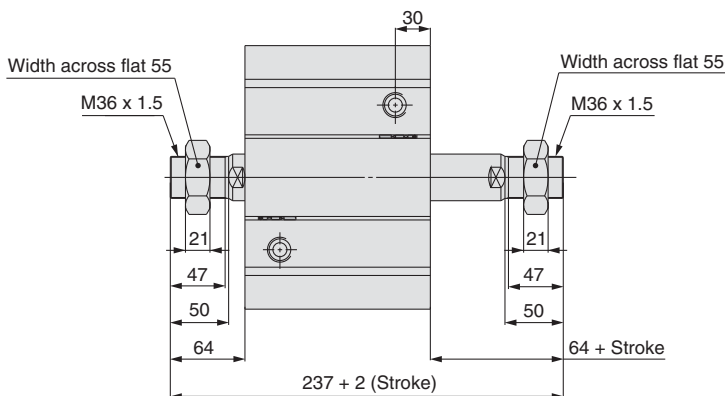


**∅200**



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.



\* The positions of double rod width across flats are not the same.

- Standard
- Large Bore Size
- Long Stroke
- Non-rotating Rod
- Axial Piping
- Anti-lateral Load
- With End Lock
- Water Resistant
- With Auto Switch
- Auto Switch
- Made to Order

# Compact Cylinder: Long Stroke Double Acting, Single Rod Series CQ2

ø32, ø40, ø50, ø63, ø80, ø100

## How to Order

Without auto switch

CQ2 A 32 [ ] - 200 DC [ ] Z - [ ]

With auto switch

CDQ2 A 32 [ ] - 200 DC [ ] Z - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

Mounting

A	Both ends tapped
L	Foot
F	Rod flange
G	Head flange
D	Double clevis

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

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

—	Rc
TN	NPT
TF	G
F	Built-in one-touch fittings <small>Note)</small>

Note) Bore sizes available with one-touch fittings are ø32 to ø63.

Cylinder stroke (mm)

Refer to the next page for standard strokes.

Action

D Double acting

Cushion

C Rubber bumper

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Made to Order

Refer to the next page for details.

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z 4 surfaces

Body option

—	Standard (Rod end female thread)
M	Rod end male thread

### 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) CDQ2L40-200DCZ

### Applicable Auto Switches

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.  
Refer to the individual catalogue (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 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC									
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	●	●	●	○	—	○										
				3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○										
	3-wire (PNP)			M9PVV				M9PV	●	●	●	○	—	○	IC circuit										
	2-wire			M9BVV				M9BW	●	●	●	○	—	○											
	3-wire (NPN)			M9NAV**				M9NA**	○	○	●	○	—	○											
	3-wire (PNP)			M9PAV**				M9PA**	○	○	●	○	—	○											
	Magnetic field resistant (2-colour indication)			—				Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less	M9BAV**	M9BA**	○	○			●	○	—	○	IC circuit	Relay, PLC
										2-wire (Non-polar)				—	P3DW	●	—			●	—	○			
3-wire (NPN equivalent)		A96V	A96		●	—	●			—				—	—	IC circuit	—								
2-wire		A93V	A93		●	—	●			—				—	—										
Reed auto switch	—	Grommet	No	3-wire (NPN equivalent)	24 V	5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	IC circuit	Relay, PLC									
				2-wire				—	—	●	—	●	—	—			—								

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NV  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

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

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

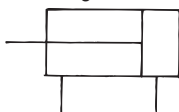
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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

## Specifications



**Symbol**  
Double acting,  
Single rod



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XB10	Intermediate stroke (Exclusive body type)
-XC4	With heavy-duty scraper
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-X271	Fluororubber seals

Bore size (mm)	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>	0.05 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>	0.29	0.52	0.91	1.54	2.71	4.54
<b>Stroke length tolerance</b>	+1.4 mm Note) 0					

Note) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size	Standard stroke (mm)
32, 40, 50 63, 80, 100	125, 150, 175, 200, 250, 300

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	Exclusive body (-XB10)	
Part no.	Refer to "How to Order" for the standard model number. (P. 69)	Suffix "-XB10" to the end of standard model number. (P. 69)	
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Bore size	Stroke range
	32 to 200	101 to 299	32 to 160 101 to 299
Example	Part no.: CQ2A50-166DCZ CQ2B50-175DCZ with 9 mm width spacer inside The B dimension is 230.5 mm.	Part no.: CQ2B50-166DCZ-XB10 Makes 166 mm stroke tube. The B dimension is 221.5 mm.	

## Type

Bore size (mm)		32	40	50	63	80	100		
Pneumatic	Built-in magnet	●	●	●	●	●	●		
	Piping	Pipe thread	—	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			TN	NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
		TF	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	
Built-in one-touch fittings <sup>Note)</sup>	ø6/4	ø6/4	ø8/6	ø8/6	—	—			
Rod end male thread	●	●	●	●	●	●			

Note) One-touch fittings cannot be replaced.

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Copper and Fluorine-free Series (For CRT Manufacturing Process)

20 - C□Q2A Bore size - Stroke DC(M)Z

•  $\phi 32, \phi 40, \phi 50, \phi 63$   
 $\phi 80, \phi 100$

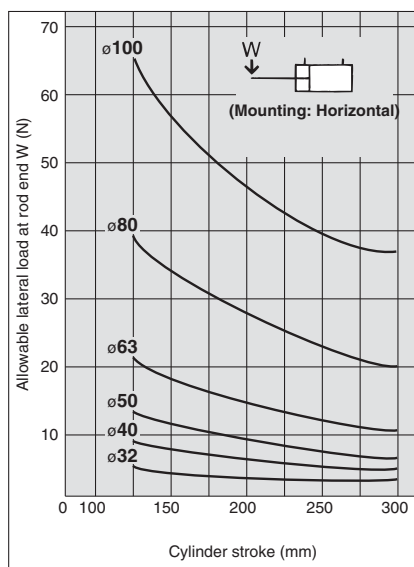
• Copper and fluorine-free series

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

### Specifications

Bore size (mm)	32	40	50	63	80	100
<b>Action</b>	Double acting, Single rod					
<b>Proof pressure</b>	1.5 MPa					
<b>Max. operating pressure</b>	1.0 MPa					
<b>Rubber bumper</b>	With (Standard)					
<b>Piping</b>	Pipe thread, Built-in one-touch fittings					
<b>Piston speed</b>	50 to 500 mm/s					
<b>Mounting</b>	Both ends tapped					
<b>Auto switch</b>	Mountable					

## Allowable Lateral Load at Rod End



## Mounting Brackets/ Part No.

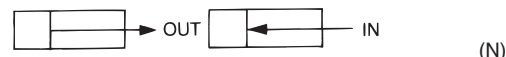
Bore size (mm)	Foot Note 1)	Flange	Double clevis
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

Note 1) When ordering a foot bracket, 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, Body mounting bolts, Type C retaining rings for axis

## Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1155
	OUT	589	982	1374

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
63	IN	841	1402	1962
	OUT	935	1559	2182
80	IN	1361	2268	3175
	OUT	1508	2513	3519
100	IN	2144	3574	5003
	OUT	2356	3927	5498

## Weight

### Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)					
	125	150	175	200	250	300
32	708	817	918	1017	1215	1415
40	888	997	1107	1217	1438	1657
50	1352	1517	1682	1841	2177	2507
63	1706	1900	2095	2292	2676	3065
80	2832	3130	3429	3725	4324	4921
100	4540	4906	5270	5634	6367	7096

### With Auto Switch

Bore size (mm)	Cylinder stroke (mm)					
	125	150	175	200	250	300
32	726	826	927	1026	1224	1424
40	902	1012	1121	1231	1451	1671
50	1367	1532	1697	1856	2192	2522
63	1730	1924	2119	2316	2700	3089
80	2856	3154	3453	3749	4348	4945
100	4578	4944	5308	5672	6405	7134

### Additional Weight

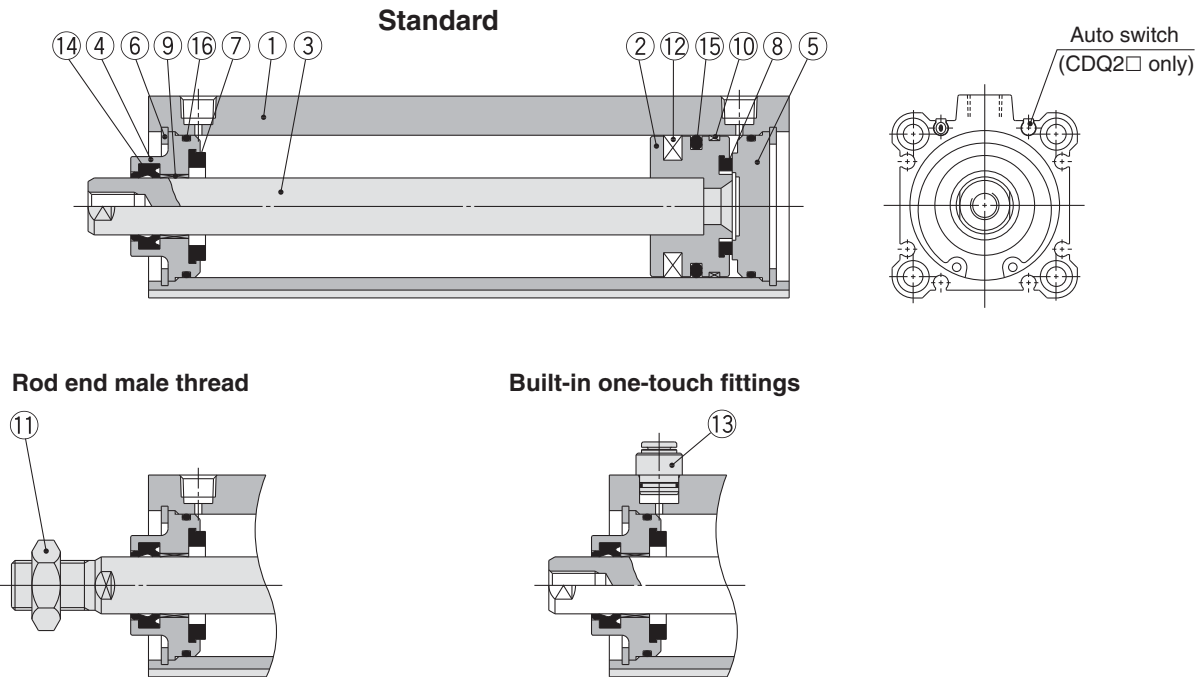
Bore size (mm)		32	40	50	63	80	100
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolts)		146	158	253	349	672	1113
Rod flange (Including mounting bolts)		165	198	348	534	1017	1309
Head flange (Including mounting bolts)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)		151	196	393	554	1109	1887

Calculation: (Example) **CQ2D32-200DCMZ**

- Basic weight: CQ2A32-200DCZ ..... 1017 g
  - Additional weight: Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 1211 g

Add each weight of auto switches when auto switches are mounted.

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy	Anodised
5	Bottom plate	Aluminum alloy	Anodised
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper A	Urethane	
8	Bumper B	Urethane	
9	Bushing	Bearing alloy	
10	Wear ring	Resin	
11	Rod end nut	Carbon steel	Nickel plated
12	Magnet	—	For CDQ2A□ only
13	One-touch fitting	—	ø32 to ø63
14*	Rod seal	NBR	
15*	Piston seal	NBR	
16*	Tube gasket	NBR	

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
32	CQ2A32-L-PS	Kits include items (14), (15), (16) from the table.
40	CQ2A40-L-PS	
50	CQ2A50-L-PS	
63	CQ2A63-L-PS	
80	CQ2A80-L-PS	
100	CQ2A100-L-PS	

\* Seal kit includes (14), (15), (16). Order the seal kit, based on each bore size.  
\* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

### Retaining Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

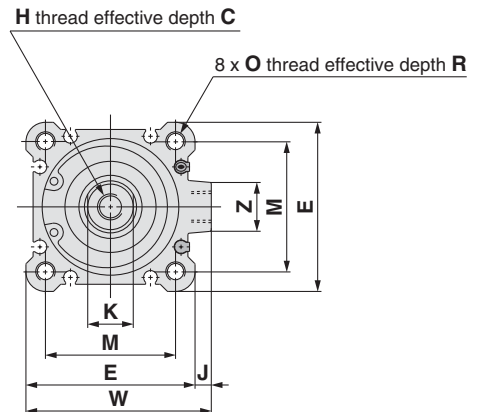
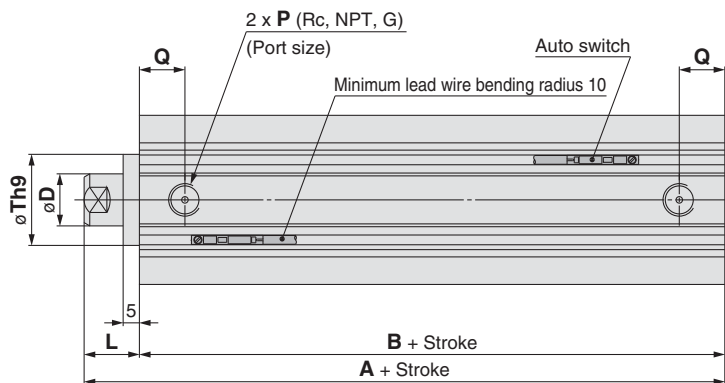
# Series CQ2

## Dimensions

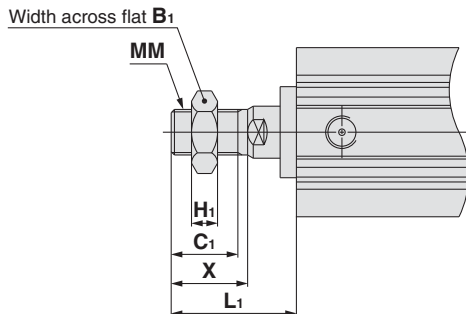
### ∅32 to ∅50

The dimensions are the same with or without an auto switch.

Both ends tapped: C□Q2A



#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	38.5	M14 x 1.5	23.5
40	22	20.5	8	38.5	M14 x 1.5	23.5
50	27	26	11	43.5	M18 x 1.5	28.5

The dimensions with built-in one-touch fittings are equivalent to those of the CQ2 series, double acting, single rod. Refer to page 15.

#### Both Ends Tapped

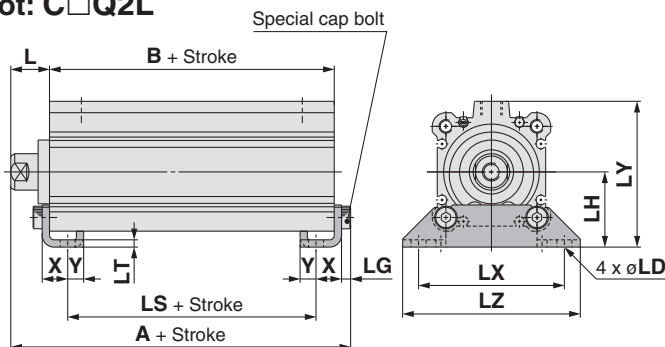
For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	J	K	L	M	O	P	Q	R	Th9	W	Z
32		62.5	45.5	13	16	45	M8 x 1.25	4.5	14	17	34	M6 x 1.0	1/8	12.5	10	22 <sup>0</sup> <sub>-0.052</sub>	49.5	14
40	125 to 200 <sup>Note 1)</sup> 250, 300	72	55	13	16	52	M8 x 1.25	5	14	17	40	M6 x 1.0	1/8	14	10	28 <sup>0</sup> <sub>-0.052</sub>	57	15
50		73.5	55.5	15	20	64	M10 x 1.5	7	17	18	50	M8 x 1.25	1/4	14	14	35 <sup>0</sup> <sub>-0.062</sub>	71	19

Note 1) For 125 to 200 strokes, strokes are available in 25 mm intervals.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 70.

#### Foot: C□Q2L



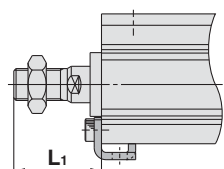
#### Foot (mm)

Bore size (mm)	A	B	L	L <sub>1</sub>	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
32	69.7	45.5	17	38.5	6.6	4	30	29.5	3.2	57	57	71	11.2	5.8
40	79.2	55	17	38.5	6.6	4	33	39	3.2	64	64	78	11.2	7
50	81.7	55.5	18	43.5	9	5	39	32.5	3.2	79	78	95	14.7	8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.

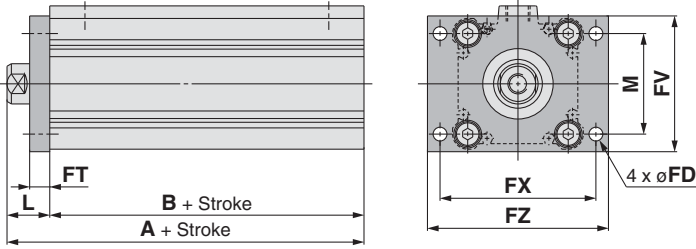
#### Rod end male thread





The dimensions are the same with or without an auto switch.

Rod flange: C□Q2F

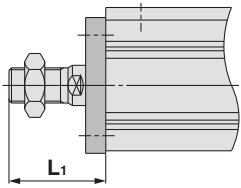


Rod Flange

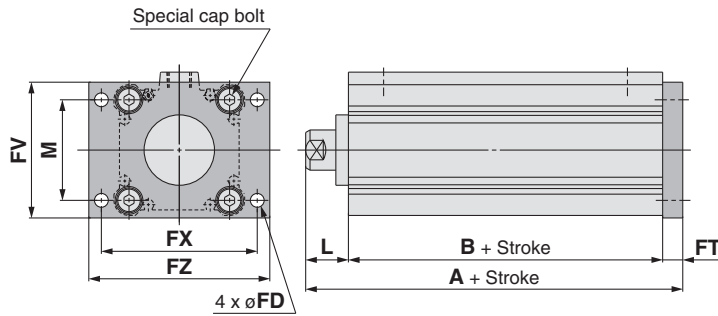
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
32	62.5	45.5	5.5	8	48	56	65	17	38.5	34
40	72	55	5.5	8	54	62	72	17	38.5	40
50	73.5	55.5	6.6	9	67	76	89	18	43.5	50

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

Rod end male thread



Head flange: C□Q2G



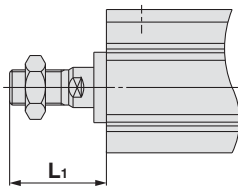
Head Flange

Bore size (mm)	A
32	70.5
40	80
50	82.5

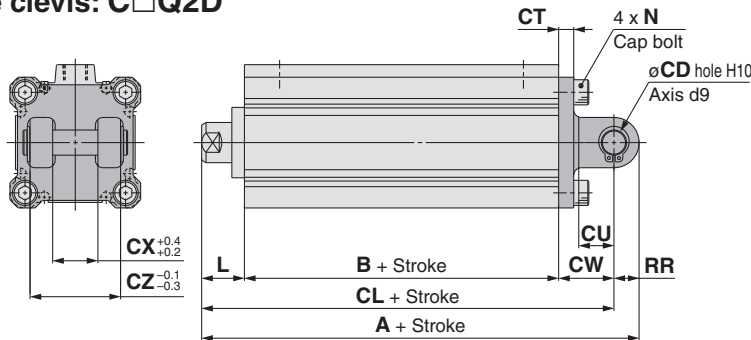
(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

Rod end male thread



Double clevis: C□Q2D



Double Clevis

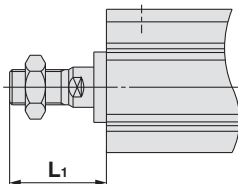
Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
32	92.5	45.5	10	82.5	5	14	20	18	36
40	104	55	10	94	6	14	22	18	36
50	115.5	55.5	14	101.5	7	20	28	22	44

Bore size (mm)	L	L <sub>1</sub>	N	RR
32	17	38.5	M6 x 1.0	10
40	17	38.5	M6 x 1.0	10
50	18	43.5	M8 x 1.25	14

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are shipped together.

Rod end male thread



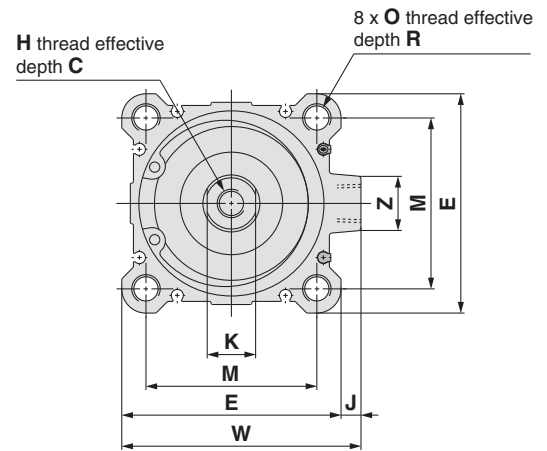
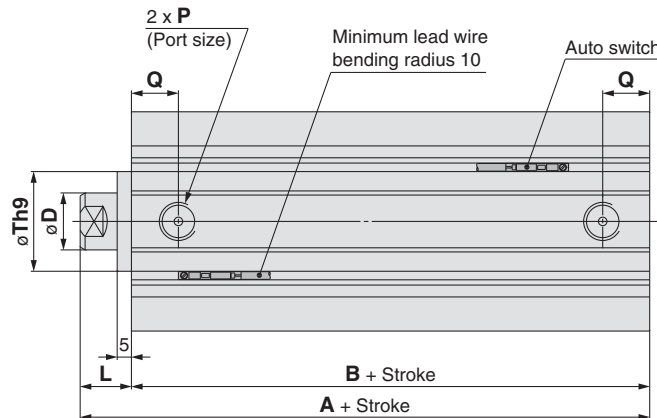
# Series CQ2

## Dimensions

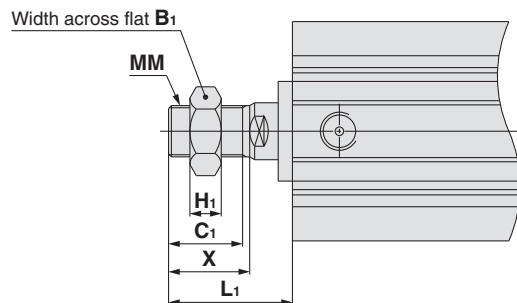
### ø63 to ø100

The dimensions are the same with or without an auto switch.

Both ends tapped: C□Q2A



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	43.5	M18 x 1.5	28.5
80	32	32.5	13	53.5	M22 x 1.5	35.5
100	41	32.5	16	53.5	M26 x 1.5	35.5

The dimensions with built-in one-touch fittings are equivalent to those of the CQ2 series, double acting, single rod. Refer to page 17.

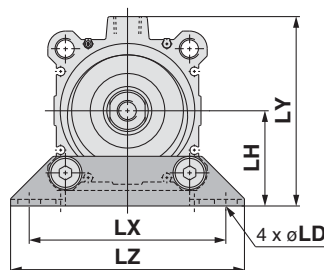
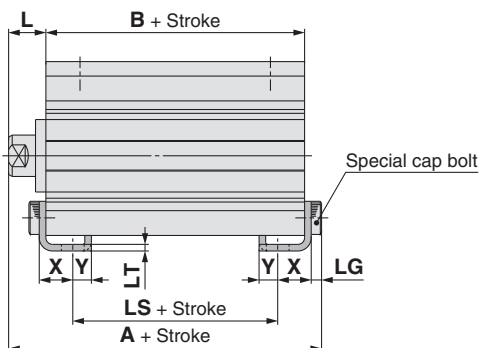
Both Ends Tapped For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	J	K	L	M	O	P	Q	R	Th9	W	Z
63	125 to 200 (Note 1) 250, 300	75	57	15	20	77	M10 x 1.5	7	17	18	60	M10 x 1.5	1/4	16.5	18	35 <sup>0</sup> <sub>-0.062</sub>	84	19
80		86	66	21	25	98	M16 x 2.0	6	22	20	77	M12 x 1.75	3/8	19	22	43 <sup>0</sup> <sub>-0.062</sub>	104	25
100		97.5	75.5	27	30	117	M20 x 2.5	6.5	27	22	94	M12 x 1.75	3/8	23	22	59 <sup>0</sup> <sub>-0.074</sub>	123.5	25

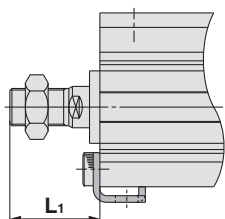
Note 1) For 125 to 200 strokes, strokes are available in 25 mm intervals.

Note 2) For calculation on the longitudinal dimension of intermediate strokes, refer to page 70.

Foot: C□Q2L



Rod end male thread



Foot (mm)

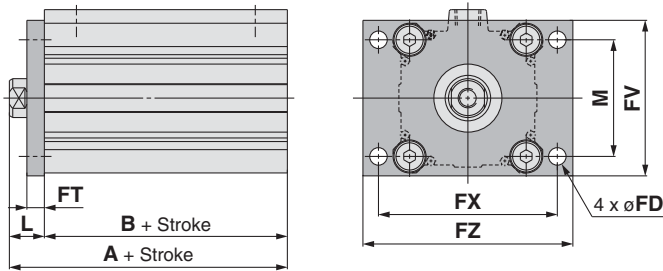
Bore size (mm)	A	B	L	L <sub>1</sub>	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
63	83.2	57	18	43.5	11	5	46	31	3.2	95	91.5	113	16.2	9
80	97.5	66	20	53.5	13	7	59	36	4.5	118	114	140	19.5	11
100	110.5	75.5	22	53.5	13	7	71	41.5	6	137	136	162	23	12.5

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

\* For details about the rod end nut and accessory brackets, refer to page 19.

The dimensions are the same with or without an auto switch.

**Rod flange: C□Q2F**

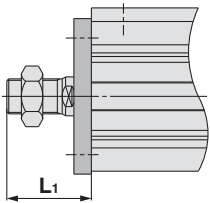


**Rod Flange**

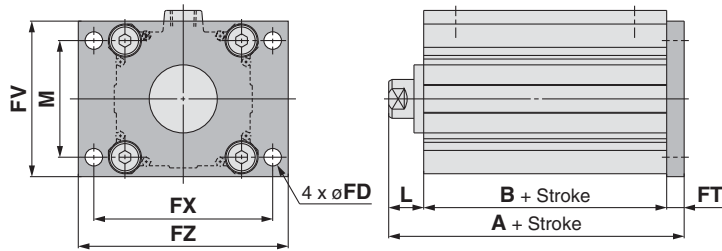
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
63	75	57	9	9	80	92	108	18	43.5	60
80	86	66	11	11	99	116	134	20	53.5	77
100	97.5	75.5	11	11	117	136	154	22	53.5	94

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod end male thread**



**Head flange: C□Q2G**



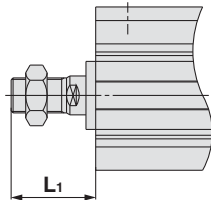
**Head Flange**

Bore size (mm)	A
63	84
80	97
100	108.5

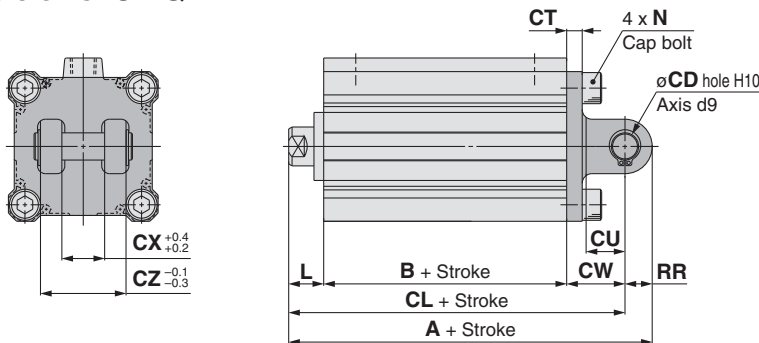
(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod end male thread**



**Double clevis: C□Q2D**



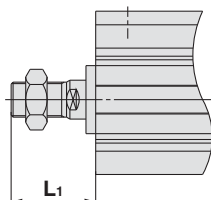
**Double Clevis**

Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
63	119	57	14	105	8	20	30	22	44
80	142	66	18	124	10	27	38	28	56
100	164.5	75.5	22	142.5	13	31	45	32	64

Bore size (mm)	L	L <sub>1</sub>	N	RR
63	18	43.5	M10 x 1.5	14
80	20	53.5	M12 x 1.75	18
100	22	53.5	M12 x 1.75	22

Double clevis bracket material: Cast iron  
Surface treatment: Nickel plated

**Rod end male thread**



\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are shipped together.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order



# Compact Cylinder: Non-rotating Rod Double Acting, Single Rod Series CQ2K

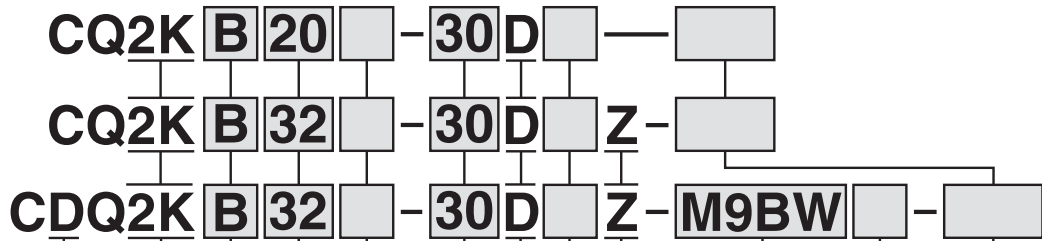
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63

## How to Order

Without auto switch  
ø12 to ø25

Without auto switch  
ø32 to ø63

With auto switch



With auto switch  
(Built-in magnet)

Non-rotating rod

Mounting

B	Through-hole (Standard)	ø12 to ø63
A	Both ends tapped	ø40, ø50, ø63
L	Foot	
F	Rod flange	
G	Head flange	
D	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)Q2KB" on pages 82 and 84.

Bore size

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

Note 1) When ø12 with auto switch is required, the body option should be with rubber bumper (C).

Example) CDQ2KB12-30DCZ

Port thread type

—	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø63
TF	G	
F	Built-in one-touch fittings <small>Note 2)</small>	

Note 2) Bore sizes available with one-touch fittings are ø32 to ø63.

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

Cylinder stroke (mm)

Refer to the next page for standard strokes.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

—	Without auto switch
---	---------------------

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø63	4 surfaces

Made to Order

Refer to the next page for details.

Body option

—	Standard (Rod end female thread)
F	With boss on head end
C	With rubber bumper (ø12 with auto switch only)
M	Rod end male thread

\* Combination of body options ("FM") is available.

Action

D	Double acting
---	---------------

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) CDQ2KL32-30DZ

Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches. Refer to the individual catalogue (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 (—)	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	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○		
				2-wire				M9BV	M9B	●	●	●	○	—	○		—
				3-wire (NPN)				M9NWV	M9NW	●	●	●	○	—	○		IC circuit
	3-wire (PNP)			M9PWV				M9PW	●	●	●	○	—	○	—		
	2-wire			M9BWW				M9BW	●	●	●	○	—	○	—		
	3-wire (NPN)			M9NAV**				M9NA**	○	○	●	○	—	○	IC circuit		
	3-wire (PNP)			M9PAV**				M9PA**	○	○	●	○	—	○	—		
	2-wire			M9BAV**				M9BA**	○	○	●	○	—	○	—		
	2-wire (Non-polar)			—				P3DW	●	—	●	●	—	○	—		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	
				2-wire				A93V	A93	●	—	●	—	—	—	—	Relay, PLC
								A90V	A90	●	—	●	—	—	—	—	IC circuit

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (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 ø63 only.

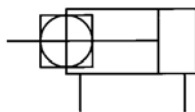
\* There are other applicable auto switches other than the listed above. For details, refer to page 175.

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

# Series CQ2K



Symbol  
Non-rotating rod



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XA □	Special rod end shape
-XB10	Intermediate stroke (Exclusive body type): ø40 to ø63
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod
-XC11	Dual stroke cylinder/Single rod
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-X1876	Cylinder tube: With concave boss on head side

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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)	12	16	20	25	32	40	50	63
<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>	0.022 0,043 Note 1)	0.038	0.055	0.09	0.15	0.26	0.46	0.77
<b>Stroke length tolerance</b>	+1.0 mm Note 2) 0							
<b>Rod non-rotating accuracy</b>	±2°		±1°			±0.8°		

\* ø12 with auto switch: With rubber bumper (Standard)

Note 1) For cylinders with rubber bumper (ø12 with auto switch only)

Note 2) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

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, 63</b>	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model number. (P. 78)	
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	
Stroke range	Bore size	Stroke range
	12, 16	1 to 29
	20, 25	1 to 49
	32 to 63	1 to 99
Example	Part no.: CQ2KB50-57DZ CQ2KB50-75DZ with 18 mm width spacer inside The B dimension is 115.5 mm.	

## Type

Bore size (mm)		12	16	20	25	32	40	50	63		
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●		
		Both ends tapped	—	—	—	—	●	●	●		
	Built-in magnet		●	●	●	●	●	●	●		
	Piping	Pipe thread	—	M5	M5	M5	M5	Note 1) M5 Rc1/8	Rc1/8	Rc1/4	Rc1/4
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4	NPT1/4
			TF	—	—	—	—	G1/8	G1/8	G1/4	G1/4
		Built-in one-touch fittings	—	—	—	—	ø6/4 Note 2)	ø6/4	ø8/6	ø8/6	
	Rod end male thread		●	●	●	●	●	●	●	●	
	With boss on head end		●	●	●	●	●	●	●	●	

Note 1) ø32 without auto switch: M5 is used for 5 mm strokekeeping dimension.

Thus, do not enter a symbol for the port thread type.

Note 2) The dimensions of the ø32-5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube.

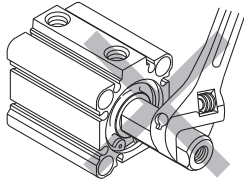
**Retaining Ring Installation/Removal**

**⚠ Caution**

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

**Mounting**

- Install or remove loads while the piston rod width across flat is secured.



- Using a non-rotating rod cylinder  
 Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod. If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Use the below table as a guide for the allowable rotational torque ranges.

Allowable rotational torque	12	16	20	25	32	40	50	63
N·m or less	0.04	0.15	0.20	0.25	0.44	0.44	0.44	0.44

Operate the cylinder in such a way that the load to the piston rod is always applied in the axial direction.

- When a work piece is secured to the end of the piston rod, ensure that the piston rod is retracted entirely, and place a wrench on the portion of the rod that protrudes beyond the section. Also, tighten in a way that prevents the tightening torque from being applied to the non-rotating guide.

**Mounting Brackets/Part No.**

Bore size (mm)	Foot <sup>Note 1)</sup>	Flange	Double clevis
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063

Note 1) When ordering a foot bracket, 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, Body mounting bolts, Type C retaining rings for axis

**Theoretical Output**

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
12	IN	25	42	59
	OUT	34	57	79
16	IN	45	75	106
	OUT	60	101	141
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180

**Weight**

**Weight**

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	60	67	74	81	88	95	—	—	—	—	—	—
16	58	67	76	85	94	103	—	—	—	—	—	—
20	103	117	131	145	159	173	187	201	215	229	—	—
25	137	152	167	182	197	212	227	242	257	272	—	—
32	196	215	234	253	272	291	310	329	347	366	506	601
40	205	226	248	269	291	312	333	355	376	398	570	682
50	—	356	390	424	457	491	525	559	592	626	901	1075
63	—	524	563	602	641	680	720	759	798	837	1173	1375

**Additional Weight**

Bore size (mm)	12	16	20	25	32	40	50	63
Both ends tapped	—	—	—	—	—	6	6	19
Rod end male thread	Male thread	1.5	3	6	12	27	53	53
	Nut	1	2	4	8	17	32	32
With boss on head side	0.7	1.3	2	3	5	7	13	25
Built-in one-touch fittings	—	—	—	—	12	12	21	21
Foot (Including mounting bolts)	—	—	—	—	—	153	242	316
Rod flange (Including mounting bolts)	—	—	—	—	—	213	372	558
Head flange (Including mounting bolts)	—	—	—	—	—	198	348	534
Double clevis (Including pin, retaining rings, bolts)	—	—	—	—	—	196	393	554

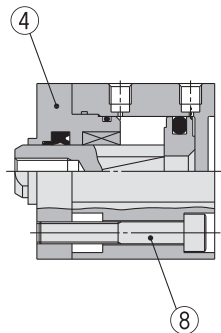
Calculation: (Example) **CQ2KD40-20DMZ**  
 • Basic weight: CQ2KB40-20DZ ..... 269 g  
 • Additional weight: Both ends tapped ..... 6 g  
 Rod end male thread ..... 44 g  
 Double clevis ..... 196 g  
 515 g

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

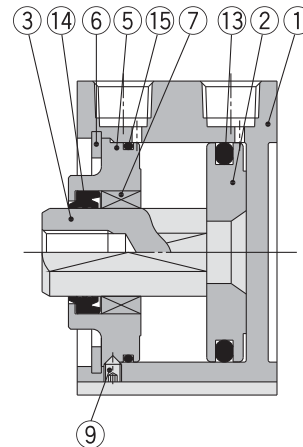
# Series CQ2K

## Construction

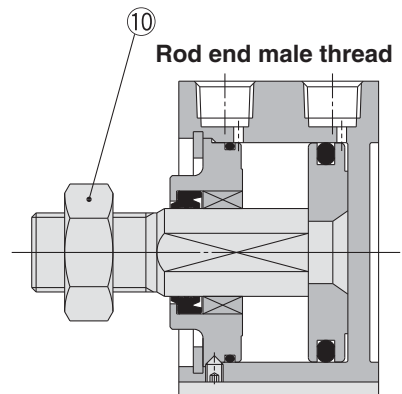
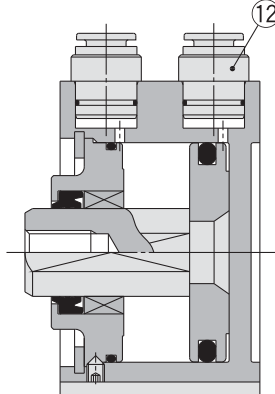
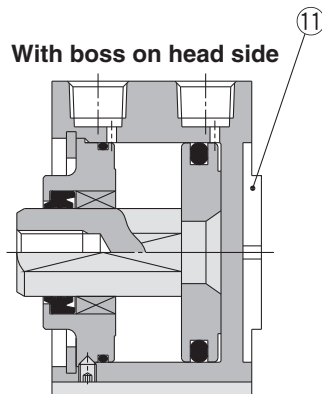
Standard (ø12 to ø32)



Standard (ø40 to ø63)



Built-in one-touch fittings



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plated
4	Rod cover	Brass	ø12, Electroless nickel plated
		Aluminum alloy	ø16 to ø32, Anodised
5	Collar	Aluminum alloy	ø40 to ø63, Anodised
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bushing	Oil-impregnated sintered alloy	ø16 to ø63
8	Hexagon socket head cap screw	Alloy steel	ø12 to ø32, Nickel plated
9	Hexagon socket head set screw	Alloy steel	ø40 to ø63, Nickel plated
10	Rod end nut	Carbon steel	Nickel plated
11	Centering location ring	Aluminum alloy	ø20 to ø63, Anodised
12	One-touch fitting	—	ø32 to ø63
13	Piston seal	NBR	
14	Rod seal	NBR	
15	Tube gasket	NBR	

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQ2KB12-PS	Kits include items 13, 14, 15 from the table.
16	CQ2KB16-PS	
20	CQ2KB20-PS	
25	CQ2KB25-PS	
32	CQ2KB32-PS	
40	CQ2KB40-PS	
50	CQ2KB50-PS	
63	CQ2KB63-PS	

\* Seal kit includes 13, 14, 15. Order the seal kit based on each bore size.

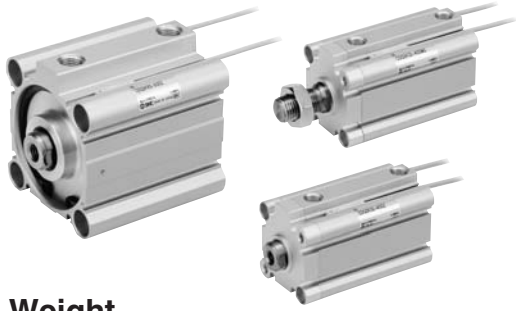
\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)





# Non-rotating Rod: Double Acting, Single Rod Series **CDQ2K** With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.169 to 175
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Weight

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
<b>12</b>	71	77	83	89	96	102	—	—	—	—	—	—
<b>16</b>	74	82	89	97	105	113	—	—	—	—	—	—
<b>20</b>	119	132	144	156	168	180	192	204	217	229	—	—
<b>25</b>	162	177	192	208	223	238	254	269	284	300	—	—
<b>32</b>	227	247	266	286	306	326	345	365	385	404	504	604
<b>40</b>	240	261	283	305	326	348	369	391	413	434	546	658
<b>50</b>	—	433	466	499	532	565	598	630	663	697	869	1041
<b>63</b>	—	622	660	698	736	774	812	850	888	926	1124	1321

### Additional Weight

Bore size (mm)	12	16	20	25	32	40	50	63
Both ends tapped	—	—	—	—	—	6	6	19
Rod end male thread	Male thread	1.5	3	6	12	26	27	53
	Nut	1	2	4	8	17	17	32
With boss on head side	0.7	1.3	2	3	5	7	13	25
Built-in one-touch fittings	—	—	—	—	12	12	21	21
Foot (Including mounting bolts)	—	—	—	—	—	153	242	316
Rod flange (Including mounting bolts)	—	—	—	—	—	213	372	558
Head flange (Including mounting bolts)	—	—	—	—	—	198	348	534
Double clevis (Including pin, retaining rings and bolts)	—	—	—	—	—	196	393	554

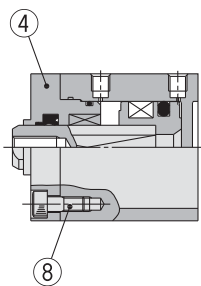
Calculation: (Example) **CDQ2KD40-25DMZ**

- Basic weight: CDQ2KB40-25DZ ..... 326 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 44 g
  - Double clevis ..... 196 g
- 572 g

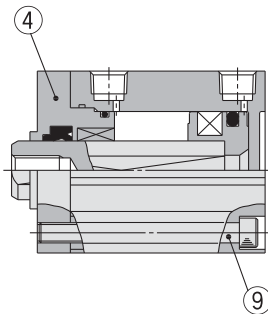
Add each weight of auto switches when auto switches are mounted.

## Construction

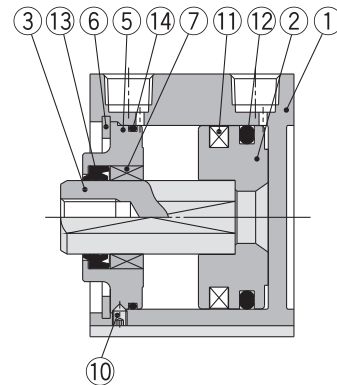
ø12 to ø25



ø32



ø40 to ø63



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plated
4	Rod cover	Brass	ø12, Electroless nickel plated
		Aluminum alloy	ø16 to ø32, Anodised
5	Collar	Aluminum alloy	ø40 to ø63, Anodised
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bushing	Oil-impregnated sintered alloy	ø16 to ø63
8	Hexagon socket head cap screw	Alloy steel	ø12 to ø25, Nickel plated
9	Hexagon socket head cap screw	Alloy steel	ø32, Nickel plated
10	Hexagon socket head set screw	Alloy steel	ø40 to ø63, Nickel plated
11	Magnet	—	—
12	Piston seal	NBR	—
13	Rod seal	NBR	—
14	Tube gasket	NBR	—

### Replacement Parts/Seal Kit (Pneumatic type (Non-lube))

Bore size (mm)	Kit no.	Contents
<b>12</b>	CQ2KB12-PS	Kits include items ⑫, ⑬, ⑭ from the table.
<b>16</b>	CQ2KB16-PS	
<b>20</b>	CQ2KB20-PS	
<b>25</b>	CQ2KB25-PS	
<b>32</b>	CQ2KB32-PS	
<b>40</b>	CQ2KB40-PS	
<b>50</b>	CQ2KB50-PS	
<b>63</b>	CQ2KB63-PS	

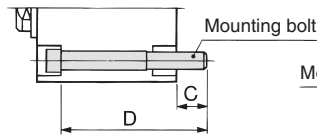
\* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

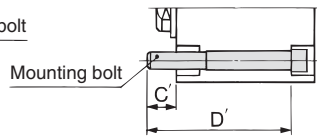
**Grease pack part no.:** GR-S-010 (10 g)

**Mounting Bolt for CDQ2KB/With Auto Switch**

Head side mounting



Rod side mounting



Cylinder model	C	D	Mounting bolt	C'	D'	Mounting bolt
CDQ2KB12-5DCZ	5.5	35	M3X35L	5.5	40	M3X40L
CDQ2KB12-10DCZ		40	M3X40L		45	M3X45L
CDQ2KB12-15DCZ		45	M3X45L		50	M3X50L
CDQ2KB12-20DCZ		50	M3X50L		55	M3X55L
CDQ2KB12-25DCZ		55	M3X55L		60	M3X60L
CDQ2KB12-30DCZ		60	M3X60L		65	M3X65L
CDQ2KB16-5DZ	8	40	M3X40L	8	45	M3X45L
CDQ2KB16-10DZ		45	M3X45L		50	M3X50L
CDQ2KB16-15DZ		50	M3X50L		55	M3X55L
CDQ2KB16-20DZ		55	M3X55L		60	M3X60L
CDQ2KB16-25DZ		60	M3X60L		65	M3X65L
CDQ2KB16-30DZ		65	M3X65L		70	M3X70L
CDQ2KB20-5DZ	10.5	40	M5X40L	7.5	45	M5X45L
CDQ2KB20-10DZ		45	M5X45L		50	M5X50L
CDQ2KB20-15DZ		50	M5X50L		55	M5X55L
CDQ2KB20-20DZ		55	M5X55L		60	M5X60L
CDQ2KB20-25DZ		60	M5X60L		65	M5X65L
CDQ2KB20-30DZ		65	M5X65L		70	M5X70L
CDQ2KB20-35DZ		70	M5X70L		75	M5X75L
CDQ2KB20-40DZ		75	M5X75L		80	M5X80L
CDQ2KB20-45DZ		80	M5X80L		85	M5X85L
CDQ2KB20-50DZ		85	M5X85L		90	M5X90L
CDQ2KB25-5DZ	9.5	40	M5X40L	6.5	45	M5X45L
CDQ2KB25-10DZ		45	M5X45L		50	M5X50L
CDQ2KB25-15DZ		50	M5X50L		55	M5X55L
CDQ2KB25-20DZ		55	M5X55L		60	M5X60L
CDQ2KB25-25DZ		60	M5X60L		65	M5X65L
CDQ2KB25-30DZ		65	M5X65L		70	M5X70L
CDQ2KB25-35DZ		70	M5X70L		75	M5X75L
CDQ2KB25-40DZ		75	M5X75L		80	M5X80L
CDQ2KB25-45DZ		80	M5X80L		85	M5X85L
CDQ2KB25-50DZ		85	M5X85L		90	M5X90L
CDQ2KB32-5DZ	8.5	50	M5X50L	10	50	M5X50L
CDQ2KB32-10DZ		55	M5X55L		55	M5X55L
CDQ2KB32-15DZ		60	M5X60L		60	M5X60L
CDQ2KB32-20DZ		65	M5X65L		65	M5X65L
CDQ2KB32-25DZ		70	M5X70L		70	M5X70L
CDQ2KB32-30DZ		75	M5X75L		75	M5X75L
CDQ2KB32-35DZ		80	M5X80L		80	M5X80L

Cylinder model	C	D	Mounting bolt	C'	D'	Mounting bolt
CDQ2KB32-40DZ	8.5	85	M5X85L	10	85	M5X85L
CDQ2KB32-45DZ		90	M5X90L		90	M5X90L
CDQ2KB32-50DZ		95	M5X95L		95	M5X95L
CDQ2KB32-75DZ		120	M5X120L		120	M5X120L
CDQ2KB32-100DZ		145	M5X145L		145	M5X145L
CDQ2KB40-5DZ		7.5	45		M5X45L	7.5
CDQ2KB40-10DZ	50		M5X50L	50	M5X50L	
CDQ2KB40-15DZ	55		M5X55L	55	M5X55L	
CDQ2KB40-20DZ	60		M5X60L	60	M5X60L	
CDQ2KB40-25DZ	65		M5X65L	65	M5X65L	
CDQ2KB40-30DZ	70		M5X70L	70	M5X70L	
CDQ2KB40-35DZ	75		M5X75L	75	M5X75L	
CDQ2KB40-40DZ	80		M5X80L	80	M5X80L	
CDQ2KB40-45DZ	85		M5X85L	85	M5X85L	
CDQ2KB40-50DZ	90		M5X90L	90	M5X90L	
CDQ2KB40-75DZ	115	M5X115L	115	M5X115L		
CDQ2KB40-100DZ	140	M5X140L	140	M5X140L		
CDQ2KB50-10DZ	12.5	55	M6X55L	12.5	55	M6X55L
CDQ2KB50-15DZ		60	M6X60L		60	M6X60L
CDQ2KB50-20DZ		65	M6X65L		65	M6X65L
CDQ2KB50-25DZ		70	M6X70L		70	M6X70L
CDQ2KB50-30DZ		75	M6X75L		75	M6X75L
CDQ2KB50-35DZ		80	M6X80L		80	M6X80L
CDQ2KB50-40DZ		85	M6X85L		85	M6X85L
CDQ2KB50-45DZ		90	M6X90L		90	M6X90L
CDQ2KB50-50DZ		95	M6X95L		95	M6X95L
CDQ2KB50-75DZ		120	M6X120L		120	M6X120L
CDQ2KB50-100DZ	145	M6X145L	145	M6X145L		
CDQ2KB63-10DZ	14.5	60	M8X60L	14.5	60	M8X60L
CDQ2KB63-15DZ		65	M8X65L		65	M8X65L
CDQ2KB63-20DZ		70	M8X70L		70	M8X70L
CDQ2KB63-25DZ		75	M8X75L		75	M8X75L
CDQ2KB63-30DZ		80	M8X80L		80	M8X80L
CDQ2KB63-35DZ		85	M8X85L		85	M8X85L
CDQ2KB63-40DZ		90	M8X90L		90	M8X90L
CDQ2KB63-45DZ		95	M8X95L		95	M8X95L
CDQ2KB63-50DZ	100	M8X100L	100	M8X100L		
CDQ2KB63-75DZ	125	M8X125L	125	M8X125L		
CDQ2KB63-100DZ	150	M8X150L	150	M8X150L		

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

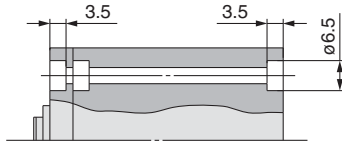
# Series CQ2K

## Dimensions

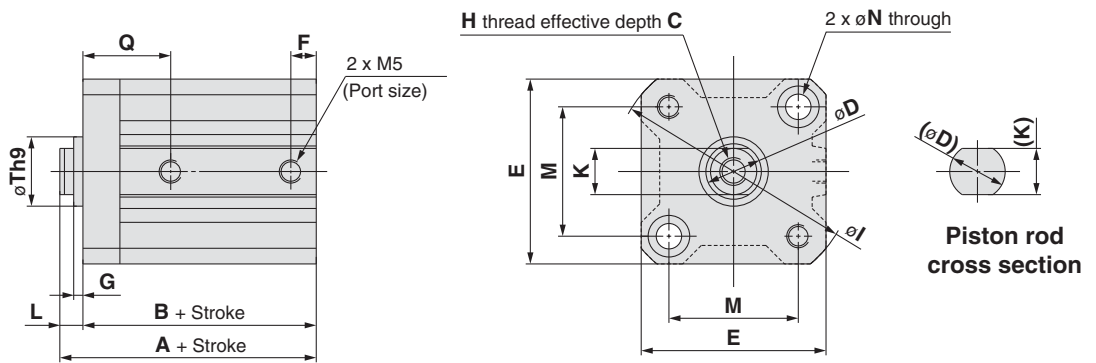
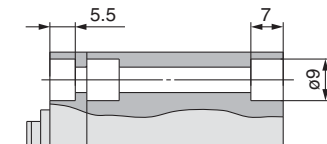
### Ø12 to Ø25/Without Auto Switch

#### Standard (Through-hole): CQ2KB

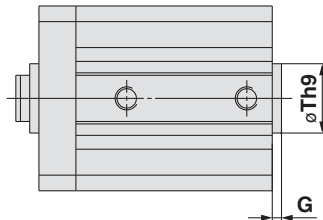
Ø12, Ø16



Ø20, Ø25



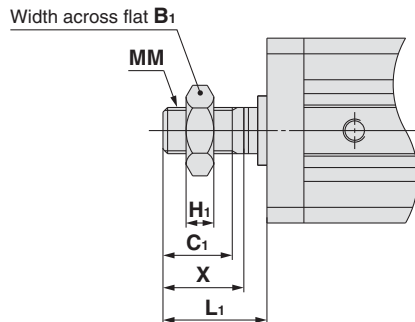
#### With boss on head side



#### With Boss on Head Side (mm)

Bore size (mm)	G	Th9
12	1.5	15 <sup>0</sup> <sub>-0.043</sub>
16	1.5	20 <sup>0</sup> <sub>-0.052</sub>
20	2	13 <sup>0</sup> <sub>-0.043</sub>
25	2	15 <sup>0</sup> <sub>-0.043</sub>

#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

#### Standard

(mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	G	H	I	K	L	M	N	Q	Th9
12	5 to 30	25.5	22	6	6	25	5	1.5	M3 x 0.5	32	5.2	3.5	15.5	3.5	12.5	15 <sup>0</sup> <sub>-0.043</sub>
16	5 to 30	27	23.5	8	8	29	5.5	1.5	M4 x 0.7	38	6	3.5	20	3.5	13	20 <sup>0</sup> <sub>-0.052</sub>
20	5 to 50	32	27.5	7	10	36	5.5	2	M5 x 0.8	47	8	4.5	25.5	5.5	17	13 <sup>0</sup> <sub>-0.043</sub>
25	5 to 50	35.5	30.5	12	12	40	5.5	2	M6 x 1.0	52	10	5	28	5.5	19	15 <sup>0</sup> <sub>-0.043</sub>

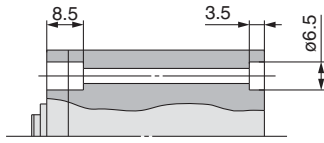
\* For details about the rod end nut and accessory brackets, refer to page 19.

Dimensions

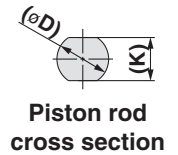
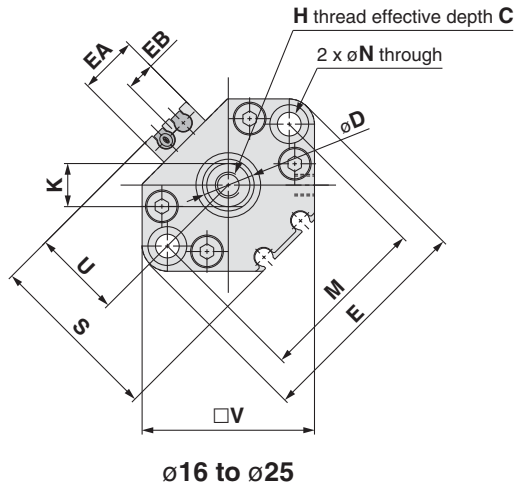
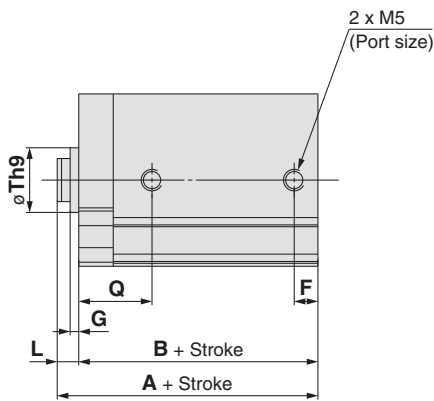
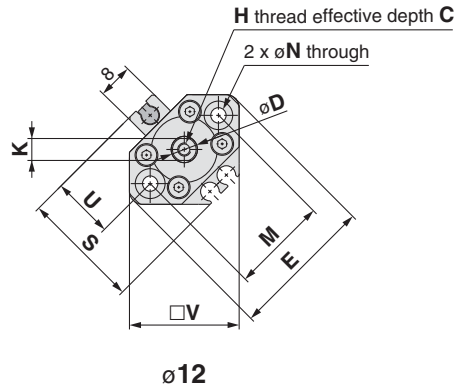
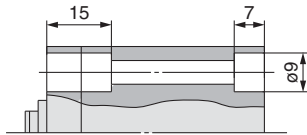
**∅12 to ∅25/With Auto Switch**

Standard (Through-hole): CDQ2KB

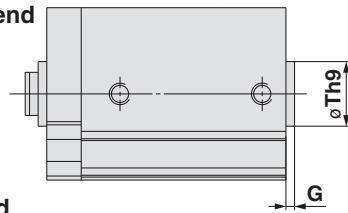
∅12, ∅16



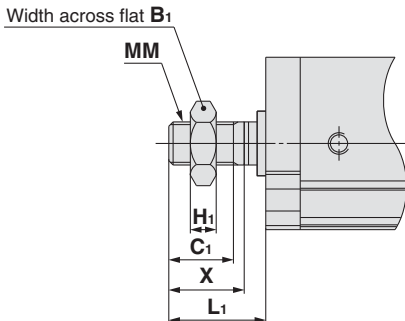
∅20, ∅25



With boss on head end



Rod end male thread



**Rod End Male Thread** (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	G	H	K	L	M	N	Q	S	Th9	U	V
12	5 to 30	36.5	33	6	6	33	—	—	6.5	1.5	M3 x 0.5	5.2	3.5	22	3.5	16	27.5	15 <sup>0</sup> <sub>-0.043</sub>	14	25
16	5 to 30	39	35.5	8	8	37	13.2	6.6	5.5	1.5	M4 x 0.7	6	3.5	28	3.5	15	29.5	20 <sup>0</sup> <sub>-0.052</sub>	15	29
20	5 to 50	44	39.5	7	10	47	13.6	6.8	5.5	2	M5 x 0.8	8	4.5	36	5.5	18.5	35.5	13 <sup>0</sup> <sub>-0.043</sub>	18	36
25	5 to 50	45.5	40.5	12	12	52	13.6	6.8	5.5	2	M6 x 1.0	10	5	40	5.5	19	40.5	15 <sup>0</sup> <sub>-0.043</sub>	21	40

\* For details about the rod end nut and accessory brackets, refer to page 19.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

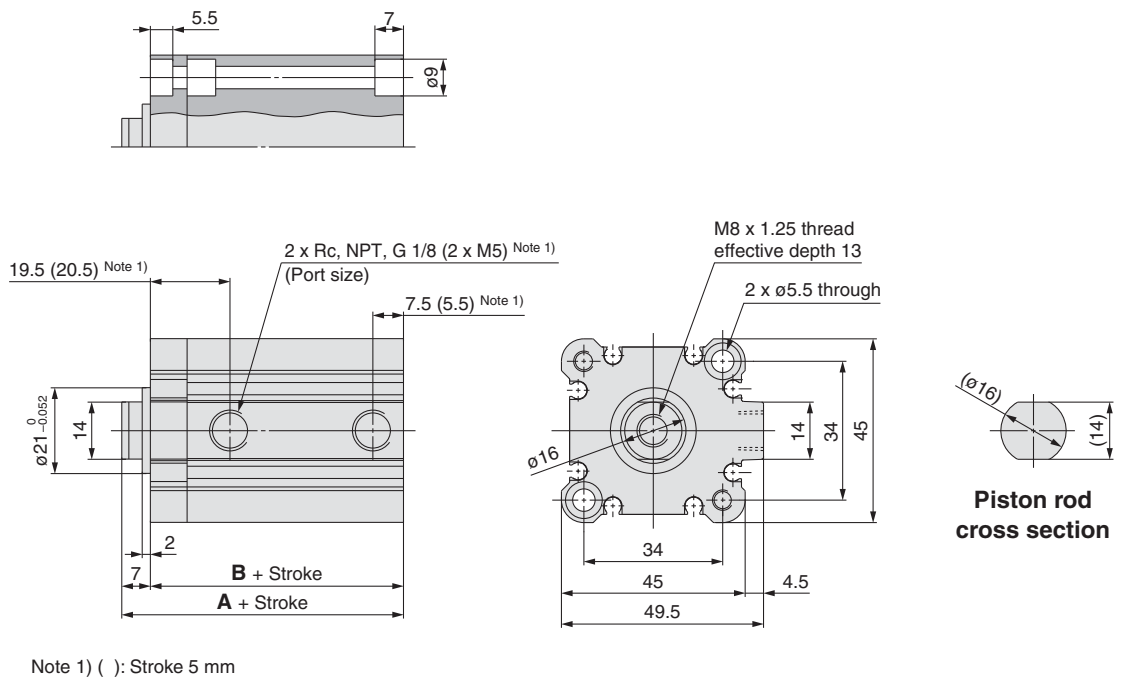
Auto Switch

Made to Order

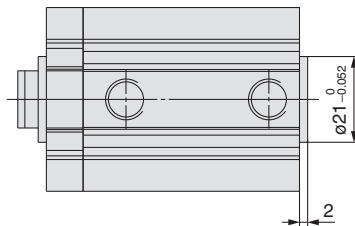
# Series CQ2K

## Dimensions

### Ø32/Without Auto Switch

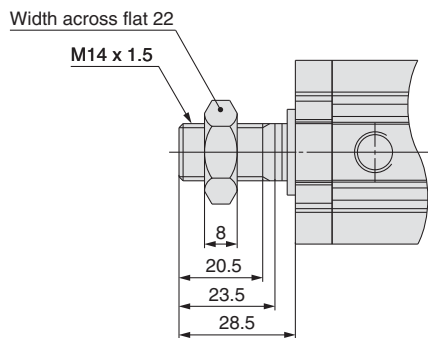


#### With boss on head side

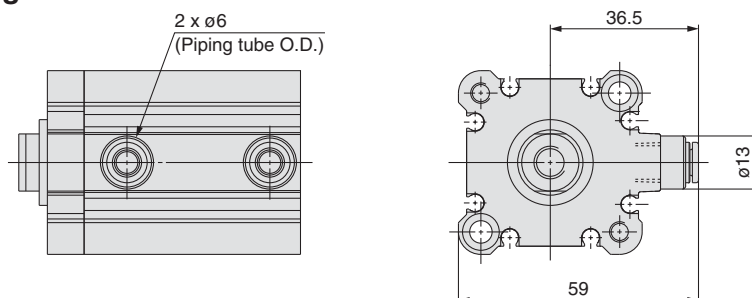


Stroke range (mm)	(mm)	
	A	B
5 to 50	39	32
75, 100	49	42

#### Rod end male thread



#### Built-in one-touch fittings: ø32

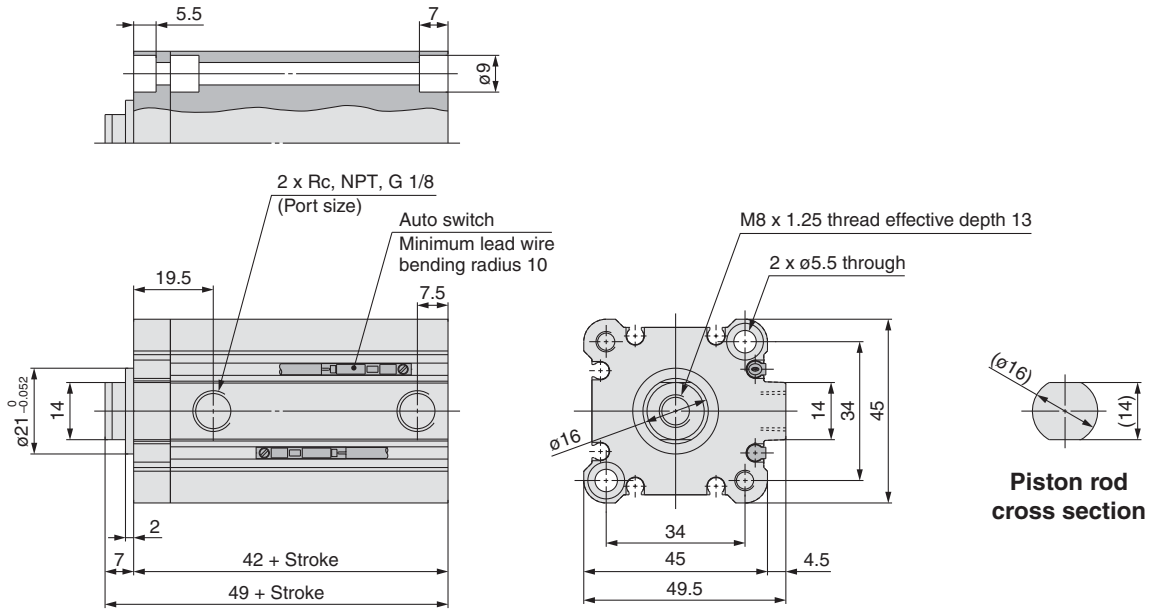


Note 2) The dimensions of the ø32-5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube.

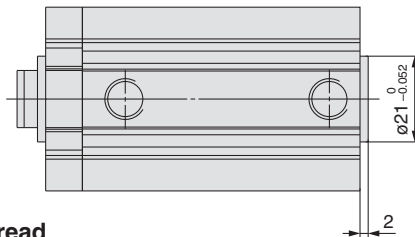
\* For details about the rod end nut and accessory brackets, refer to page 19.

Dimensions

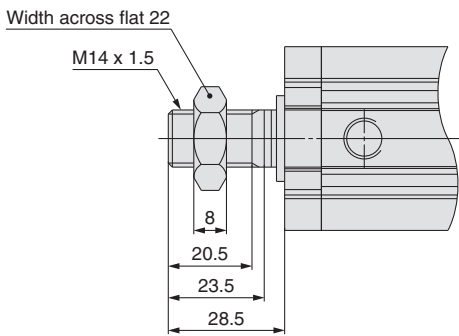
**Ø32/With Auto Switch**



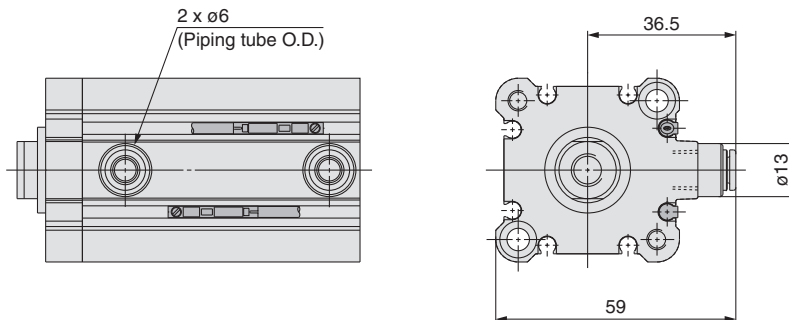
With boss on head end



Rod end male thread



**Built-in one-touch fittings: ø32**



\* For details about the rod end nut and accessory brackets, refer to page 19.

Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

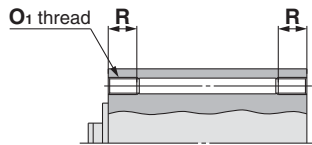
# Series CQ2K

## Dimensions

### ∅40 to ∅63/With Auto Switch

(In the case of without auto switches, the A and B dimensions will be only changed. Refer to the dimension table.)

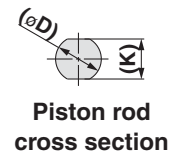
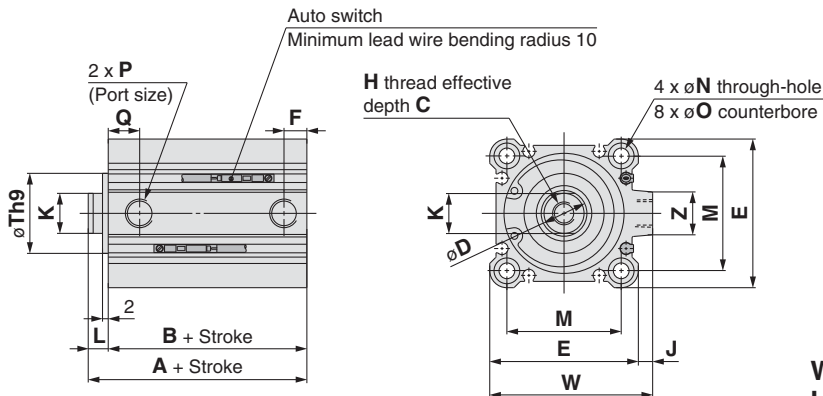
#### Both ends tapped: CDQ2KA



#### Both Ends Tapped (mm)

Bore size (mm)	O <sub>1</sub>	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18

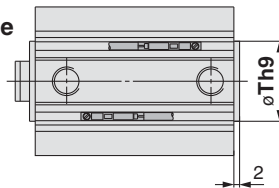
#### Standard (Through-hole): CDQ2KB



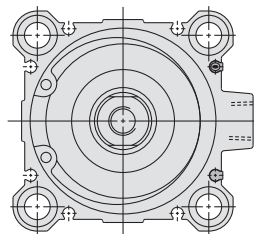
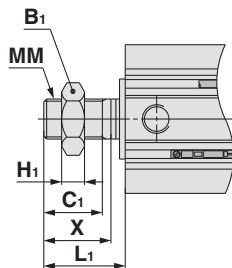
#### With Boss on Head Side (mm)

Bore size (mm)	Th9
40	28 <sup>0</sup> <sub>-0.052</sub>
50	35 <sup>0</sup> <sub>-0.062</sub>
63	35 <sup>0</sup> <sub>-0.062</sub>

#### With boss on head side



#### Rod end male thread

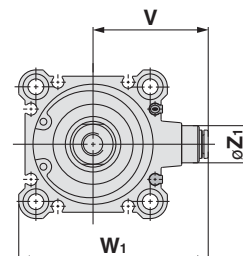
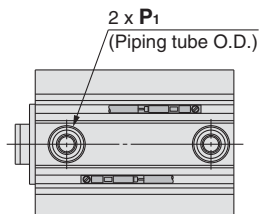


#### Cylinder tube form ∅63

#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5
63	27	26	11	33.5	M18 x 1.5	28.5

#### Built-in one-touch fittings: ∅40 to ∅63



#### Built-in One-touch Fittings (mm)

Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

#### Standard

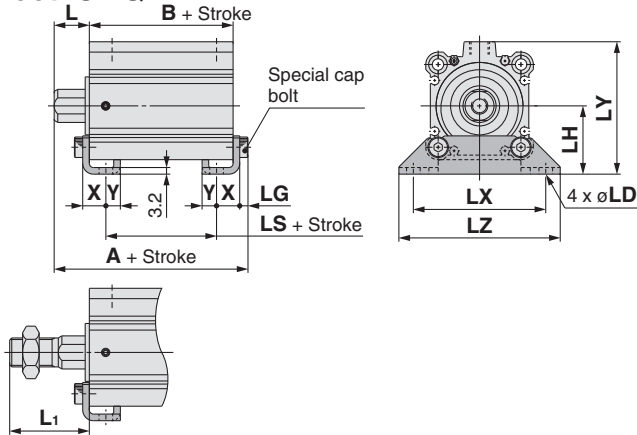
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	Th9	W	Z
		A	B	A	B																
40	5 to 50	36.5	29.5	46.5	39.5	13	16	52	8	M8 x 1.25	5	14	7	40	5.5	9 depth 7	1/8	11	28 <sup>0</sup> <sub>-0.052</sub>	57	15
	75, 100	46.5	39.5																		
50	10 to 50	38.5	30.5	48.5	40.5	15	20	64	10.5	M10 x 1.5	7	18	8	50	6.6	11 depth 8	1/4	10.5	35 <sup>0</sup> <sub>-0.062</sub>	71	19
	75, 100	48.5	40.5																		
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	7	18	8	60	9	14 depth 10.5	1/4	15	35 <sup>0</sup> <sub>-0.062</sub>	84	19
	75, 100	54	46																		

\* For details about the rod end nut and accessory brackets, refer to page 19.

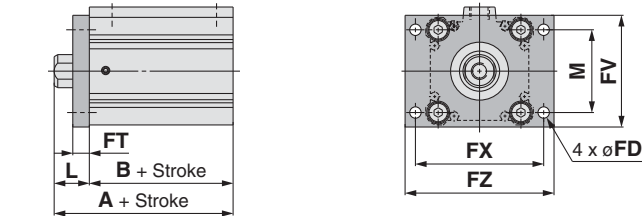


# Compact Cylinder: Non-rotating Rod Double Acting, Single Rod *Series CQ2K*

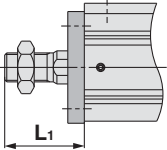
## Foot: CDQ2KL



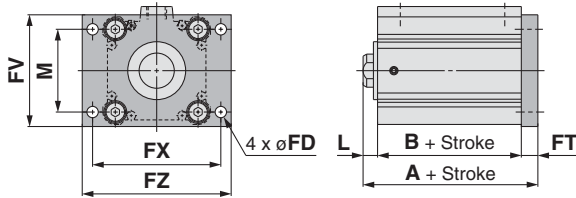
## Rod flange: CDQ2KF



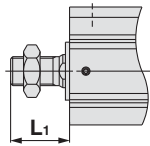
## Rod end male thread



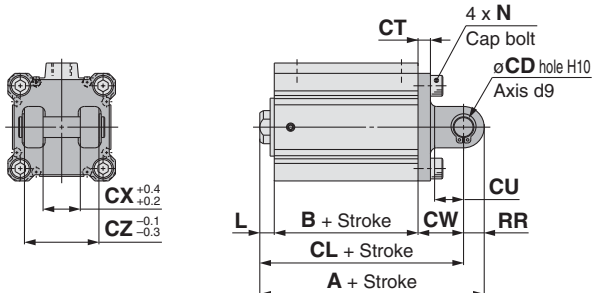
## Head flange: CDQ2KG



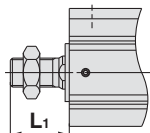
## Rod end male thread



## Double clevis: CDQ2KD



## Rod end male thread



\* For details about the rod end nut and accessory brackets, refer to page 19.

\* Double clevis pin and retaining rings are included.

## Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			(mm)		
		A	B	LS	A	B	LS	L	L <sub>1</sub>	LD
40	5 to 50	53.7	29.5	13.5	63.7	39.5	23.5	17	38.5	6.6
	75, 100	63.7	39.5	23.5						
50	10 to 50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	9
	75, 100	66.7	40.5	17.5						
63	10 to 50	62.2	36	10	72.2	46	20	18	43.5	11
	75, 100	72.2	46	20						

Bore size (mm)	LG	LH	LX	LY	LZ	X	Y
40	4	33	64	64	78	11.2	7
50	5	39	79	78	95	14.7	8
63	5	46	95	91.5	113	16.2	9

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ
		A	B	A	B					
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72
	75, 100	56.5	39.5							
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89
	75, 100	58.5	40.5							
63	10 to 50	54	36	64	46	9	9	80	92	108
	75, 100	64	46							

Bore size (mm)	L	L <sub>1</sub>	M
40	17	38.5	40
50	18	43.5	50
63	18	43.5	60

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Head Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		(mm)	
		A	B	A	B	L	L <sub>1</sub>
40	5 to 50	44.5		54.5		7	28.5
	75, 100	54.5					
50	10 to 50	47.5		57.5		8	33.5
	75, 100	57.5					
63	10 to 50	53		63		8	33.5
	75, 100	63					

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU
		A	B	CL	A	B	CL			
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14
	75, 100	78.5	39.5	68.5						
50	10 to 50	80.5	30.5	66.5	90.5	40.5	76.5	14	7	20
	75, 100	90.5	40.5	76.5						
63	10 to 50	88	36	74	98	46	84	14	8	20
	75, 100	98	46	84						

Bore size (mm)	CW	CX	CZ	L	L <sub>1</sub>	N	RR
40	22	18	36	7	28.5	M6 x 1.0	10
50	28	22	44	8	33.5	M8 x 1.25	14
63	30	22	44	8	33.5	M10 x 1.5	14

Double clevis bracket material: Cast iron  
Surface treatment: Painted



# Compact Cylinder: Non-rotating Rod Double Acting, Double Rod Series CQ2KW

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

## How to Order

Without auto switch  
ø12 to ø25

CQ2KW B 20 □ - 30 D □

Without auto switch  
ø32 to ø63

CQ2KW B 32 □ - 30 D □ Z

With auto switch

CDQ2KW B 32 □ - 30 D □ Z - M9BW □

With auto switch  
(Built-in magnet)

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Mounting

B	Through-hole (Standard)	ø12 to ø63
A	Both ends tapped	ø40 to ø63
L	Foot	
F	Flange	

Bore size

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

Port thread type

—	M thread	ø12 to ø25
	Rc	ø32 to ø63
TN	NPT	
TF	G	
F	Built-in one-touch fittings <small>Note)</small>	

Note) Bore sizes available with one-touch fittings are ø32 to ø63.

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

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø63	4 surfaces

Body option

—	Standard (Rod end female thread)
C	With rubber bumper (ø12 with auto switch only)
M	Rod end male thread

Cylinder stroke (mm)

Refer to the next page for standard strokes.

Action

D Double acting

### 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) CDQ2KWB32-30DZ

### Applicable Auto Switches

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.  
Refer to the individual catalogue (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 (—)	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	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○				
				2-wire				M9BV	M9B	●	●	●	○	—	○	—			
				3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○	—			
	3-wire (PNP)			M9PWW				M9PW	●	●	●	○	—	○	—	—			
	2-wire			M9BWW				M9BW	●	●	●	○	—	○	—	—			
	3-wire (NPN)			M9NAV**				M9NA**	○	○	●	○	—	○	—	—	—		
	3-wire (PNP)			M9PAV**				M9PA**	○	○	●	○	—	○	—	—	—		
	2-wire			M9BAV**				M9BA**	○	○	●	○	—	○	—	—	—		
	2-wire (Non-polar)			—				P3DW	●	—	●	●	—	—	—	—	—		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	100 V	A96V	A96	●	—	●	—	—	—	IC circuit	—		
				2-wire				A93V	A93	●	—	●	—	—	—	—	Relay, PLC		
				—				A90V	A90	●	—	●	—	—	—	—	IC circuit		

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (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 ø63 only.

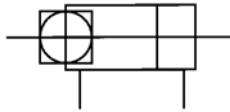
\* There are other applicable auto switches other than the listed above. For details, refer to page 175.

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

# Series CQ2KW



**Symbol**  
Non-rotating rod,  
Double acting



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XB10	Intermediate stroke (Exclusive body type)
-X633	Intermediate stroke of double rod cylinder, $\phi 125$ to $\phi 160$ only

\* -X633: Intermediate stroke in 5 mm intervals only

## Specifications

Bore size (mm)	12	16	20	25	32	40	50	63
<b>Action</b>	Double acting, Double 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>	0.022 0.043 Note 1)	0.038	0.055	0.09	0.15	0.26	0.46	0.77
<b>Stroke length tolerance</b>	+1.0 mm Note 2) 0							
<b>Rod non-rotating accuracy</b>	$\pm 2^\circ$		$\pm 1^\circ$			$\pm 0.8^\circ$		

\*  $\phi 12$  with auto switch: With rubber bumper (Standard)

Note 1) For cylinders with rubber bumper ( $\phi 12$  with auto switch only)

Note 2) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size	Standard stroke
<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, 63</b>	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.				
Part no.	Refer to "How to Order" for the standard model number. (P. 92)				
Description	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.				
Stroke range	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>32 to 63</td> <td>55 to 95</td> </tr> </tbody> </table>	Bore size	Stroke range	32 to 63	55 to 95
Bore size	Stroke range				
32 to 63	55 to 95				
Example	Part no.: CQ2KWB50-65DZ CQ2KWB50-75DZ with 10 mm width spacer inside The B dimension is 125.5 mm.				

## Type

Bore size (mm)		12	16	20	25	32	40	50	63	
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●	
		Both ends tapped	—	—	—	—	●	●	●	
	Built-in magnet		●	●	●	●	●	●	●	
	Piping	Pipe thread	—	M5	M5	M5	M5	Note 1) M5 Rc1/8	Rc1/8	Rc1/4
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4
		TF	—	—	—	—	—	G1/8	G1/8	G1/4
Built-in one-touch fittings		—	—	—	—	—	$\phi 6/4$ Note 2)	$\phi 6/4$	$\phi 8/6$	$\phi 8/6$
Rod end male thread		●	●	●	●	●	●	●	●	

Note 1)  $\phi 32$  without auto switch: M5 is used for 5 mm strokepiping dimension.

Thus, do not enter a symbol for the port thread type.

Note 2) The dimensions of the  $\phi 32$ -5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube.

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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.

## Retaining Ring Installation/Removal

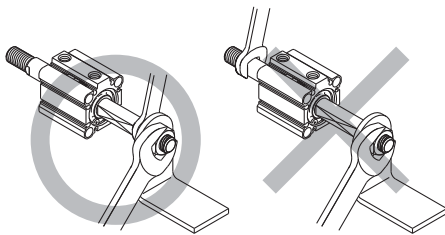
### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Mounting

### ⚠ Warning

- Do not apply reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction. Install or remove loads while the piston rod width across flat is secured. Also, tighten by giving consideration to prevent the tightening torque from being applied to the non-rotating guide. Do not fix the other side of the piston rod width across flat and apply reverse torque.



- Using a non-rotating rod cylinder  
Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod. If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Use the below table as a guide for the allowable rotational torque ranges.

Allowable rotational torque	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63
N·m or less	0.04	0.15	0.20	0.25	0.44	0.44	0.44	0.44

## Mounting Brackets/Part No.

Bore size (mm)	Foot <sup>Note 1)</sup>	Flange
40	CQ-L040	CQ-F040
50	CQ-L050	CQ-F050
63	CQ-L063	CQ-F063

- Note 1) When ordering a foot bracket, order 2 pieces per cylinder.  
 Note 2) Parts belonging to each bracket are as follows.  
 Foot or Flange: Body mounting bolts

## Theoretical Output

Bore size (mm)	Operating pressure (MPa)		
	0.3	0.5	0.7
12	25	42	59
16	45	75	106
20	71	118	165
25	113	189	264
32	181	302	422
40	317	528	739
50	495	825	1150
63	841	1400	1960

## Weight

### Weight (g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	62	69	76	83	90	97	—	—	—	—	—	—
16	62	73	84	95	106	117	—	—	—	—	—	—
20	101	116	131	146	161	176	191	206	221	236	—	—
25	138	155	172	189	206	223	240	257	274	291	—	—
32	233	256	279	302	325	348	371	394	417	440	600	715
40	336	365	394	424	453	483	512	541	571	600	806	953
50	—	517	558	600	642	684	725	767	809	850	1142	1351
63	—	742	779	815	851	887	923	959	995	1032	1285	1465

## Additional Weight

Bore size (mm)		12	16	20	25	32	40	50	63
Both ends tapped		—	—	—	—	—	6	6	19
Rod end male thread	Male thread	3	6	12	24	52	54	106	106
	Nut	2	4	8	16	34	34	64	64
Built-in one-touch fittings		—	—	—	—	12	12	21	21
Foot		—	—	—	—	—	154	243	317
Flange		—	—	—	—	—	214	373	559

Calculation: (Example) **CQ2KWA40-20DMZ**

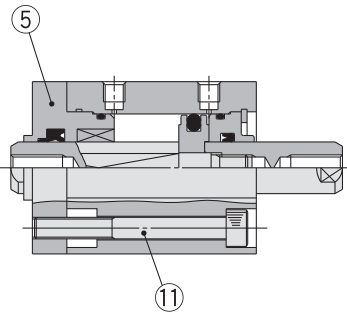
- Basic weight: CQ2KWB40-20DZ..... 424 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 88 g
- 518 g

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

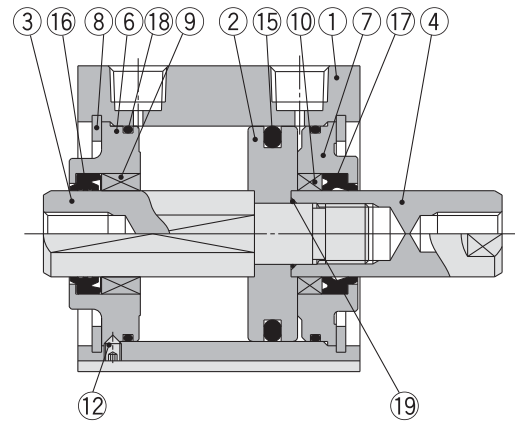
# Series CQ2KW

## Construction

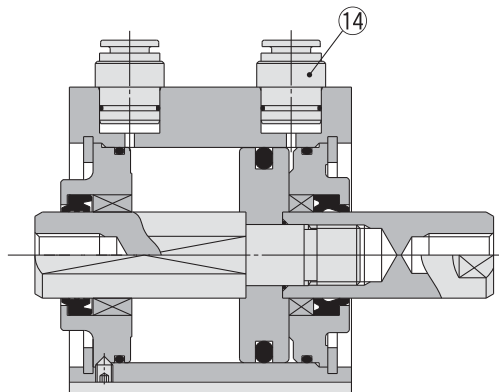
Standard (ø12 to ø32)



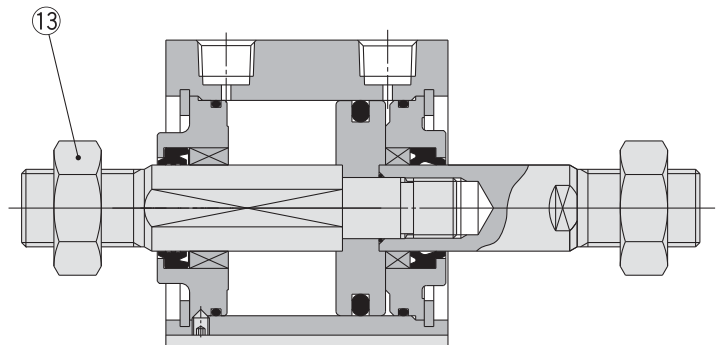
Standard (ø40 to ø63)



Built-in one-touch fittings



Rod end male thread



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod A	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plated
4	Piston rod B	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plated
5	Rod cover	Brass	ø12, Electroless nickel plated
		Aluminum alloy	ø16 to ø32, Anodised
6	Collar for non-rotating	Aluminum alloy	ø40 to ø63, Anodised
		Aluminum alloy	ø12 to ø40, Anodised
7	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50 to ø63, Chromated, Painted
8	Retaining ring	Carbon tool steel	Phosphate coated
9	Bushing for non-rotating	Oil-impregnated sintered alloy	ø16 to ø63
10	Bushing	Bearing alloy	ø50, ø63
11	Hexagon socket head cap screw	Alloy steel	ø12 to ø32, Nickel plated
12	Hexagon socket head set screw	Alloy steel	ø40 to ø63, Nickel plated
13	Rod end nut	Carbon steel	Nickel plated
14	One-touch fitting	—	ø32 to ø63
15	Piston seal	NBR	
16	Rod seal for non-rotating	NBR	
17	Rod seal	NBR	
18	Gasket	NBR	
19	Piston gasket	NBR	ø32 to ø63

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQ2KWB12-PS	Kits include items 15, 16, 17, 18 from the table.
16	CQ2KWB16-PS	
20	CQ2KWB20-PS	
25	CQ2KWB25-PS	
32	CQ2KWB32-PS	
40	CQ2KWB40-PS	
50	CQ2KWB50-PS	
63	CQ2KWB63-PS	

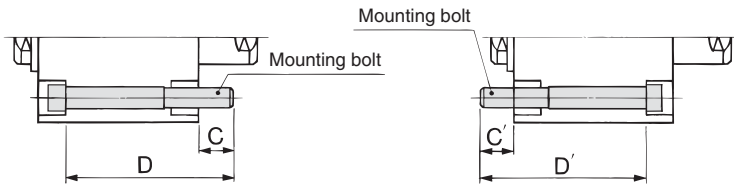
\* Seal kit includes 15, 16, 17, 18. Order the seal kit based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

**Grease pack part no.:** GR-S-010 (10 g)

**Mounting Bolt for CQ2KWB/Without Auto Switch**

Non-rotating rod side mounting



Cylinder model	C	D	Mounting bolt	C'	D'	Mounting bolt
CQ2KWB12-5D	8.3	40	M3X40L	8.3	40	M3X40L
CQ2KWB12-10D		45	M3X45L		45	M3X45L
CQ2KWB12-15D		50	M3X50L		50	M3X50L
CQ2KWB12-20D		55	M3X55L		55	M3X55L
CQ2KWB12-25D		60	M3X60L		60	M3X60L
CQ2KWB12-30D		65	M3X65L		65	M3X65L
CQ2KWB16-5D	7.5	40	M3X40L	7.5	40	M3X40L
CQ2KWB16-10D		45	M3X45L		45	M3X45L
CQ2KWB16-15D		50	M3X50L		50	M3X50L
CQ2KWB16-20D		55	M3X55L		55	M3X55L
CQ2KWB16-25D		60	M3X60L		60	M3X60L
CQ2KWB16-30D		65	M3X65L		65	M3X65L
CQ2KWB20-5D	6.5	40	M5X40L	8	40	M5X40L
CQ2KWB20-10D		45	M5X45L		45	M5X45L
CQ2KWB20-15D		50	M5X50L		50	M5X50L
CQ2KWB20-20D		55	M5X55L		55	M5X55L
CQ2KWB20-25D		60	M5X60L		60	M5X60L
CQ2KWB20-30D		65	M5X65L		65	M5X65L
CQ2KWB20-35D		70	M5X70L		70	M5X70L
CQ2KWB20-40D		75	M5X75L		75	M5X75L
CQ2KWB20-45D		80	M5X80L		80	M5X80L
CQ2KWB20-50D	85	M5X85L	85	M5X85L		
CQ2KWB25-5D	8.5	45	M5X45L	10	45	M5X45L
CQ2KWB25-10D		50	M5X50L		50	M5X50L
CQ2KWB25-15D		55	M5X55L		55	M5X55L
CQ2KWB25-20D		60	M5X60L		60	M5X60L
CQ2KWB25-25D		65	M5X65L		65	M5X65L
CQ2KWB25-30D		70	M5X70L		70	M5X70L
CQ2KWB25-35D		75	M5X75L		75	M5X75L
CQ2KWB25-40D		80	M5X80L		80	M5X80L
CQ2KWB25-45D		85	M5X85L		85	M5X85L
CQ2KWB25-50D		90	M5X90L		90	M5X90L
CQ2KWB32-5DZ	11	50	M5X50L	7.5	45	M5X45L
CQ2KWB32-10DZ		55	M5X55L		50	M5X50L
CQ2KWB32-15DZ		60	M5X60L		55	M5X55L
CQ2KWB32-20DZ		65	M5X65L		60	M5X60L
CQ2KWB32-25DZ		70	M5X70L		65	M5X65L
CQ2KWB32-30DZ		75	M5X75L		70	M5X70L
CQ2KWB32-35DZ		80	M5X80L		75	M5X75L
CQ2KWB32-40DZ		85	M5X85L		80	M5X80L
CQ2KWB32-45DZ		90	M5X90L		85	M5X85L
CQ2KWB32-50DZ		95	M5X95L		90	M5X90L
CQ2KWB32-75DZ		130	M5X130L		125	M5X125L
CQ2KWB32-100DZ	155	M5X155L	150	M5X150L		

Cylinder model	C	D	Mounting bolt
CQ2KWB40-5DZ	7	45	M5X45L
CQ2KWB40-10DZ		50	M5X50L
CQ2KWB40-15DZ		55	M5X55L
CQ2KWB40-20DZ		60	M5X60L
CQ2KWB40-25DZ		65	M5X65L
CQ2KWB40-30DZ		70	M5X70L
CQ2KWB40-35DZ		75	M5X75L
CQ2KWB40-40DZ		80	M5X80L
CQ2KWB40-45DZ		85	M5X85L
CQ2KWB40-50DZ		90	M5X90L
CQ2KWB40-75DZ		125	M5X125L
CQ2KWB40-100DZ		150	M5X150L
CQ2KWB50-10DZ	12.5	55	M6X55L
CQ2KWB50-15DZ		60	M6X60L
CQ2KWB50-20DZ		65	M6X65L
CQ2KWB50-25DZ		70	M6X70L
CQ2KWB50-30DZ		75	M6X75L
CQ2KWB50-35DZ		80	M6X80L
CQ2KWB50-40DZ		85	M6X85L
CQ2KWB50-45DZ		90	M6X90L
CQ2KWB50-50DZ		95	M6X95L
CQ2KWB50-75DZ			130
CQ2KWB50-100DZ		155	M6X155L
CQ2KWB63-10DZ	13.5	55	M8X55L
CQ2KWB63-15DZ		60	M8X60L
CQ2KWB63-20DZ		65	M8X65L
CQ2KWB63-25DZ		70	M8X70L
CQ2KWB63-30DZ		75	M8X75L
CQ2KWB63-35DZ		80	M8X80L
CQ2KWB63-40DZ		85	M8X85L
CQ2KWB63-45DZ		90	M8X90L
CQ2KWB63-50DZ		95	M8X95L
CQ2KWB63-75DZ			130
CQ2KWB63-100DZ		155	M8X155L

\* ø40 to ø63: The C' and D' dimensions are the same as those of C and D.

**Copper and Fluorine-free Series (For CRT Manufacturing Process)**

20 — CQ2KWB **Bore size** — **Stroke** D(M)(Z)  
 — ø16, ø20, ø25, ø32, ø40, ø50, ø63  
 •Copper and fluorine-free series

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

**Specifications**

Bore size (mm)	16	20	25	32	40	50	63
Action	Double acting, Double rod						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Pipe thread						
Piston speed	50 to 500 mm/s						
Mounting	Through-hole						
Auto switch	Mountable						

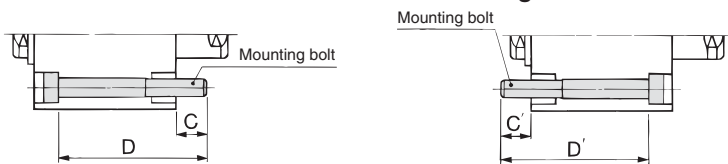
Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order





Mounting Bolt for CDQ2KWB/With Auto Switch

Non-rotating rod side mounting



Cylinder model	C	D	Mounting bolt	C'	D'	Mounting bolt
CDQ2KWB12-5DCZ	6.1	40	M3X40L	6.1	45	M3X45L
CDQ2KWB12-10DCZ		45	M3X45L		50	M3X50L
CDQ2KWB12-15DCZ		50	M3X50L		55	M3X55L
CDQ2KWB12-20DCZ		55	M3X55L		60	M3X60L
CDQ2KWB12-25DCZ		60	M3X60L		65	M3X65L
CDQ2KWB12-30DCZ		65	M3X65L		70	M3X70L
CDQ2KWB16-5DZ	7.5	45	M3X45L	7.5	50	M3X50L
CDQ2KWB16-10DZ		50	M3X50L		55	M3X55L
CDQ2KWB16-15DZ		55	M3X55L		60	M3X60L
CDQ2KWB16-20DZ		60	M3X60L		65	M3X65L
CDQ2KWB16-25DZ		65	M3X65L		70	M3X70L
CDQ2KWB16-30DZ		70	M3X70L		75	M3X75L
CDQ2KWB20-5DZ	9	45	M5X45L	11	55	M5X55L
CDQ2KWB20-10DZ		50	M5X50L		60	M5X60L
CDQ2KWB20-15DZ		55	M5X55L		65	M5X65L
CDQ2KWB20-20DZ		60	M5X60L		70	M5X70L
CDQ2KWB20-25DZ		65	M5X65L		75	M5X75L
CDQ2KWB20-30DZ		70	M5X70L		80	M5X80L
CDQ2KWB20-35DZ		75	M5X75L		85	M5X85L
CDQ2KWB20-40DZ		80	M5X80L		90	M5X90L
CDQ2KWB20-45DZ		85	M5X85L		95	M5X95L
CDQ2KWB20-50DZ		90	M5X90L		100	M5X100L
CDQ2KWB25-5DZ	8	45	M5X45L	10	55	M5X55L
CDQ2KWB25-10DZ		50	M5X50L		60	M5X60L
CDQ2KWB25-15DZ		55	M5X55L		65	M5X65L
CDQ2KWB25-20DZ		60	M5X60L		70	M5X70L
CDQ2KWB25-25DZ		65	M5X65L		75	M5X75L
CDQ2KWB25-30DZ		70	M5X70L		80	M5X80L
CDQ2KWB25-35DZ		75	M5X75L		85	M5X85L
CDQ2KWB25-40DZ		80	M5X80L		90	M5X90L
CDQ2KWB25-45DZ		85	M5X85L		95	M5X95L
CDQ2KWB25-50DZ		90	M5X90L		100	M5X100L
CDQ2KWB32-5DZ	11	60	M5X60L	7.5	55	M5X55L
CDQ2KWB32-10DZ		65	M5X65L		60	M5X60L
CDQ2KWB32-15DZ		70	M5X70L		65	M5X65L
CDQ2KWB32-20DZ		75	M5X75L		70	M5X70L
CDQ2KWB32-25DZ		80	M5X80L		75	M5X75L
CDQ2KWB32-30DZ		85	M5X85L		80	M5X80L
CDQ2KWB32-35DZ		90	M5X90L		85	M5X85L
CDQ2KWB32-40DZ		95	M5X95L		90	M5X90L
CDQ2KWB32-45DZ		100	M5X100L		95	M5X95L
CDQ2KWB32-50DZ		105	M5X105L		100	M5X100L
CDQ2KWB32-75DZ	130	M5X130L	125	M5X125L		
CDQ2KWB32-100DZ	155	M5X155L	150	M5X150L		

Cylinder model	C	D	Mounting bolt
CDQ2KWB40-5DZ	7	55	M5X55L
CDQ2KWB40-10DZ		60	M5X60L
CDQ2KWB40-15DZ		65	M5X65L
CDQ2KWB40-20DZ		70	M5X70L
CDQ2KWB40-25DZ		75	M5X75L
CDQ2KWB40-30DZ		80	M5X80L
CDQ2KWB40-35DZ		85	M5X85L
CDQ2KWB40-40DZ		90	M5X90L
CDQ2KWB40-45DZ		95	M5X95L
CDQ2KWB40-50DZ		100	M5X100L
CDQ2KWB40-75DZ	12.5	125	M5X125L
CDQ2KWB40-100DZ		150	M5X150L
CDQ2KWB50-10DZ		65	M6X65L
CDQ2KWB50-15DZ		70	M6X70L
CDQ2KWB50-20DZ		75	M6X75L
CDQ2KWB50-25DZ		80	M6X80L
CDQ2KWB50-30DZ		85	M6X85L
CDQ2KWB50-35DZ		90	M6X90L
CDQ2KWB50-40DZ		95	M6X95L
CDQ2KWB50-45DZ		100	M6X100L
CDQ2KWB50-50DZ	105	M6X105L	
CDQ2KWB50-75DZ	13.5	130	M6X130L
CDQ2KWB50-100DZ		155	M6X155L
CDQ2KWB63-10DZ		65	M8X65L
CDQ2KWB63-15DZ		70	M8X70L
CDQ2KWB63-20DZ		75	M8X75L
CDQ2KWB63-25DZ		80	M8X80L
CDQ2KWB63-30DZ		85	M8X85L
CDQ2KWB63-35DZ		90	M8X90L
CDQ2KWB63-40DZ		95	M8X95L
CDQ2KWB63-45DZ		100	M8X100L
CDQ2KWB63-50DZ	105	M8X105L	
CDQ2KWB63-75DZ	130	M8X130L	
CDQ2KWB63-100DZ	155	M8X155L	

\* ø40 to ø63: The C' and D' dimensions are the same as those of C and D.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

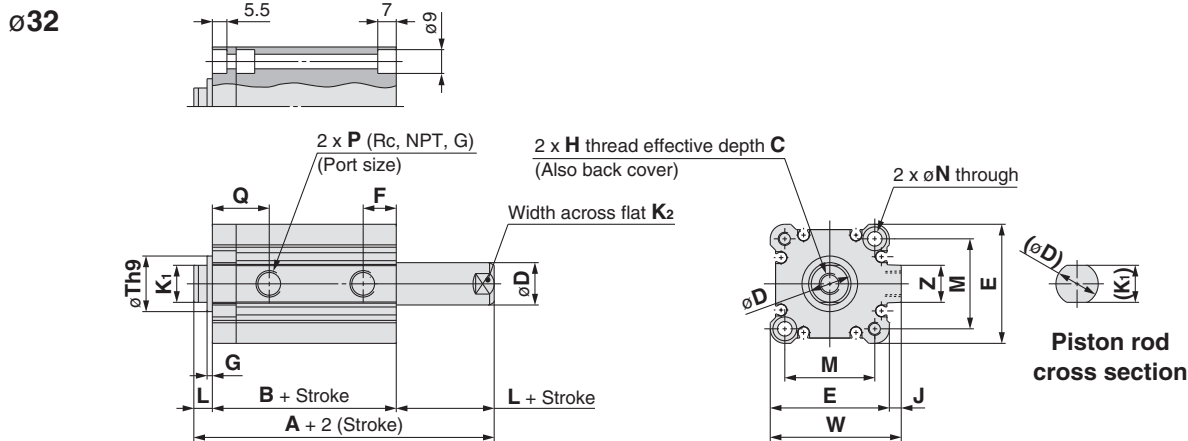
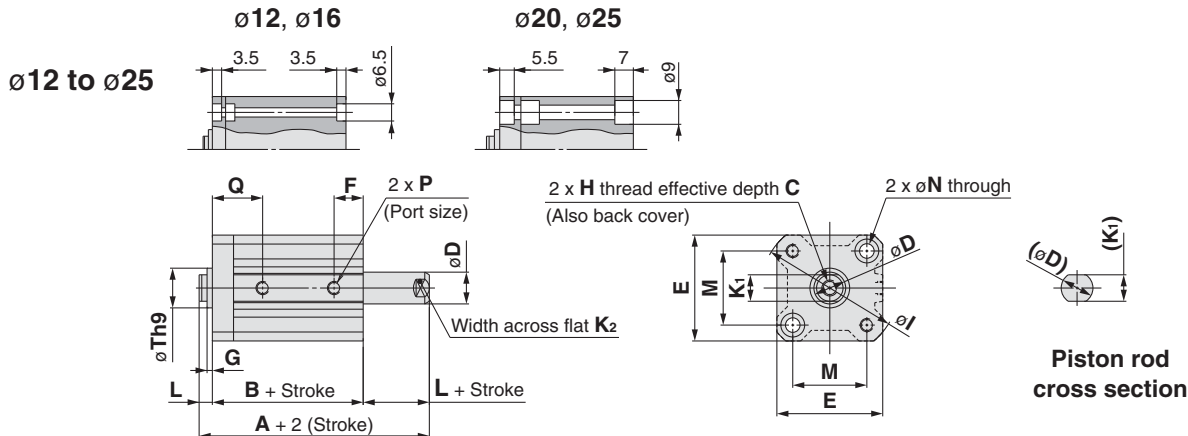
Made to Order

# Series CQ2KW

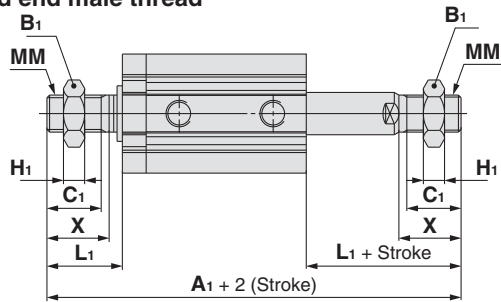
## Dimensions

### Ø12 to Ø32/Without Auto Switch

#### Standard (Through-hole): CQ2KWB



#### Rod end male thread



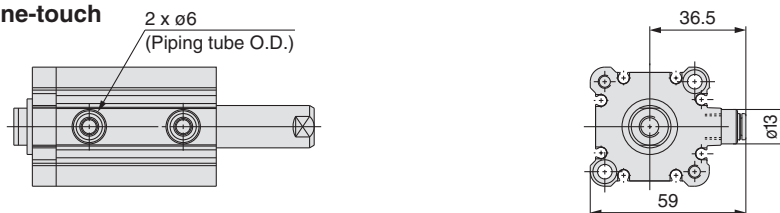
#### Rod End Male Thread (mm)

Bore size (mm)	Stroke range (mm)	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>
12	5 to 30	58.2	8	9	4
16	5 to 30	62	10	10	5
20	5 to 50	71	13	12	5
25	5 to 50	82	17	15	6
32	5 to 50	96.5	22	20.5	8
	75, 100	106.5			

Bore size (mm)	L <sub>1</sub>	MM	X
12	14	M5 x 0.8	10.5
16	15.5	M6 x 1.0	12
20	18.5	M8 x 1.25	14
25	22.5	M10 x 1.25	17.5
32	28.5	M14 x 1.5	23.5

#### Built-in one-touch fittings: Ø32

##### Built-in one-touch fittings



\* The dimensions of Ø32-5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube. (mm)

#### Standard

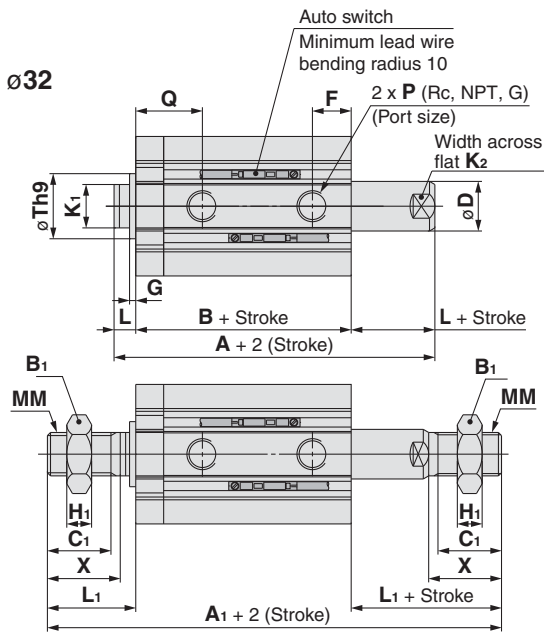
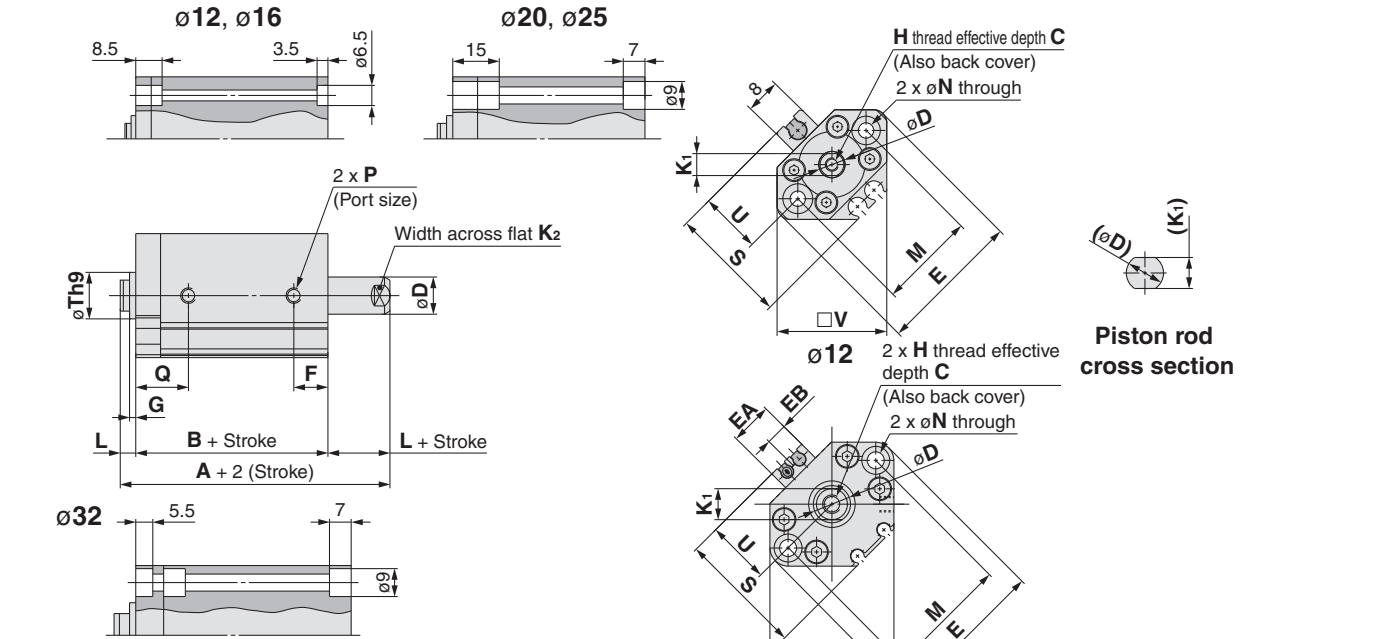
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	G	H	I	J	K <sub>1</sub>	K <sub>2</sub>	L	M	N	P	Q	Th9	W	Z
12	5 to 30	37.2	30.2	6	6	25	10	1.5	M3 x 0.5	32	—	5.2	5	3.5	15.5	3.5	M5	15	15 <sup>0</sup> <sub>-0.043</sub>	—	—
16	5 to 30	38	31	8	8	29	10	1.5	M4 x 0.7	38	—	6	6	3.5	20	3.5	M5	15	20 <sup>0</sup> <sub>-0.052</sub>	—	—
20	5 to 50	43	34	7	10	36	9.5	2	M5 x 0.8	47	—	8	8	4.5	25.5	5.5	M5	17.5	13 <sup>0</sup> <sub>-0.043</sub>	—	—
25	5 to 50	47	37	12	12	40	11	2	M6 x 1.0	52	—	10	10	5	28	5.5	M5	19	15 <sup>0</sup> <sub>-0.043</sub>	—	—
32	5	53.5	39.5	13	16	45	12.5	2	M8 x 1.25	—	4.5	14	14	7	34	5.5	M5	21.5	21 <sup>0</sup> <sub>-0.052</sub>	49.5	14
	10 to 50																				
	75, 100	63.5	49.5																		

\* For details about the rod end nut and accessory brackets, refer to page 19.  
 (Note) The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.

Dimensions

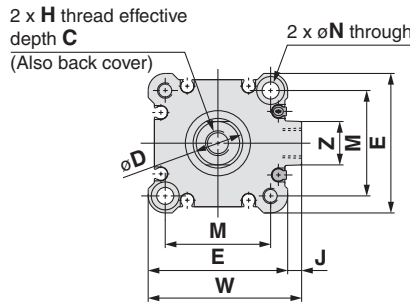
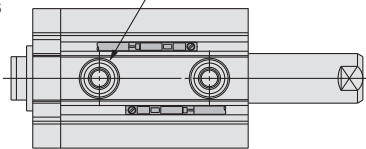
**∅12 to ∅32/With Auto Switch**

Standard (Through-hole): CDQ2KWB



**Built-in one-touch fittings: ∅32**

**Built-in one-touch fittings**  
2 x ∅6 (Piping tube O.D.)



Rod end male thread

**Rod End Male Thread (mm)**

Bore size (mm)	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>
12	65.4	8	9	4
16	72	10	10	5
20	83	13	12	5
25	92	17	15	6
32	106.5	22	20.5	8

Bore size (mm)	L <sub>1</sub>	MM	X
12	14	M5 x 0.8	10.5
16	15.5	M6 x 1.0	12
20	18.5	M8 x 1.25	14
25	22.5	M10 x 1.25	17.5
32	28.5	M14 x 1.5	23.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	G	H	J	K <sub>1</sub>	K <sub>2</sub>	L	M	N	P	Q	S	Th9	U	V	W	Z
12	5 to 30	44.4	37.4	6	6	33	—	—	10.5	1.5	M3 x 0.5	—	5.2	5	3.5	22	3.5	M5	15.5	27.5	15 <sup>0</sup> <sub>-0.043</sub>	14	25	—	—
16	5 to 30	48	41	8	8	37	13.2	6.6	10	1.5	M4 x 0.7	—	6	6	3.5	28	3.5	M5	15	29.5	20 <sup>0</sup> <sub>-0.052</sub>	15	29	—	—
20	5 to 50	55	46	7	10	47	13.6	6.8	10.5	2	M5 x 0.8	—	8	8	4.5	36	5.5	M5	18.5	35.5	13 <sup>0</sup> <sub>-0.043</sub>	18	36	—	—
25	5 to 50	57	47	12	12	52	13.6	6.8	11	2	M6 x 1.0	—	10	10	5	40	5.5	M5	19	40.5	15 <sup>0</sup> <sub>-0.043</sub>	21	40	—	—
32	5 to 50, 75, 100	63.5	49.5	13	16	45	—	—	12.5	2	M8 x 1.25	4.5	14	14	7	34	5.5	1/8	21.5	—	21 <sup>0</sup> <sub>-0.052</sub>	—	—	49.5	14

\* For details about the rod end nut and accessory brackets, refer to page 19.  
Note) The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

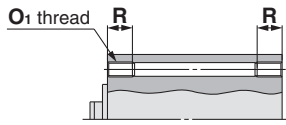
# Series CQ2KW

## Dimensions

### Ø40 to Ø63/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

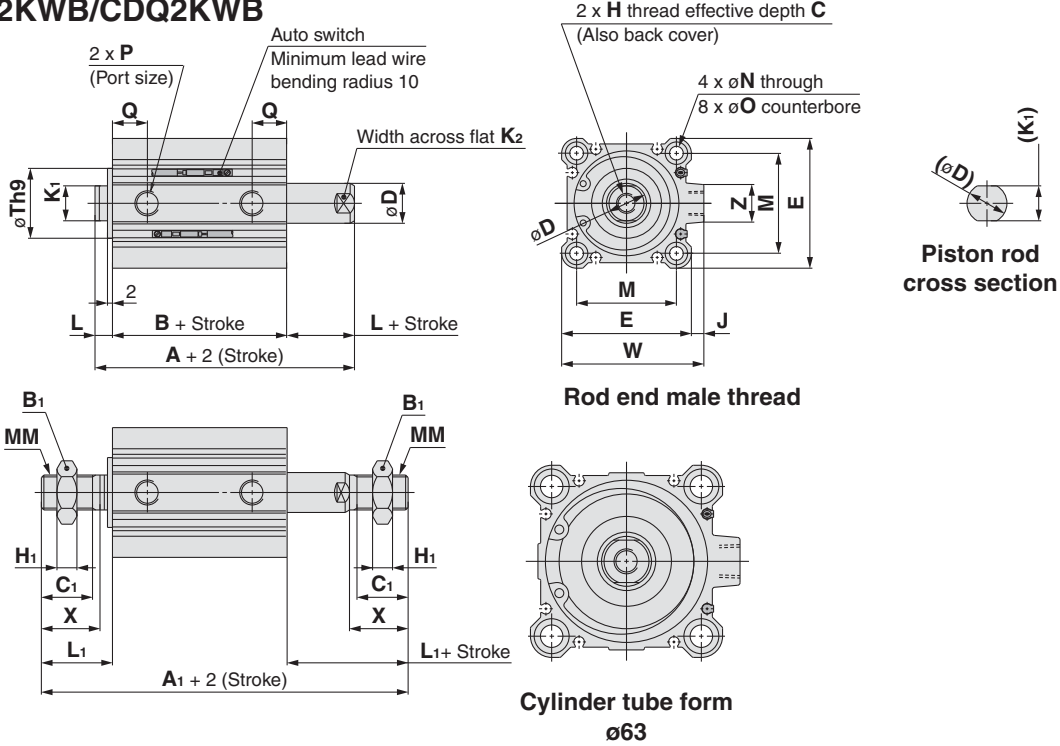
#### Both ends tapped: CQ2KWA/CDQ2KWA



#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18

#### Standard (Through-hole): CQ2KWB/CDQ2KWB

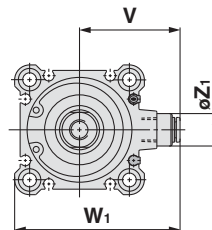
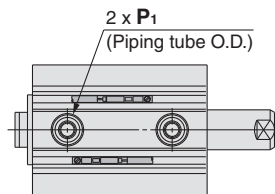


Cylinder tube form Ø63

#### Rod End Male Thread

Bore size (mm)	Without auto switch		With auto switch		B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>						
40	97	107	22	20.5	8	28.5	M14 x 1.5	23.5		
50	107.5	117.5	27	26	11	33.5	M18 x 1.5	28.5		
63	109	119	27	26	11	33.5	M18 x 1.5	28.5		

#### Built-in one-touch fittings: Ø40 to Ø63



#### Built-in One-touch Fittings

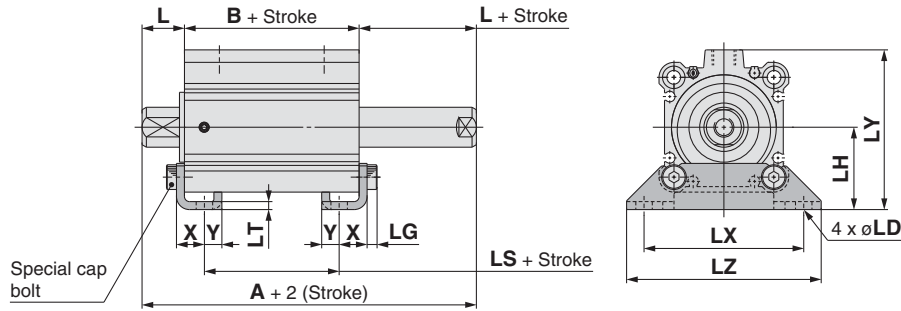
Bore size (mm)	Z <sub>1</sub>	P <sub>1</sub>	V	W <sub>1</sub>
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

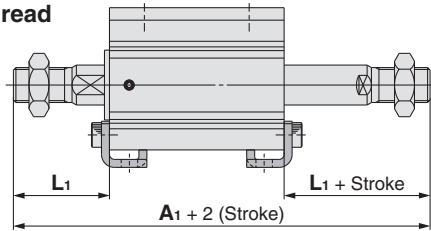
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	H	J	K <sub>1</sub>	K <sub>2</sub>	L	M	N	O	P	Q	Th9	W	Z
		A	B	A	B																
40	5 to 50	54	40	64	50	13	16	52	M8 x 1.25	5	14	14	7	40	5.5	9 depth 7	1/8	14	28 <sup>0</sup> <sub>-0.052</sub>	57	15
	75, 100	64	50																		
50	10 to 50	56.5	40.5	66.5	50.5	15	20	64	M10 x 1.5	7	18	17	8	50	6.6	11 depth 8	1/4	14	35 <sup>0</sup> <sub>-0.062</sub>	71	19
	75, 100	66.5	50.5																		
63	10 to 50	58	42	68	52	15	20	77	M10 x 1.5	7	18	17	8	60	9	14 depth 10.5	1/4	15.5	35 <sup>0</sup> <sub>-0.062</sub>	84	19
	75, 100	68	52																		

\* For details about the rod end nut and accessory brackets, refer to page 19.  
Note) The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.

Foot: CQ2KWL/CDQ2KWL



Rod end male thread



Rod End Male Thread

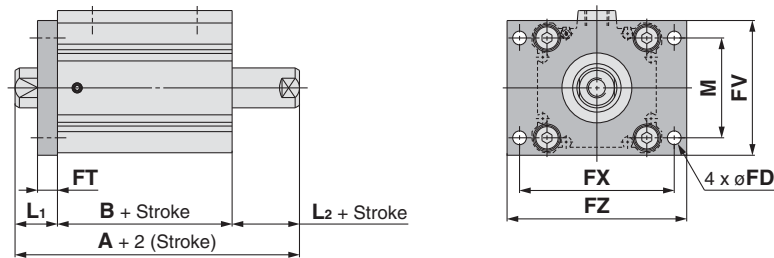
Bore size (mm)	Without auto switch		With auto switch		L <sub>1</sub>
	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	
40	117	127	117	127	38.5
50	127.5	137.5	127.5	137.5	43.5
63	129	139	129	139	43.5

Foot

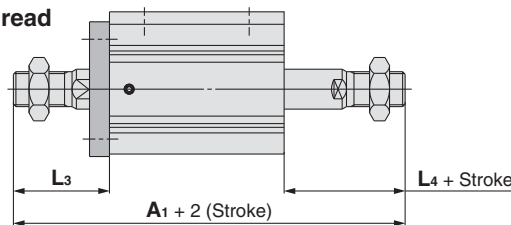
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
40	5 to 50	74	40	24	84	50	34	17	6.6	4	33	3.2	64	68	78	11.2	7
	75, 100	84	50	34	84	50	34	17	6.6	4	33	3.2	64	68	78	11.2	7
50	10 to 50	76.5	40.5	17.5	86.5	50.5	27.5	18	9	5	39	3.2	79	78	95	14.7	8
	75, 100	86.5	50.5	27.5	86.5	50.5	27.5	18	9	5	39	3.2	79	78	95	14.7	8
63	10 to 50	78	42	16	88	52	26	18	11	5	46	3.2	95	91.5	113	16.2	8
	75, 100	88	52	26	88	52	26	18	11	5	46	3.2	95	91.5	113	16.2	8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

Flange: CQ2KWF/CDQ2KWF



Rod end male thread



Rod End Male Thread

Bore size (mm)	Without auto switch		With auto switch	
	A <sub>1</sub>	A <sub>1</sub>	L <sub>3</sub>	L <sub>4</sub>
40	107	117	38.5	28.5
50	117.5	127.5	43.5	33.5
63	119	129	43.5	33.5

Flange For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L <sub>1</sub>	L <sub>2</sub>	M
		A	B	A	B								
40	5 to 50	64	40	74	50	5.5	8	54	62	72	17	7	40
	75, 100	74	50	74	50	5.5	8	54	62	72	17	7	40
50	10 to 50	66.5	40.5	76.5	50.5	6.6	9	67	76	89	18	8	50
	75, 100	76.5	50.5	76.5	50.5	6.6	9	67	76	89	18	8	50
63	10 to 50	68	42	78	52	9	9	80	92	108	18	8	60
	75, 100	78	52	78	52	9	9	80	92	108	18	8	60

\* For details about the rod end nut and accessory brackets, refer to page 19.

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

# Compact Cylinder: Axial Piping Double Acting, Single Rod Series CQP2

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

## How to Order

Without auto switch

CQP2B [ ] 50 [ ] - 30 D [ ] - [ ]

With auto switch

CDQP2B [ ] 50 [ ] - 30 D [ ] - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

Axial piping

Mounting

**B** Through-hole

\* Cylinder mounting bolts are not included.  
Order them separately referring to "Mounting Bolt for C(D)QP2B" on pages 106 and 109.

Type	
—	Pneumatic
<b>H</b>	Air-hydro <sup>Note 1)</sup>

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

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

### 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) CDQP2B32-30D

Port thread type

—	M thread	ø12 to ø25
	Rc	
<b>TN</b>	NPT	ø32 to ø100
<b>TF</b>	G	

Made to Order

Refer to the next page for details.

Number of auto switches

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

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Body option

—	Standard (Rod end female thread)
<b>C</b>	With rubber bumper <sup>Note 2)</sup>
<b>M</b>	Rod end male thread

\* Combination of body option ("CM") is available.  
Note 2) Air-hydro type with rubber bumper is not available.

Action

**D** Double acting

Cylinder stroke (mm)

Refer to the next page for standard strokes.

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	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>	●	●	●	○	—	○	IC circuit							
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○								
		2-wire		<b>M9BV</b>				<b>M9B</b>	●	●	●	○	—	○									
				<b>J79C</b>				—	●	—	●	●	—	—									
	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NVW</b>	<b>M9NW</b>	●	●	●	○	—	○	IC circuit							
				3-wire (PNP)				<b>M9PWV</b>	<b>M9PW</b>	●	●	●	○	—	○								
				2-wire				<b>M9BWV</b>	<b>M9BW</b>	●	●	●	○	—	○								
								<b>M9NAV**</b>	<b>M9NA**</b>	○	○	●	○	—	○								
				Water resistant (2-colour indication)				Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9PAV**</b>	<b>M9PA**</b>		○	○	●	○	—	○	IC circuit
										3-wire (PNP)				<b>M9BAV**</b>	<b>M9BA**</b>		○	○	●	○	—	○	
With diagnostic output (2-colour indication)	Grommet	Yes	4-wire	24 V	5 V, 12 V	—	—	<b>F79F</b>	●	—	●	○	—	○	IC circuit								
Magnetic field resistant (2-colour indication)			2-wire (Non-polar)				—	<b>P4DW</b>	—	—	●	●	—	○									
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	<b>A96V</b>	<b>A96</b>	●	—	●	—	—	IC circuit								
				2-wire				<b>A72</b>	<b>A72H</b>	●	—	●	—	—		—							
								<b>A93V</b>	<b>A93</b>	●	—	●	—	—		—							
		Connector	No	Yes	2-wire	24 V	5 V, 12 V	100 V or less	<b>A90V</b>	<b>A90</b>	●	—	●	—	—	IC circuit							
									<b>A73C</b>	—	●	—	●	●	●		—						
									<b>A80C</b>	—	●	—	●	●	●		—						
Diagnostic indication (2-colour indication)	Grommet	Yes	2-wire	24 V	5 V, 12 V	24 V or less	<b>A79W</b>	—	●	—	●	—	—	IC circuit									
							—	—	●	—	●	—	—		—								

\* \* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ  
None ..... N (Example) J79CN

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

\* The D-P4DWL type is available from ø40 to ø100 only.

\* Only for the D-P4DWL type, an auto switch is assembled and shipped with the cylinder.

\* There are other applicable auto switches other than the listed above. For details, refer to page 127.

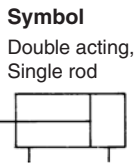
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Compact Cylinder: Axial Piping Double Acting, Single Rod **Series CQP2**

## Specifications



Rod end male thread



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XA□	Special rod end shape
-XB6	Heat resistant cylinder (-10 to 150°C) w/o auto switch only
-XB7	Cold resistant cylinder (-40 to 70°C) w/o auto switch only
-XB9	Low-speed cylinder (10 to 50 mm/s)
-XB13	Low-speed cylinder (5 to 50 mm/s)
-XC4	With heavy-duty scraper, ø32 to ø100 only
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC35	With coil scraper
-XC36	With boss on rod side
-X271	Fluororubber seals

Refer to pages 123 to 127 for the specifications of cylinders with autoswitches.

- 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.

### 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>	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
<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 (Non-lube) (mm)

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

### Air-hydro type (mm)

Bore size	Standard stroke
<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

## Manufacture of Intermediate Strokes

<b>Type</b>	A spacer is installed in the standard stroke body.	
<b>Part no.</b>	Refer to "How to Order" for the standard model number. (P. 103)	
<b>Description</b>	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	
<b>Stroke range</b>	<b>Bore size</b>	<b>Stroke range</b>
	12, 16	1 to 29
	20, 25	1 to 49
	32 to 100	1 to 99
<b>Example</b>	Part no.: CQP2B50-57D CQP2B50-75D with 18 mm width spacer inside The B dimension is 115.5 mm.	

- Except air-hydro type
- In the case of spacer type, intermediate strokes with bumper for ø40 to ø100, it can be manufactured in 5 mm intervals in 5 mm and 55 to 95 mm.

# Series CQP2

## Retaining Ring Installation/Removal

### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Mounting/Removal

- Do not remove the hexagon socket set screw on the side of the rod.
- Be aware that if the hexagon socket set screw is removed with compressed air supplied to the cylinder, an internal steel ball could fly out or the compressed air could be discharged, leading to injury to humans or damage to peripheral equipment.

## Type

Bore size (mm)		12	16	20	25	32	40	50	63	80	100	
Pneumatic	Mounting Through-hole (Standard)	●	●	●	●	●	●	●	●	●	●	
	Built-in magnet	●	●	●	●	●	●	●	●	●	●	
	Piping	Pipe thread	M5	M5	M5	M5	Rc1/8 NPT1/8	Rc1/8 NPT1/8	Rc1/4 NPT1/4	Rc1/4 NPT1/4	Rc3/8 NPT3/8	Rc3/8 NPT3/8
			G1/8	G1/8	G1/4	G1/4	G3/8	G3/8				
	Rod end male thread	●	●	●	●	●	●	●	●	●	●	
With rubber bumper	●	●	●	●	●	●	●	●	●	●		
Air-hydro	Mounting Through-hole (Standard)	—	—	●	●	●	●	●	●	●	●	
	Built-in magnet	—	—	●	●	●	●	●	●	●	●	
	Piping	Pipe thread	—	—	M5	M5	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
Rod end male thread			—	—	●	●	●	●	●	●	●	

## Theoretical Output



(N)

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
12	IN	25	42	59
	OUT	34	57	79
16	IN	45	75	106
	OUT	60	101	141
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

## Weight

### Weight

(g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	32	39	46	53	60	67	—	—	—	—	—	—
16	54	63	72	81	90	98	—	—	—	—	—	—
20	70	84	98	112	126	140	154	168	182	196	—	—
25	102	117	132	147	161	176	191	206	220	235	—	—
32	149	173	199	222	246	270	295	319	343	367	487	607
40	224	258	280	310	336	362	388	414	440	467	602	737
50	—	414	455	496	538	579	620	662	703	744	949	1154
63	—	584	632	679	727	774	822	870	917	965	1205	1445
80	—	1085	1163	1242	1320	1399	1477	1556	1634	1713	2108	2503
100	—	1894	1992	2091	2189	2287	2385	2483	2581	2679	3169	3659

### Additional Weight

(g)

Bore size (mm)		12	16	20	25	32	40	50	63	80	100
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53	120	175
	Nut	1	2	4	8	17	17	32	32	49	116
With rubber bumper		0	0	-2	-3	-3	-7	-9	-18	-31	-56

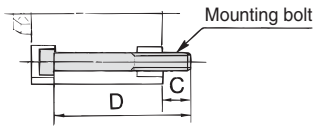
Calculation: (Example) CQP2B32-20DCM

- Basic weight: CQP2B32-20D..... 222 g
- Additional weight: Rod end male thread ..... 43 g
- With rubber bumper..... -3 g

262 g



**Mounting Bolt for CQP2B/Without Auto Switch**



Cylinder model	C	D	Mounting bolt
CQP2B12-5D	6.5	25	M3X25L
CQP2B12-10D		30	M3X30L
CQP2B12-15D		35	M3X35L
CQP2B12-20D		40	M3X40L
CQP2B12-25D		45	M3X45L
CQP2B12-30D		50	M3X50L
CQP2B16-5D	5	25	M3X25L
CQP2B16-10D		30	M3X30L
CQP2B16-15D		35	M3X35L
CQP2B16-20D		40	M3X40L
CQP2B16-25D		45	M3X45L
CQP2B16-30D		50	M3X50L
CQP2B20-5D	7.5	25	M5X25L
CQP2B20-10D		30	M5X30L
CQP2B20-15D		35	M5X35L
CQP2B20-20D		40	M5X40L
CQP2B20-25D		45	M5X45L
CQP2B20-30D		50	M5X50L
CQP2B20-35D		55	M5X55L
CQP2B20-40D		60	M5X60L
CQP2B20-45D		65	M5X65L
CQP2B20-50D		70	M5X70L
CQP2B25-5D	9.5	30	M5X30L
CQP2B25-10D		35	M5X35L
CQP2B25-15D		40	M5X40L
CQP2B25-20D		45	M5X45L
CQP2B25-25D		50	M5X50L
CQP2B25-30D		55	M5X55L
CQP2B25-35D		60	M5X60L
CQP2B25-40D		65	M5X65L
CQP2B25-45D		70	M5X70L
CQP2B25-50D		75	M5X75L

Cylinder model	C	D	Mounting bolt	
CQP2B32-5D	9	30	M5X30L	
CQP2B32-10D		35	M5X35L	
CQP2B32-15D		40	M5X40L	
CQP2B32-20D		45	M5X45L	
CQP2B32-25D		50	M5X50L	
CQP2B32-30D		55	M5X55L	
CQP2B32-35D		60	M5X60L	
CQP2B32-40D		65	M5X65L	
CQP2B32-45D		70	M5X70L	
CQP2B32-50D		75	M5X75L	
CQP2B32-75D	7.5	110	M5X110L	
CQP2B32-100D		135	M5X135L	
CQP2B40-5D		7.5	35	M5X35L
CQP2B40-10D			40	M5X40L
CQP2B40-15D			45	M5X45L
CQP2B40-20D			50	M5X50L
CQP2B40-25D			55	M5X55L
CQP2B40-30D			60	M5X60L
CQP2B40-35D			65	M5X65L
CQP2B40-40D			70	M5X70L
CQP2B40-45D	75		M5X75L	
CQP2B40-50D	80		M5X80L	
CQP2B40-75D	12.5	115	M5X115L	
CQP2B40-100D		140	M5X140L	
CQP2B50-10D		12.5	45	M6X45L
CQP2B50-15D			50	M6X50L
CQP2B50-20D			55	M6X55L
CQP2B50-25D			60	M6X60L
CQP2B50-30D			65	M6X65L
CQP2B50-35D			70	M6X70L
CQP2B50-40D			75	M6X75L
CQP2B50-45D			80	M6X80L
CQP2B50-50D	85		M6X85L	
CQP2B50-75D	120		M6X120L	
CQP2B50-100D	145	M6X145L		

Cylinder model	C	D	Mounting bolt
CQP2B63-10D	14.5	50	M8X50L
CQP2B63-15D		55	M8X55L
CQP2B63-20D		60	M8X60L
CQP2B63-25D		65	M8X65L
CQP2B63-30D		70	M8X70L
CQP2B63-35D		75	M8X75L
CQP2B63-40D		80	M8X80L
CQP2B63-45D		85	M8X85L
CQP2B63-50D		90	M8X90L
CQP2B63-75D		125	M8X125L
CQP2B63-100D	15	150	M8X150L
CQP2B80-10D		55	M10X55L
CQP2B80-15D		60	M10X60L
CQP2B80-20D		65	M10X65L
CQP2B80-25D		70	M10X70L
CQP2B80-30D		75	M10X75L
CQP2B80-35D		80	M10X80L
CQP2B80-40D		85	M10X85L
CQP2B80-45D		90	M10X90L
CQP2B80-50D		95	M10X95L
CQP2B80-75D	15.5	130	M10X130L
CQP2B80-100D		155	M10X155L
CQP2B100-10D		65	M10X65L
CQP2B100-15D		70	M10X70L
CQP2B100-20D		75	M10X75L
CQP2B100-25D		80	M10X80L
CQP2B100-30D		85	M10X85L
CQP2B100-35D		90	M10X90L
CQP2B100-40D		95	M10X95L
CQP2B100-45D		100	M10X100L
CQP2B100-50D	105	M10X105L	
CQP2B100-75D	140	M10X140L	
CQP2B100-100D	165	M10X165L	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

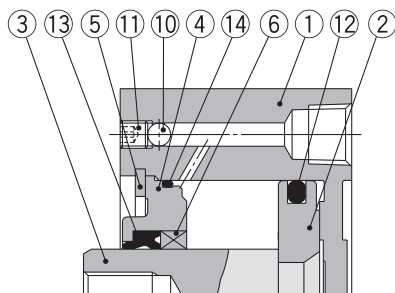
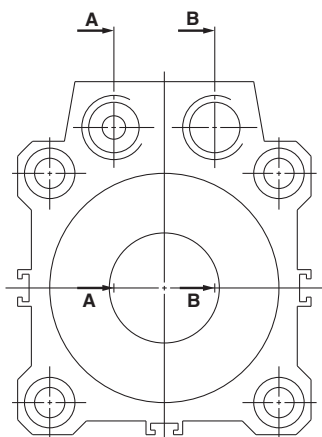
Auto Switch

Made to Order

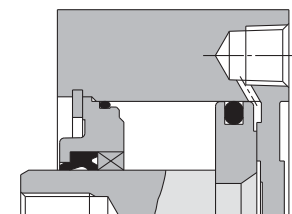
# Series CQP2

## Construction

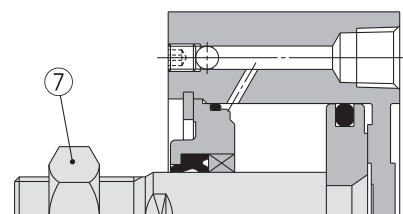
### Standard



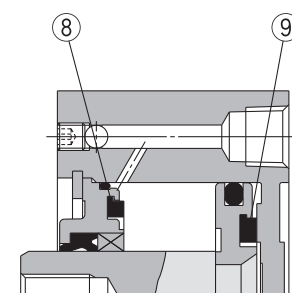
A-A section (Port on rod side)



B-B section (Port on head side)



Rod end male thread



With rubber bumper

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
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, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	ø50 to ø100
7	Rod end nut	Carbon steel	Nickel plated
8	Bumper A	Urethane	
9	Bumper B	Urethane	
10	Steel ball	Carbon steel	
11	Hexagon socket head set screw	Alloy steel	Nickel plated
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Gasket	NBR	

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.		Contents
	Pneumatic type (Non-lube)	Air-hydro type	
12	CQ2B12-PS	—	Kits include items 12, 13, 14 from the table.
16	CQ2B16-PS	—	
20	CQ2B20-PS	CQ2BH20-PS	
25	CQ2B25-PS	CQ2BH25-PS	
32	CQ2B32-PS	CQ2BH32-PS	
40	CQ2B40-PS	CQ2BH40-PS	
50	CQ2B50-PS	CQ2BH50-PS	
63	CQ2B63-PS	CQ2BH63-PS	
80	CQ2B80-PS	CQ2BH80-PS	
100	CQ2B100-PS	CQ2BH100-PS	

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

\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

## Copper and Fluorine-free Series (For CRT Manufacturing Process)

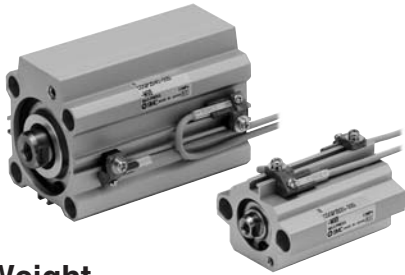
20 — CQP2B Bore size — Stroke D  
 Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

### Specifications

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Action	Double acting, Single rod									
Proof pressure	1.5 MPa									
Max. operating pressure	1.0 MPa									
Rubber bumper	None									
Piping	Pipe thread									
Piston speed	50 to 500 mm/s									
Mounting	Through-hole									
Auto switch	Mountable									

# Axial Piping: Double Acting, Single Rod Series CDQP2 With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.123 to 127
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Additional Weight (g)

Bore size (mm)		12	16	20	25	32
Rod end male thread	Male thread	1.5	3	6	12	26
	Nut	1	2	4	8	17
With rubber bumper		0	-1	-2	-3	-3

Bore size (mm)		40	50	63	80	100
Rod end male thread	Male thread	27	53	53	120	175
	Nut	17	32	32	49	116
With rubber bumper		-7	-9	-18	-31	-56

### Weight (g)

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	54	62	69	75	82	89	—	—	—	—	—	—
16	91	99	107	115	123	131	—	—	—	—	—	—
20	121	135	147	161	175	188	201	214	228	242	—	—
25	177	190	203	217	230	244	257	270	284	297	—	—
32	217	242	266	290	315	339	363	387	412	436	557	679
40	319	345	371	397	423	449	475	502	528	554	684	814
50	—	546	588	629	670	712	753	794	836	877	1084	1291
63	—	764	812	859	907	955	1002	1050	1098	1145	1384	1622
80	—	1377	1455	1534	1612	1691	1769	1848	1926	2005	2397	2790
100	—	2296	2394	2492	2590	2688	2786	2884	2982	3080	3570	4060

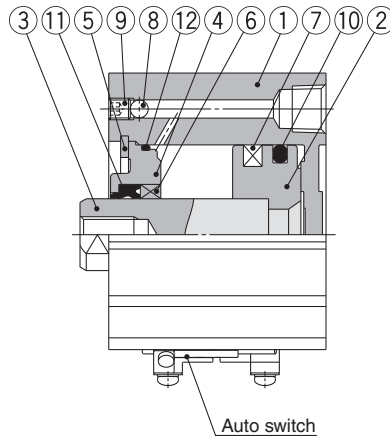
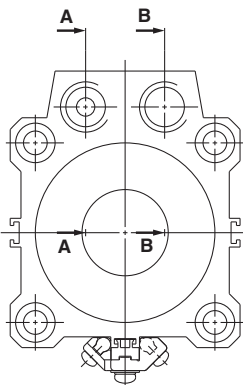
Calculation: (Example) CDQP2B32-20DCM  
 • Basic weight: CDQP2B32-20D..... 290 g  
 • Additional weight: Rod end male thread...43 g  
 With rubber bumper..... -3 g  
 330 g

Add each weight of auto switches when auto switches are mounted.

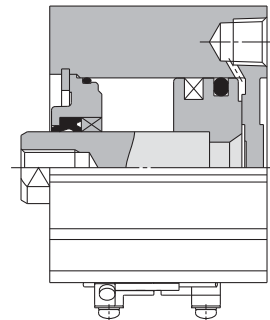
### Auto Switch Mounting Bracket/Weight

Mounting bracket part no.	Applicable bore size	Weight (g)
BQ-1	ø12 to ø25	1.5
BQ-2	ø32 to ø100	1.5
BQ2-012	ø12 to ø100	5

## Construction



A-A section (Port on rod end)



B-B section (Port on head end)

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
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, Anodised
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	ø50 to ø100
7	Magnet	—	—
8	Steel ball	Carbon steel	—
9	Hexagon socket head set screw	Alloy steel	Nickel plated
10	Piston seal	NBR	—
11	Rod seal	NBR	—
12	Gasket	NBR	—

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.		Contents
	Pneumatic type (Non-lube)	Air-hydro type	
12	CQ2B12-PS	—	Kits include items ⑩, ⑪, ⑫ from the table.
16	CQ2B16-PS	—	
20	CQ2B20-PS	CQ2BH20-PS	
25	CQ2B25-PS	CQ2BH25-PS	
32	CQ2B32-PS	CQ2BH32-PS	
40	CQ2B40-PS	CQ2BH40-PS	
50	CQ2B50-PS	CQ2BH50-PS	
63	CQ2B63-PS	CQ2BH63-PS	
80	CQ2B80-PS	CQ2BH80-PS	
100	CQ2B100-PS	CQ2BH100-PS	

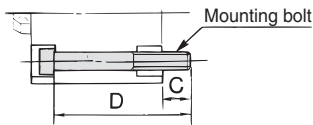
\* Seal kit includes ⑩, ⑪, ⑫. Order the seal kit based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

# Series CQP2

## Mounting Bolt for CDQP2B/With Auto Switch



Cylinder model	C	D	Mounting bolt
CDQP2B12-5D	5.5	35	M3X35L
CDQP2B12-10D		40	M3X40L
CDQP2B12-15D		45	M3X45L
CDQP2B12-20D		50	M3X50L
CDQP2B12-25D		55	M3X55L
CDQP2B12-30D	8	60	M3X60L
CDQP2B16-5D		40	M3X40L
CDQP2B16-10D		45	M3X45L
CDQP2B16-15D		50	M3X50L
CDQP2B16-20D		55	M3X55L
CDQP2B16-25D	10.5	60	M3X60L
CDQP2B16-30D		65	M3X65L
CDQP2B20-5D		40	M5X40L
CDQP2B20-10D		45	M5X45L
CDQP2B20-15D		50	M5X50L
CDQP2B20-20D	12.5	55	M5X55L
CDQP2B20-25D		60	M5X60L
CDQP2B20-30D		65	M5X65L
CDQP2B20-35D		70	M5X70L
CDQP2B20-40D		75	M5X75L
CDQP2B20-45D	15	80	M5X80L
CDQP2B20-50D		85	M5X85L
CDQP2B25-5D		40	M5X40L
CDQP2B25-10D		45	M5X45L
CDQP2B25-15D		50	M5X50L
CDQP2B25-20D	17.5	55	M5X55L
CDQP2B25-25D		60	M5X60L
CDQP2B25-30D		65	M5X65L
CDQP2B25-35D		70	M5X70L
CDQP2B25-40D		75	M5X75L
CDQP2B25-45D	20	80	M5X80L
CDQP2B25-50D		85	M5X85L

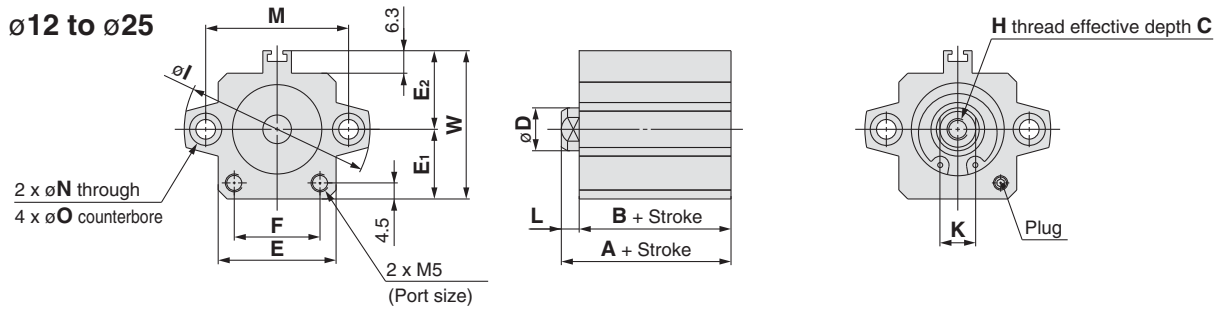
Cylinder model	C	D	Mounting bolt	
CDQP2B32-5D	9	40	M5X40L	
CDQP2B32-10D		45	M5X45L	
CDQP2B32-15D		50	M5X50L	
CDQP2B32-20D		55	M5X55L	
CDQP2B32-25D		60	M5X60L	
CDQP2B32-30D	12	65	M5X65L	
CDQP2B32-35D		70	M5X70L	
CDQP2B32-40D		75	M5X75L	
CDQP2B32-45D		80	M5X80L	
CDQP2B32-50D		85	M5X85L	
CDQP2B32-75D	15	110	M5X110L	
CDQP2B32-100D		135	M5X135L	
CDQP2B40-5D		18	45	M5X45L
CDQP2B40-10D			50	M5X50L
CDQP2B40-15D			55	M5X55L
CDQP2B40-20D	60		M5X60L	
CDQP2B40-25D	65		M5X65L	
CDQP2B40-30D	21	70	M5X70L	
CDQP2B40-35D		75	M5X75L	
CDQP2B40-40D		80	M5X80L	
CDQP2B40-45D		85	M5X85L	
CDQP2B40-50D		90	M5X90L	
CDQP2B40-75D	24	115	M5X115L	
CDQP2B40-100D		140	M5X140L	
CDQP2B50-10D		27	55	M6X55L
CDQP2B50-15D			60	M6X60L
CDQP2B50-20D			65	M6X65L
CDQP2B50-25D	70		M6X70L	
CDQP2B50-30D	75		M6X75L	
CDQP2B50-35D	30	80	M6X80L	
CDQP2B50-40D		85	M6X85L	
CDQP2B50-45D		90	M6X90L	
CDQP2B50-50D		95	M6X95L	
CDQP2B50-75D		120	M6X120L	
CDQP2B50-100D	145	M6X145L		

Cylinder model	C	D	Mounting bolt
CDQP2B63-10D	14.5	60	M8X60L
CDQP2B63-15D		65	M8X65L
CDQP2B63-20D		70	M8X70L
CDQP2B63-25D		75	M8X75L
CDQP2B63-30D		80	M8X80L
CDQP2B63-35D	17.5	85	M8X85L
CDQP2B63-40D		90	M8X90L
CDQP2B63-45D		95	M8X95L
CDQP2B63-50D		100	M8X100L
CDQP2B63-75D		125	M8X125L
CDQP2B63-100D	21	150	M8X150L
CDQP2B80-10D		65	M10X65L
CDQP2B80-15D		70	M10X70L
CDQP2B80-20D		75	M10X75L
CDQP2B80-25D		80	M10X80L
CDQP2B80-30D	24	85	M10X85L
CDQP2B80-35D		90	M10X90L
CDQP2B80-40D		95	M10X95L
CDQP2B80-45D		100	M10X100L
CDQP2B80-50D		105	M10X105L
CDQP2B80-75D	30	130	M10X130L
CDQP2B80-100D		155	M10X155L
CDQP2B100-10D		75	M10X75L
CDQP2B100-15D		80	M10X80L
CDQP2B100-20D		85	M10X85L
CDQP2B100-25D	33	90	M10X90L
CDQP2B100-30D		95	M10X95L
CDQP2B100-35D		100	M10X100L
CDQP2B100-40D		105	M10X105L
CDQP2B100-45D		110	M10X110L
CDQP2B100-50D	36	115	M10X115L
CDQP2B100-75D		140	M10X140L
CDQP2B100-100D		165	M10X165L

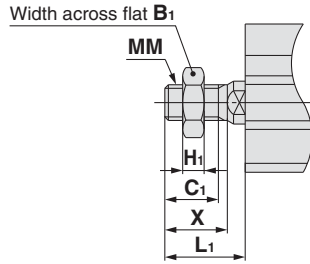
Dimensions

**∅12 to ∅100/Without Auto Switch**

∅12 to ∅25



**Rod end male thread**



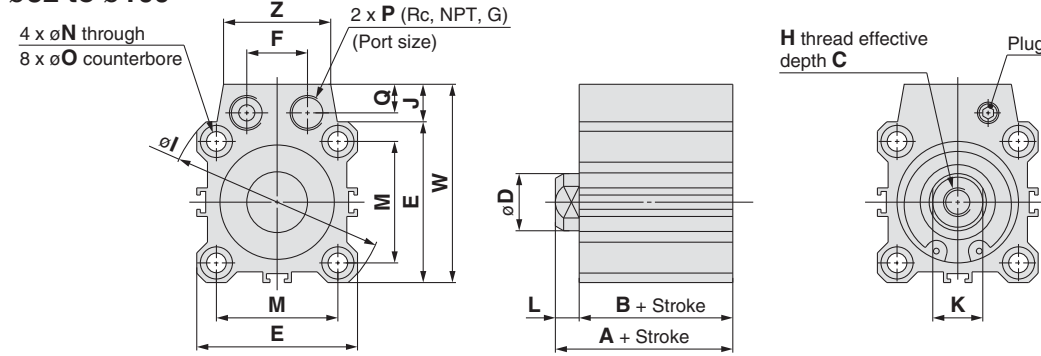
**Rod End Male Thread** (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

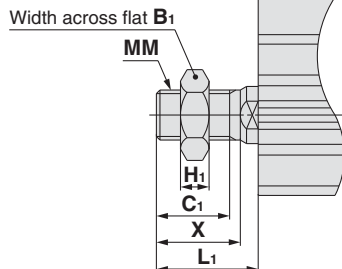
**Standard**

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L	M	N	O	W
12	5 to 30	20.5	17	6	6	23	13	14	14	M3 x 0.5	32	5	3.5	22	3.5	6.5 depth 3.5	27
16	5 to 30	22	18.5	8	8	26	15	17	17	M4 x 0.7	38	6	3.5	28	3.5	6.5 depth 3.5	32
20	5 to 50	24	19.5	7	10	30	17	19	21	M5 x 0.8	47	8	4.5	36	5.5	9 depth 7	36
25	5 to 50	27.5	22.5	12	12	33	19.5	22	24	M6 x 1.0	52	10	5	40	5.5	9 depth 7	41.5

∅32 to ∅100



**Rod end male thread**



**Rod End Male Thread** (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

**Standard**

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	Q	W	Z
32	5 to 50	30	23	13	16	45	17	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	55.5	30
	75, 100	40	33																
40	5 to 50	36.5	29.5	13	16	52	17	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	62	30
	75, 100	46.5	39.5																
50	10 to 50	38.5	30.5	15	20	64	22	M10 x 1.5	86	13	17	8	50	6.6	11 depth 8	1/4	10	77	39
	75, 100	48.5	40.5																
63	10 to 50	44	36	15	20	77	22	M10 x 1.5	103	13	17	8	60	9	14 depth 10.5	1/4	10	90	39
	75, 100	54	46																
80	10 to 50	53.5	43.5	21	25	98	26	M16 x 2.0	132	16	22	10	77	11	17.5 depth 13.5	3/8	12.5	114	48
	75, 100	63.5	53.5																
100	10 to 50	65	53	27	30	117	26	M20 x 2.5	156	17.5	27	12	94	11	17.5 depth 13.5	3/8	12.5	134.5	48
	75, 100	75	63																

Note) The external dimensions with rubber bumper are the same as those of the standard, as shown above.

\* For details about the rod end nut and accessory brackets, refer to page 19.

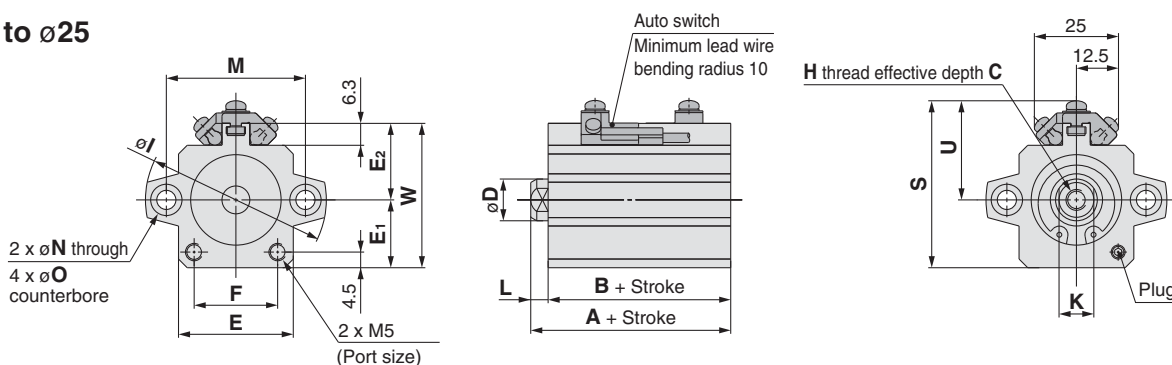
- Standard
- Large Bore Size
- Long Stroke
- Non-rotating Rod
- Axial Piping
- Anti-lateral Load
- With End Lock
- Water Resistant
- With Auto Switch
- Auto Switch
- Made to Order

# Series CQP2

## Dimensions

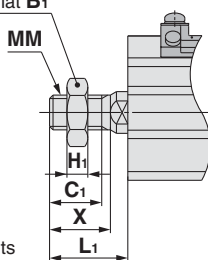
### ∅12 to ∅100/With Auto Switch

∅12 to ∅25



Rod end male thread

Width across flat B<sub>1</sub>



#### Rod End Male Thread

(mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

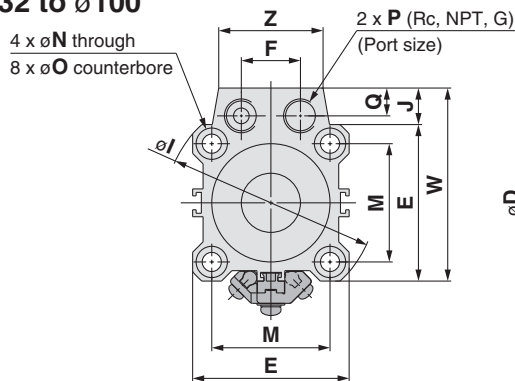
#### Standard

For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L	M	N	O	S	U	W
12	5 to 30	31.5	28	6	6	23	13	14	14	M3 x 0.5	32	5	3.5	22	3.5	6.5 depth 3.5	33.5	20.5	27
16	5 to 30	34	30.5	8	8	26	15	17	17	M4 x 0.7	38	6	3.5	28	3.5	6.5 depth 3.5	38.5	23.5	32
20	5 to 50	36	31.5	7	10	30	17	19	21	M5 x 0.8	47	8	4.5	36	5.5	9 depth 7	42.5	25.5	36
25	5 to 50	37.5	32.5	12	12	33	19.5	22	24	M6 x 1.0	52	10	5	40	5.5	9 depth 7	48	28.5	41.5

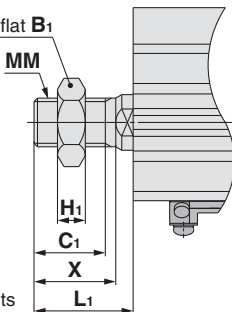
Note) The external dimensions with rubber bumper are the same as those of the standard, as shown above.

∅32 to ∅100



Rod end male thread

Width across flat B<sub>1</sub>



#### Rod End Male Thread

(mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

#### Standard

For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S	U	W	Z
32	5 to 100	40	33	13	16	45	17	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	65.5	32.5	55.5	30
40	5 to 100	46.5	39.5	13	16	52	17	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	72	36	62	30
50	10 to 100	48.5	40.5	15	20	64	22	M10 x 1.5	86	13	17	8	50	6.6	11 depth 8	1/4	10	87	42	77	39
63	10 to 100	54	46	15	20	77	22	M10 x 1.5	103	13	17	8	60	9	14 depth 10.5	1/4	10	100	48.5	90	39
80	10 to 100	63.5	53.5	21	25	98	26	M16 x 2.0	132	16	22	10	77	11	17.5 depth 13.5	3/8	12.5	123.5	58.5	114	48
100	10 to 100	75	63	27	30	117	26	M20 x 2.5	156	17.5	27	12	94	11	17.5 depth 13.5	3/8	12.5	144.5	68.5	134.5	48

Note) The external dimensions with rubber bumper are the same as those of the standard, as shown above. \* For details about the rod end nut and accessory brackets, refer to page 19.

# Compact Cylinder: Axial Piping Single Acting, Single Rod Series CQP2

ø12, ø16, ø20, ø25, ø32, ø40, ø50

## How to Order

Without auto switch

CQP2B 50 [ ] - 10 T [ ] - [ ]

With auto switch

CDQP2B 50 [ ] - 10 T [ ] - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

Axial piping

Mounting

B Through-hole

\* Cylinder mounting bolts are not included.  
Order them separately referring to  
"Mounting Bolt for C(D)QP2B" on pages  
114 and 117.

### 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) CDQP2B32-10S

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm

Port thread type

—	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø50
TF	G	

Made to Order  
Refer to the next page  
for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Body option

—	Standard (Rod end female thread)
M	Rod end male thread

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Cylinder stroke (mm)

Refer to the next page for standard strokes.

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (-)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC		
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	—	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○			
		Connector		2-wire				M9BV	M9B	●	●	●	○	—	○			
				J79C				—	●	—	●	●	●	—	—			
	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●	○	—	○	IC circuit	Relay, PLC	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	—	○			
				2-wire				M9B WV	M9B W	●	●	●	○	—	○			
				3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○			
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○			
				2-wire				M9BAV**	M9BA**	○	○	●	○	—	○			
With diagnostic output (2-colour indication)	Grommet	Yes	4-wire	24 V	5 V, 12 V	—	—	F79F	●	—	●	○	—	○	IC circuit	—		
—			F79F				●	—	●	○	—	○						
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	
				—				A72	A72H	●	—	●	—	—	—			
				12 V				A93V	A93	●	—	●	—	—	—			
				5 V, 12 V				A90V	A90	●	—	●	—	—	—			
		Connector	Yes	2-wire	24 V	5 V, 12 V	100 V or less	—	A73C	—	●	—	●	●	●	—	IC circuit	Relay, PLC
				—					A80C	—	●	—	●	●	●			
				5 V, 12 V					A80C	—	●	—	●	●	●			
				—					A79W	—	●	—	●	—	—	—		

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

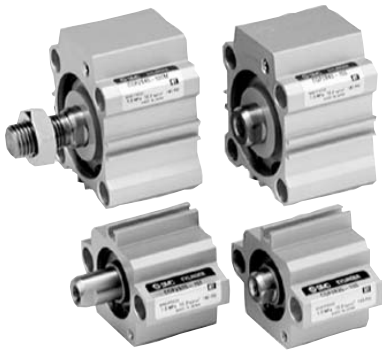
\* Lead wire length symbols: 0.5 m ..... — (Example) M9NV  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ  
None ..... N (Example) J79CN

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

\* There are other applicable auto switches other than the listed above. For details, refer to page 127.

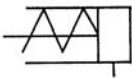
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Series CQP2

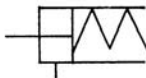


## Symbol

Single acting,  
Spring return



Single acting,  
Spring extend



## Made to Order

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

Symbol	Specifications
-XA□	Special rod end shape
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC36	With boss on rod side
-X271	Fluororubber seals

## Retaining Ring Installation/Removal

### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Mounting/Removal

- Do not remove the hexagon socket set screw on the side of the rod.
  - Be aware that if the hexagon socket set screw is removed with compressed air supplied to the cylinder, an internal steel ball could fly out or the compressed air could be discharged, leading to injury to humans or damage to peripheral equipment.

## Specifications

Bore size (mm)	12	16	20	25	32	40	50
Action	Double acting, Single rod						
Fluid	Air						
Proof pressure	1.5 MPa						
Maximum operating pressure	1.0 MPa						
Minimum operating pressure (MPa)	0.25	0.25	0.18	0.18	0.17	0.15	0.13
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)						
Lubrication	Not required (Non-lube)						
Piston speed	50 to 500 mm/s						
Allowable kinetic energy (J)	0.022	0.038	0.055	0.09	0.15	0.26	0.46
Stroke length tolerance	+1.0 mm 0						

## Standard Strokes

Bore size	Standard stroke (mm)
12	5, 10
16	
20	
25	
32	
40	10, 20
50	

## Manufacture of Intermediate Strokes

(Except single acting, spring return)

Type	A spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model number. (P. 112)	
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	
Stroke range	Bore size	Stroke range
	12 to 40	1 to 9
	50	1 to 19
Example	Part no.: CQP2B20-3T CQP2B20-5T with 2 mm width spacer inside The B dimension is 24.5 mm.	

## Type

Bore size (mm)		12	16	20	25	32	40	50
Pneumatic	Mounting	●	●	●	●	●	●	●
	Through-hole (Standard)	●	●	●	●	●	●	●
	Built-in magnet	●	●	●	●	●	●	●
	Piping	Pipe thread	M5	M5	M5	M5	Rc1/8	Rc1/8
	NPT1/8						NPT1/8	NPT1/4
	G1/8						G1/8	G1/4
	Rod end male thread	●	●	●	●	●	●	●

Refer to pages 123 to 127 for the specifications of cylinders with autoswitches.

- 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.



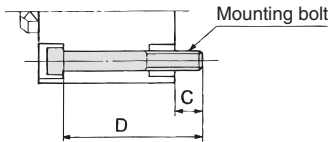
### Theoretical Output

Action	Bore size (mm)	Operating pressure (MPa)		
		0.3	0.5	0.7
Spring return	12	21	44	66
	16	45	86	126
	20	79	142	205
	25	126	224	323
	32	211	372	533
	40	338	589	841
	50	535	928	1316
Spring extend	12	14	31	48
	16	24	54	85
	20	71	118	165
	25	113	189	264
	32	181	302	422
	40	317	528	739
	50	495	825	1150

### Weight

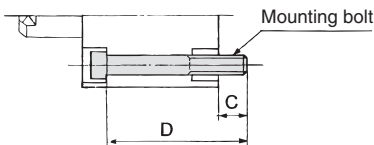
Action	Bore size (mm)	Cylinder stroke (mm)			
		5	10	15	20
Spring return	12	33	40	—	—
	16	55	64	—	—
	20	68	83	—	—
	25	103	118	—	—
	32	149	173	—	—
	40	236	262	—	—
	50	—	426	—	691
Spring extend	12	33	40	—	—
	16	55	64	—	—
	20	73	87	—	—
	25	109	124	—	—
	32	160	180	—	—
	40	262	284	—	—
	50	—	468	—	540

### Mounting Bolt for CQP2B/Without Auto Switch



### Spring Return

Cylinder model	C	D	Mounting bolt
CQP2B12-5S	6.5	25	M3X25L
CQP2B12-10S		30	M3X30L
CQP2B16-5S	5	25	M3X25L
CQP2B16-10S		30	M3X30L
CQP2B20-5S	7.5	25	M5X25L
CQP2B20-10S		30	M5X30L
CQP2B25-5S	9.5	30	M5X30L
CQP2B25-10S		35	M5X35L
CQP2B32-5S	9	30	M5X30L
CQP2B32-10S		35	M5X35L
CQP2B40-5S	7.5	35	M5X35L
CQP2B40-10S		40	M5X40L
CQP2B50-10S	12.5	45	M6X45L
CQP2B50-20S		55	M6X55L



### Spring Extend

Cylinder model	C	D	Mounting bolt
CQP2B12-5T	6.5	25	M3X25L
CQP2B12-10T		30	M3X30L
CQP2B16-5T	5	25	M3X25L
CQP2B16-10T		30	M3X30L
CQP2B20-5T	7.5	25	M5X25L
CQP2B20-10T		30	M5X30L
CQP2B25-5T	9.5	30	M5X30L
CQP2B25-10T		35	M5X35L
CQP2B32-5T	9	30	M5X30L
CQP2B32-10T		35	M5X35L
CQP2B40-5T	7.5	35	M5X35L
CQP2B40-10T		40	M5X40L
CQP2B50-10T	12.5	45	M6X45L
CQP2B50-20T		55	M6X55L

### Additional Weight

Bore size (mm)		12	16	20	25	32	40	50
Rod end male thread	Male thread	1.5	3	6	12	26	27	53
	Nut	1	2	4	8	17	17	32

Calculation: (Example) **CQP2B32-10SM**

- Basic weight: CQP2B32-10S .....173 g
  - Additional weight: Rod end male thread ..... 43 g
- 216 g

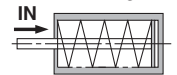
### Spring Force

#### Single Acting, Spring Return (N)

Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	13	8.6
	10	13	3.9
16	5	15	10.3
	10	15	5.9
20	5	15	10
	10	15	5.9
25	5	20	16
	10	20	11
32	5	30	23
	10	30	16
40	5	30	13
	10	39	21
50	10	50	30
	20	54	24

#### Single acting, Spring return

Spring state with first mounting load



When spring is set in cylinder

Spring state with second mounting load



When spring is compressed with air

#### Single Acting, Spring Extend (N)

Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	11	2.9
	10	9.7	2.8
16	5	20	3.9
	10	20	3.9
20	5	27	5.3
	10	27	5.9
25	5	29	9.8
	10	29	9.8
32	5	29	20
	10	29	20
40	5	29	20
	10	29	20
50	10	83	24
	20	83	24

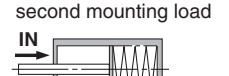
#### Single acting, Spring extend

Spring state with first mounting load



When spring is set in cylinder

Spring state with second mounting load



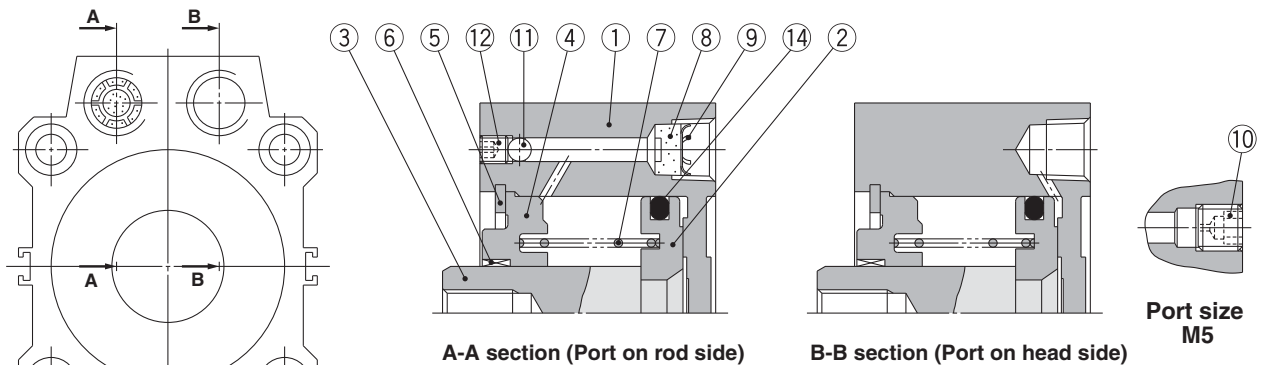
When spring is compressed with air

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

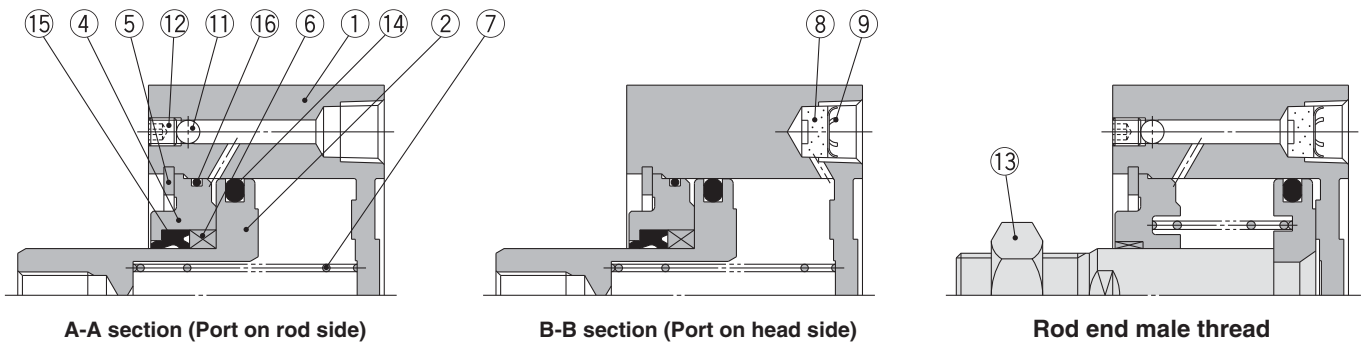
# Series CQP2

## Construction

### Spring return



### Spring extend



## Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2*	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50, Chromate, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	
7	Return spring	Piano wire	Zinc chromated
8	Bronze element	Sintered metallic BC	Port size Rc1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5
11	Steel ball	Carbon steel	
12	Hexagon socket head set screw	Alloy steel	Nickel plated
13	Rod end nut	Carbon steel	Nickel plated

\* On spring extend (Type T), piston and piston rod are integrated (stainless steel).

No.	Description	Material	Note
14	Piston seal	NBR	
15	Rod seal	NBR	
16	Gasket	NBR	

## Replacement Parts/Seal Kit

Bore size (mm)	Kit no. (Single acting/Spring return)	Kit no. (Single acting/Spring extend)
12	CQ2B12-S-PS	CQ2B12-T-PS
16	CQ2B16-S-PS	CQ2B16-T-PS
20	CQ2B20-S-PS	CQ2B20-T-PS
25	CQ2B25-S-PS	CQ2B25-T-PS
32	CQ2B32-S-PS	CQ2B32-T-PS
40	CQ2B40-S-PS	CQ2B40-T-PS
50	CQ2B50-S-PS	CQ2B50-T-PS
Contents	Kits include item 14 from the table.	Kits include items 14, 15, 16 from the table.
How to Order	* Seal kit includes 14. Order the seal kit, based on each bore size.	* Seal kit includes 14, 15, 16. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.  
Grease pack part no.: GR-S-010 (10 g)

## Copper and Fluorine-free Series (For CRT Manufacturing Process)

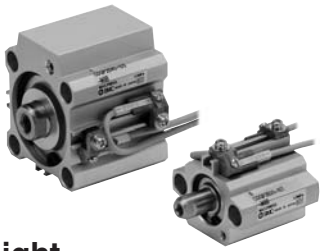
20 — CQP2B Bore size — Stroke  $\frac{S}{T}$ (M)  
 Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

## Specifications

Bore size (mm)	12	16	20	25	32	40	50
Action	Single acting, Single rod						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Pipe thread						
Piston speed	50 to 500 mm/s						
Mounting	Through-hole						
Auto switch	Mountable						

# Axial Piping: Single Acting, Single Rod Series **CDQP2** With Auto Switch



Refer to the below pages for further information on auto switches.

Auto switch proper mounting position and its mounting height	P.123 to 127
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting brackets/Part no.	

## Weight

### Weight

Action	Bore size (mm)	Cylinder stroke (mm)			
		5	10	15	20
Spring return	12	55	63	—	—
	16	92	100	—	—
	20	121	135	—	—
	25	178	191	—	—
	32	217	242	—	—
	40	323	349	—	—
Spring extend	12	61	69	—	—
	16	92	100	—	—
	20	126	140	—	—
	25	184	197	—	—
	32	228	253	—	—
	40	349	375	—	—
	50	—	600	—	683

### Additional Weight

Rod end male thread	Bore size (mm)							
	12	16	20	25	32	40	50	
Male thread	1.5	3	6	12	26	27	53	
Nut	1	2	4	8	17	17	32	

Calculation: (Example) **CDQP2B32-10SM**

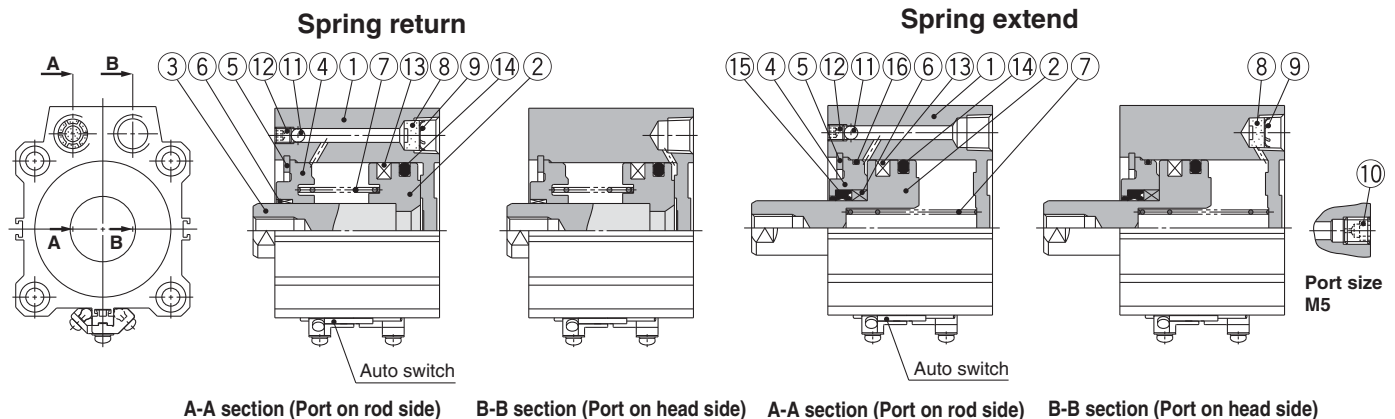
• Basic weight: CDQP2B32-10S ..... 242 g

• Additional weight: Rod end male thread... 43 g

Add each weight of auto switches when auto switches are mounted.

285 g

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston*	Aluminum alloy	Chromated
3	Piston rod*	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodised
		Aluminum alloy casted	ø50, Chromate, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	
7	Return spring	Piano wire	Zinc chromated
8	Bronze element	Sintered metallic BC	Port size Rc1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5
11	Steel ball	Carbon steel	
12	Hexagon socket head set screw	Alloy steel	Nickel plated
13	Magnet	—	
14	Piston seal	NBR	
15	Rod seal	NBR	
16	Gasket	NBR	

\* On spring extend (Type T), piston and piston rod are integrated (stainless steel).

### Replacement Parts/Seal Kit

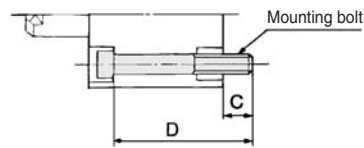
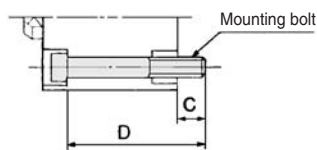
Bore size (mm)	Kit no. (Single acting/Spring return)	Kit no. (Single acting/Spring extend)
12	CQ2B12-S-PS	CQ2B12-T-PS
16	CQ2B16-S-PS	CQ2B16-T-PS
20	CQ2B20-S-PS	CQ2B20-T-PS
25	CQ2B25-S-PS	CQ2B25-T-PS
32	CQ2B32-S-PS	CQ2B32-T-PS
40	CQ2B40-S-PS	CQ2B40-T-PS
50	CQ2B50-S-PS	CQ2B50-T-PS
Contents	Kits include item ⑭ from the table.	Kits include items ⑭, ⑮, ⑯ from the table.
How to Order	* Seal kit includes ⑭. Order the seal kit, based on each bore size.	* Seal kit includes ⑭, ⑮, ⑯. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

# Series CQP2

## Mounting Bolt for CDQP2B/With Auto Switch



### Spring Return

Cylinder model	C	D	Mounting bolt
CDQP2B12-5S	5.5	35	M3X35L
CDQP2B12-10S		40	M3X40L
CDQP2B16-5S	8	40	M3X40L
CDQP2B16-10S		45	M3X45L
CDQP2B20-5S	10.5	40	M5X40L
CDQP2B20-10S		45	M5X45L
CDQP2B25-5S	9.5	40	M5X40L
CDQP2B25-10S		45	M5X45L
CDQP2B32-5S	9	40	M5X40L
CDQP2B32-10S		45	M5X45L
CDQP2B40-5S	7.5	45	M5X45L
CDQP2B40-10S		50	M5X50L
CDQP2B50-10S	12.5	55	M6X55L
CDQP2B50-20S		60	M6X60L

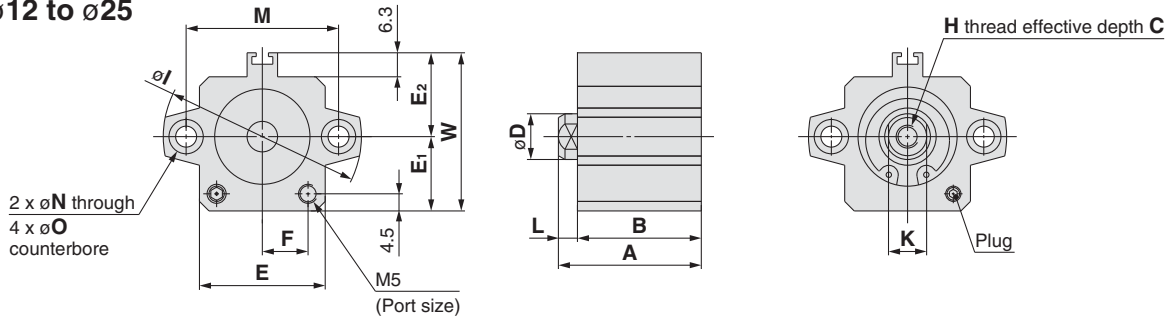
### Spring Extend

Cylinder model	C	D	Mounting bolt
CDQP2B12-5T	6.1	40	M3X40L
CDQP2B12-10T		45	M3X45L
CDQP2B16-5T	8	40	M3X40L
CDQP2B16-10T		45	M3X45L
CDQP2B20-5T	10.5	40	M5X40L
CDQP2B20-10T		45	M5X45L
CDQP2B25-5T	9.5	40	M5X40L
CDQP2B25-10T		45	M5X45L
CDQP2B32-5T	9	40	M5X40L
CDQP2B32-10T		45	M5X45L
CDQP2B40-5T	7.5	45	M5X45L
CDQP2B40-10T		50	M5X50L
CDQP2B50-10T	12.5	55	M6X55L
CDQP2B50-20T		65	M6X65L

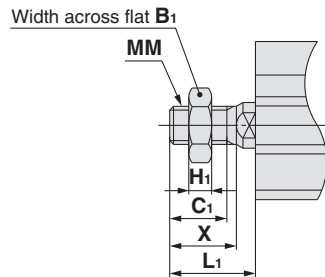
Dimensions

**∅12 to ∅50/Spring Return Without Auto Switch**

**∅12 to ∅25**



**Rod end male thread**



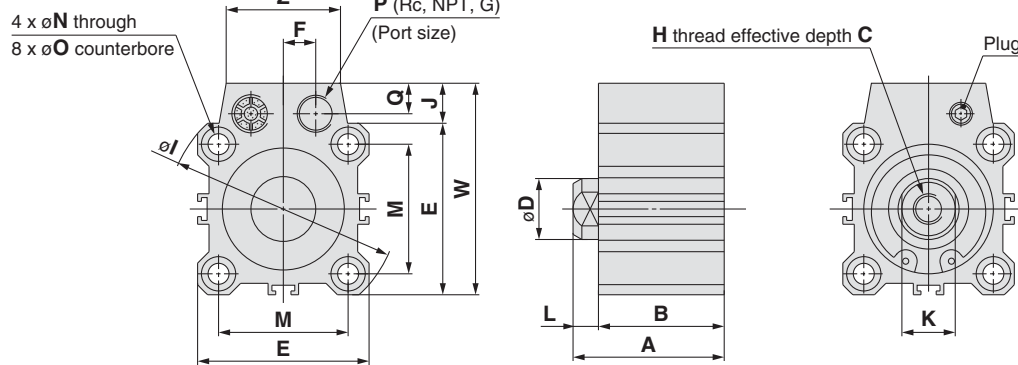
**Rod End Male Thread**

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

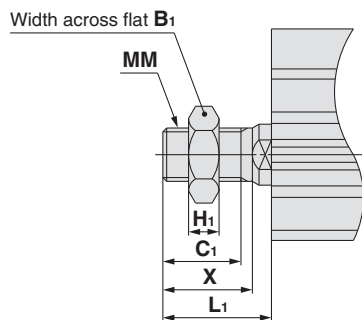
**Standard**

Bore size (mm)	A		B		C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L	M	N	O	W
	5st	10st	5st	10st														
12	25.5	30.5	22	27	6	6	23	13	14	7	M3 x 0.5	32	5	3.5	22	3.5	6.5 depth 3.5	27
16	27	32	23.5	28.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	3.5	28	3.5	6.5 depth 3.5	32
20	29	34	24.5	29.5	7	10	30	17	19	10.5	M5 x 0.8	47	8	4.5	36	5.5	9 depth 7	36
25	32.5	37.5	27.5	32.5	12	12	33	19.5	22	12	M6 x 1.0	52	10	5	40	5.5	9 depth 7	41.5

**∅32 to ∅50**



**Rod end male thread**



**Rod End Male Thread**

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

**Standard**

Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L	M	N	O	P	Q	W	Z
	5st	10st	20st	5st	10st	20st																
32	35	40	—	28	33	—	13	16	45	8.5	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	55.5	30
40	41.5	46.5	—	34.5	39.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	62	30
50	—	48.5	58.5	—	40.5	50.5	15	20	64	11	M10 x 1.5	86	13	17	8	50	6.6	11 depth 8	1/4	10	77	39

\* For details about the rod end nut and accessory brackets, refer to page 19.

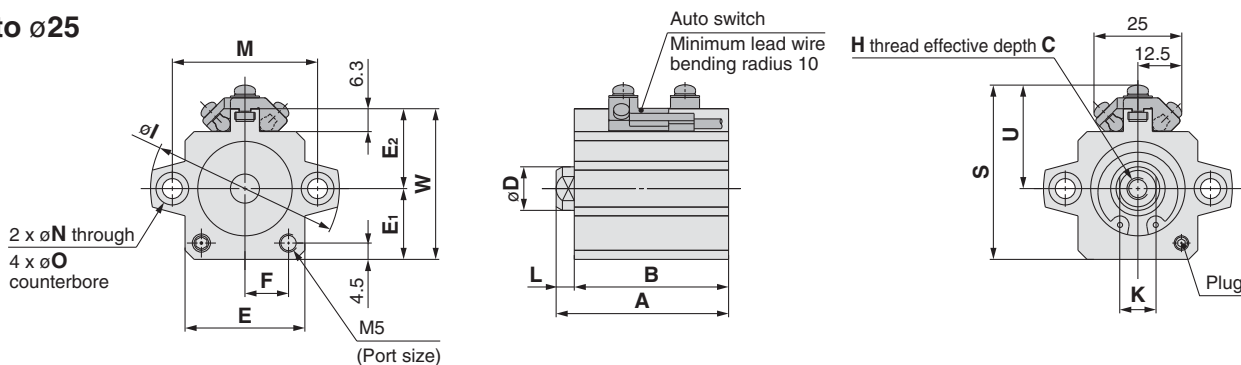
Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQP2

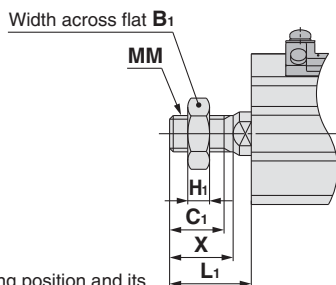
## Dimensions

### Ø12 to Ø50/Spring Return With Auto Switch

Ø12 to Ø25



#### Rod end male thread



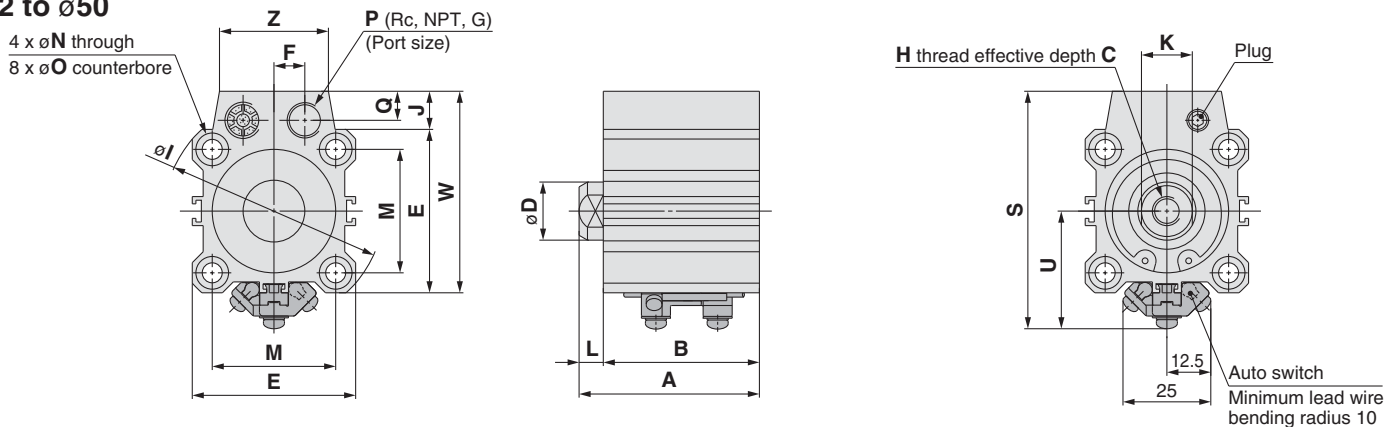
#### Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

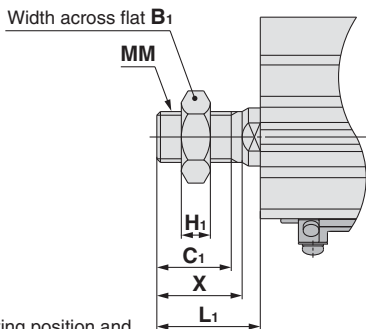
**Standard** For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

Bore size (mm)	A		B		C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L	M	N	O	S	U	W
	5st	10st	5st	10st																
12	36.5	41.5	33	38	6	6	23	13	14	7	M3 x 0.5	32	5	3.5	22	3.5	6.5 depth 3.5	33.5	20.5	27
16	39	44	35.5	40.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	3.5	28	3.5	6.5 depth 3.5	38.5	23.5	32
20	41	46	36.5	41.5	7	10	30	17	19	10.5	M5 x 0.8	47	8	4.5	36	5.5	9 depth 7	42.5	25.5	36
25	42.5	47.5	37.5	42.5	12	12	33	19.5	22	12	M6 x 1.0	52	10	5	40	5.5	9 depth 7	48	28.5	41.5

Ø32 to Ø50



#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

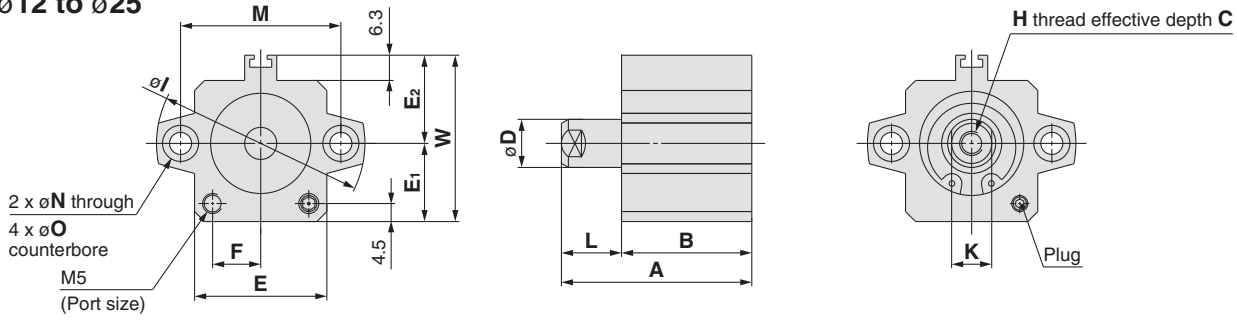
Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S	U	W	Z
	5st	10st	20st	5st	10st	20st																		
32	45	50	—	38	43	—	13	16	45	8.5	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	65.5	32.5	55.5	30
40	51.5	56.5	—	44.5	49.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	72	36	62	30
50	—	58.5	68.5	—	50.5	60.5	15	20	64	11	M10 x 1.5	86	13	17	8	50	6.6	11 depth 8	1/4	10	87	42	77	39

\* For details about the rod end nut and accessory brackets, refer to page 19.

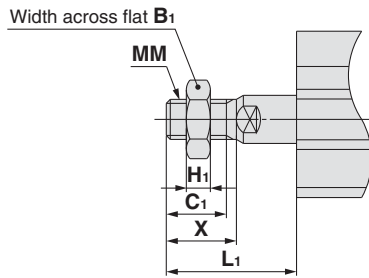
Dimensions

**∅12 to ∅50/Spring Extend Without Auto Switch**

∅12 to ∅25



Rod end male thread



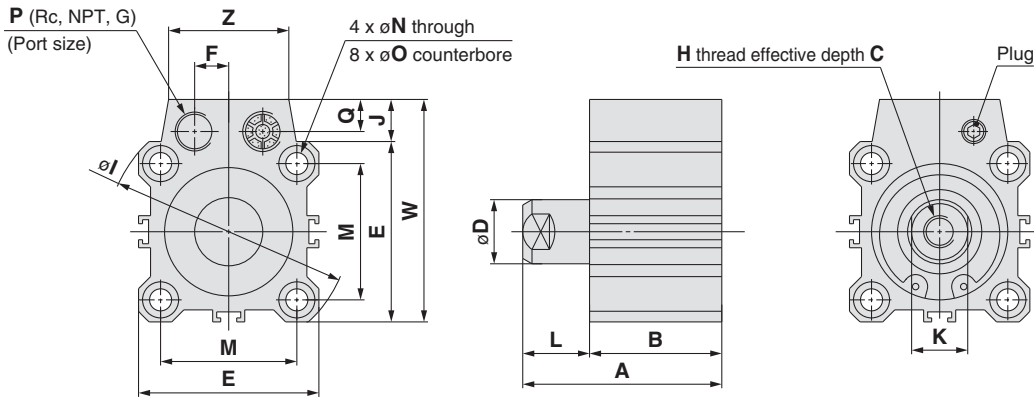
Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

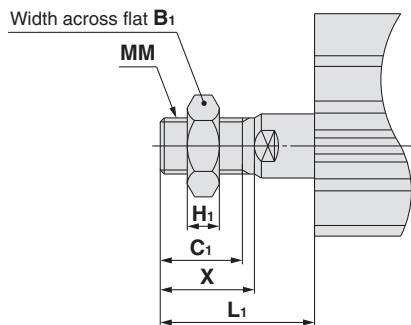
Standard

Bore size (mm)	A		B		C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L		M	N	O	W
	5st	10st	5st	10st										5st	10st				
12	30.5	40.5	22	27	6	6	23	13	14	7	M3 x 0.5	32	5	8.5	13.5	22	3.5	6.5 depth 3.5	27
16	32	42	23.5	28.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	8.5	13.5	28	3.5	6.5 depth 3.5	32
20	34	44	24.5	29.5	7	10	30	17	19	10.5	M5 x 0.8	47	8	9.5	14.5	36	5.5	9 depth 7	36
25	37.5	47.5	27.5	32.5	12	12	33	19.5	22	12	M6 x 1.0	52	10	10	15	40	5.5	9 depth 7	41.5

∅32 to ∅50



Rod end male thread



Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>			MM	X
				5st	10st	20st		
32	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
40	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
50	27	26	11	—	43.5	53.5	M18 x 1.5	28.5

Standard

Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L			M	N	O	P	Q	W	Z
	5st	10st	20st	5st	10st	20st									5st	10st	20st							
32	40	50	—	28	33	—	13	16	45	8.5	M8 x 1.25	60	10.5	14	12	17	—	34	5.5	9 depth 7	1/8	8	55.5	30
40	46.5	56.5	—	34.5	39.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	12	17	—	40	5.5	9 depth 7	1/8	8	62	30
50	—	58.5	78.5	—	40.5	50.5	15	20	64	11	M10 x 1.5	86	13	17	—	18	28	50	6.6	11 depth 8	1/4	10	77	39

\* For details about the rod end nut and accessory brackets, refer to page 19.

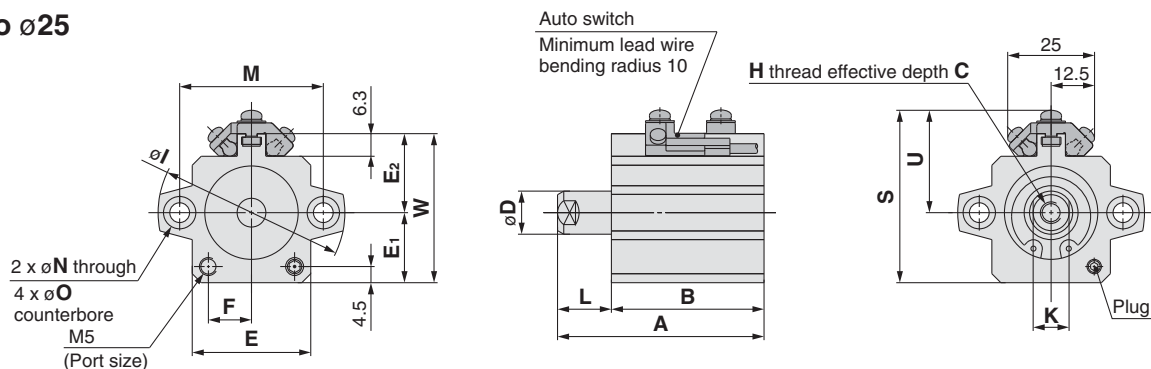
- Standard
- Large Bore Size
- Long Stroke
- Non-rotating Rod
- Axial Piping
- Anti-lateral Load
- With End Lock
- Water Resistant
- With Auto Switch
- Auto Switch
- Made to Order

# Series CQP2

## Dimensions

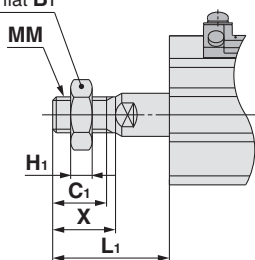
### ∅12 to ∅50/Spring Extend With Auto Switch

∅12 to ∅25



Rod end male thread

Width across flat B<sub>1</sub>



Rod End Male Thread

(mm)

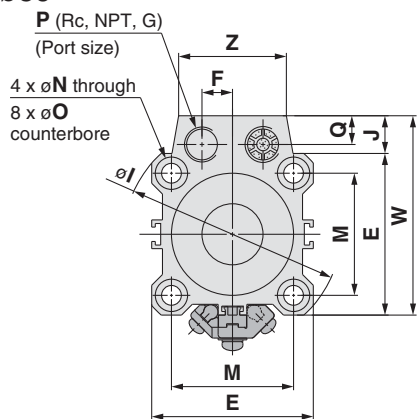
Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

(mm)

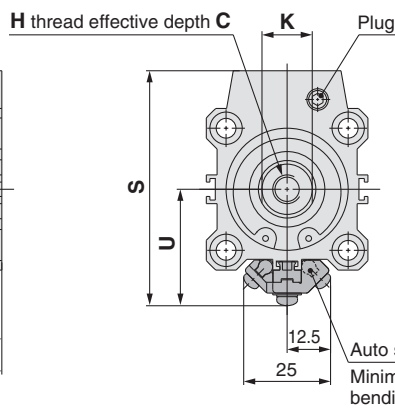
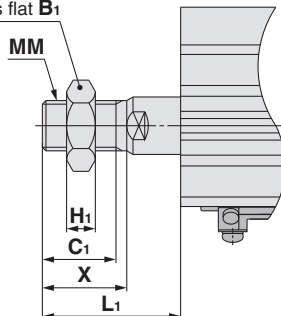
Bore size (mm)	A		B		C	D	E	E <sub>1</sub>	E <sub>2</sub>	F	H	I	K	L		M	N	O	S	U	W
	5st	10st	5st	10st										5st	10st						
12	45.9	55.9	37.4	42.4	6	6	23	13	14	7	M3 x 0.5	32	5	8.5	13.5	22	3.5	6.5 depth 3.5	33.5	20.5	27
16	44	54	35.5	40.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	8.5	13.5	28	3.5	6.5 depth 3.5	38.5	23.5	32
20	46	56	36.5	41.5	7	10	30	17	19	10.5	M5 x 0.8	47	8	9.5	14.5	36	5.5	9 depth 7	42.5	25.5	36
25	47.5	57.5	37.5	42.5	12	12	33	19.5	22	12	M6 x 1.0	52	10	10	15	40	5.5	9 depth 7	48	28.5	41.5

∅32 to ∅50



Rod end male thread

Width across flat B<sub>1</sub>



Rod End Male Thread

(mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>			MM	X
				5st	10st	20st		
32	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
40	22	20.5	8	33.5	38.5	—	M14 x 1.5	23.5
50	27	26	11	—	43.5	53.5	M18 x 1.5	28.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

(mm)

Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L			M	N	O	P	Q	S	U	W	Z
	5st	10st	20st	5st	10st	20st									5st	10st	20st									
32	50	60	—	38	43	—	13	16	45	8.5	M8 x 1.25	60	10.5	14	12	17	—	34	5.5	9 depth 7	1/8	8	62	29	55.5	30
40	56.5	66.5	—	44.5	49.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	12	17	—	40	5.5	9 depth 7	1/8	8	68.5	32.5	62	30
50	—	68.5	88.5	—	50.5	60.5	15	20	64	11	M10 x 1.5	86	13	17	—	18	28	50	6.6	11 depth 8	1/4	10	83.5	38.5	77	39

\* For details about the rod end nut and accessory brackets, refer to page 19.



- Made to Order
- Auto Switch
- With Auto Switch
- Water Resistant
- With End Lock
- Anti-lateral Load
- Axial Piping
- Non-rotating Rod
- Long Stroke
- Large Bore Size
- Standard

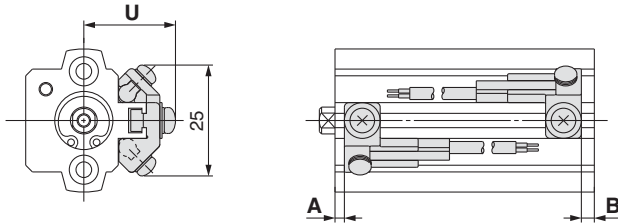
# Axial Piping Series **CDQP2** With Auto Switch 1

## 1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

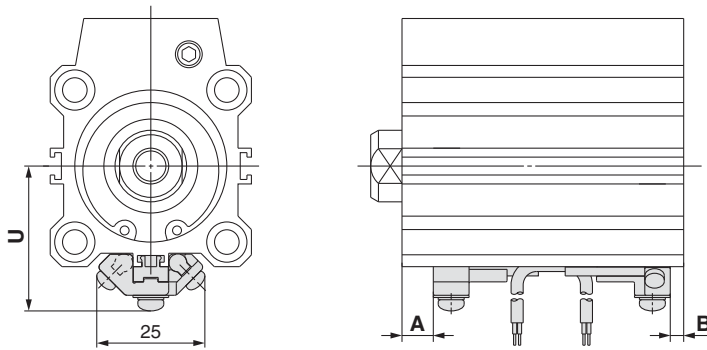
Applicable Cylinder Series: CDQP2, CDQP2□□□□-□S/-□T (Axial piping)

- D-A9□
- D-M9□
- D-M9□W
- D-M9□AL
- D-A9□V
- D-M9□V
- D-M9□WV
- D-M9□AVL

ø12 to ø25



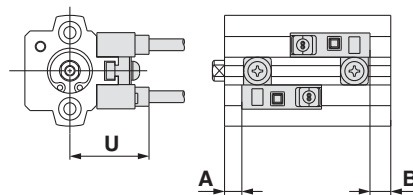
ø32 to ø100



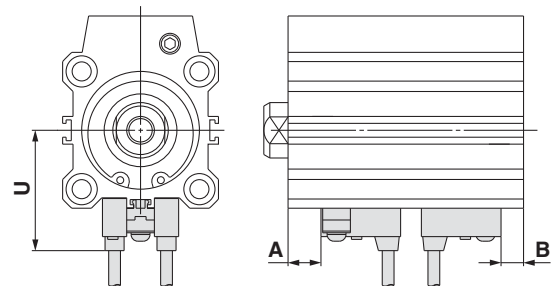
- D-A7□
- D-A80
- D-A7□H
- D-A80H
- D-F7□
- D-J79
- D-F7□W
- D-J79W
- D-F79F

- D-F7NTL
- D-F7BAL
- D-A73C
- D-A80C
- D-J79C
- D-A79W
- D-F7□WV
- D-F7□V
- D-F7BAVL

ø12 to ø25

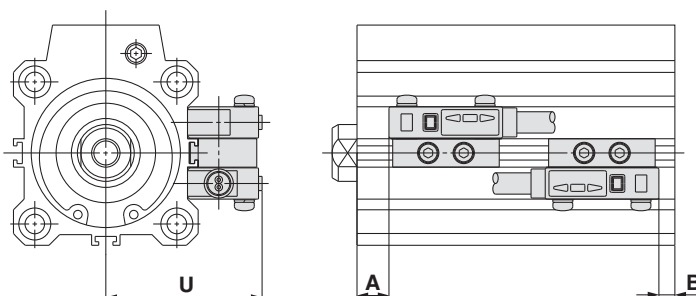


ø32 to ø100



D-P4DWL

ø40 to ø100



### Auto Switch Proper Mounting Position

#### Applicable Cylinder Series: CDQP2 (Axial piping)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P4DWL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
12	2	3	6	7	4.5	5.5	5	6	10	11	2	3	—	—
16	5	2.5	9	6.5	7.5	5	8	5.5	13	10.5	5	2.5	—	—
20	5	3.5	9	7.5	7.5	6.5	8	7	13	12	5	4	—	—
25	5.5	4	9.5	8	7.5	7	8	7.5	13	12.5	5	4.5	—	—
32	6.5	3.5	10.5	7.5	9	6	9.5	6.5	14.5	11.5	6.5	3.5	—	—
40	10.5	6	14.5	10	13	8.5	13.5	9	18.5	14	10.5	6	9	4.5
50	8.5	9	12.5	13	11	11.5	11.5	12	16.5	17	8.5	9	7	7.5
63	11	12	15	16	13.5	14.5	14	15	19	20	11	12	9.5	10.5
80	14	16.5	18	20.5	17.5	18	18	18.5	23	23.5	15	15.5	13.5	14
100	18.5	21.5	22.5	25.5	21	24	21.5	24.5	26.5	29.5	18.5	21.5	17	20

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

#### Applicable Cylinder Series: CDQP2□□□-□S/□T (Axial piping, Single acting)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W	
	A	B	A	B	A	B	A	B	A	B	A	B
Bore size												
12	2	3 (7)	6	7 (11)	4.5	5.5 (10)	5	6 (10.5)	10	11 (15.5)	2	3 (7.5)
16	5 (3)	2.5 (4.5)	9 (7)	6.5 (8.5)	7.5 (5.5)	5 (7)	8 (6)	5.5 (7.5)	13 (11)	10.5 (12.5)	5 (3)	2.5 (4.5)
20	5	3.5	9	7.5	7.5	6.5	8	7	13	12	5	4
25	5.5	4	9.5	8	7.5	7	8	7.5	13	12.5	5	4.5
32	6.5	3.5	10.5	7.5	9	6	9.5	6.5	14.5	11.5	6.5	3.5
40	10.5	6	14.5	10	13	8.5	13.5	9	18.5	14	10.5	6
50	8.5	9	12.5	13	11	11.5	11.5	12	16.5	17	8.5	9

( ): Spring extend type

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

#### Applicable Cylinder Series: CDQP2, CDQP2□□□-□S/□T (Axial piping)

(mm)

Auto switch model	D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A7□ D-A80		D-A7□H D-A80H D-F7□ D-J79 D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL		D-A73C D-A80C		D-F7□V D-F7□WV D-F7BAVL		D-J79C		D-A79W		D-P4DWL	
	U	U	U	U	U	U	U	U	U	U	U	U	U	U		
Bore size																
12	20.5	19.5	20.5	26.5	23	26	22	—								
16	23.5	22.5	23.5	29.5	26	29	25	—								
20	25.5	24.5	25.5	31.5	28	31	27	—								
25	28.5	27.5	28.5	34.5	31	34	30	—								
32	32.5	31.5	32.5	38.5	35	38	34	—								
40	36	35	36	42	38.5	41.5	37.5	44								
50	42	41	42	48	44.5	47.5	43.5	50								
63	48.5	47.5	48.5	54.5	51	54	50	56.5								
80	58.5	57.5	58.5	64.5	61	64	60	66.5								
100	68.5	67.5	68.5	74.5	71	74	70	76.5								

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Axial Piping

## Series **CDQP2**

### With Auto Switch 2

## 2 Minimum Stroke for Auto Switch Mounting

Applicable Cylinder Series: CDQP2, CDQP2□□□-□S/-□T (Axial piping)

(mm)

Number of auto switches	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□	D-M9□WV D-M9□AVL D-F7□WV D-F7BAVL	D-M9□ D-M9□W D-M9□AL D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL	D-P4DWL
With 1 pc.	5	5	10	10	15	15	20	15
With 2 pcs.	5	10	10	15	15	20	20	15

## 3 Operating Range

Applicable Cylinder Series: CDQP2, CDQP2□□□-□S/-□T (Axial piping)

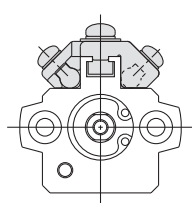
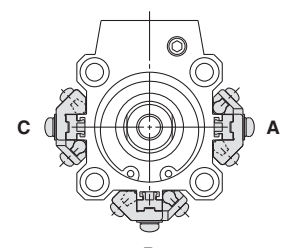
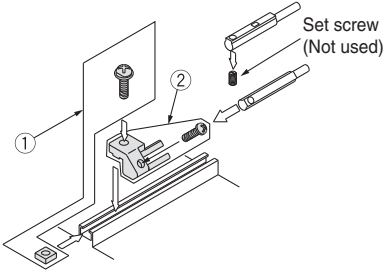
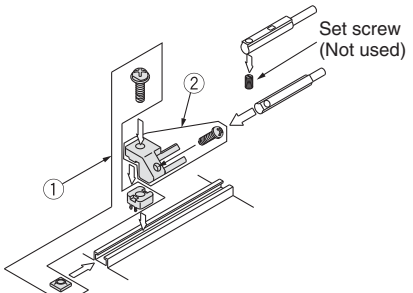
(mm)

Auto switch model	Bore size									
	12	16	20	25	32	40	50	63	80	100
D-A9□(V)	7.5	9.5	9	9	9.5	9.5	8.5	11	10	10.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L	3.5	5	5	5	5.5	5.5	6	6.5	7	7
D-A7□(H)(C) D-A80□(H)(C)	10	12	12	12	12	11	10	12	12	13
D-A79W	13	13	13	13	13	14	14	16	15	17
D-F7□(V) D-J79(C) D-F7□W(V) D-F7BA(V)L D-F7NTL D-F79F	5.5	6	5.5	5	6	6	6	6.5	6.5	7
D-P4DWL	—	—	—	—	—	5	5	5	5	5.5

\* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

## 4 Auto Switch Mounting Brackets/Part No.

### Applicable Cylinder Series: CDQP2, CDQP2□□□-□S/-□T (Axial piping)

Auto switch mounting surface	Bore size (mm)	
	ø12, ø16, ø20, ø25	ø32 to ø100
		
Auto switch model	Auto switch mounting surface Auto switch mounting rail side only	Auto switch mounting surface A/B/C side
<b>D-A9□</b> <b>D-A9□V</b> <b>D-M9□</b> <b>D-M9□V</b> <b>D-M9□W</b> <b>D-M9□WV</b> <b>D-M9□AL</b> <b>D-M9□AVL</b>	① BQ-1 ② BQ2-012 Two kinds of auto switch brackets are used as a set.  	① BQ-2 ② BQ2-012 Two kinds of auto switch brackets are used as a set.  

Note 1) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

Auto switch model	Bore size (mm)		
	ø12 to ø25	ø32	ø40 to ø100
<b>D-A7□/A80</b> <b>D-A73C/A80C</b> <b>D-A7□H/A80H</b> <b>D-A79W</b> <b>D-F7□/J79</b> <b>D-F7□V</b> <b>D-J79C</b> <b>D-F7□W/J79W</b> <b>D-F7□WV</b> <b>D-F7BAL/F7BAVL</b> <b>D-F79F/F7NTL</b>	BQ-1		BQ-2
<b>D-P4DWL</b>	—		BQP1-050

Note 2) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

However, when the D-P4DWL type with ø40 to ø100 is mounted, the auto switch is assembled at the time of shipment.

Note 3) Refer to pages 1360 to 1362 in Best Pneumatics No. 2 for further information on auto switch mounting method.

#### [Stainless Steel Mounting Screw Kit]

The following stainless steel mounting screw kit (with nuts) is available. Use it in accordance with the operating environment. (Since auto switch spacer (for BQ-2) is not included, order BQ-2 separately.)

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

The above stainless steel screws are used when a cylinder is shipped with the D-F7BAL/F7BAVL auto switches.

When only an auto switch is shipped independently, BBA2 is attached.

Note 4) Refer to page 1361 in Best Pneumatics No. 2 for details of BBA2.

Note 5) When the D-M9□A(V)L type is mounted, order auto switch mounting brackets BQ2-012S, BQ-2 or the stainless steel mounting screw kit BBA2 separately.

#### Auto Switch Mounting Bracket/Weight

Mounting bracket part no.	Applicable bore size	Weight (g)
BQ-1	ø12 to ø25	1.5
BQ-2	ø32 to ø100	1.5
BQ2-012	ø12 to ø25	5
BQP1-050	ø40 to ø100	16

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

# Axial Piping

## Series **CDQP2**

### With Auto Switch 3

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable. Refer to Best Pneumatics No. 2 for detailed specifications.

**Applicable Cylinder Series: CDQP2, CDQP2□□□□-□S/-□T (Axial piping)**

Auto switch type	Model	Electrical entry	Features	Applicable bore size
<b>Reed</b>	D-A73	Grommet (Perpendicular)	—	ø12 to ø100
	D-A80		Without indicator light	
	D-A73H, A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	
<b>Solid state</b>	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	ø12 to ø100
	D-F7NWV, F7BWV		Diagnostic indication (2-colour indication)	
	D-F7BAVL		Water resistant (2-colour indication)	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-colour indication)	
	D-F7BAL		Water resistant (2-colour indication)	
	D-F7NTL		With timer	
	D-P5DWL	Grommet (In-line)	Magnetic field resistant (2-colour indication)	

- \* With pre-wired connector is also available for solid state auto switches. For details, refer to Best Pneumatics No. 2.
- \* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to Best Pneumatics No. 2.
- \* When using a magnetic field resistant solid state auto switch D-P3DW□ type, please contact SMC separately. (Applicable bore size: ø32 to ø100)
- \* Heat resistant solid state auto switch (D-F7NJL) is not applicable.
- \* Regarding the D-P5DWL, please contact SMC separately.

# Compact Cylinder: Anti-lateral Load

## Series CQ2

ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

**Without auto switch** CQ2 **B** **S** **32** **—** **30** **D** **—** **C** **—** **Z** **—**

**With auto switch** CDQ2 **B** **S** **32** **—** **30** **D** **—** **C** **—** **Z** **—** **M9BW** **—** **—**

**Mounting**

<b>B</b>	Through-hole (Standard)
<b>A</b>	Both ends tapped
<b>L</b>	Foot
<b>F</b>	Rod flange
<b>G</b>	Head flange
<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)Q2BS" on pages 133 and 134.

**Type**

<b>S</b>	Anti-lateral load
----------	-------------------

**Bore size**

<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>—</b>	Rc
<b>TN</b>	NPT
<b>TF</b>	G

**Cylinder stroke (mm)**

Refer to the next page for standard strokes.

**Action**

<b>D</b>	Double acting
----------	---------------

**Auto switch**

<b>—</b>	Without auto switch
----------	---------------------

\* Refer to the below table for applicable auto switches.

**Number of auto switches**

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

**Auto switch mounting groove**

<b>Z</b>	4 surfaces
----------	------------

**Body option 2**

<b>—</b>	Standard (Rod end female thread)
<b>M</b>	Rod end male thread

**Cushion**

<b>C</b>	Rubber bumper
----------	---------------

**Body option 1**

<b>—</b>	Standard
<b>F</b>	With boss on head end

**Made to Order**  
Refer to the next page for details.

### 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) CDQ2LS40-30DCZ

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

### Applicable Auto Switches

Refer to the individual catalogue (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 (—)	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>	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○		
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	●	●	○	—	○		
	3-wire (NPN)			<b>M9NVV</b>				<b>M9NV</b>	●	●	●	○	—	○	IC circuit		
	3-wire (PNP)			<b>M9PVV</b>				<b>M9PV</b>	●	●	●	○	—	○			
	2-wire			<b>M9BVV</b>				<b>M9BV</b>	●	●	●	○	—	○	—		
	3-wire (NPN)			<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>	○	○	●	○	—	○			
	Reed auto switch			—				Grommet	No	3-wire (NPN equivalent)	24 V	5 V, 12 V	100 V or less	<b>A96V</b>	<b>A96</b>		●
2-wire		<b>A93V</b>	<b>A93</b>		●	—	●			—				—	—	—	Relay, PLC
		<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. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

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

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

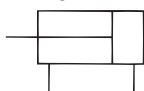
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Series CQ2



## Symbol

Double acting,  
Single rod



## Made to Order

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

Symbol	Specifications
-XB10	Intermediate stroke (Exclusive body type)
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
-X271	Fluororubber seals

## Retaining Ring Installation/Removal

### ⚠ Caution

1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Specifications

Bore size (mm)	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>	0.05 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>	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 dumper change.

## Standard Strokes

Bore size	Standard stroke (mm)
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

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to "How to Order" for the standard model number. (P. 128)	Suffix "-XB10" to the end of standard model number. (P. 128)
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.
Stroke range	Bore size	Stroke range
	32 to 100	1 to 99
Example	Part no.: CQ2BS50-57DCZ CQ2BS50-75DCZ with 18 mm width spacer inside The B dimension is 125.5 mm.	Part no.: CQ2BS50-57DCZ-XB10 Makes 57 stroke tube. The B dimension is 107.5 mm.

- In the case of exclusive body type with  $\phi 32$  to  $\phi 100$  (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension will be changed. Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.

## Type

Bore size (mm)		32	40	50	63	80	100	
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	
		Both ends tapped	●	●	●	●	●	
	Built-in magnet		●	●	●	●	●	
	Piping	Pipe thread	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
			G1/8	G1/8	G1/4	G1/4	G3/8	G3/8
	Rod end male thread		●	●	●	●	●	●
	With rubber bumper (Standard)		●	●	●	●	●	●
	With boss on head end		●	●	●	●	●	●

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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.



## Copper and Fluorine-free Series (For CRT Manufacturing Process)

20-CQ2BS Bore size — Stroke DC(M)Z

Copper and fluorine-free series

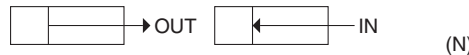
∅32, ∅40, ∅50, ∅63  
∅80, ∅100

For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

### Specifications

Bore size (mm)	32	40	50	63	80	100
Action	Double acting, Single rod					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Rubber bumper	With (Standard)					
Piping	Pipe thread					
Piston speed	50 to 500 mm/s					
Mounting	Through-hole/Both ends tapped					
Auto switch	Mountable					

### Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1155
	OUT	589	982	1374
63	IN	841	1402	1962
	OUT	935	1559	2182
80	IN	1361	2268	3175
	OUT	1508	2513	3519
100	IN	2144	3574	5003
	OUT	2356	3927	5498

### Weight

#### Weight

Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
32	134	154	174	193	213	233	252	272	291	311	457	556
40	211	232	254	275	297	318	340	361	383	404	577	689
50	—	369	402	435	467	500	533	566	598	632	902	1073
63	—	557	595	633	671	709	747	786	824	862	1189	1386
80	—	983	1043	1104	1164	1224	1284	1345	1405	1465	1985	2281
100	—	1711	1792	1872	1952	2033	2113	2194	2274	2354	3086	3494

#### Additional Weight

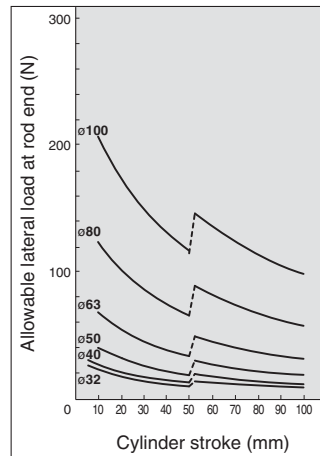
Bore size (mm)		32	40	50	63	80	100
Both ends tapped		6	6	6	19	45	45
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolts)		142	154	243	320	690	1057
Rod flange (Including mounting bolts)		180	214	373	559	1056	1365
Head flange (Including mounting bolts)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)		151	196	393	554	1109	1887

Calculation: (Example) **CQ2DS32-20DCMZ**

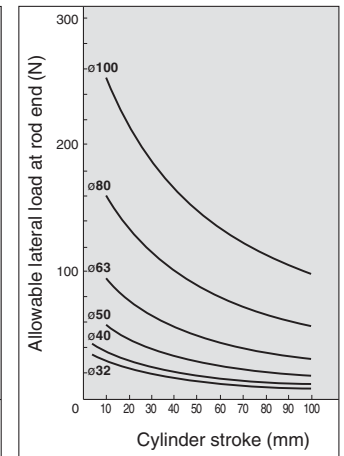
- Basic weight: CQ2BS32-20DCZ ..... 193 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 393 g

## Allowable Lateral Load at Rod End

### Without Auto Switch



### With Auto Switch



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

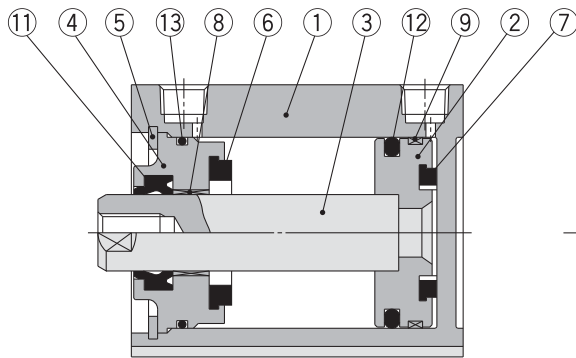
Auto Switch

Made to Order

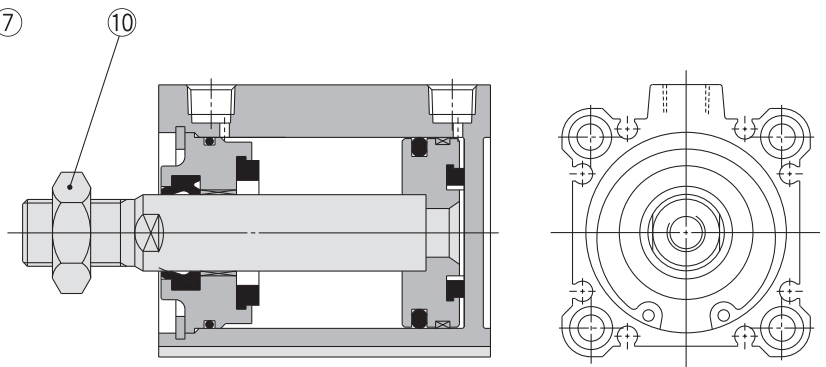
# Series CQ2

## Construction

### Standard



### Rod end male thread



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy	Anodised
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bumper A	Urethane	
7	Bumper B	Urethane	
8	Bushing	Bearing alloy	
9	Wear ring	Resin	
10	Rod end nut	Carbon steel	Nickel plated
11	Rod seal	NBR	
12	Piston seal	NBR	
13	Tube gasket	NBR	

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
32	CQ2B32-PS	Kits include items ①, ②, ③ from the table.
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	

\* Seal kit includes ①, ②, ③. Order the seal kit based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

**Grease pack part no.: GR-S-010 (10 g)**

### Mounting Brackets/Part No.

Bore size (mm)	Foot Note 1)	Flange	Double clevis
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 1) When ordering a foot bracket, order 2 pieces per cylinder.

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

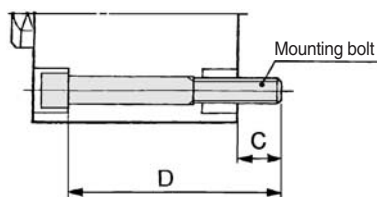
Foot or Flange: Body mounting bolts

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



# Series CQ2

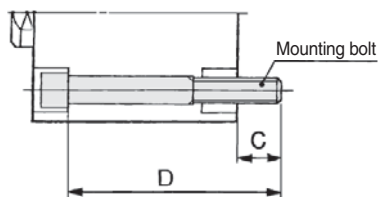
## Mounting Bolt for CQ2BS/Without Auto Switch



Cylinder model	C	D	Mounting bolt
CQ2BS32-5DCZ	9	40	M5X40L
CQ2BS32-10DCZ		45	M5X45L
CQ2BS32-15DCZ		50	M5X50L
CQ2BS32-20DCZ		55	M5X55L
CQ2BS32-25DCZ		60	M5X60L
CQ2BS32-30DCZ		65	M5X65L
CQ2BS32-35DCZ		70	M5X70L
CQ2BS32-40DCZ		75	M5X75L
CQ2BS32-45DCZ		80	M5X80L
CQ2BS32-50DCZ		85	M5X85L
CQ2BS32-75DCZ		120	M5X120L
CQ2BS32-100DCZ		145	M5X145L
CQ2BS40-5DCZ		7.5	45
CQ2BS40-10DCZ	50		M5X50L
CQ2BS40-15DCZ	55		M5X55L
CQ2BS40-20DCZ	60		M5X60L
CQ2BS40-25DCZ	65		M5X65L
CQ2BS40-30DCZ	70		M5X70L
CQ2BS40-35DCZ	75		M5X75L
CQ2BS40-40DCZ	80		M5X80L
CQ2BS40-45DCZ	85		M5X85L
CQ2BS40-50DCZ	90		M5X90L
CQ2BS40-75DCZ	125		M5X125L
CQ2BS40-100DCZ	150		M5X150L
CQ2BS50-10DCZ	12.5		55
CQ2BS50-15DCZ		60	M6X60L
CQ2BS50-20DCZ		65	M6X65L
CQ2BS50-25DCZ		70	M6X70L
CQ2BS50-30DCZ		75	M6X75L
CQ2BS50-35DCZ		80	M6X80L
CQ2BS50-40DCZ		85	M6X85L
CQ2BS50-45DCZ		90	M6X90L
CQ2BS50-50DCZ		95	M6X95L
CQ2BS50-75DCZ		130	M6X130L
CQ2BS50-100DCZ		155	M6X155L

Cylinder model	C	D	Mounting bolt	
CQ2BS63-10DCZ	14.5	60	M8X60L	
CQ2BS63-15DCZ		65	M8X65L	
CQ2BS63-20DCZ		70	M8X70L	
CQ2BS63-25DCZ		75	M8X75L	
CQ2BS63-30DCZ		80	M8X80L	
CQ2BS63-35DCZ		85	M8X85L	
CQ2BS63-40DCZ		90	M8X90L	
CQ2BS63-45DCZ		95	M8X95L	
CQ2BS63-50DCZ		100	M8X100L	
CQ2BS63-75DCZ		135	M8X135L	
CQ2BS63-100DCZ		160	M8X160L	
CQ2BS80-10DCZ		15	65	M10X65L
CQ2BS80-15DCZ			70	M10X70L
CQ2BS80-20DCZ	75		M10X75L	
CQ2BS80-25DCZ	80		M10X80L	
CQ2BS80-30DCZ	85		M10X85L	
CQ2BS80-35DCZ	90		M10X90L	
CQ2BS80-40DCZ	95		M10X95L	
CQ2BS80-45DCZ	100		M10X100L	
CQ2BS80-50DCZ	105		M10X105L	
CQ2BS80-75DCZ	140		M10X140L	
CQ2BS80-100DCZ	165		M10X165L	
CQ2BS100-10DCZ	15.5		75	M10X75L
CQ2BS100-15DCZ			80	M10X80L
CQ2BS100-20DCZ		85	M10X85L	
CQ2BS100-25DCZ		90	M10X90L	
CQ2BS100-30DCZ		95	M10X95L	
CQ2BS100-35DCZ		100	M10X100L	
CQ2BS100-40DCZ		105	M10X105L	
CQ2BS100-45DCZ		110	M10X110L	
CQ2BS100-50DCZ		115	M10X115L	
CQ2BS100-75DCZ		150	M10X150L	
CQ2BS100-100DCZ		175	M10X175L	

**Mounting Bolt for CDQ2BS/With Auto Switch**



Cylinder model	C	D	Mounting bolt
CDQ2BS32-5DCZ	9	50	M5X50L
CDQ2BS32-10DCZ		55	M5X55L
CDQ2BS32-15DCZ		60	M5X60L
CDQ2BS32-20DCZ		65	M5X65L
CDQ2BS32-25DCZ		70	M5X70L
CDQ2BS32-30DCZ		75	M5X75L
CDQ2BS32-35DCZ		80	M5X80L
CDQ2BS32-40DCZ		85	M5X85L
CDQ2BS32-45DCZ		90	M5X90L
CDQ2BS32-50DCZ		95	M5X95L
CDQ2BS32-75DCZ		120	M5X120L
CDQ2BS32-100DCZ		145	M5X145L
CDQ2BS40-5DCZ		7.5	55
CDQ2BS40-10DCZ	60		M5X60L
CDQ2BS40-15DCZ	65		M5X65L
CDQ2BS40-20DCZ	70		M5X70L
CDQ2BS40-25DCZ	75		M5X75L
CDQ2BS40-30DCZ	80		M5X80L
CDQ2BS40-35DCZ	85		M5X85L
CDQ2BS40-40DCZ	90		M5X90L
CDQ2BS40-45DCZ	95		M5X95L
CDQ2BS40-50DCZ	100		M5X100L
CDQ2BS40-75DCZ	125	M5X125L	
CDQ2BS40-100DCZ	150	M5X150L	
CDQ2BS50-10DCZ	12.5	65	M6X65L
CDQ2BS50-15DCZ		70	M6X70L
CDQ2BS50-20DCZ		75	M6X75L
CDQ2BS50-25DCZ		80	M6X80L
CDQ2BS50-30DCZ		85	M6X85L
CDQ2BS50-35DCZ		90	M6X90L
CDQ2BS50-40DCZ		95	M6X95L
CDQ2BS50-45DCZ		100	M6X100L
CDQ2BS50-50DCZ		105	M6X105L
CDQ2BS50-75DCZ		130	M6X130L
CDQ2BS50-100DCZ		155	M6X155L

Cylinder model	C	D	Mounting bolt
CDQ2BS63-10DCZ	14.5	70	M8X70L
CDQ2BS63-15DCZ		75	M8X75L
CDQ2BS63-20DCZ		80	M8X80L
CDQ2BS63-25DCZ		85	M8X85L
CDQ2BS63-30DCZ		90	M8X90L
CDQ2BS63-35DCZ		95	M8X95L
CDQ2BS63-40DCZ		100	M8X100L
CDQ2BS63-45DCZ		105	M8X105L
CDQ2BS63-50DCZ		110	M8X110L
CDQ2BS63-75DCZ		135	M8X135L
CDQ2BS63-100DCZ	160	M8X160L	
CDQ2BS80-10DCZ	15	75	M10X75L
CDQ2BS80-15DCZ		80	M10X80L
CDQ2BS80-20DCZ		85	M10X85L
CDQ2BS80-25DCZ		90	M10X90L
CDQ2BS80-30DCZ		95	M10X95L
CDQ2BS80-35DCZ		100	M10X100L
CDQ2BS80-40DCZ		105	M10X105L
CDQ2BS80-45DCZ		110	M10X110L
CDQ2BS80-50DCZ		115	M10X115L
CDQ2BS80-75DCZ		140	M10X140L
CDQ2BS80-100DCZ	165	M10X165L	
CDQ2BS100-10DCZ	15.5	85	M10X85L
CDQ2BS100-15DCZ		90	M10X90L
CDQ2BS100-20DCZ		95	M10X95L
CDQ2BS100-25DCZ		100	M10X100L
CDQ2BS100-30DCZ		105	M10X105L
CDQ2BS100-35DCZ		110	M10X110L
CDQ2BS100-40DCZ		115	M10X115L
CDQ2BS100-45DCZ		120	M10X120L
CDQ2BS100-50DCZ		125	M10X125L
CDQ2BS100-75DCZ		150	M10X150L
CDQ2BS100-100DCZ	175	M10X175L	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Dimensions

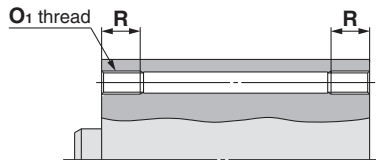
### Ø32 to Ø50/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

Standard (Through-hole): CQ2BS/CDQ2BS

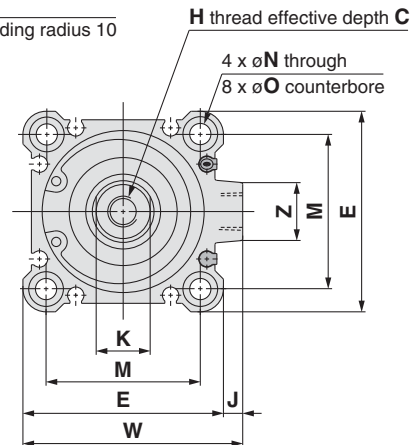
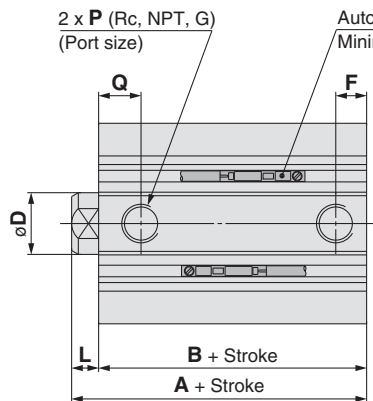
Both ends tapped: CQ2AS/CDQ2AS

#### CDQ2AS

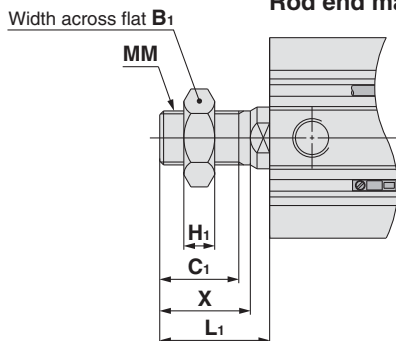


#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14



#### Rod end male thread



The dimensions with boss on head end are equivalent to those of the CQ2 series, double acting, single rod. Refer to page 15.

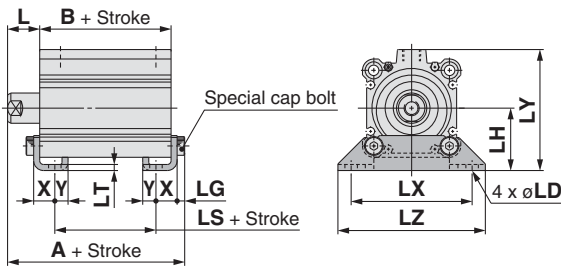
#### Rod End Male Thread

(mm)

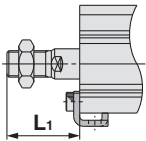
Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B															
32	5 to 50	40	33	50	43	13	16	45	7.5	M8 x 1.25	4.5	14	7	34	5.5	9 depth 7	1/8	10.5	49.5	14
	75, 100	50	43																	
40	5 to 50	46.5	39.5	56.5	49.5	13	16	52	8	M8 x 1.25	5	14	7	40	5.5	9 depth 7	1/8	11	57	15
	75, 100	56.5	49.5																	
50	10 to 50	48.5	40.5	58.5	50.5	15	20	64	10.5	M10 x 1.5	7	17	8	50	6.6	11 depth 8	1/4	10.5	71	19
	75, 100	58.5	50.5																	

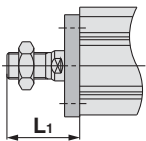
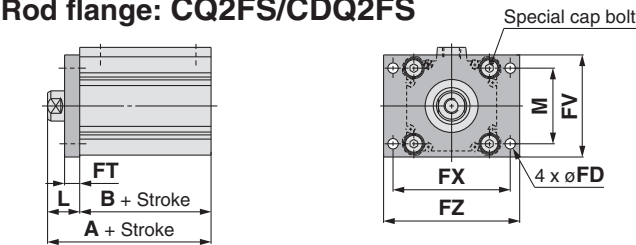
## Foot: CQ2LS/CDQ2LS



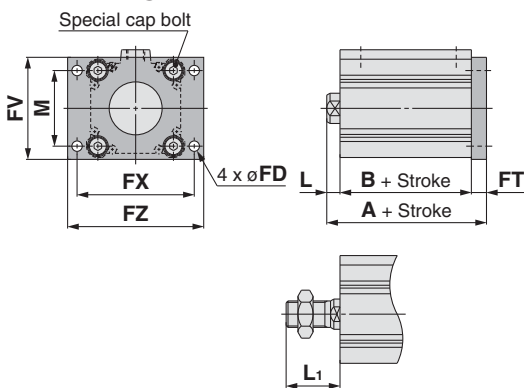
### Rod end male thread



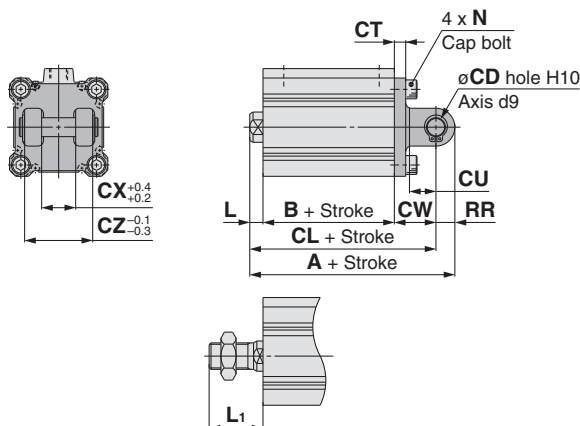
## Rod flange: CQ2FS/CDQ2FS



## Head flange: CQ2GS/CDQ2GS



## Double clevis: CQ2DS/CDQ2DS



## Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD
		A	B	LS	A	B	LS			
32	5 to 50	57.2	33	17	67.2	43	27	17	38.5	6.6
	75, 100	67.2	43	27						
40	5 to 50	63.7	39.5	23.5	73.7	49.5	33.5	17	38.5	6.6
	75, 100	73.7	49.5	33.5						
50	10 to 50	66.7	40.5	17.5	76.7	50.5	27.5	18	43.5	9
	75, 100	76.7	50.5	27.5						

Bore size (mm)	Stroke range (mm)	LG	LH	LT	LX	LY	LZ	X	Y
32	5 to 50	4	30	3.2	57	57	71	11.2	5.8
	75, 100								
40	5 to 50	4	33	3.2	64	64	78	11.2	7
	75, 100								
50	10 to 50	5	39	3.2	79	78	95	14.7	8
	75, 100								

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ
		A	B	A	B					
32	5 to 50	50	33	60	43	5.5	8	48	56	65
	75, 100	60	43							
40	5 to 50	56.5	39.5	66.5	49.5	5.5	8	54	62	72
	75, 100	66.5	49.5							
50	10 to 50	58.5	40.5	68.5	50.5	6.6	9	67	76	89
	75, 100	68.5	50.5							

Bore size (mm)	Stroke range (mm)	L	L <sub>1</sub>	M
32	5 to 50	17	38.5	34
	75, 100			
40	5 to 50	17	38.5	40
	75, 100			
50	10 to 50	18	43.5	50
	75, 100			

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Head Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	A	L	L <sub>1</sub>
32	5 to 50	48	58	7	28.5
	75, 100				
40	5 to 50	54.5	64.5	7	28.5
	75, 100				
50	10 to 50	57.5	67.5	8	33.5
	75, 100				

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.)  
Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU
		A	B	CL	A	B	CL			
32	5 to 50	70	33	60	80	43	70	10	5	14
	75, 100	80	43	70						
40	5 to 50	78.5	39.5	68.5	88.5	49.5	78.5	10	6	14
	75, 100	88.5	49.5	78.5						
50	10 to 50	90.5	40.5	76.5	100.5	50.5	86.5	14	7	20
	75, 100	100.5	50.5	86.5						

Bore size (mm)	Stroke range (mm)	CW	CX	CZ	L	L <sub>1</sub>	N	RR
32	5 to 50	20	18	36	7	28.5	M6 x 1.0	10
	75, 100							
40	5 to 50	22	18	36	7	28.5	M6 x 1.0	10
	75, 100							
50	10 to 50	28	22	44	8	33.5	M8 x 1.25	14
	75, 100							

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

# Series CQ2

## Dimensions

### ∅63 to ∅100/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

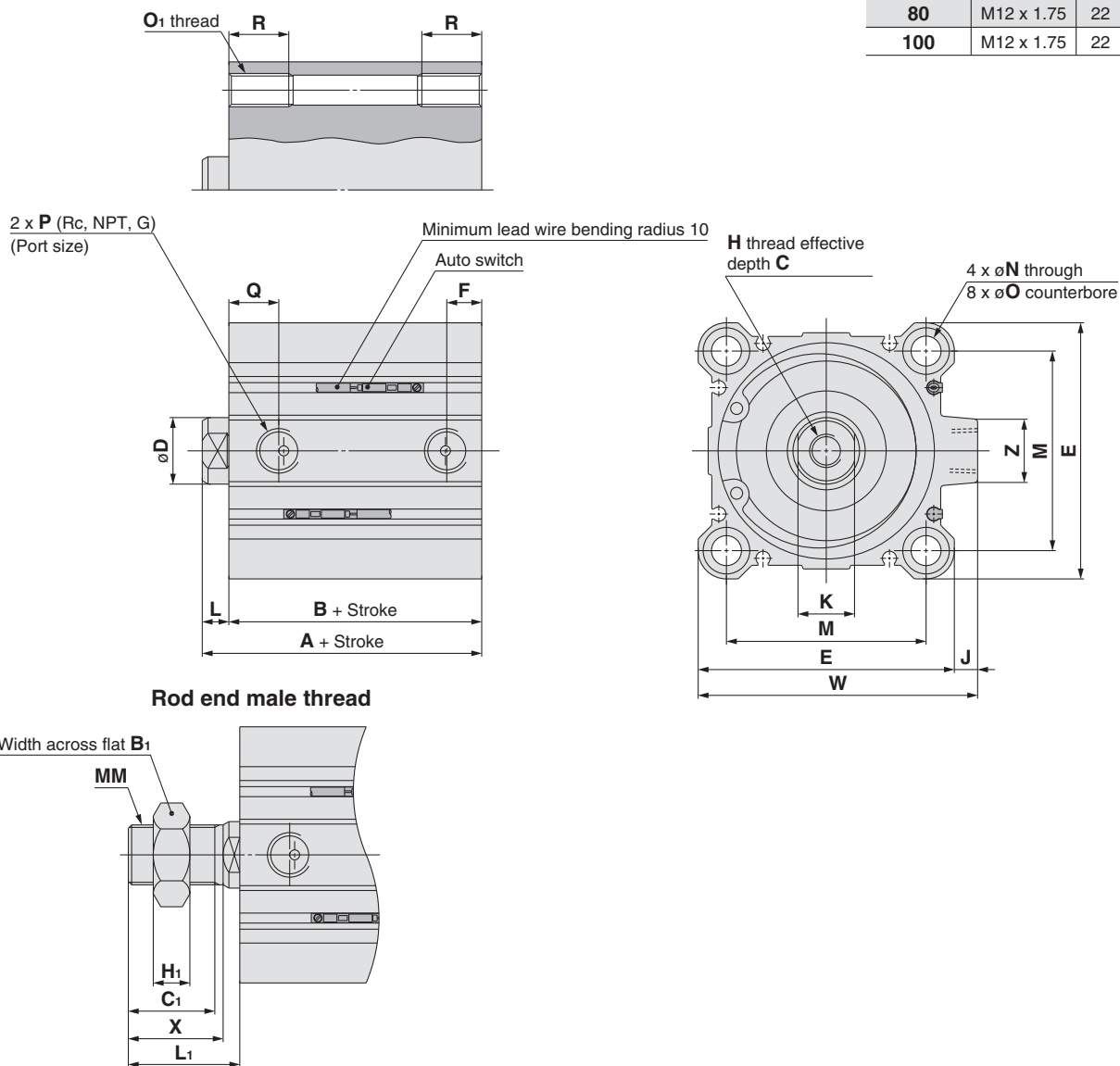
Standard (Through-hole): CQ2BS/CDQ2BS

Both ends tapped: CQ2AS/CDQ2AS

The dimensions with boss on head side are equivalent to those of the CQ2 series, double acting, single rod. Refer to page 17.

### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



### Rod End Male Thread

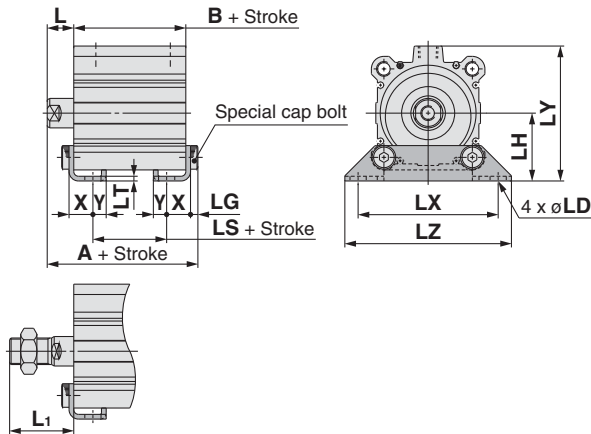
(mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

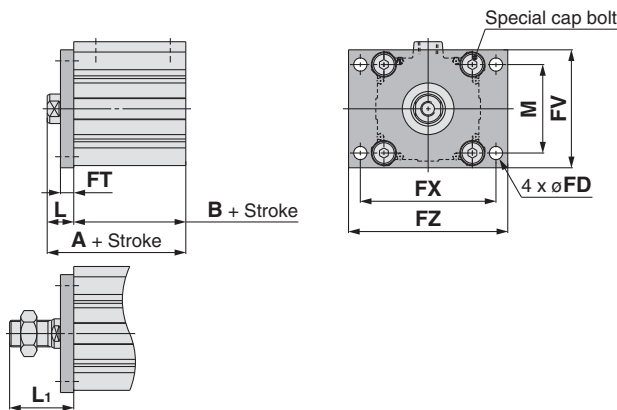
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		(mm)														
		A	B	A	B	C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
63	10 to 50	54	46	64	56	15	20	77	10.5	M10 x 1.5	7	17	8	60	9	14 depth 10.5	1/4	15	84	19
	75, 100	64	56																	
80	10 to 50	63.5	53.5	73.5	63.5	21	25	98	12.5	M16 x 2.0	6	22	10	77	11	17.5 depth 13.5	3/8	16	104	25
	75, 100	73.5	63.5																	
100	10 to 50	75	63	85	73	27	30	117	13	M20 x 2.5	6.5	27	12	94	11	17.5 depth 13.5	3/8	23	123.5	25
	75, 100	85	73																	



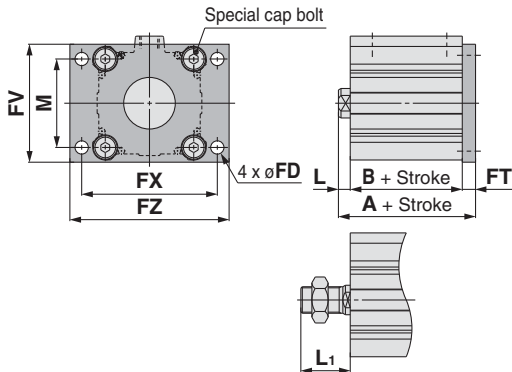
## Foot: CQ2LS/CDQ2LS



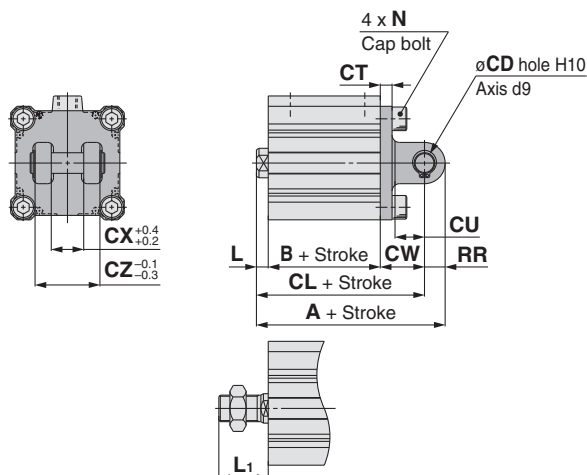
## Rod flange: CQ2FS/CDQ2FS



## Head flange: CQ2GS/CDQ2GS



## Double clevis: CQ2DS/CDQ2DS



## Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD
		A	B	LS	A	B	LS			
63	10 to 50	72.2	46	20	82.2	56	30	18	43.5	11
	75, 100	82.2	56	30						
80	10 to 50	85	53.5	23.5	95	63.5	33.5	20	53.5	13
	75, 100	95	63.5	33.5						
100	10 to 50	98	63	29	108	73	39	22	53.5	13
	75, 100	108	73	39						

Bore size (mm)	Stroke range (mm)	LG	LH	LT	LX	LY	LZ	X	Y
63	10 to 50	5	46	3.2	95	91.5	113	16.2	9
	75, 100								
80	10 to 50	7	59	4.5	118	114	140	19.5	11
	75, 100								
100	10 to 50	7	71	6	137	136	162	23	12.5
	75, 100								

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ
		A	B	A	B					
63	10 to 50	64	46	74	56	9	9	80	92	108
	75, 100	74	56							
80	10 to 50	73.5	53.5	83.5	63.5	11	11	99	116	134
	75, 100	83.5	63.5							
100	10 to 50	85	63	95	73	11	11	117	136	154
	75, 100	95	73							

Bore size (mm)	Stroke range (mm)	L	L <sub>1</sub>	M
63	10 to 50	18	43.5	60
	75, 100			
80	10 to 50	20	53.5	77
	75, 100			
100	10 to 50	22	53.5	94
	75, 100			

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Head Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	A	L	L <sub>1</sub>
63	10 to 50	63	73	8	33.5
	75, 100	73			
80	10 to 50	74.5	84.5	10	43.5
	75, 100	84.5			
100	10 to 50	86	96	12	43.5
	75, 100	96			

(\* The dimensions except A, L and L<sub>1</sub> are the same as those of the rod flange.) Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU
		A	B	CL	A	B	CL			
63	10 to 50	98	46	84	108	56	94	14	8	20
	75, 100	108	56	94						
80	10 to 50	119.5	53.5	101.5	129.5	63.5	111.5	18	10	27
	75, 100	129.5	63.5	111.5						
100	10 to 50	142	63	120	152	73	130	22	13	31
	75, 100	152	73	130						

Bore size (mm)	Stroke range (mm)	CW	CX	CZ	L	L <sub>1</sub>	N	RR
63	10 to 50	30	22	44	8	33.5	M10 x 1.5	14
	75, 100							
80	10 to 50	38	28	56	10	43.5	M12 x 1.75	18
	75, 100							
100	10 to 50	45	32	64	12	43.5	M12 x 1.75	22
	75, 100							

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.



# Compact Cylinder: With End Lock

## Series CBQ2

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

### How to Order

Without auto switch

CBQ2 B 40 [ ] - 30 DC [ ] - H N - [ ]

With auto switch

CDBQ2 B 40 [ ] - 30 DC [ ] - H N - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

Mounting

ø20, ø25

ø32 to ø100

ø20, ø25		ø32 to ø100	
B	Through-hole/Both ends tapped common (Standard)	B	Through-hole (Standard) <small>Note 2)</small>
L	Foot	A	Both ends tapped
F	Rod flange	L	Foot
G	Head flange	F	Rod flange
D	Double clevis	G	Head flange
		D	Double clevis

Note 1) Mounting brackets are shipped together, (but not assembled).

Note 2) At the 75 and 100 mm strokes with ø80, ø100, both ends tapped (A) is the standard. Through-hole (B) is not available.

Note 3) Mounting brackets are shipped together, (but not assembled).

Bore size

Stroke (mm)	20	25	32	40	50	63	80	100
20 mm	20	25	32	40	50	63	80	100
25 mm	20	25	32	40	50	63	80	100
32 mm	20	25	32	40	50	63	80	100
40 mm	20	25	32	40	50	63	80	100

Port thread type

Port thread type	Stroke (mm)
—	M thread ø20, ø25
—	Rc
TN	NPT ø32 to ø100
TF	G

Cylinder stroke (mm)

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

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

Manual release type

N	Non-lock type
L	Lock type

Lock position

H	Head end lock
R	Rod end lock

Body option

—	Rod end female thread
CM	Rod end male thread

Cushion

C Rubber bumper

Action

D Double acting

Made to Order

Refer to the next page for details.

### 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) CDBQ2L32-30DC-RL

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	1 (M)	3 (L)	5 (Z)	None (N)		
							ø20, ø25	ø32 to ø100	ø20, ø25	ø32 to ø100							
Solid state auto switch	—	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○		
		2-wire	M9BV	M9B				●	●	●	○	—	○				
		—	J79C	—				●	—	●	●	—	—				
	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NVV	M9NV	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PVV	M9PV	●	●	●	○	—	○		
		2-wire	M9BVV	M9B				●	●	●	○	—	○				
		3-wire (NPN)	M9NAV**	M9NA**				○	○	●	○	—	○				
		3-wire (PNP)	M9PAV**	M9PA**				○	○	●	○	—	○				
		2-wire	M9BAV**	M9BA**				○	○	●	○	—	○				
Water resistant (2-colour indication)	Grommet	No	4-wire	24 V	5 V, 12 V	—	—	F79F	●	—	●	○	—	○	IC circuit		
			2-wire (Non-polar)				—	P4DW	—	—	●	●	—	○			
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	IC circuit		
				—				A72	—	A72H	●	—	●	—		—	
		12 V	100 V	A93V				A93	●	—	●	—	—				
		5 V, 12 V	100 V or less	A90V				A90	●	—	●	—	—				
	Diagnostic indication (2-colour indication)	Grommet	No	2-wire	24 V	12 V	—	A73C	—	●	—	●	●	—	IC circuit		
				—				A80C	—	●	—	●	●	—			
		5 V, 12 V	24 V or less	A79W				—	●	—	●	—	—				
		—	—	—				—	●	—	●	—	—				

\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NV  
1 m ..... M (Example) M9NVW  
3 m ..... L (Example) M9NVWL  
5 m ..... Z (Example) M9NVWZ  
None ..... N (Example) J79CN

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* The D-P4DWL type is available from ø40 to ø100 only.  
\* Only for the D-P4DWL type, an auto switch is assembled and shipped with the cylinder.

\* There are other applicable auto switches other than the listed above. For details, refer to page 155.

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

\* When the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types with ø32 to ø50 are mounted on a surface other than the port side, order auto switch mounting brackets separately. Refer to page 154 for details.

# Series CBQ2



## Specifications

Bore size (mm)	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>	0.15 MPa <small>Note)</small>							
<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>	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
<b>Stroke length tolerance</b>	+1.0 mm 0							
<b>Lock position</b>	Head end, Rod end							
<b>Holding force (Max.) (N)</b>	215	330	550	860	1340	2140	3450	5390
<b>Pressure for unlocking</b>	0.15 MPa or less							
<b>Backlash</b>	2 mm or less							
<b>Manual release</b>	Non-lock type, Lock type							

Note) 0.05 MPa except for the end lock unit



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers

Refer to pages 151 to 155 for the specifications of cylinders with autoswitches.

- 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.

## Standard Strokes

Bore size	Standard stroke
<b>20 to 63</b>	10, 15, 20, 25, 50, 75, 100
<b>80, 100</b>	25, 50, 75, 100

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model number. (P. 140)	
Description	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.	
Stroke range	Bore size	Stroke range
	20 to 100	5 to 95
Example	Part no.: CBQ2B40-45DC-HL CBQ2B40-50DC-HL with 5 mm width spacer inside	

## Mounting Brackets/Part No.

Bore size (mm)	Foot <small>Note 1)</small>	Flange	Double clevis <small>Note 2)</small>
<b>20</b>	CQS-L020	CQS-F020	CQS-D020
<b>25</b>	CQS-L025	CQS-F025	CQS-D025
<b>32</b>	CQ-L032	CQ-F032	CQ-D032
<b>40</b>	CQ-L040	CQ-F040	CQ-D040
<b>50</b>	CQ-L050	CQ-F050	CQ-D050
<b>63</b>	CQ-L063	CQ-F063	CQ-D063
<b>80</b>	CQ-L080	CQ-F080	CQ-D080
<b>100</b>	CQ-L100	CQ-F100	CQ-D100

Note 1) When ordering a foot bracket, order 2 pieces per cylinder.

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

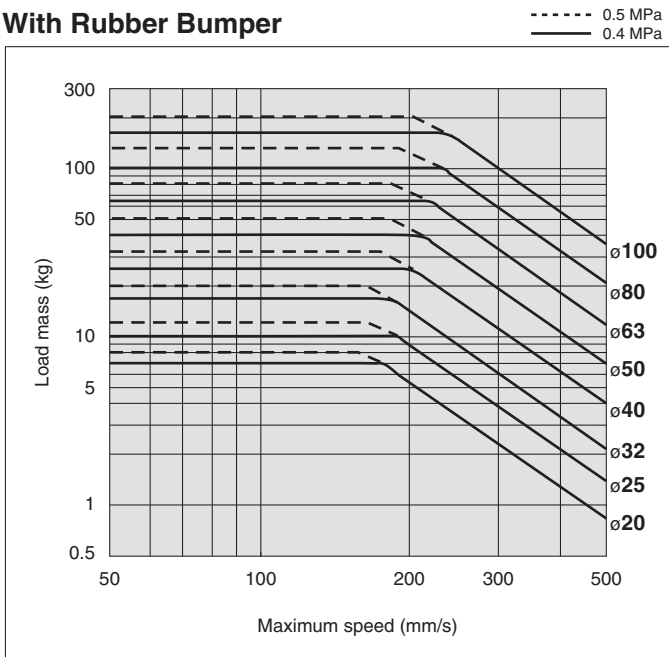
Foot or Flange: Body mounting bolts

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

Note 3) Clevis pin and retaining rings are included with double clevis.

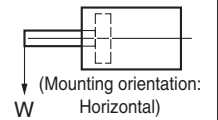
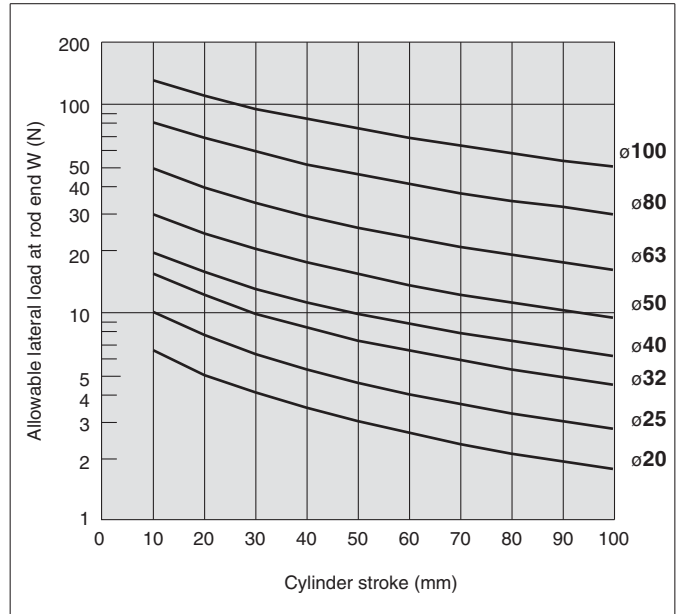
**Allowable Kinetic Energy**

**With Rubber Bumper**



**Allowable Lateral Load at Rod End**

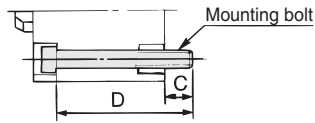
**With Auto Switch**



- Standard
- Large Bore Size
- Long Stroke
- Non-rotating Rod
- Axial Piping
- Anti-lateral Load
- With End Lock
- Water Resistant
- With Auto Switch
- Auto Switch
- Made to Order

# Series CBQ2

## Mounting Bolt for CBQ2



### With Head End Lock (H□)

Cylinder model	C	D	Mounting bolt
C□BQ2B20-10DC-H□	10	75	M5X75L
C□BQ2B20-15DC-H□		80	M5X80L
C□BQ2B20-20DC-H□		85	M5X85L
C□BQ2B20-25DC-H□		90	M5X90L
C□BQ2B20-50DC-H□		120	M5X120L
C□BQ2B20-75DC-H□		145	M5X145L
C□BQ2B20-100DC-H□		170	M5X170L
C□BQ2B25-10DC-H□	7	75	M5X75L
C□BQ2B25-15DC-H□		80	M5X80L
C□BQ2B25-20DC-H□		85	M5X85L
C□BQ2B25-25DC-H□		90	M5X90L
C□BQ2B25-50DC-H□		120	M5X120L
C□BQ2B25-75DC-H□		145	M5X145L
C□BQ2B25-100DC-H□		170	M5X170L
C□BQ2B32-10DC-H□	6.5	75	M5X75L
C□BQ2B32-15DC-H□		80	M5X80L
C□BQ2B32-20DC-H□		85	M5X85L
C□BQ2B32-25DC-H□		90	M5X90L
C□BQ2B32-50DC-H□		115	M5X115L
C□BQ2B32-75DC-H□		140	M5X140L
C□BQ2B32-100DC-H□		165	M5X165L
C□BQ2B40-10DC-H□	7	85	M5X85L
C□BQ2B40-15DC-H□		90	M5X90L
C□BQ2B40-20DC-H□		95	M5X95L
C□BQ2B40-25DC-H□		100	M5X100L
C□BQ2B40-50DC-H□		125	M5X125L
C□BQ2B40-75DC-H□		150	M5X150L
C□BQ2B40-100DC-H□		175	M5X175L

Cylinder model	C	D	Mounting bolt
C□BQ2B50-10DC-H□	12.5	90	M6X90L
C□BQ2B50-15DC-H□		95	M6X95L
C□BQ2B50-20DC-H□		100	M6X100L
C□BQ2B50-25DC-H□		105	M6X105L
C□BQ2B50-50DC-H□		130	M6X130L
C□BQ2B50-75DC-H□		155	M6X155L
C□BQ2B50-100DC-H□		180	M6X180L
C□BQ2B63-10DC-H□	13.5	90	M8X90L
C□BQ2B63-15DC-H□		95	M8X95L
C□BQ2B63-20DC-H□		100	M8X100L
C□BQ2B63-25DC-H□		105	M8X105L
C□BQ2B63-50DC-H□		130	M8X130L
C□BQ2B63-75DC-H□		155	M8X155L
C□BQ2B63-100DC-H□		180	M8X180L
C□BQ2B80-25DC-H□	12.5	135	M10X135L
C□BQ2B80-50DC-H□	13	160	M10X160L
C□BQ2B100-25DC-H□		145	M10X145L
C□BQ2B100-50DC-H□		170	M10X170L

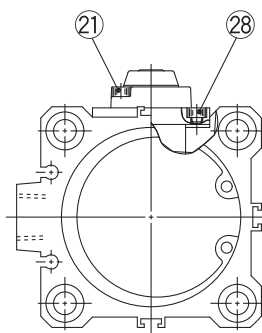
### With Rod End Lock (R□)

Cylinder model	C	D	Mounting bolt
C□BQ2B20-10DC-R□	6.5	65	M5X65L
C□BQ2B20-15DC-R□		70	M5X70L
C□BQ2B20-20DC-R□		75	M5X75L
C□BQ2B20-25DC-R□	10	80	M5X80L
C□BQ2B20-50DC-R□		120	M5X120L
C□BQ2B20-75DC-R□		145	M5X145L
C□BQ2B20-100DC-R□	8.5	170	M5X170L
C□BQ2B25-10DC-R□		70	M5X70L
C□BQ2B25-15DC-R□		75	M5X75L
C□BQ2B25-20DC-R□		80	M5X80L
C□BQ2B25-25DC-R□		85	M5X85L
C□BQ2B25-50DC-R□		120	M5X120L
C□BQ2B25-75DC-R□		145	M5X145L
C□BQ2B25-100DC-R□	170	M5X170L	
C□BQ2B32-10DC-R□	9	70	M5X70L
C□BQ2B32-15DC-R□		75	M5X75L
C□BQ2B32-20DC-R□		80	M5X80L
C□BQ2B32-25DC-R□		85	M5X85L
C□BQ2B32-50DC-R□		110	M5X110L
C□BQ2B32-75DC-R□		135	M5X135L
C□BQ2B32-100DC-R□		160	M5X160L
C□BQ2B40-10DC-R□	7.5	75	M5X75L
C□BQ2B40-15DC-R□		80	M5X80L
C□BQ2B40-20DC-R□		85	M5X85L
C□BQ2B40-25DC-R□		90	M5X90L
C□BQ2B40-50DC-R□		115	M5X115L
C□BQ2B40-75DC-R□		140	M5X140L
C□BQ2B40-100DC-R□		165	M5X165L

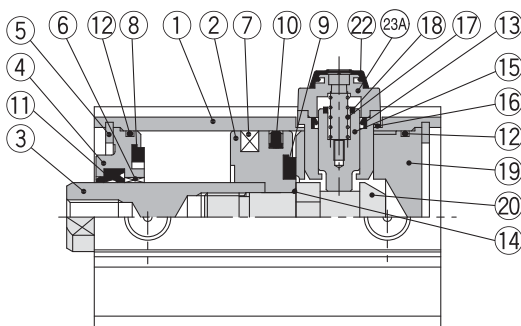
Cylinder model	C	D	Mounting bolt
C□BQ2B50-10DC-R□	12.5	80	M6X80L
C□BQ2B50-15DC-R□		85	M6X85L
C□BQ2B50-20DC-R□		90	M6X90L
C□BQ2B50-25DC-R□		95	M6X95L
C□BQ2B50-50DC-R□		120	M6X120L
C□BQ2B50-75DC-R□		145	M6X145L
C□BQ2B50-100DC-R□		170	M6X170L
C□BQ2B63-10DC-R□	14.5	85	M8X85L
C□BQ2B63-15DC-R□		90	M8X90L
C□BQ2B63-20DC-R□		95	M8X95L
C□BQ2B63-25DC-R□		100	M8X100L
C□BQ2B63-50DC-R□		125	M8X125L
C□BQ2B63-75DC-R□		150	M8X150L
C□BQ2B63-100DC-R□		175	M8X175L
C□BQ2B63-25DC-R□	15	130	M10X130L
C□BQ2B63-50DC-R□		155	M10X155L
C□BQ2B100-25DC-R□		15.5	140
C□BQ2B100-50DC-R□	165		M10X165L

## Construction

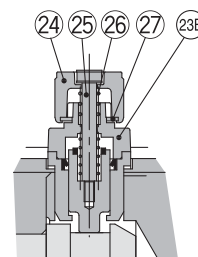
ø32 to ø63



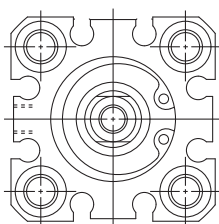
Cylinder tube form  
ø32 to ø63



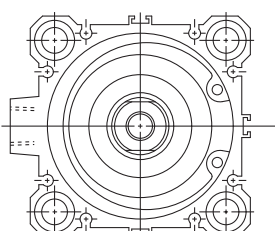
Head end lock



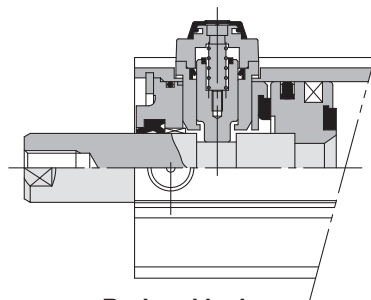
Manual release (Lock type): Suffix L



Cylinder tube form  
ø25 or less

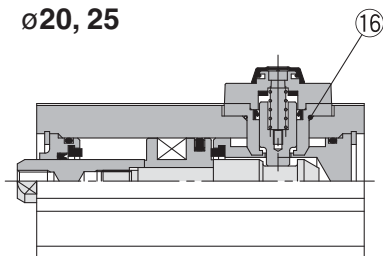


Cylinder tube form  
ø80 or more

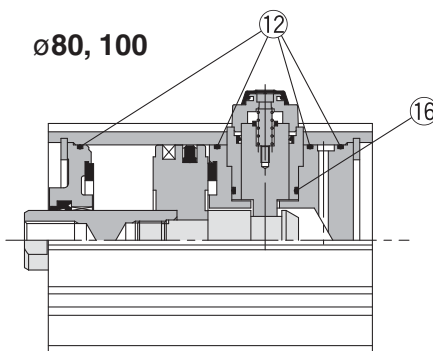


Rod end lock

ø20, 25



ø80, 100



## Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	R□ Aluminum alloy	Anodised
		H□ Aluminum alloy	ø40 or less, Anodised
		Aluminum alloy casted	ø50 or more, Painted after chromated
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	R□ Copper alloy	Used for all bore sizes
		H□	Used for ø40 or more
7	Magnet	—	With auto switch
8	Bumper A	Urethane	
9	Bumper B	Urethane	
10	Piston seal	NBR	
11	Rod seal	NBR	
12	Tube gasket	NBR	Using 4 pcs. for ø80, ø100
13	Lock piston seal	NBR	
14	Piston gasket	NBR	Nothing for ø20, ø25
15	Lock piston	Carbon steel	Quenched, Hard chrome plated
16	Gasket	NBR	
17	Lock spring	Stainless steel	
18	Bumper	Urethane	
19	Head cover	Aluminum alloy	Anodised
20	Lock bolt	Carbon steel	Quenched, Electroless nickel plated
21	Hexagon socket head cap screw	Alloy steel	Black zinc chromated
22	Rubber cap	Synthetic rubber	
23A	Cap A	Aluminum casted	Black painted
23B	Cap B	Carbon steel	Oxide film treated

No.	Description	Material	Note
24	M/O knob	Zinc die-casted	Black painted
25	M/O bolt	Alloy steel	Black zinc chromated, Red painted
26	M/O spring	Steel wire	Zinc chromated
27	Stopper ring	Rolled steel	Zinc chromated
28	Hexagon socket head cap screw	Alloy steel	Nickel plated

## Replacement Parts/Seal Kit (End lock type)

Bore size (mm)	Kit no.	Contents
20	CBQ2B20-PS	Kits include items 10, 11, 12, 13, 16, 21, 28 from the table and a grease pack.
25	CBQ2B25-PS	
32	CBQ2B32-PS	
40	CBQ2B40-PS	
50	CBQ2B50-PS	
63	CBQ2B63-PS	
80	CBQ2B80-PS	
100	CBQ2B100-PS	

\* Seal kit includes 10, 11, 12, 13, 16, 21, 28. Order the seal kit based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

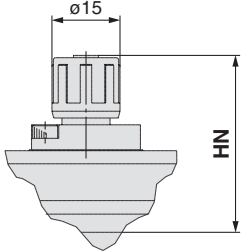
# Series CBQ2

## Dimensions

### Ø20, Ø25

Standard (Through-hole/Both ends tapped common):  
CBQ2B/CDBQ2B

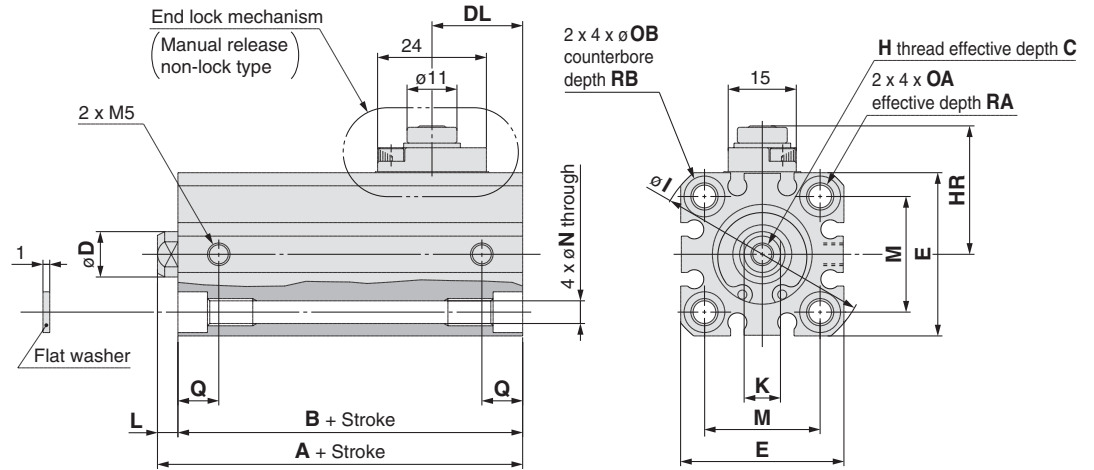
#### End lock mechanism (Manual release lock type)



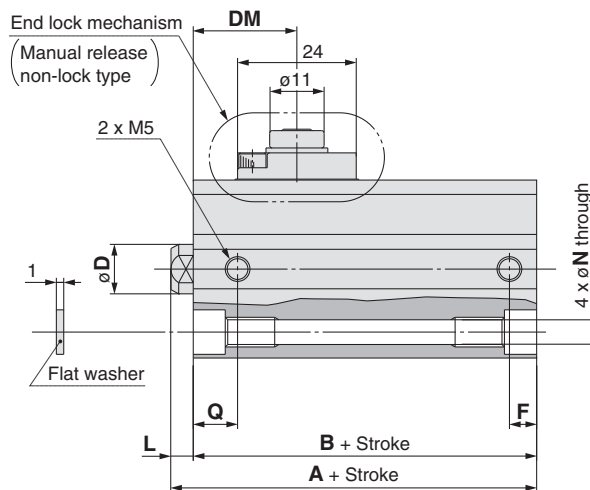
#### End Lock Mechanism Dimensions (mm)

Bore size (mm)	DL	DM	HR	HN (Max.)
20	20	21	28.5	40
25	21	21	29.5	41

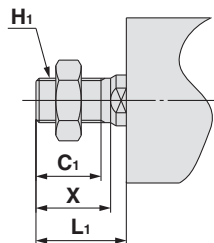
#### With head end lock



#### With rod end lock



#### Rod end male thread



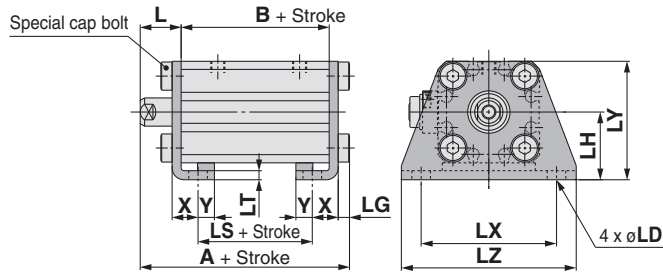
#### Rod End Male Thread

Bore size (mm)	Standard stroke	C <sub>1</sub>	X	H <sub>1</sub>	L <sub>1</sub>
20	10, 15, 20, 25	12	14	M8 x 1.25	18.5
	50, 75, 100				28.5
25	10, 15, 20, 25	15	17.5	M10 x 1.25	22.5
	50, 75, 100				32.5

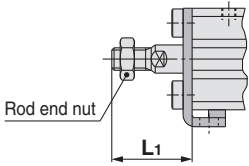
Bore size (mm)	Standard stroke	With head end lock				With rod end lock				C	D	E	H	I	K	M	N	OA	OB	Q	RA	RB
		A	B	L	A	B	F	L														
20	10, 15, 20, 25	65.5	61	4.5	59	54.5	5.5	4.5	7	10	36	M5 x 0.8	47	8	25.5	5.4	M6 x 1.0	9	9	10	7	
	50, 75, 100	80.5	66	14.5	80.5	66	9	14.5														
25	10, 15, 20, 25	69	64	5	62.5	57.5	5.5	5	12	12	40	M6 x 1.0	52	10	28	5.4	M6 x 1.0	9	11	10	7	
	50, 75, 100	84	69	15	84	69	11	15														



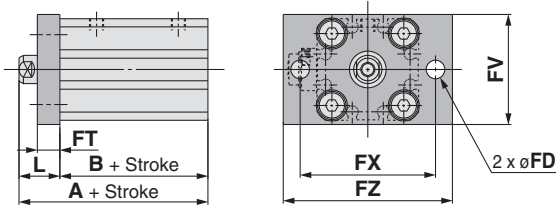
## Foot: CBQ2L/CDBQ2L



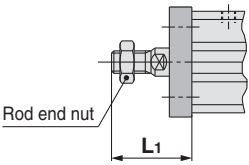
Rod end male thread



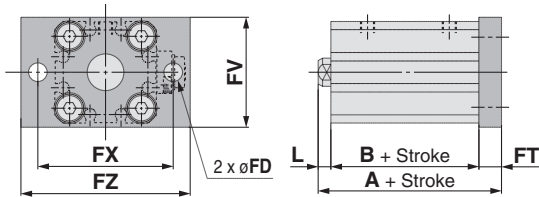
## Rod flange: CBQ2F/CDBQ2F



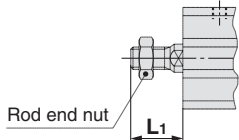
Rod end male thread



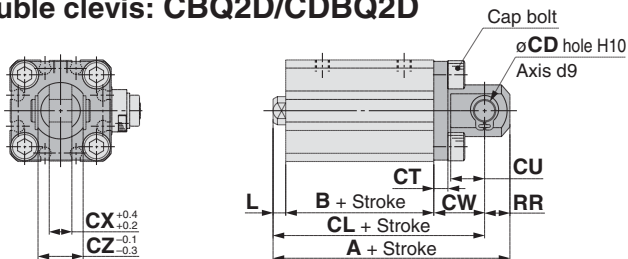
## Head flange: CBQ2G/CDBQ2G



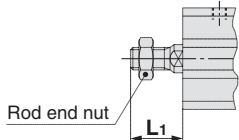
Rod end male thread



## Double clevis: CBQ2D/CDBQ2D



Rod end male thread



## Foot

Bore size (mm)	Standard stroke	With head end lock			With rod end lock		
		A	B	LS	A	B	LS
20	10, 15, 20, 25	82.7	61	49	76.2	54.5	42.5
	50, 75, 100	87.7	66	54	87.7	66	54
25	10, 15, 20, 25	86.2	64	49	79.7	57.5	42.5
	50, 75, 100	91.2	69	54	91.2	69	54

Bore size (mm)	Standard stroke	L	L <sub>1</sub>	LD	LG	LH	LT	LX	LY	LZ	X	Y
		20	10, 15, 20, 25	14.5	28.5	6.6	4	24	3.2	48	42	62
25	50, 75, 100	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod Flange

Bore size (mm)	Standard stroke	With head end lock		With rod end lock	
		A	B	A	B
20	10, 15, 20, 25	75.5	61	69	54.5
	50, 75, 100	80.5	66	80.5	66
25	10, 15, 20, 25	79	64	72.5	57.5
	50, 75, 100	84	69	84	69

Bore size (mm)	Standard stroke	FD	FT	FV	FX	FZ	L	L <sub>1</sub>
		20	10, 15, 20, 25	6.6	8	39	48	60
25	50, 75, 100	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Head Flange

Bore size (mm)	Standard stroke	With head end lock				With rod end lock			
		A	B	L	L <sub>1</sub>	A	B	L	L <sub>1</sub>
20	10, 15, 20, 25	73.5	61	4.5	18.5	67	54.5	4.5	18.5
	50, 75, 100	88.5	66	14.5	28.5	88.5	66	14.5	28.5
25	10, 15, 20, 25	77	64	5	22.5	70.5	57.5	5	22.5
	50, 75, 100	92	69	15	32.5	92	69	15	32.5

Bore size (mm)	Standard stroke	FD	FT	FV	FX	FZ
		20	10, 15, 20, 25	6.6	8	39
25	50, 75, 100	6.6	8	42	52	64

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

## Double Clevis

Bore size (mm)	Standard stroke	With head end lock					With rod end lock				
		A	B	CL	L	L <sub>1</sub>	A	B	CL	L	L <sub>1</sub>
20	10, 15, 20, 25	92.5	61	83.5	4.5	18.5	86	54.5	77	4.5	18.5
	50, 75, 100	107.5	66	98.5	14.5	28.5	107.5	66	98.5	14.5	28.5
25	10, 15, 20, 25	99	64	89	5	22.5	92.5	57.5	82.5	5	22.5
	50, 75, 100	114	69	104	15	32.5	114	69	104	15	32.5

Bore size (mm)	Standard stroke	CD	CT	CU	CW	CX	CZ	RR
		20	10, 15, 20, 25	8	5	12	18	8
25	50, 75, 100	10	5	14	20	10	20	10

Double clevis bracket material: Carbon steel  
Surface treatment: Nickel plated

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

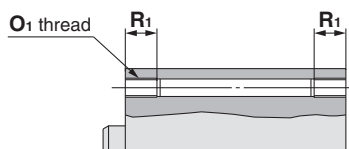
# Series CBQ2

## Dimensions

### ø32 to ø100

Standard (Through-hole):  
CBQ2B/CDBQ2B

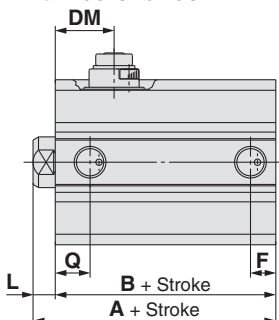
Both ends tapped: CBQ2A/CDBQ2A



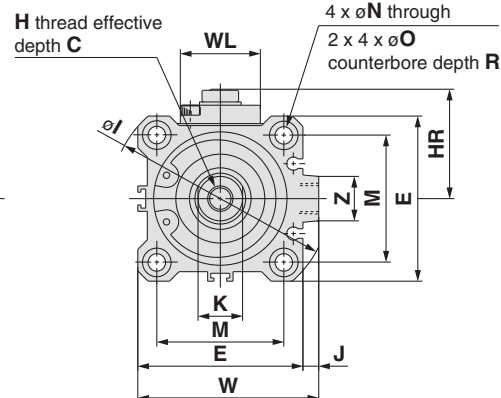
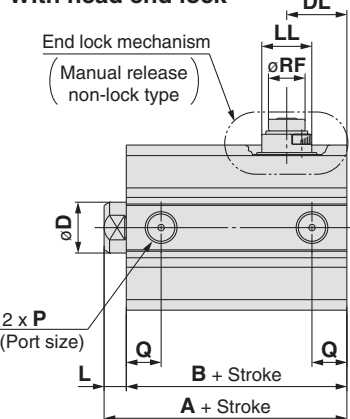
Both Ends Tapped (mm)

Bore size (mm)	O1	R1
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

With rod end lock



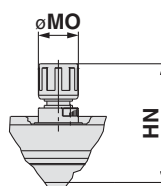
With head end lock



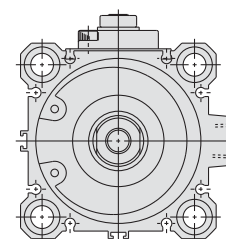
End Lock Mechanism Dimensions (mm)

Bore size (mm)	DL	DM	HR	HN (Max.)	LL	MO	WL	RF
32	25	22	33.5	45	15	15	24	11
40	29	26	38.5	52.5	21	19	24	11
50	29.5	24	45	59	21	19	24	11
63	28.5	25	50	64	21	19	24	11
80	45	45.5	62	76.5	30	23	40	21
100	48	49	71.5	86	30	23	40	21

End lock mechanism  
(Manual release lock type)



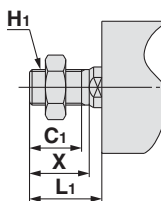
Cylinder tube form  
ø63, ø80, ø100



Rod End Male Thread (mm)

Bore size (mm)	Standard stroke	C1	X	H1	L1
32	10, 15, 20, 25	20.5	23.5	M14 x 1.5	28.5
40		20.5	23.5	M14 x 1.5	28.5
50	50, 75, 100	26	28.5	M18 x 1.5	33.5
63	25, 50	26	28.5	M18 x 1.5	33.5
80		32.5	35.5	M22 x 1.5	43.5
100	75, 100	32.5	35.5	M26 x 1.5	53.5
	25, 50				43.5
	75, 100				53.5

Rod end male thread



Bore size (mm)	Standard stroke	C	D	E	H	I	J	K	M	N	O	P	R	W	Z
32	10, 15, 20, 25 50, 75, 100	13	16	45	M8 x 1.25	60	4.5	14	34	5.5	9	Rc1/8	7	49.5	14
40		13	16	52	M8 x 1.25	69	5	14	40	5.5	9	Rc1/8	7	57	14
50		15	20	64	M10 x 1.5	86	7	17	50	6.6	11	Rc1/4	8	71	19
63		15	20	77	M10 x 1.5	103	7	17	60	9	14	Rc1/4	10.5	84	19
80	25, 50, 75, 100	21	25	98	M16 x 2.0	132	6	22	77	11	17.5*	Rc3/8	13.5*	104	26
100		27	30	117	M20 x 2.5	156	6.5	27	94	11	17.5*	Rc3/8	13.5*	123.5	26

\* At the 75 and 100 mm strokes with ø80, ø100, both ends tapped (A) is the standard. Through-hole (B) is not available.

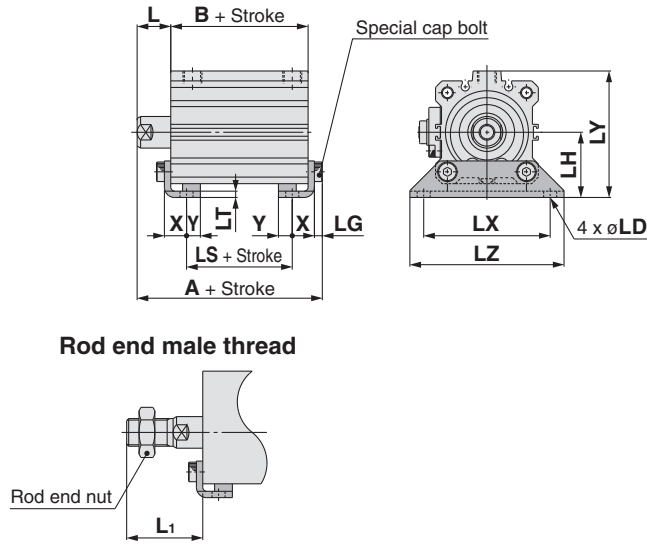
With Head End Lock (mm)

Bore size (mm)	Standard stroke	A	B	L	Q
32	10, 15, 20, 25 50, 75, 100	72.5	65.5	7	12.5
40		82	75	7	14
50		83.5	75.5	8	14
63		85	77	8	15.5
80	25, 50	121	111	10	18
	75, 100	136	116	20	19
100	25, 50	132.5	120.5	12	22
	75, 100	147.5	125.5	22	23

With Rod End Lock (mm)

Bore size (mm)	Standard stroke	A	B	F	L	Q
32	10, 15, 20, 25 50, 75, 100	65	58	7.5	7	10.5
40		71.5	64.5	8	7	11
50		73.5	65.5	10.5	8	10.5
63		79	71	10.5	8	15
80	25, 50	113.5	103.5	12.5	10	16
	75, 100	136	116	19	20	19
100	25, 50	125	113	13	12	23
	75, 100	147.5	125.5	23	22	23

## Foot: CBQ2L/CDBQ2L



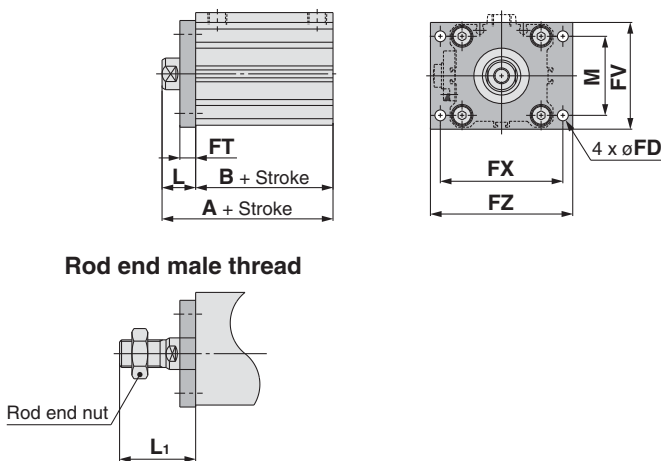
## Foot

Bore size (mm)	Standard stroke	With head end lock			With rod end lock			L	L <sub>1</sub>	LD
		A	B	LS	A	B	LS			
32		89.7	65.5	49.5	82.2	58	42	17	38.5	6.6
40	10, 15, 20, 25 50, 75, 100	99.2	75	59	88.7	64.5	48.5	17	38.5	6.6
50		101.7	75.5	52.5	91.7	65.5	42.5	18	43.5	9
63		103.2	77	51	97.2	71	45	18	43.5	11
80	25, 50	142.5	111	81	135	103.5	73.5	20	53.5	13
	75, 100	147.5	116	86	147.5	116	86			
100	25, 50	155.5	120.5	86.5	148	113	79	22	53.5	13
	75, 100	160.5	125.5	91.5	160.5	125.5	91.5			

Bore size (mm)	Standard stroke	LG	LH	LT	LX	LY	LZ	X	Y
32		4	30	3.2	57	57	71	11.2	5.8
40	10, 15, 20, 25 50, 75, 100	4	33	3.2	64	64	78	11.2	7
50		5	39	3.2	79	78	95	14.7	8
63		5	46	3.2	95	91.5	113	16.2	9
80	25, 50, 75, 100	7	59	4.5	118	114	140	19.5	11
100		7	71	6	137	136	162	23	12.5

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

## Rod flange: CBQ2F/CDBQ2F



## Rod Flange

Bore size (mm)	Standard stroke	With head end lock		With rod end lock		FD	FT	FV	FX	FZ
		A	B	A	B					
32		82.5	65.5	75	58	5.5	8	48	56	65
40	10, 15, 20, 25 50, 75, 100	92	75	81.5	64.5	5.5	8	54	62	72
50		93.5	75.5	83.5	65.5	6.6	9	67	76	89
63		95	77	89	71	9	9	80	92	108
80	25, 50	131	111	123.5	103.5	11	11	99	116	134
	75, 100	136	116	136	116					
100	25, 50	142.5	120.5	135	113	11	11	117	136	154
	75, 100	147.5	125.5	147.5	125.5					

Bore size (mm)	Standard stroke	L	L <sub>1</sub>	M
32		17	38.5	34
40	10, 15, 20, 25 50, 75, 100	17	38.5	40
50		18	43.5	50
63		18	43.5	60
80	25, 50, 75, 100	20	53.5	77
100		22	53.5	94

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

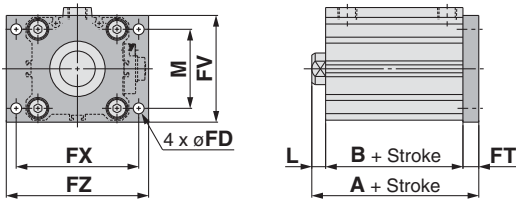
Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CBQ2

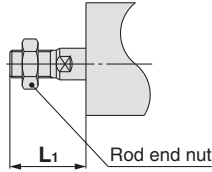
## Dimensions

### Ø32 to Ø100

#### Head flange: CBQ2G/CDBQ2G



#### Rod end male thread



#### Head Flange

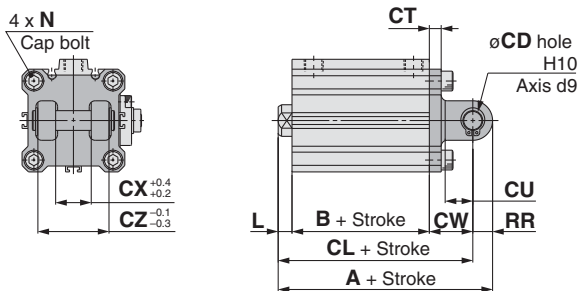
(mm)

Bore size (mm)	Standard stroke	With head end lock				With rod end lock			
		A	B	L	L <sub>1</sub>	A	B	L	L <sub>1</sub>
32	10, 15, 20, 25 50, 75, 100	80.5	65.5	7	28.5	73	58	7	28.5
40		90	75	7	28.5	79.5	64.5	7	28.5
50		92.5	75.5	8	33.5	82.5	65.5	8	33.5
63		94	77	8	33.5	88	71	8	33.5
80	25, 50	132	111	10	43.5	124.5	103.5	10	43.5
	75, 100	147	116	20	53.5	147	116	20	53.5
100	25, 50	143.5	120.5	12	43.5	136	113	12	43.5
	75, 100	158.5	125.5	22	53.5	158.5	125.5	22	53.5

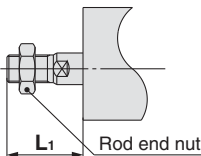
Bore size (mm)	Standard stroke	M	FD	FT	FV	FX	FZ
32	10, 15, 20, 25 50, 75, 100	34	5.5	8	48	56	65
40		40	5.5	8	54	62	72
50		50	6.6	9	67	76	89
63		60	9	9	80	92	108
80		77	11	11	99	116	134
100		94	11	11	117	136	154

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

#### Double clevis: CBQ2D/CDBQ2D



#### Rod end male thread



#### Double Clevis

(mm)

Bore size (mm)	Standard stroke	With head end lock			With rod end lock			CD	CT	CU	L	L <sub>1</sub>
		A	B	CL	A	B	CL					
32	10, 15, 20, 25 50, 75, 100	102.5	65.5	92.5	95	58	85	10	5	14	7	28.5
40		114	75	104	103.5	64.5	93.5	10	6	14	7	28.5
50		125.5	75.5	111.5	115.5	65.5	101.5	14	7	20	8	33.5
63		129	77	115	123	71	109	14	8	20	8	33.5
80	25, 50	177	111	159	169.5	103.5	151.5	18	10	27	10	43.5
	75, 100	192	116	174	192	116	174				20	53.5
100	25, 50	199.5	120.5	177.5	192	113	170	22	13	31	12	43.5
	75, 100	214.5	125.5	192.5	214.5	125.5	192.5				22	53.5

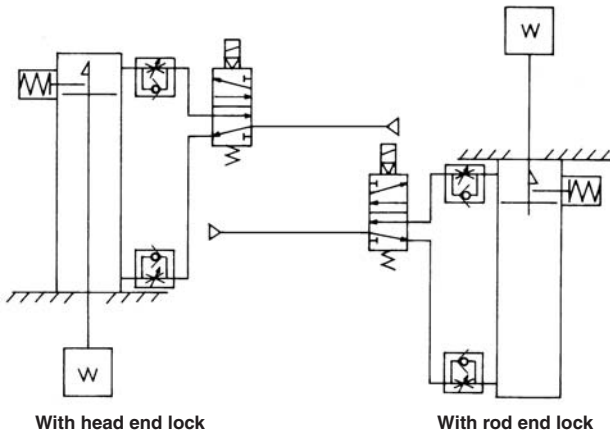
Bore size (mm)	Standard stroke	CW	CX	CZ	N	RR
32	10, 15, 20, 25 50, 75, 100	20	18	36	M6 x 1.0	10
40		22	18	36	M6 x 1.0	10
50		28	22	44	M8 x 1.25	14
63		30	22	44	M10 x 1.5	14
80		38	28	56	M12 x 1.75	18
100		45	32	64	M12 x 1.75	22

Double clevis bracket material: Cast iron  
Surface treatment: Painted

## Use the Recommended Pneumatic Circuit

### ⚠ Caution

- This is necessary for the correct locking and unlocking actions.



## Operating Precautions

### ⚠ Caution

- Do not use 3-position solenoid valves.**  
Avoid use in combination with 3-position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.
- Back pressure is required for releasing the lock.**  
Before starting operation, be sure to control the system so that air is supplied to the side without the lock mechanism as shown in the above figure. There is a possibility that the lock may not be released. (Refer to the section on releasing the lock.)
- Release the lock for mounting or adjusting the cylinder.**  
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.
- Operate with a load ratio of 50% or less.**  
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
- Do not operate multiple cylinders in synchronisation.**  
Avoid applications in which two or more end lock cylinders are synchronised to move one work piece, as one of the cylinder locks may not be able to release when required.
- Use a speed controller with meter-out control.**  
Lock cannot be released occasionally by meter-in control.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**  
If the cylinder piston does not reach the end of stroke, locking and unlocking may not be possible.
- Adjust the position of an auto switch, so that it could work at the both positions where it is distanced from the stroke and a backlash (2 mm).**  
When a 2-colour indication switch is adjusted for green indication at the stroke end, it may change to red for the backlash return, but this is not abnormal.

## Operating Pressure

### ⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for releasing the lock.

## Exhaust Speed

### ⚠ Caution

1. When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some time due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the

## Releasing the Lock

### ⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Also, it is very dangerous because the piston rod will move suddenly.

## Manual Release

### ⚠ Caution

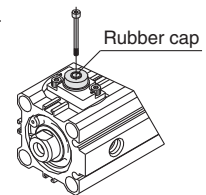
#### 1. Manual release (Non-lock type)

Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

Thread sizes, pulling forces and strokes are as shown below.

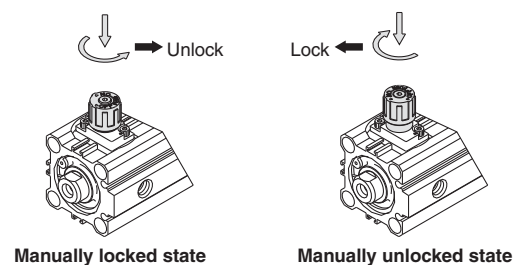
Bore size (mm)	Thread size	Pulling force (N)	Stroke (mm)
20, 25, 32	M2.5 x 0.45 x 25 ℓ or more	4.9	2
40, 50, 63	M3 x 0.5 x 30 ℓ or more	10	3
80, 100	M5 x 0.8 x 40 ℓ or more	24.5	3

Remove the bolt for normal operation.  
It can cause lock malfunction or faulty release.



#### 2. Manual release (Lock type)

While pushing the M/O knob, turn it 90° counterclockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼ OFF mark on the M/O knob. When locking is desired, turn the M/O knob clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on the M/O knob. The correct position is confirmed by a click sound "click". If not confirmed, locking is not done.



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

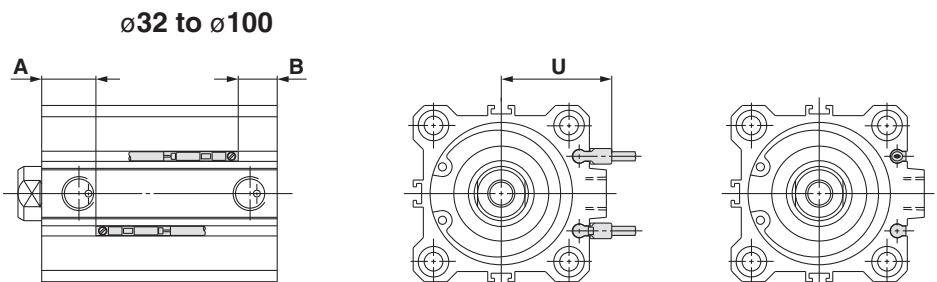
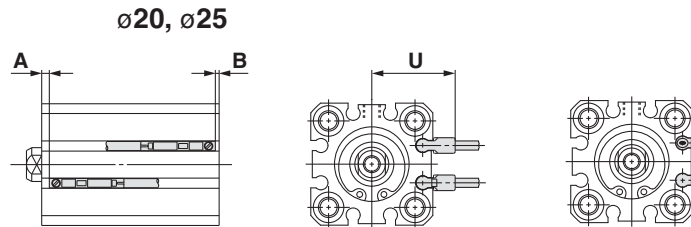
Made to Order

# With End Lock Series CDBQ2 With Auto Switch 1

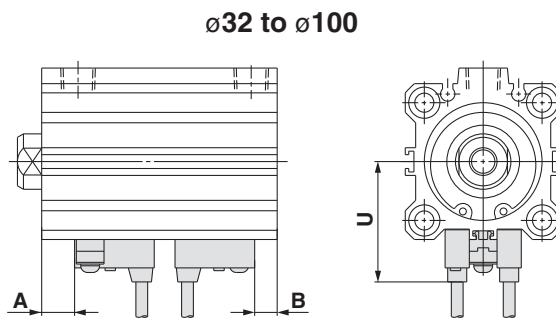
## 1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

Applicable Cylinder Series: CDBQ2 (With end lock)

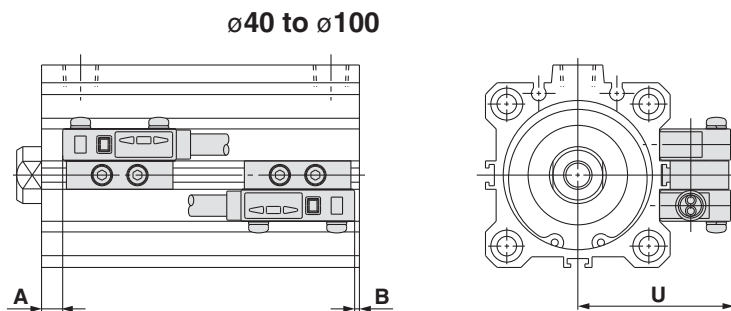
- D-A9□
- D-M9□
- D-M9□W
- D-M9□AL
- D-A9□V
- D-M9□V
- D-M9□WV
- D-M9□AVL



- |        |          |
|--------|----------|
| D-A7□  | D-F7NTL  |
| D-A80  | D-F7BAL  |
| D-A7□H | D-A73C   |
| D-A80H | D-A80C   |
| D-F7□  | D-J79C   |
| D-J79  | D-A79W   |
| D-F7□W | D-F7□WV  |
| D-J79W | D-F7□V   |
| D-F79F | D-F7BAVL |



D-P4DWL



### Auto Switch Mounting Height

#### Applicable Cylinder Series: CDBQ2 (With end lock)

Auto switch model	D-A7□ D-A80		D-A7□H/A80H D-A73C/A80C D-F7□/J79/J79W D-F7□V/J79C D-F7□W/F7□WV D-F7BAL/F7BAVL D-F79F/F7NTL		D-A79W		D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-P4DWL	
	A	B	A	B	A	B	A	B	A	B	A	B
20 (Head end lock)	—	—	—	—	—	—	6 (11)	35 (35)	10 (15)	39 (39)	—	—
20 (Rod end lock)	—	—	—	—	—	—	31.5 (34)	3 (12)	35.5 (38)	7 (16)	—	—
25 (Head end lock)	—	—	—	—	—	—	8 (10)	37 (39)	12 (14)	41 (43)	—	—
25 (Rod end lock)	—	—	—	—	—	—	32 (35)	5.5 (14)	36 (39)	9.5 (18)	—	—
32 (Head end lock)	9	38.5	9.5	39	6.5	36	8	37.5	12	41.5	—	—
32 (Rod end lock)	36	4	36.5	4.5	33.5	1.5	35	3	39	7	—	—
40 (Head end lock)	13	44	13.5	44.5	10.5	41.5	12	43	16	47	9	40
40 (Rod end lock)	42	4.5	42.5	5	39.5	2	41	3.5	45	7.5	38	0.5
50 (Head end lock)	11	46.5	11.5	47	8.5	44	10	45.5	14	49.5	7	42.5
50 (Rod end lock)	41.5	6	42	6.5	39	3.5	40.5	5	44.5	9	37.5	2
63 (Head end lock)	13.5	45.5	14	46	11	43	12.5	44.5	16.5	48.5	9.5	41.5
63 (Rod end lock)	45.5	7.5	46	8	43	5	44.5	6.5	48.5	10.5	41.5	3.5
80 (Head end lock)	16.5 (21.5)	76.5 (76.5)	17 (22)	77 (77)	14 (19)	74 (74)	15.5 (20.5)	75.5 (75.5)	19.5 (24.5)	79.5 (79.5)	12.5 (17.5)	72.5 (72.5)
80 (Rod end lock)	66.5 (66.5)	19 (31.5)	67 (67)	19.5 (32)	64 (64)	16.5 (29)	65.5 (65.5)	18 (30.5)	69.5 (69.5)	22 (34.5)	62.5 (62.5)	15 (27.5)
100 (Head end lock)	21 (26)	81.5 (81.5)	21.5 (26.5)	82 (82)	18.5 (23.5)	79 (79)	20 (25)	80.5 (80.5)	24 (29)	84.5 (84.5)	17 (22)	77.5 (77.5)
100 (Rod end lock)	71 (69.5)	24 (38)	71.5 (70)	24.5 (38.5)	68.5 (67)	21.5 (35.5)	70 (68.5)	23 (37)	74 (72.5)	27 (41)	67 (65.5)	20 (34)

Note) The dimensions in ( ) for ø20 and ø25 are for 50, 75 and 100 mm strokes, and the dimensions in ( ) for ø80 and ø100 are for 75 and 100 mm strokes. Adjust the auto switch after confirming the operating conditions in the actual setting.

#### Applicable Cylinder Series: CDBQ2 (With end lock)

Auto switch model	D-A7□ D-A80	D-A7□H D-A80H/J79W D-F7□/F7BAL D-J79/F79F D-F7□W/F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A79W	D-A9□V	D-M9□V D-M9□WV D-M9□AVL	D-P4DWL
	U	U	U	U	U	U	U	U	U
20	—	—	—	—	—	—	22.5	24.5	—
25	—	—	—	—	—	—	24.5	26.5	—
32	31.5	32.5	38.5	35	38	34	27	29	—
40	35	36	42	38.5	41.5	37.5	30.5	32.5	44
50	41	42	48	44.5	47.5	43.5	36.5	38.5	50
63	47.5	48.5	54.5	51	54	50	40	42	56.5
80	57.5	58.5	64.5	61	64	60	50	52	66.5
100	67.5	68.5	74.5	71	74	70	60	62	76.5

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# With End Lock Series CDBQ2 With Auto Switch 2

## 2 Minimum Stroke for Auto Switch Mounting

Applicable Cylinder Series: CDBQ2 (With end lock)

(mm)

Number of auto switches	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□	D-M9□WV D-M9□AVL D-F7□WV D-F7BAVL	D-M9□ D-M9□W D-M9□AL D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL	D-P4DWL
With 1 pc.	5	5	10	10	15	15	20	15
With 2 pcs.	5	10	10	15	15	20	20	15

## 3 Operating Range

Applicable Cylinder Series: CDBQ2 (With end lock)

(mm)

Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-A9□(V)	10	10	9.5 (9.5)	9.5 (9.5)	9.5 (8.5)	11.5 (11)	9 (10)	11.5 (10.5)
D-M9□(V) D-M9□W(V) D-M9□A(V)L	5.5	5.5	6 (5.5)	6 (5.5)	7 (6)	7.5 (6.5)	8 (7)	8.5 (7)
D-A7□(H)(C) D-A80□(H)(C)	—	—	12	11	10	12	12	13
D-A79W	—	—	13	14	14	16	15	17
D-F7□(V) D-J79(C) D-F7□W(V) D-F7BA(V)L D-F7NTL D-F79F	—	—	6	6	6	6.5	6.5	7
D-P4DWL	—	—	—	5	5	5	5	5.5

\* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

\* The values for ø32 or more of the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types indicate the operating range when the conventional switch installation groove is attached without using the auto switch mounting bracket BQ2-012.

\* The values in ( ) for ø32 or more of the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types indicate the operating range when the auto switch mounting bracket BQ2-012 is used.



## 4 Auto Switch Mounting Brackets/Part No.

### Applicable Cylinder Series: CDBQ2 (With end lock)

Auto switch mounting surface	Bore size (mm)		
	ø20, ø25	ø32, ø40, ø50	ø63, ø80, ø100
Auto switch model	Auto switch mounting surface Port/A/B/C side	Auto switch mounting surface Port side	Auto switch mounting surface A/B/C side
<b>D-A9□</b> <b>D-A9□V</b> <b>D-M9□</b> <b>D-M9□V</b> <b>D-M9□W</b> <b>D-M9□WV</b> <b>D-M9□AL</b> <b>D-M9□AVL</b>	Auto switch mounting brackets are not required.	Auto switch mounting brackets are not required.	① BQ-2 ② BQ2-012 Two kinds of auto switch brackets are used as a set. 

Note 1) When a compact auto switch is mounted on the three sides (A, B and C above) other than the port side of ø32 to ø50 cylinders, auto switch mounting brackets shown above are required. Order them separately from cylinders. (The above is also applicable when a compact auto switch is mounted using an auto switch mounting rail, but not using a compact auto switch installation groove for ø63 to ø100 cylinders.)

Ordering example  
 CDBQ2B32-50D-M9BW.....1 pc.  
 BQ-2.....2 pcs.  
 BQ2-012.....2 pcs.

Note 2) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

Auto switch model	Bore size (mm)					
	32	40	50	63	80	100
<b>D-A7□/A80</b> <b>D-A73C/A80C</b> <b>D-A7□H/A80H</b> <b>D-A79W</b> <b>D-F7□/J79</b> <b>D-F7□V</b> <b>D-J79C</b> <b>D-F7□W/J79W</b> <b>D-F7□WV</b> <b>D-F7BAL/F7BAVL</b> <b>D-F79F/F7NTL</b>			BQ-2			
<b>D-P4DWL</b>	—					BQP1-050

Note 3) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

Note 4) Refer to pages 1360 to 1362 in Best Pneumatics No. 2 for further information on auto switch mounting method.

#### [Stainless Steel Mounting Screw Kit]

The following stainless steel mounting screw kit (with nuts) is available. Use it in accordance with the operating environment. (Since auto switch spacer (for BQ-2) is not included, order BQ-2 separately.)

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

The above stainless steel mounting screws are used when a cylinder is shipped with the D-F7BAL/F7BAVL auto switches.

When only an auto switch is shipped independently, BBA2 is attached.

Note 5) Refer to page 1361 in Best Pneumatics No. 2 for details of BBA2.

Note 6) When the D-M9□A(V)L type is mounted on a port side other than ø32, ø40 or ø50, order auto switch mounting brackets BQ2-012S, BQ-2 or the stainless steel mounting screw kit BBA2 separately.

#### Auto Switch Mounting Bracket/Weight

Mounting bracket part no.	Weight (g)
BQ-2	1.5
BQ2-012	5
BQP1-050	16

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

# With End Lock

## Series CDBQ2

# With Auto Switch 3

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable. Refer to Best Pneumatics No. 2 for detailed specifications.

Applicable Cylinder Series: CDBQ2 (With end lock)

Auto switch type	Model	Electrical entry	Features	Applicable bore size
Reed	D-A73	Grommet (Perpendicular)	—	ø32 to ø100
	D-A80		Without indicator light	
	D-A73H, A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	ø32 to ø100
	D-F7NWV, F7BWV		Diagnostic indication (2-colour indication)	
	D-F7BAVL		Water resistant (2-colour indication)	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-colour indication)	
	D-F7BAL		Water resistant (2-colour indication)	
	D-F7NTL		With timer	
	D-P5DWL	Grommet (In-line)	Magnetic field resistant (2-colour indication)	

\* With pre-wired connector is also available for solid state auto switches. For details, refer to Best Pneumatics No. 2.

\* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to Best Pneumatics No. 2.

\* When using a magnetic field resistant solid state auto switch D-P3DW□ type, please contact SMC separately. (Applicable bore size: ø32 to ø100)

\* Heat resistant solid state auto switch (D-F7NJL) is not applicable.

\* Regarding the D-P5DWL, please contact SMC separately.

# Compact Cylinder: Water Resistant Double Acting, Single Rod Series CQ2

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

## How to Order

Without auto switch  
ø20, ø25

CQ2 B 20 R - 30 D

Without auto switch  
ø32 to ø100

CQ2 B 32 R - 30 D Z

With auto switch

CDQ2 B 32 R - 30 D Z - M9BA

With auto switch  
(Built-in magnet)

### Mounting

B	Through-hole (Standard)	(ø20 to ø100)
A	Both ends tapped	
L	Foot	
F	Rod flange	(ø40 to ø100)
G	Head flange	
D	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 158 and 160.

### Bore size

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

### Port thread type

—	M thread
	Rc
TN	NPT
TF	G

### Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

### Made to Order

Refer to the next page for details.

### Auto switch

— Without auto switch

\* Refer to the below table for applicable auto switches.

### Auto switch mounting groove

Z	ø20 to ø25	2 surfaces
	ø32 to ø100	4 surfaces

### Body option

—	Standard (Rod end female thread)
M	Rod end male thread

### Action

D Double acting

### Cylinder stroke (mm)

For "Standard Strokes", refer to the next page.

### Water resistant cylinder

R	NBR seal (Nitrile rubber)
V	FKM seal (Fluororubber)

## 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) CDQ2B32R-25DMZ

## Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 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 (—)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	Water resistant (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NAV	M9NA	○	○	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PAV	M9PA	○	○	●	○	○		
				2-wire				M9BAV	M9BA	○	○	●	○	○		

\* Lead wire length symbols: 0.5 m ..... — (Example) M9BA  
1 m ..... M (Example) M9BAM  
3 m ..... L (Example) M9BAL  
5 m ..... Z (Example) M9BAZ

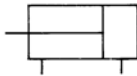
\* Solid state auto switches marked with "○" are produced upon receipt of order.

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

# Series CQ2



**JIS Symbol**  
Double acting,  
Single rod



**Made to Order**  
(For details, refer to pages 177 to 207.)

Symbol	Specifications
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel

Refer to pages 169 to 175 for the specifications of cylinders with autoswitches.

- 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	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>	0.08 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>	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
<b>Stroke length tolerance</b>	+1.0 mm 0							

## Standard Strokes

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

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model number. (P. 156)	
Description	Strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.	
Stroke range	Bore size	Stroke range
	20, 25	1 to 49
	32 to 100	1 to 99
Example	Part no.: CQ2B50R-57DZ CQ2B50R-75DZ with 18 mm width spacer inside The B dimension is 115.5 mm.	

## Type

Bore size (mm)		20	25	32	40	50	63	80	100		
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●		
		Both ends tapped	—	—	—	●	●	●	●		
	Built-in magnet		●	●	●	●	●	●	●		
	Piping	Pipe thread	—	M5	M5	<sup>Note)</sup> M5 Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			<b>TN</b>	—	—	NPT1/8	NPT1/8	NPT1/4	NPT1/4	NPT3/8	NPT3/8
<b>TF</b>			—	—	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	
Rod end male thread		●	●	●	●	●	●	●	●		

Note) ø32 without auto switch: M5 x 0.8 is used for 5 mm strokekeeping dimension.  
Thus, do not enter a symbol for the port thread type.

### Theoretical Output



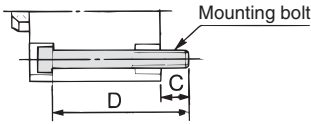
Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

### Mounting Brackets/Part No.

Bore size (mm)	Foot <sup>Note 1)</sup>	Flange	Double clevis
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 1) When ordering a foot bracket, 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

### Mounting Bolt for CQ2B/Without Auto Switch



Cylinder model	C	D	Mounting bolt
CQ2B20 <sup>5</sup> -5D	7.5	35	M5X35L
CQ2B20 <sup>5</sup> -10D		40	M5X40L
CQ2B20 <sup>5</sup> -15D		45	M5X45L
CQ2B20 <sup>5</sup> -20D		50	M5X50L
CQ2B20 <sup>5</sup> -25D		55	M5X55L
CQ2B20 <sup>5</sup> -30D		60	M5X60L
CQ2B20 <sup>5</sup> -35D		65	M5X65L
CQ2B20 <sup>5</sup> -40D		70	M5X70L
CQ2B20 <sup>5</sup> -45D		75	M5X75L
CQ2B20 <sup>5</sup> -50D		80	M5X80L
CQ2B25 <sup>5</sup> -5D	9.5	40	M5X40L
CQ2B25 <sup>5</sup> -10D		45	M5X45L
CQ2B25 <sup>5</sup> -15D		50	M5X50L
CQ2B25 <sup>5</sup> -20D		55	M5X55L
CQ2B25 <sup>5</sup> -25D		60	M5X60L
CQ2B25 <sup>5</sup> -30D		65	M5X65L
CQ2B25 <sup>5</sup> -35D		70	M5X70L
CQ2B25 <sup>5</sup> -40D		75	M5X75L
CQ2B25 <sup>5</sup> -45D		80	M5X80L
CQ2B25 <sup>5</sup> -50D		85	M5X85L
CQ2B32 <sup>5</sup> -5DZ	9	40	M5X40L
CQ2B32 <sup>5</sup> -10DZ		45	M5X45L
CQ2B32 <sup>5</sup> -15DZ		50	M5X50L
CQ2B32 <sup>5</sup> -20DZ		55	M5X55L
CQ2B32 <sup>5</sup> -25DZ		60	M5X60L
CQ2B32 <sup>5</sup> -30DZ		65	M5X65L
CQ2B32 <sup>5</sup> -35DZ		70	M5X70L
CQ2B32 <sup>5</sup> -40DZ		75	M5X75L
CQ2B32 <sup>5</sup> -45DZ		80	M5X80L
CQ2B32 <sup>5</sup> -50DZ		85	M5X85L
CQ2B32 <sup>5</sup> -75DZ	120	M5X120L	
CQ2B32 <sup>5</sup> -100DZ	145	M5X145L	

Cylinder model	C	D	Mounting bolt	
CQ2B40 <sup>5</sup> -5DZ	7.5	35	M5X35L	
CQ2B40 <sup>5</sup> -10DZ		40	M5X40L	
CQ2B40 <sup>5</sup> -15DZ		45	M5X45L	
CQ2B40 <sup>5</sup> -20DZ		50	M5X50L	
CQ2B40 <sup>5</sup> -25DZ		55	M5X55L	
CQ2B40 <sup>5</sup> -30DZ		60	M5X60L	
CQ2B40 <sup>5</sup> -35DZ		65	M5X65L	
CQ2B40 <sup>5</sup> -40DZ		70	M5X70L	
CQ2B40 <sup>5</sup> -45DZ		75	M5X75L	
CQ2B40 <sup>5</sup> -50DZ		80	M5X80L	
CQ2B40 <sup>5</sup> -75DZ	12.5	115	M5X115L	
CQ2B40 <sup>5</sup> -100DZ		140	M5X140L	
CQ2B50 <sup>5</sup> -10DZ		14.5	45	M6X45L
CQ2B50 <sup>5</sup> -15DZ			50	M6X50L
CQ2B50 <sup>5</sup> -20DZ			55	M6X55L
CQ2B50 <sup>5</sup> -25DZ			60	M6X60L
CQ2B50 <sup>5</sup> -30DZ			65	M6X65L
CQ2B50 <sup>5</sup> -35DZ			70	M6X70L
CQ2B50 <sup>5</sup> -40DZ			75	M6X75L
CQ2B50 <sup>5</sup> -45DZ			80	M6X80L
CQ2B50 <sup>5</sup> -50DZ	85		M6X85L	
CQ2B50 <sup>5</sup> -75DZ	120		M6X120L	
CQ2B50 <sup>5</sup> -100DZ	145	M6X145L		
CQ2B63 <sup>5</sup> -10DZ	14.5	50	M8X50L	
CQ2B63 <sup>5</sup> -15DZ		55	M8X55L	
CQ2B63 <sup>5</sup> -20DZ		60	M8X60L	
CQ2B63 <sup>5</sup> -25DZ		65	M8X65L	
CQ2B63 <sup>5</sup> -30DZ		70	M8X70L	
CQ2B63 <sup>5</sup> -35DZ		75	M8X75L	
CQ2B63 <sup>5</sup> -40DZ		80	M8X80L	
CQ2B63 <sup>5</sup> -45DZ		85	M8X85L	
CQ2B63 <sup>5</sup> -50DZ		90	M8X90L	
CQ2B63 <sup>5</sup> -75DZ		125	M8X125L	
CQ2B63 <sup>5</sup> -100DZ	150	M8X150L		

Cylinder model	C	D	Mounting bolt
CQ2B80 <sup>5</sup> -10DZ	15	55	M10X55L
CQ2B80 <sup>5</sup> -15DZ		60	M10X60L
CQ2B80 <sup>5</sup> -20DZ		65	M10X65L
CQ2B80 <sup>5</sup> -25DZ		70	M10X70L
CQ2B80 <sup>5</sup> -30DZ		75	M10X75L
CQ2B80 <sup>5</sup> -35DZ		80	M10X80L
CQ2B80 <sup>5</sup> -40DZ		85	M10X85L
CQ2B80 <sup>5</sup> -45DZ		90	M10X90L
CQ2B80 <sup>5</sup> -50DZ		95	M10X95L
CQ2B80 <sup>5</sup> -75DZ		130	M10X130L
CQ2B80 <sup>5</sup> -100DZ	155	M10X155L	
CQ2B100 <sup>5</sup> -10DZ	15.5	65	M10X65L
CQ2B100 <sup>5</sup> -15DZ		70	M10X70L
CQ2B100 <sup>5</sup> -20DZ		75	M10X75L
CQ2B100 <sup>5</sup> -25DZ		80	M10X80L
CQ2B100 <sup>5</sup> -30DZ		85	M10X85L
CQ2B100 <sup>5</sup> -35DZ		90	M10X90L
CQ2B100 <sup>5</sup> -40DZ		95	M10X95L
CQ2B100 <sup>5</sup> -45DZ		100	M10X100L
CQ2B100 <sup>5</sup> -50DZ		105	M10X105L
CQ2B100 <sup>5</sup> -75DZ		140	M10X140L
CQ2B100 <sup>5</sup> -100DZ	165	M10X165L	

### Weight

#### Weight Without Auto Switch

Stroke	(g)											
	5	10	15	20	25	30	35	40	45	50	75	100
Bore size												
ø20	112	126	141	155	169	184	198	212	227	241	—	—
ø25	149	165	182	197	213	229	245	261	277	293	—	—
ø32	203	224	246	267	288	309	330	352	373	394	544	650
ø40	220	241	263	284	306	327	349	371	392	414	568	680
ø50	—	378	411	444	476	509	542	575	608	641	879	1051
ø63	—	547	585	623	662	700	738	776	814	852	1125	1321
ø80	—	973	1034	1094	1154	1214	1275	1335	1395	1455	1873	2169
ø100	—	1703	1783	1863	1944	2024	2104	2185	2265	2345	2915	3323

#### Additional Weight

Bore size (mm)	20	25	32	40	50	63	80	100	
Both ends tapped	—	—	—	6	6	19	45	45	
Rod end male thread	Male thread	6	12	26	27	53	53	120	175
	Nut	4	8	17	17	32	32	49	116
Foot (Including mounting bolts)	—	—	—	154	243	320	690	1057	
Rod flange (Including mounting bolts)	—	—	—	214	373	559	1056	1365	
Head flange (Including mounting bolts)	—	—	—	198	348	534	1017	1309	
Double clevis (Including pin, retaining rings, bolts)	—	—	—	196	393	554	1109	1887	

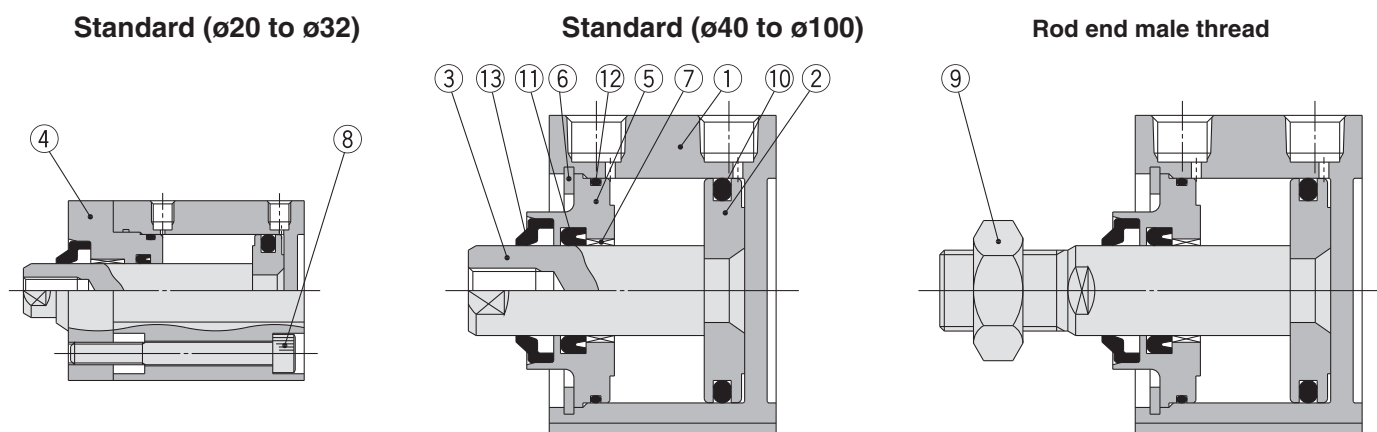
Calculation: (Example) CQ2D40R-20DMZ

- Basic weight: CQ2B40R-20DZ ..... 284 g
- Additional weight: Both ends tapped ..... 6 g
- Rod end male thread ..... 44 g
- Double clevis ..... 196 g

530 g  
 Add each weight of auto switches when auto switches are mounted.

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø20 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Rod cover	Aluminum alloy	ø20 to ø32, Anodised
5	Collar	Aluminum alloy	ø40 to ø100, Anodised
6	Retaining ring	Carbon tool steel	ø40 to ø100, Phosphate coated
7	Bushing	Oil-impregnated sintered alloy	ø20, ø25
		Bearing alloy	ø32 to ø100
8	Hexagon socket head cap screw	Chromium molybdenum steel	ø20 to ø32, Nickel plated
9	Rod end nut	Carbon steel	Nickel plated
10	Piston seal	R: NBR	
		V: FKM	
11	Rod seal	R: NBR	
		V: FKM	
12	Tube gasket	R: NBR	
		V: FKM	
13	Rod scraper	R: NBR	
		V: FKM	

\* R: NBR seal (Nitrile rubber) V: FKM seal (Fluororubber)

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.		Contents
	R: NBR	V: FKM	
20	CQ2B20R-PS	CQ2B20V-PS	Kits include items ⑩, ⑪, ⑫ from the table.
25	CQ2B25R-PS	CQ2B25V-PS	
32	CQ2B32R-PS	CQ2B32V-PS	
40	CQ2B40R-PS	CQ2B40V-PS	
50	CQ2B50R-PS	CQ2B50V-PS	
63	CQ2B63R-PS	CQ2B63V-PS	
80	CQ2B80R-PS	CQ2B80V-PS	
100	CQ2B100R-PS	CQ2B100V-PS	

- \* Seal kit includes ⑩, ⑪, ⑫. Order the seal kit, based on each bore size.
  - \* A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a rod cover and collar, but also with a rod cover assembly and collar assembly. Contact SMC separately for how to order them.
  - \* Since the seal kit does not include a grease pack, order it separately.
- Grease pack part no.: GR-S-010 (10 g)**

### Retaining Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

### Handling Precautions

#### ⚠ Caution

- Before installing a cylinder, thoroughly flush out the piping to prevent dust or cutting chips from entering the cylinder. For hydraulic cylinders, use the air bleed valve to release the air inside the cylinder.
- Eccentric loads applied to the piston rod dramatically shorten the service life. Use the piston rod by always applying a load in an axial direction.
- Make sure not to scratch or gouge the sliding portion of the piston rod, as this could damage the seals and lead to leakage.

### Handling Precautions

#### ⚠ Caution

- When the cylinder is exposed to dust or sand, or is used in a place where liquid from the piston rod splashes, use the heavy-duty scraper (-XC4) type.
- If there is a possibility of liquid splashing on cylinder fittings when using an air cylinder, use insert fittings, self-align fittings, steel piping, etc. Consider the compatibility of liquid components and piping materials before using.
- When selecting seals, generally use NBR (nitrile rubber) seals with liquids that do not contain chlorine and sulfur, and use FKM (fluoro rubber) seals with liquids that contain chlorine and sulfur. However, depending on the type and the brand of liquid (such as coolant liquid) that splashes on the cylinder, the operating life of seals may be reduced dramatically.

#### Examples of coolant liquid

- Shimiron, PA-O-5 (Daido Chemical Industry Co., Ltd.) (NBR seals)
- Noritake Cool, AFG-S (Noritake Co., Ltd.) (NBR seals)
- Yushiroken, S-46S (Yushiro Chemical Industry Co., Ltd.) (NBR seals)
- Yushiroken, EC-50-T3 (Yushiro Chemical Industry Co., Ltd.) (NBR seals)
- Yushiron Oil, No. 23 (Yushiro Chemical Industry Co., Ltd.) (FKM seals)
- Daphne Cut, Hs-1 (Idemitsu Kosan Co., Ltd.) (FKM seals)

# Water Resistant: Double Acting, Single Rod Series **CDQ2** With Auto Switch



## Weight

### Weight

Stroke Bore size	(g)											
	5	10	15	20	25	30	35	40	45	50	75	100
ø20	130	142	155	167	179	191	204	216	228	240	—	—
ø25	182	197	213	228	244	259	275	290	306	320	—	—
ø32	263	284	305	327	348	369	390	412	433	454	561	668
ø40	293	315	336	358	379	401	422	444	465	487	598	710
ø50	—	489	522	555	588	620	653	687	720	753	925	1097
ø63	—	700	738	776	814	852	890	928	966	1004	1201	1397
ø80	—	1219	1279	1340	1400	1460	1520	1581	1641	1701	1998	2295
ø100	—	2061	2142	2222	2302	2383	2463	2543	2624	2704	3112	3520

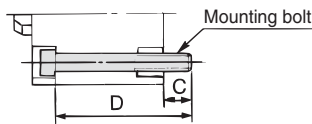
### Additional Weight

Bore size (mm)		20	25	32	40	50	63	80	100
Both ends tapped		—	—	—	6	6	19	45	45
Rod end male thread	Male thread	6	12	26	27	53	53	120	175
	Nut	4	8	17	17	32	32	49	116
Foot (Including mounting bolts)		—	—	—	154	243	320	690	1057
Rod flange (Including mounting bolts)		—	—	—	214	373	559	1056	1365
Head flange (Including mounting bolts)		—	—	—	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)		—	—	—	196	393	554	1109	1887

Calculation: (Example) **CDQ2D40R-20DMZ**  
 • Basic weight: CDQ2B40R-20DZ ..... 358 g  
 • Additional weight: Both ends tapped ..... 6 g  
 Rod end male thread ..... 44 g  
 Double clevis ..... 196 g  
 604 g

Add each weight of auto switches when auto switches are mounted.

## Mounting Bolt for CDQ2B/With Auto Switch



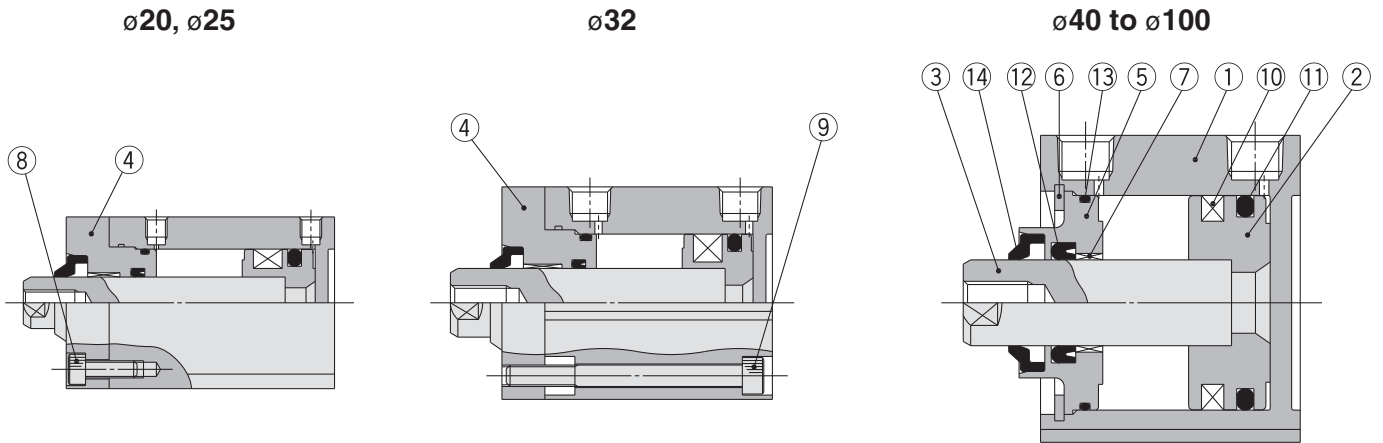
Cylinder model	C	D	Mounting bolt
CDQ2B20 <sup>5</sup> -5DZ	10.5	50	M5X50L
CDQ2B20 <sup>5</sup> -10DZ		55	M5X55L
CDQ2B20 <sup>5</sup> -15DZ		60	M5X60L
CDQ2B20 <sup>5</sup> -20DZ		65	M5X65L
CDQ2B20 <sup>5</sup> -25DZ		70	M5X70L
CDQ2B20 <sup>5</sup> -30DZ		75	M5X75L
CDQ2B20 <sup>5</sup> -35DZ		80	M5X80L
CDQ2B20 <sup>5</sup> -40DZ		85	M5X85L
CDQ2B20 <sup>5</sup> -45DZ		90	M5X90L
CDQ2B20 <sup>5</sup> -50DZ		95	M5X95L
CDQ2B25 <sup>5</sup> -5DZ	9.5	50	M5X50L
CDQ2B25 <sup>5</sup> -10DZ		55	M5X55L
CDQ2B25 <sup>5</sup> -15DZ		60	M5X60L
CDQ2B25 <sup>5</sup> -20DZ		65	M5X65L
CDQ2B25 <sup>5</sup> -25DZ		70	M5X70L
CDQ2B25 <sup>5</sup> -30DZ		75	M5X75L
CDQ2B25 <sup>5</sup> -35DZ		80	M5X80L
CDQ2B25 <sup>5</sup> -40DZ		85	M5X85L
CDQ2B25 <sup>5</sup> -45DZ		90	M5X90L
CDQ2B25 <sup>5</sup> -50DZ		95	M5X95L
CDQ2B32 <sup>5</sup> -5DZ	9	50	M5X50L
CDQ2B32 <sup>5</sup> -10DZ		55	M5X55L
CDQ2B32 <sup>5</sup> -15DZ		60	M5X60L
CDQ2B32 <sup>5</sup> -20DZ		65	M5X65L
CDQ2B32 <sup>5</sup> -25DZ		70	M5X70L
CDQ2B32 <sup>5</sup> -30DZ		75	M5X75L
CDQ2B32 <sup>5</sup> -35DZ		80	M5X80L
CDQ2B32 <sup>5</sup> -40DZ		85	M5X85L
CDQ2B32 <sup>5</sup> -45DZ		90	M5X90L
CDQ2B32 <sup>5</sup> -50DZ		95	M5X95L
CDQ2B32 <sup>5</sup> -75DZ	120	M5X120L	
CDQ2B32 <sup>5</sup> -100DZ	145	M5X145L	

Cylinder model	C	D	Mounting bolt	
CDQ2B40 <sup>5</sup> -5DZ	7.5	45	M5X45L	
CDQ2B40 <sup>5</sup> -10DZ		50	M5X50L	
CDQ2B40 <sup>5</sup> -15DZ		55	M5X55L	
CDQ2B40 <sup>5</sup> -20DZ		60	M5X60L	
CDQ2B40 <sup>5</sup> -25DZ		65	M5X65L	
CDQ2B40 <sup>5</sup> -30DZ		70	M5X70L	
CDQ2B40 <sup>5</sup> -35DZ		75	M5X75L	
CDQ2B40 <sup>5</sup> -40DZ		80	M5X80L	
CDQ2B40 <sup>5</sup> -45DZ		85	M5X85L	
CDQ2B40 <sup>5</sup> -50DZ		90	M5X90L	
CDQ2B40 <sup>5</sup> -75DZ	12.5	115	M5X115L	
CDQ2B40 <sup>5</sup> -100DZ		140	M5X140L	
CDQ2B50 <sup>5</sup> -10DZ		7.5	55	M6X55L
CDQ2B50 <sup>5</sup> -15DZ			60	M6X60L
CDQ2B50 <sup>5</sup> -20DZ			65	M6X65L
CDQ2B50 <sup>5</sup> -25DZ			70	M6X70L
CDQ2B50 <sup>5</sup> -30DZ			75	M6X75L
CDQ2B50 <sup>5</sup> -35DZ			80	M6X80L
CDQ2B50 <sup>5</sup> -40DZ			85	M6X85L
CDQ2B50 <sup>5</sup> -45DZ			90	M6X90L
CDQ2B50 <sup>5</sup> -50DZ	95		M6X95L	
CDQ2B50 <sup>5</sup> -75DZ	14.5		120	M6X120L
CDQ2B50 <sup>5</sup> -100DZ		145	M6X145L	
CDQ2B63 <sup>5</sup> -10DZ		14.5	60	M8X60L
CDQ2B63 <sup>5</sup> -15DZ			65	M8X65L
CDQ2B63 <sup>5</sup> -20DZ			70	M8X70L
CDQ2B63 <sup>5</sup> -25DZ			75	M8X75L
CDQ2B63 <sup>5</sup> -30DZ			80	M8X80L
CDQ2B63 <sup>5</sup> -35DZ			85	M8X85L
CDQ2B63 <sup>5</sup> -40DZ			90	M8X90L
CDQ2B63 <sup>5</sup> -45DZ			95	M8X95L
CDQ2B63 <sup>5</sup> -50DZ	100		M8X100L	
CDQ2B63 <sup>5</sup> -75DZ	125		M8X125L	
CDQ2B63 <sup>5</sup> -100DZ	150	M8X150L		

Cylinder model	C	D	Mounting bolt	
CDQ2B80 <sup>5</sup> -10DZ	15	65	M10X65L	
CDQ2B80 <sup>5</sup> -15DZ		70	M10X70L	
CDQ2B80 <sup>5</sup> -20DZ		75	M10X75L	
CDQ2B80 <sup>5</sup> -25DZ		80	M10X80L	
CDQ2B80 <sup>5</sup> -30DZ		85	M10X85L	
CDQ2B80 <sup>5</sup> -35DZ		90	M10X90L	
CDQ2B80 <sup>5</sup> -40DZ		95	M10X95L	
CDQ2B80 <sup>5</sup> -45DZ		100	M10X100L	
CDQ2B80 <sup>5</sup> -50DZ		105	M10X105L	
CDQ2B80 <sup>5</sup> -75DZ		15.5	130	M10X130L
CDQ2B80 <sup>5</sup> -100DZ	155		M10X155L	
CDQ2B100 <sup>5</sup> -10DZ	15.5		75	M10X75L
CDQ2B100 <sup>5</sup> -15DZ			80	M10X80L
CDQ2B100 <sup>5</sup> -20DZ			85	M10X85L
CDQ2B100 <sup>5</sup> -25DZ			90	M10X90L
CDQ2B100 <sup>5</sup> -30DZ			95	M10X95L
CDQ2B100 <sup>5</sup> -35DZ			100	M10X100L
CDQ2B100 <sup>5</sup> -40DZ			105	M10X105L
CDQ2B100 <sup>5</sup> -45DZ			110	M10X110L
CDQ2B100 <sup>5</sup> -50DZ		115	M10X115L	
CDQ2B100 <sup>5</sup> -75DZ		140	M10X140L	
CDQ2B100 <sup>5</sup> -100DZ	165	M10X165L		

# Series CQ2

## Construction



### Component Parts

No.	Description	Material	Note
1	<b>Cylinder tube</b>	Aluminum alloy	Hard anodised
2	<b>Piston</b>	Aluminum alloy	Chromated
3	<b>Piston rod</b>	Stainless steel	ø20 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	<b>Rod cover</b>	Aluminum alloy	ø20 to ø32, Anodised
5	<b>Collar</b>	Aluminum alloy	ø40 to ø100, Anodised
6	<b>Retaining ring</b>	Carbon tool steel	Phosphate coated
7	<b>Bushing</b>	Oil-impregnated sintered alloy	ø20, ø25
		Bearing alloy	ø32 to ø100
8	Hexagon socket head cap screw	Chromium molybdenum steel	ø20 to ø25, Nickel plated
9	Hexagon socket head cap screw	Chromium molybdenum steel	ø32, Nickel plated
10	<b>Magnet</b>	—	
11	<b>Piston seal</b>	R: NBR	
		V: FKM	
12	<b>Rod seal</b>	R: NBR	
		V: FKM	
13	<b>Tube gasket</b>	R: NBR	
		V: FKM	
14	<b>Rod scraper</b>	R: NBR	
		V: FKM	

\* R: NBR seal (Nitrile rubber)  
V: FKM seal (Fluororubber)

### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.		Contents
	R: NBR	V: FKM	
20	CQ2B20R-PS	CQ2B20V-PS	Kits include items ⑪, ⑫, ⑬ from the table.
25	CQ2B25R-PS	CQ2B25V-PS	
32	CQ2B32R-PS	CQ2B32V-PS	
40	CQ2B40R-PS	CQ2B40V-PS	
50	CQ2B50R-PS	CQ2B50V-PS	
63	CQ2B63R-PS	CQ2B63V-PS	
80	CQ2B80R-PS	CQ2B80V-PS	
100	CQ2B100R-PS	CQ2B100V-PS	

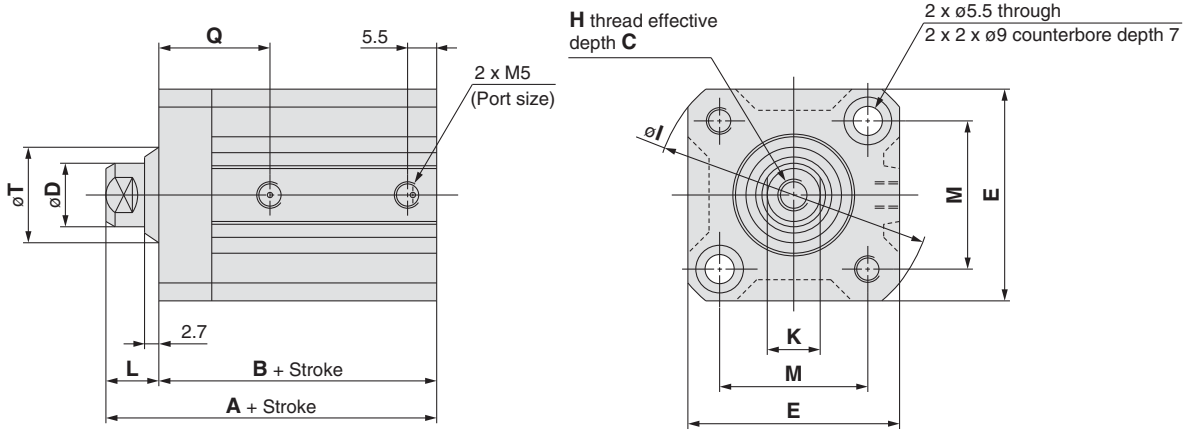
\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit, based on each bore size.  
\* A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a rod cover and collar, but also with a rod cover assembly and collar assembly. Contact SMC separately for how to order them.  
\* Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**



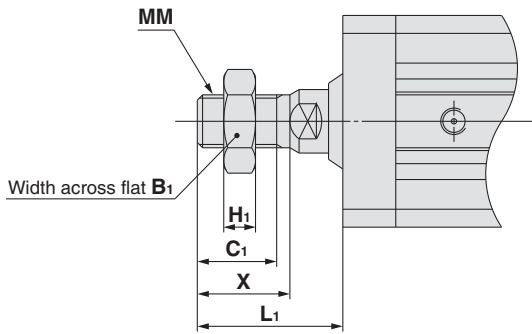
Dimensions

**Ø20, Ø25/Without Auto Switch**

Standard (Through-hole): CQ2B



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
20	13	12	5	23.5	M8 x 1.25	14
25	17	15	6	27.5	M10 x 1.25	17.5

Standard

(mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	I	K	L	M	Q	T
20	5 to 50	39	29.5	7	10	36	M5 x 0.8	47	8	9.5	25.5	19	16.1
25	5 to 50	42.5	32.5	12	12	40	M6 x 1.0	52	10	10	28	21	18.1

\* For details about the rod end nut and accessory brackets, refer to page 19.

\* Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

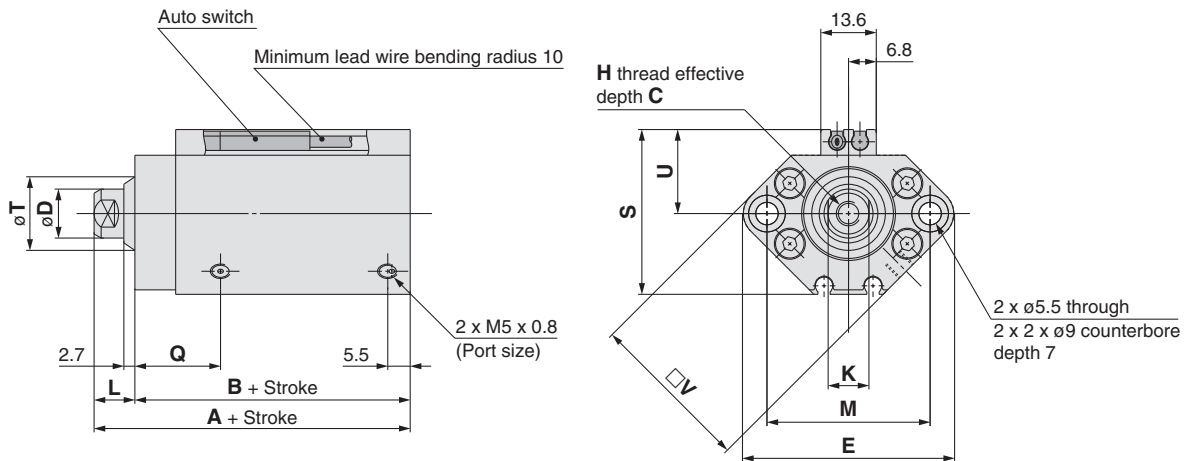
Made to Order

# Series CQ2

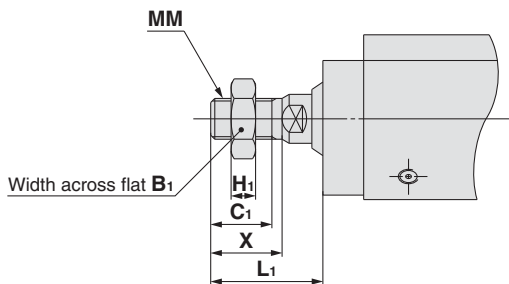
## Dimensions

### Ø20, Ø25/With Auto Switch

#### Standard (Through-hole): CDQ2B



#### Rod end male thread



**Rod End Male Thread** (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
20	13	12	5	23.5	M8 x 1.25	14
25	17	15	6	27.5	M10 x 1.25	17.5

**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	K	L	M	Q	S	T	U	V
20	5 to 50	51	41.5	7	10	47	M5 x 0.8	8	9.5	36	20.5	35.5	16.1	18	36
25	5 to 50	52.5	42.5	12	12	52	M6 x 1.0	10	10	40	21	40.5	18.1	21	40

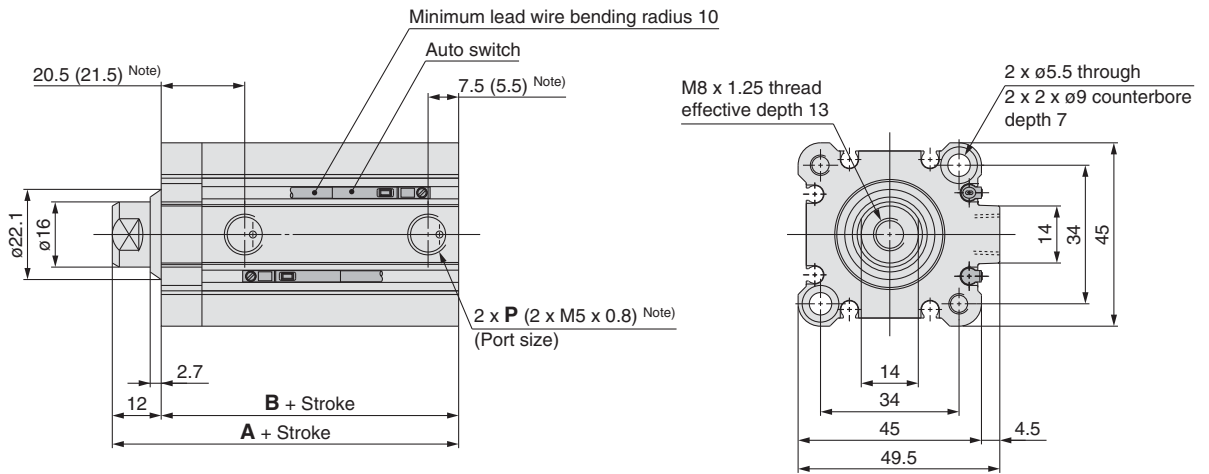
\* For details about the rod end nut and accessory brackets, refer to page 19.

\* Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

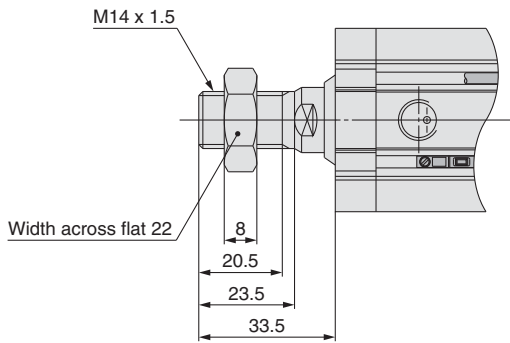
Dimensions

**Ø32/With Auto Switch**

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)



**Rod end male thread**



Note ( ): Without auto switch, 5 mm strokes

(mm)

Stroke range (mm)	Without auto switch		With auto switch		P		
	A	B	A	B	—	TN	TF
5 to 50	45	33	55	43	Rc1/8	NPT1/8	G1/8
75, 100	55	43					

\* For details about the rod end nut and accessory brackets, refer to page 19.

\* Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

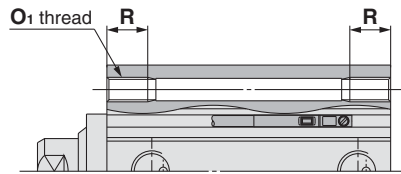
# Series CQ2

## Dimensions

### Ø40, Ø50/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

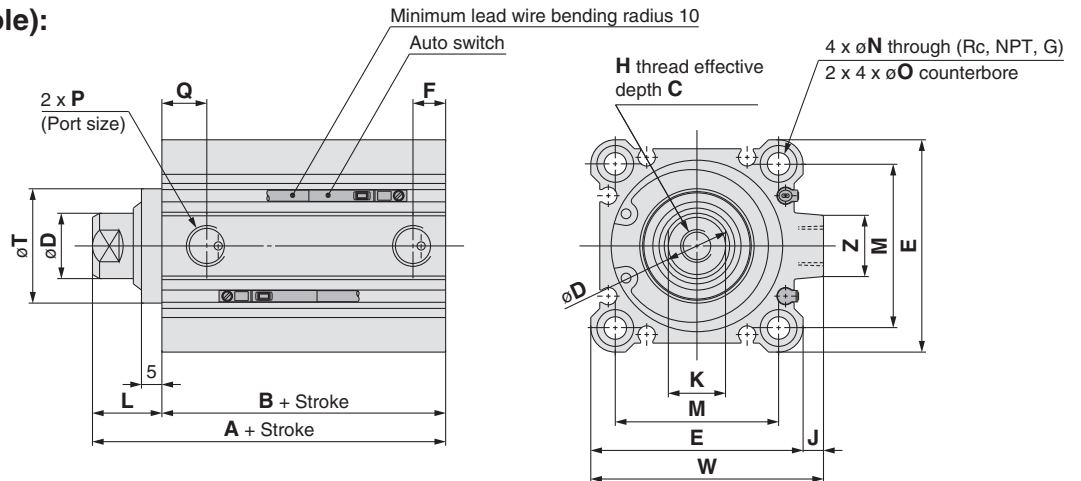
#### Both ends tapped: CQ2A/CDQ2A



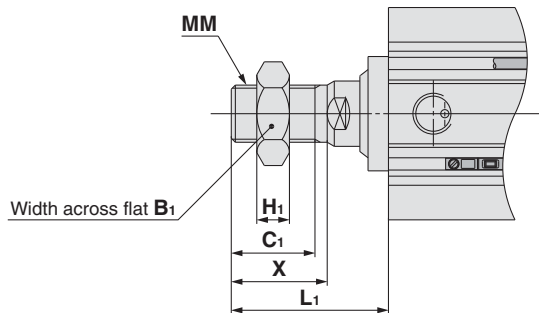
#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
40	M6 x 1.0	10
50	M8 x 1.25	14

#### Standard (Through-hole): CQ2B/CDQ2B



#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
40	22	20.5	8	38.5	M14 x 1.5	23.5
50	27	26	11	43.5	M18 x 1.5	28.5

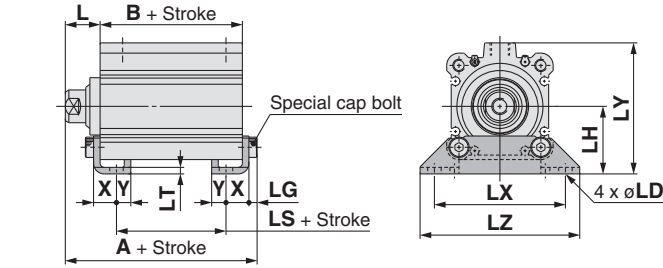
**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	T	W	Z
		A	B	A	B																
40	5 to 50	46.5	29.5	56.5	39.5	13	16	52	8	M8 x 1.25	5	14	17	40	5.5	9 depth 7	1/8	11	28	57	15
	75, 100	56.5	39.5																		
50	10 to 50	48.5	30.5	58.5	40.5	15	20	64	10.5	M10 x 1.5	7	17	18	50	6.6	11 depth 8	1/4	10.5	35	71	19
	75, 100	58.5	40.5																		

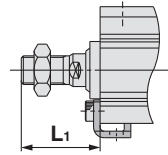
Note 1) For details about the rod end nut and accessory brackets, refer to page 19.

Note 2) Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

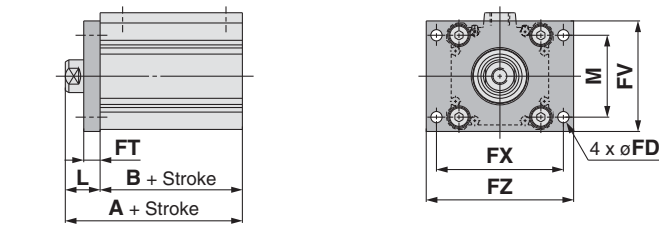
**Foot: CQ2L/CDQ2L**



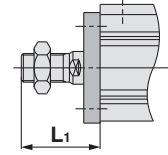
Rod end male thread



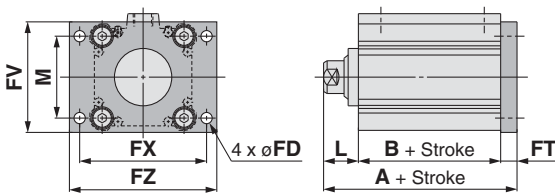
**Rod flange: CQ2F/CDQ2F**



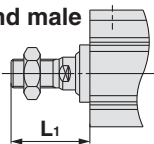
Rod end male thread



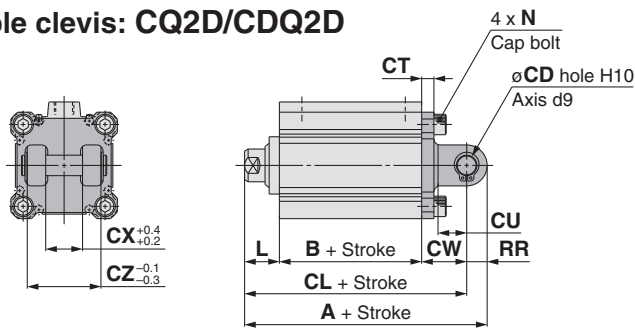
**Head flange: CQ2G/CDQ2G**



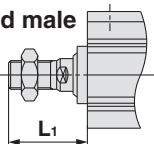
Rod end male thread



**Double clevis: CQ2D/CDQ2D**



Rod end male thread



**Foot**

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD
		A	B	LS	A	B	LS			
40	5 to 50	53.7	29.5	13.5	63.7	39.5	23.5	17	38.5	6.6
	75, 100	63.7	39.5	23.5						
50	10 to 50	56.7	30.5	7.5	66.7	40.5	17.5	18	43.5	9
	75, 100	66.7	40.5	17.5						

Bore size (mm)	LG	LH	LT	LX	LY	LZ	X	Y
40	4	33	3.2	64	64	78	11.2	7
50	5	39	3.2	79	78	95	14.7	8

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

**Rod Flange**

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ
		A	B	A	B					
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72
	75, 100	56.5	39.5							
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89
	75, 100	58.5	40.5							

Bore size (mm)	L	L <sub>1</sub>	M
40	17	38.5	40
50	18	43.5	50

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Head Flange**

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch
		A	A
40	5 to 50	54.5	64.5
	75, 100	64.5	
50	10 to 50	57.5	67.5
	75, 100	67.5	

(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis**

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU
		A	B	CL	A	B	CL			
40	5 to 50	78.5	29.5	68.5	88.5	39.5	78.5	10	6	14
	75, 100	88.5	39.5	78.5						
50	10 to 50	90.5	30.5	76.5	100.5	40.5	86.5	14	7	20
	75, 100	100.5	40.5	86.5						

Bore size (mm)	CW	CX	CZ	L	L <sub>1</sub>	N	RR
40	22	18	36	17	38.5	M6 x 1.0	10
50	28	22	44	18	43.5	M8 x 1.25	14

Double clevis bracket material: Cast iron  
Surface treatment: Painted

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

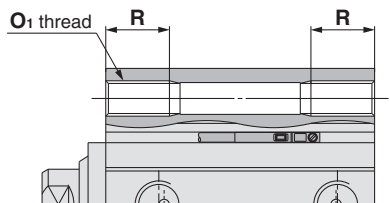
# Series CQ2

## Dimensions

### Ø63 to Ø100/With Auto Switch

(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

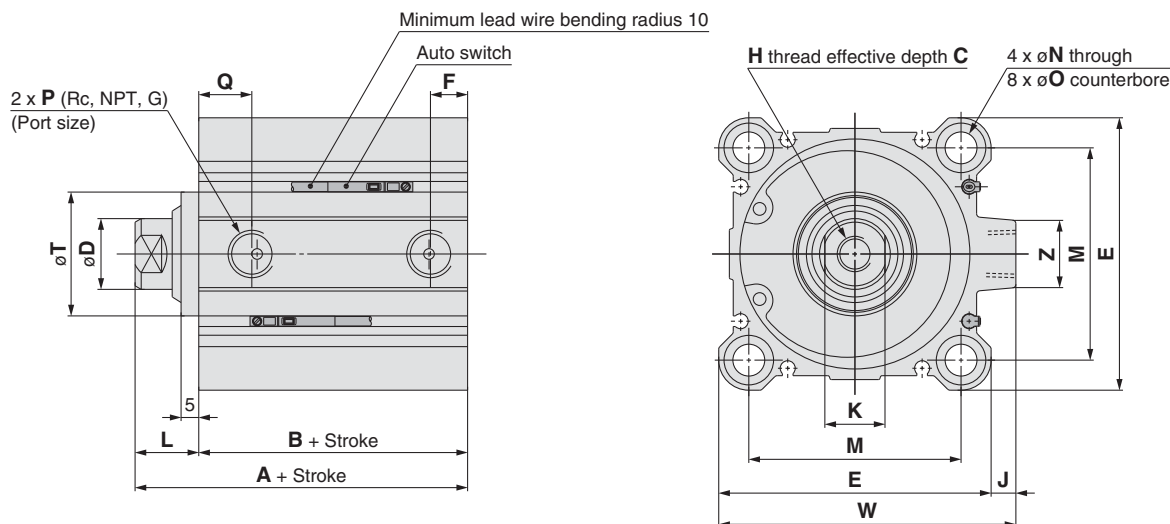
#### Both ends tapped: CQ2A/CDQ2A



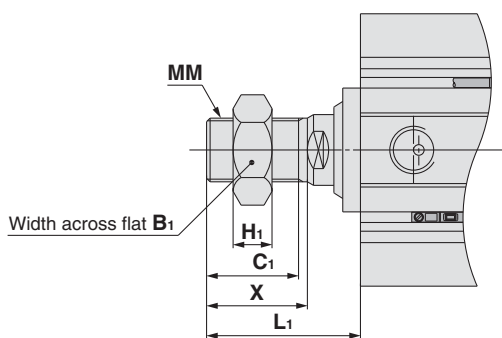
#### Both Ends Tapped

Bore size (mm)	O <sub>1</sub>	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

#### Standard (Through-hole): CQ2B/CDQ2B



#### Rod end male thread



#### Rod End Male Thread

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
63	27	26	11	43.5	M18 x 1.5	28.5
80	32	32.5	13	53.5	M22 x 1.5	35.5
100	41	32.5	16	53.5	M26 x 1.5	35.5

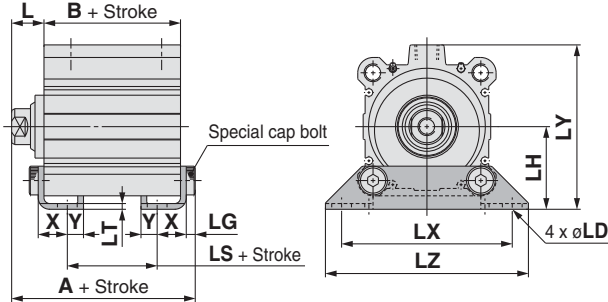
**Standard** For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	T
		A	B	A	B														
63	10 to 50	54	36	64	46	15	20	77	10.5	M10 x 1.5	7	17	18	60	9	14 depth 10.5	1/4	15	35
	75, 100	64	46																
80	10 to 50	63.5	43.5	73.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	20	77	11	17.5 depth 13.5	3/8	16	43
	75, 100	73.5	53.5																
100	10 to 50	75	53	85	63	27	30	117	13	M20 x 2.5	6.5	27	22	94	11	17.5 depth 13.5	3/8	23	59
	75, 100	85	63																

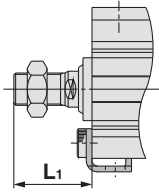
Bore size (mm)	W	Z
63	84	19
80	104	25
100	123.5	25

\* For details about the rod end nut and accessory brackets, refer to page 19.  
Note) Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

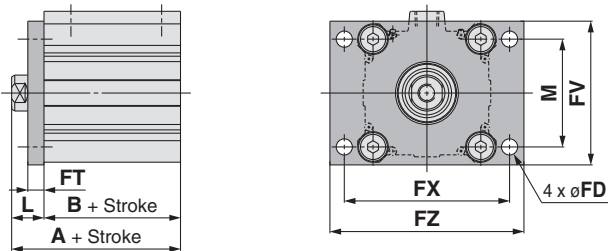
**Foot: CQ2L/CDQ2L**



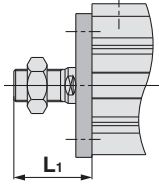
Rod end male thread



**Rod flange: CQ2F/CDQ2F**



Rod end male thread



**Foot** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L <sub>1</sub>	LD	LG	LH	LT
		A	B	LS	A	B	LS						
63	10 to 50	62.2	36	10	72.2	46	20	18	43.5	11	5	46	3.2
	75, 100	72.2	46	20									
80	10 to 50	75	43.5	13.5	85	53.5	23.5	20	53.5	13	7	59	4.5
	75, 100	85	53.5	23.5									
100	10 to 50	88	53	19	98	63	29	22	53.5	13	7	71	6
	75, 100	98	63	29									

Foot bracket material: Carbon steel  
Surface treatment: Nickel plated

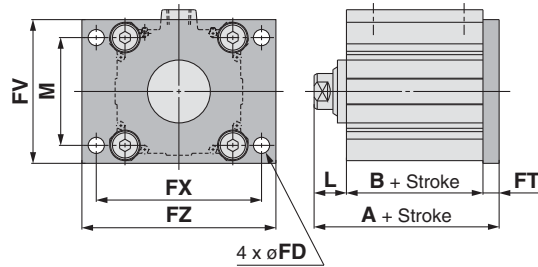
Bore size (mm)	Stroke range (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

**Rod Flange** (mm)

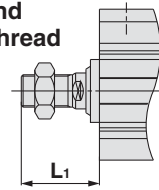
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L <sub>1</sub>	M
		A	B	A	B								
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63	11	11	117	136	154	22	53.5	94
	75, 100	85	63										

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

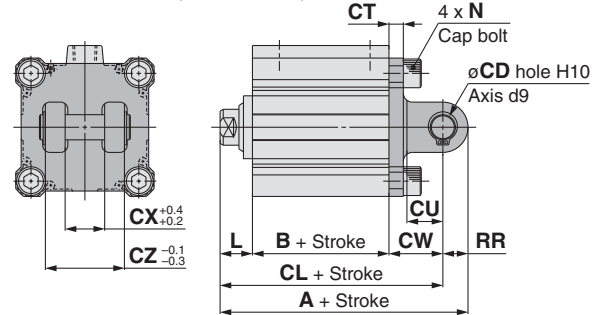
**Head flange: CQ2G/CDQ2G**



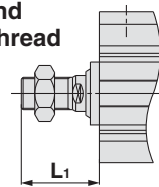
Rod end male thread



**Double clevis: CQ2D/CDQ2D**



Rod end male thread



**Head Flange** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch
		A	A
63	10 to 50	63	73
	75, 100	73	
80	10 to 50	74.5	84.5
	75, 100	84.5	
100	10 to 50	86	96
	75, 100	96	

(\* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel  
Surface treatment: Nickel plated

**Double Clevis** (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			CD	CT	CU	CW	CX
		A	B	CL	A	B	CL					
63	10 to 50	98	36	84	108	46	94	14	8	20	30	22
	75, 100	108	46	94								
80	10 to 50	119.5	43.5	101.5	129.5	53.5	111.5	18	10	27	38	28
	75, 100	129.5	53.5	111.5								
100	10 to 50	142	53	120	152	63	130	22	13	31	45	32
	75, 100	152	63	130								

Double clevis bracket material: Cast iron  
Surface treatment: Painted

Bore size (mm)	Stroke range (mm)	CZ	L	L <sub>1</sub>	N	RR
63	10 to 50	44	18	43.5	M10 x 1.5	14
	75, 100					
80	10 to 50	56	20	53.5	M12 x 1.75	18
	75, 100					
100	10 to 50	64	22	53.5	M12 x 1.75	22
	75, 100					

\* For details about the rod end nut and accessory brackets, refer to page 19.  
\* Double clevis pin and retaining rings are included.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

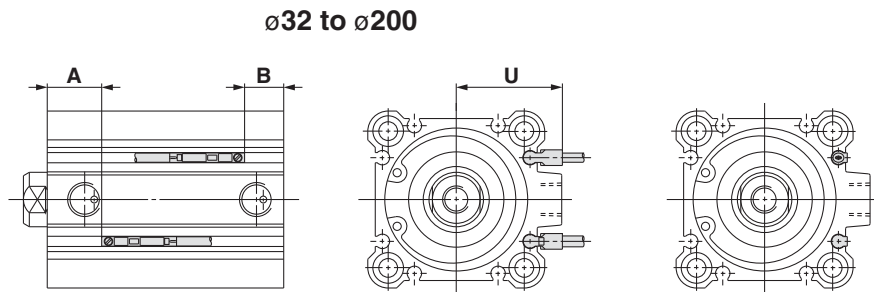
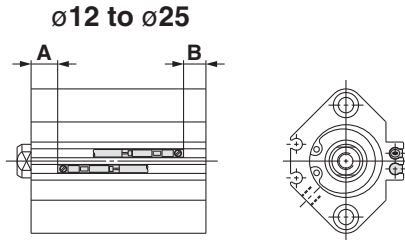
Made to Order

# Compact Cylinder Series **CDQ2** With Auto Switch 1

## 1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

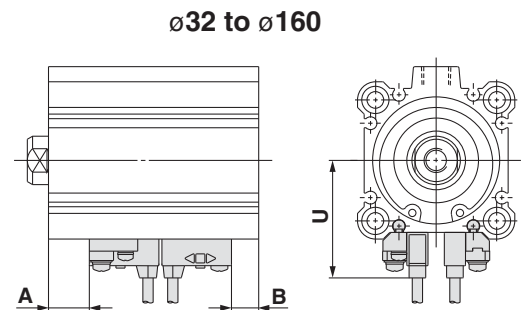
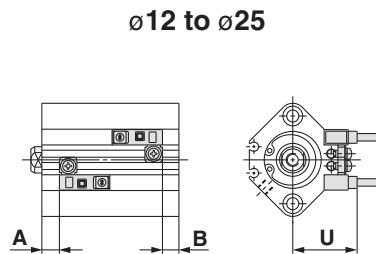
Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/-□T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant)

D-A9□  
D-M9□  
D-M9□W  
D-M9□AL  
D-A9□V  
D-M9□V  
D-M9□WV  
D-M9□AVL



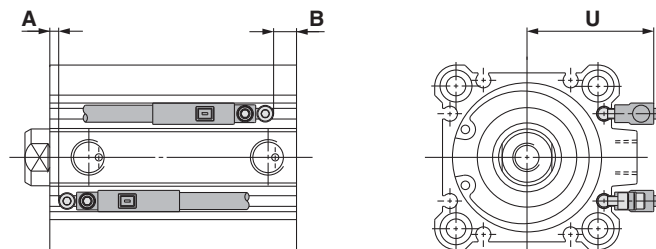
D-A7□  
D-A80  
D-A7□H  
D-A80H  
D-F7□  
D-J79  
D-F7□W  
D-J79W  
D-F79F

D-F7NTL  
D-F7BAL  
D-A73C  
D-A80C  
D-J79C  
D-A79W  
D-F7□WV  
D-F7□V  
D-F7BAVL



D-P3DW□

ø32 to ø100





### Auto Switch Proper Mounting Position

#### Applicable Cylinder Series: CDQ2 (Double acting, Single rod) (mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
12	2	3	6	7	4.5	5.5	5	6	10	11	2	3	—	—
16	5	2.5	9	6.5	7.5	5	8	5.5	13	10.5	5	2.5	—	—
20	5	3.5	9	7.5	7.5	6	8	6.5	13	11.5	5	3.5	—	—
25	5.5	4	9.5	8	8	6.5	8.5	7	13.5	12	5.5	4	—	—
32	8	5	12	9	9	6	9.5	6.5	14.5	11.5	6.5	3.5	2.5	0
40	12	7.5	16	11.5	13	8.5	13.5	9	18.5	14	10.5	6	6.5	2
50	10	10.5	14	14.5	11	11.5	11.5	12	16.5	17	8.5	9	4.5	4.5
63	12.5	13.5	16.5	17.5	13.5	14.5	14	15	19	20	11	12	7	7.5
80	15.5	18	19.5	22	16.5	19	17	19.5	22	24.5	14	16.5	10	12
100	20	23	24	27	21	24	21.5	24.5	26.5	29.5	18.5	21.5	14.5	17.5

#### Applicable Cylinder Series: CDQ2W (Double acting, Double rod) (mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
12	2	7.5	6	11.5	4.5	10	5	10.5	10	15.5	2	7.5	—	—
16	5	8	9	12	7.5	10.5	8	11	13	16	5	8	—	—
20	5	10	9	14	7.5	12.5	8	13	13	18	5	10	—	—
25	5.5	10.5	9.5	14.5	8	13	8.5	13.5	13.5	18.5	5.5	10.5	—	—
32	8	12.5	12	16.5	9	13.5	9.5	14	14.5	19	6.5	11	2.5	7
40	12	18	16	22	13	19	13.5	19.5	18.5	24.5	10.5	16.5	6.5	12.5
50	10	20.5	14	24.5	11	21.5	11.5	22	16.5	27	8.5	19	4.5	14.5
63	12.5	19.5	16.5	23.5	13.5	20.5	14	21	19	26	11	18	7	13.5
80	15.5	25.5	19.5	29.5	16.5	26.5	17	27	22	32	14	24	10	19.5
100	20	30.5	24	34.5	21	31.5	21.5	32	26.5	37	18.5	29	14.5	25

#### Applicable Cylinder Series: CDQ2□□□-□S/□T (Single acting) (mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W	
	A	B	A	B	A	B	A	B	A	B	A	B
Bore size												
12	2	3 (7.5)	6	7 (11.5)	4.5	5.5 (10)	5	6 (10.5)	10	11 (15.5)	2	3 (7.5)
16	5 (3)	2.5 (4.5)	9 (7)	6.5 (8.5)	7.5 (5.5)	5 (7)	8 (6)	5.5 (7.5)	13 (11)	10.5 (12.5)	5 (3)	2.5 (4.5)
20	5	3.5	9	7.5	7.5	6	8	6.5	13	11.5	5	3.5
25	5.5	4	9.5	8	8	6.5	8.5	7	13.5	12	5.5	4
32	8	5	12	9	9	6	9.5	6.5	14.5	11.5	6.5	3.5
40	12	7.5	16	11.5	13	8.5	13.5	9	18.5	14	10.5	6
50	10	10.5	14	14.5	11	11.5	11.5	12	16.5	17	8.5	9

( ) : Spring extend type

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Compact Cylinder Series CDQ2 With Auto Switch 2

## 1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

### Auto Switch Proper Mounting Position

#### Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C D-F7□/F7□V D-F79F/F7□W D-F7□WV/J79 D-J79W/J79C D-F7BAL D-F7BAVL		D-A79W		D-F7NTL		
	A	B	A	B	A	B	A	B	A	B	A	B	
Bore size													
125	30	30	34	34	32.5	32.5	33	33	30	30	38	38	
140	30	30	34	34	32.5	32.5	33	33	30	30	38	38	
160	34	34	38	38	36.5	36.5	37	37	34	34	42	42	
180	40.5	40.5	44.5	44.5	—	—	—	—	—	—	—	—	
200	43.5	43.5	47.5	47.5	—	—	—	—	—	—	—	—	

#### Applicable Cylinder Series: CDQ2 (Long stroke)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
32	8.5	16.5	12.5	20.5	9.5	17.5	10	18	15	23	7	15	3	11
40	12	22.5	16	26.5	13	23.5	13.5	24	18.5	29	10.5	21	6.5	17
50	10	25.5	14	29.5	11	26.5	11.5	27	16.5	32	8.5	24	4.5	19.5
63	12.5	24.5	16.5	28.5	13.5	25.5	14	26	19	31	11	23	7	18.5
80	15.5	30.5	19.5	34.5	16.5	31.5	17	32	22	37	14	29	10	24.5
100	18.5	37	22.5	41	19.5	38	20	38.5	25	43.5	17	35.5	13	31

#### Applicable Cylinder Series: CDQ2K (Non-rotating rod)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
12	7	3	11	7	9.5	5.5	10	6	15	11	7	3	—	—
16	10	2.5	14	6.5	12.5	5	13	5.5	18	10.5	10	2.5	—	—
20	13	3.5	17	7.5	15.5	6	16	6.5	21	11.5	13	3.5	—	—
25	13.5	4	17.5	8	16	6.5	16.5	7	21.5	12	13	4	—	—
32	17	5	21	9	18	6	18.5	6.5	23.5	11.5	15.5	3.5	11.5	0
40	12	7.5	16	11.5	13	8.5	13.5	9	18.5	14	10.5	6	6.5	2
50	10	10.5	14	14.5	11	11.5	11.5	12	16.5	17	8.5	9	4.5	4.5
63	12.5	13.5	16.5	17.5	13.5	14.5	14	15	19	20	11	12	7	7.5

#### Applicable Cylinder Series: CDQ2KW

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
12	7.5	7.5	11.5	11.5	9.5	10	10	10.5	15	15.5	7.5	7.5	—	—
16	10	8	14	12	12.5	10.5	13	11	18	16	10	8	—	—
20	13	10	17	14	15.5	12.5	16	13	21	18	13	10	—	—
25	13.5	10.5	17.5	14.5	16	13	16.5	13.5	21.5	18.5	13.5	10.5	—	—
32	17	12.5	21	16.5	18	13.5	18.5	14	23.5	19	15.5	11	11.5	7
40	12	18	16	22	13	19	13.5	19.5	18.5	24.5	10.5	16.5	6.5	12.5
50	10	20.5	14	24.5	11	21.5	11.5	22	16.5	27	8.5	19	4.5	14.5
63	12.5	19.5	16.5	23.5	13.5	20.5	14	21	19	26	11	18	7	13.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

## Applicable Cylinder Series: CDQ2□S (Anti-lateral load)

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A73 D-A80		D-A72/A7□H/A80H D-A73C/A80C/F7□ D-F79F/J79/F7□V D-J79C/F7□W D-J79W/F7□WV D-F7BAVL/F7BAL		D-F7NTL		D-A79W		D-P3DW□	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size														
32	14	9	18	13	15	10	15.5	10.5	20.5	15.5	12.5	7.5	8	3.5
40	17.5	12	21.5	16	18.5	13	19	13.5	24	18.5	16	10.5	11.5	6.5
50	15	15.5	19	19.5	16	16.5	16.5	17	21.5	22	13.5	14	9.5	9.5
63	17.5	18.5	21.5	22.5	18.5	19.5	19	20	24	25	16	17	12	12.5
80	20.5	23	24.5	27	21.5	24	22	24.5	27	29.5	19	21.5	15	17
100	23.5	29.5	27.5	33.5	24.5	30.5	25	31	30	36	22	28	18	23.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

## Applicable Cylinder Series: CDQ2□R/□V (Water resistant)

(mm)

Auto switch model	D-M9□AL D-M9□AVL		D-F7BAL D-F7BAVL	
	A	B	A	B
Bore size				
20	19	7.5	18	6.5
25	19.5	8	18	7
32	22	9	19.5	6.5
40	16	11.5	13.5	9
50	14	14.5	11.5	12
63	16.5	17.5	14	15
80	19.5	22	17	19.5
100	24	27	21.5	24.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

## Auto Switch Mounting Height

### Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant)

(mm)

Auto switch model	D-M9□V	D-A9□V	D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F/F7NTL D-A7□H/A80H	D-F7□V D-F7□WV	D-J79C	D-A7□ D-A80	D-A73C D-A80C	D-A79W	D-P3DW□
	U	U	U	U	U	U	U	U	U
Bore size									
12	21.5	19	21.5	23.5	26.5	21	27.5	24.5	—
16	22.5	20	22.5	24.5	27.5	22	28.5	25.5	—
20	25	23	25.5	27.5	30	24.5	31	28	—
25	28	26	28	30.5	32.5	27.5	34	31	—
32	30	27.5	36	36.5	39.5	34	40.5	37.5	33
40	32	30	38	40	42.5	37.5	43.5	40.5	36.5
50	37.5	35	43.5	45	48	43	49	46	42
63	42.5	40.5	48.5	50.5	53.5	48	54.5	51.5	47
80	51	49	57	59	61.5	56.5	62.5	59.5	55.5
100	59	57	65.5	67	70	64.5	71	68	65.5

\* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V)L type.

\* The D-P3DW□ type is available from ø32 to ø100.

## Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

(mm)

Auto switch model	D-M9□V D-M9□WV D-M9□AVL	D-A9□V	D-A7□ D-A80	D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F/F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A79W
	U	U	U	U	U	U	U	U
Bore size								
125	69.5	67.5	75.5	76.5	82.5	79	81	78
140	76.5	74.5	82.5	83.5	89.5	86	88	85
160	85.5	83.5	91.5	92.5	98.5	95	97	94
180	105.5	103.5	—	—	—	—	—	—
200	112.5	110.5	—	—	—	—	—	—

# Compact Cylinder Series **CDQ2** With Auto Switch 3

## 2 Minimum Stroke for Auto Switch Mounting

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant) (mm)

Number of auto switches	D-M9□V D-F7□V D-J79C	D-A9□V D-A7□ D-A80 D-A73C D-A80C	D-A9□	D-M9□WV D-M9□AVL* D-F7□WV D-F7BAVL	D-M9□ D-M9□W D-M9□AL* D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL	D-P3DW□
With 1 pc.	5	5	10	10	15	15	20	15
With 2 pcs.	5	10	10	15	15	20	20	15

\* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V)L type.

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size) (mm)

Number of auto switches	D-M9□ D-M9□V D-F7□ D-F7□V D-J79 D-J79C	D-A9□ D-A9□V D-A7□ D-A80 D-A73C D-A80C D-A7□H D-A80H	D-M9□W D-M9□WV D-M9□AL D-M9□AVL	D-F7□W D-F7□WV D-J79W D-F7BAL D-F7BAVL D-F7NTL D-F79F	D-A79W
With 1 pc.	5	5	10	15	15
With 2 pcs.	5	10	15	20	20

## 3 Operating Range

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant) (mm)

Auto switch model	Bore size														
	12	16	20	25	32	40	50	63	80	100	125	140	160	180	200
D-A9□(V)	7.5	9.5	10	9	9	9.5	9.5	11	10.5	10.5	13.5	12.5	12	13	12.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L*	3	5	5.5	5.5	5	5	6	6.5	7	7.5	7.5	8	7.5	7.5	8.5
D-A7□(H)(C) D-A80□(H)(C)	9.5	12	12	11	10.5	11.5	11	13	11.5	11.5	16.5	15	14.5	—	—
D-A79W	13	14.5	15.5	14	14	15.5	14.5	17	15	15.5	19.5	18	17.5	—	—
D-F7□(V) D-J79(C) D-F7□W(V) D-F7BA(V)L D-F7NTL D-F79F	4.5	5.5	5	5	5	5	5	6	7	8	7.5	7.5	7.5	—	—
D-P3DW□	—	—	—	—	3	4.5	4.5	6	5.5	6.5	—	—	—	—	—

\* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

\* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V)L type.

## 4 Auto Switch Mounting Brackets/Part No.

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/-□T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant)

Applicable auto switch	D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL D-A9□/A9□V	D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV D-F7BAL/F7BAVL/F79F/F7NTL D-A7□/A80/A7□H/A80H/A73C/A80C/A79W	D-P3DW□								
Bore size (mm)	ø12 to ø200	ø12 to ø25	ø32 to ø100								
Auto switch mounting bracket part no.	—	BQ4-012	BQ5-032								
Auto switch mounting bracket fitting parts lineup/Weight	—	<ol style="list-style-type: none"> <li>Auto switch mounting screw (M2.5 x 8L)</li> <li>Auto switch mounting nut</li> </ol> Weight: 1.5 g	<ol style="list-style-type: none"> <li>Auto switch fixing screw (M2.5 x 10L)</li> <li>Auto switch mounting screw (M3 x 8L)</li> <li>Auto switch spacer</li> <li>Auto switch mounting nut</li> </ol> Weight: 3.5 g								
		When requesting the enclosure of the auto switch mounting brackets (2 pcs.) with the cylinder for shipment, add "BQ" to the end of the cylinder model number. Standard model no. +BQ Example) CDQ2B32-30DZ-BQ/ CDQ2B32-30DZ-BQ-XC4 (Made to Order)									
Auto switch mounting surface	Surfaces with auto switch mounting slot	Auto switch mounting rail side only	A/B/C side except port side								
Mounting of auto switch	<p>Auto switch mounting screw</p> <p>Auto switch</p> <p>When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter.</p> <p><b>Tightening torque for auto switch mounting screw (N·m)</b></p> <table border="1"> <thead> <tr> <th>Auto switch model</th> <th>Tightening torque</th> </tr> </thead> <tbody> <tr> <td>D-M9□(V)</td> <td rowspan="2">0.05 to 0.15</td> </tr> <tr> <td>D-M9□W(V)</td> </tr> <tr> <td>D-M9□A(V)L</td> <td rowspan="2">0.10 to 0.20</td> </tr> <tr> <td>D-A9□(V)</td> </tr> </tbody> </table>	Auto switch model	Tightening torque	D-M9□(V)	0.05 to 0.15	D-M9□W(V)	D-M9□A(V)L	0.10 to 0.20	D-A9□(V)	<ol style="list-style-type: none"> <li>Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position.</li> <li>Engage the ridge on the auto switch mounting arm with the recess in the cylinder tube rail, and slide it to the position of the nut.</li> <li>Gently screw the auto switch mounting screw into the thread of the auto switch mounting nut through the mounting hole on the auto switch mounting arm.</li> <li>Confirm where the mounting position is, and tighten the auto switch mounting screw to fix the auto switch. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m.</li> <li>The detection position can be changed under the conditions in step ③.</li> </ol>	<ol style="list-style-type: none"> <li>Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position.</li> <li>With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut.</li> <li>Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole.</li> <li>Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer.</li> <li>Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m.</li> <li>Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m.</li> <li>The detection position can be changed under the conditions in step ⑤.</li> </ol>
Auto switch model	Tightening torque										
D-M9□(V)	0.05 to 0.15										
D-M9□W(V)											
D-M9□A(V)L	0.10 to 0.20										
D-A9□(V)											
			<ol style="list-style-type: none"> <li>Insert the protrusion on the bottom of the auto switch into the mating part of the auto switch mounting bracket and fix the auto switch and the auto switch mounting bracket temporarily by tightening the hexagon socket head cap screw (M2.5 x 9L) 1 to 2 turns.</li> <li>Insert the temporarily tightened mounting bracket into the mating groove of the cylinder tube, and slide the auto switch onto the cylinder tube through the groove.</li> <li>Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 6L, M2.5 x 9L).*</li> <li>If the detecting position is changed, go back to step ②.</li> </ol> <p>* The hexagon socket head cap screw (M2.5 x 6L) is used to fix the mounting bracket and cylinder tube. This enables the replacement of the auto switch without adjusting the auto switch position.</p> <p>Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.</p> <p>Note 2) The tightening torque of the hexagon socket head cap screw (M2.5 x 6L, M2.5 x 9L) must be 0.2 to 0.3 N·m.</p> <p>Note 3) Tighten the hexagon socket head cap screws evenly.</p>								

Note) Auto switch mounting bracket and auto switch are enclosed with the cylinder for shipment. For an environment that needs the water resistant auto switch, select the D-M9□A(V)L type. Auto switch mounting bracket for the D-F7BA(V)L type uses BQ4-012 and BQ5-032 normal specifications (metal screw).

\* The auto switches applicable to the CDQ2□R/□V (water resistant) is the D-M9□A(V)L type.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Compact Cylinder Series **CDQ2** With Auto Switch 4

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable. Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for detailed specifications.

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□□-□S/-□T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load)

Auto switch type	Model	Electrical entry	Features	Applicable bore size
Reed	D-A72	Grommet (Perpendicular)	—	ø12 to ø100 ø125 to ø160
	D-A73		—	
	D-A80		Without indicator light	
	D-A79W		Diagnostic indication (2-colour indication)	
	D-A73C	Connector (Perpendicular)	—	
	D-A80C		Without indicator light	
	D-A72H	Grommet (In-line)	—	
	D-A73H, A76H		—	
	D-A80H		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	
	D-F7NWV, F7BWW		Diagnostic indication (2-colour indication)	
	D-F7BAVL		Water resistant (2-colour indication)	
	D-J79C	Connector (Perpendicular)	—	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-colour indication)	
	D-F7BAL		Water resistant (2-colour indication)	
	D-F79F		Diagnostic indication (2-colour indication)	
D-F7NTL	With timer			

\* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

\* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to page 1290 in Best Pneumatics No. 2.

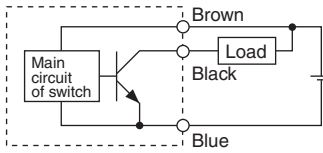
\* Trimmer auto switch (D-F7K) and heat resistant solid state auto switch (D-F7NJL) are not available.

# Prior to Use

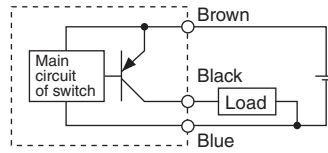
## Auto Switch Connection and Example

### Basic Wiring

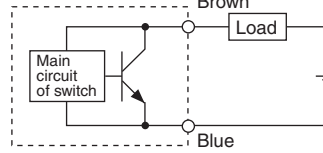
#### Solid state 3-wire, NPN



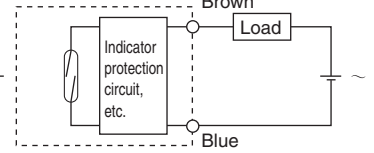
#### Solid state 3-wire, PNP



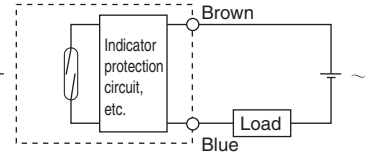
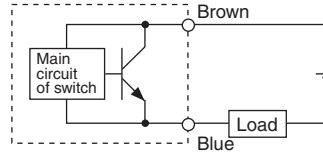
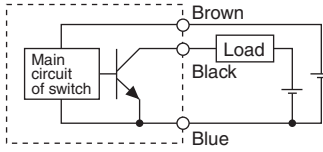
#### 2-wire (Solid state)



#### 2-wire (Reed)

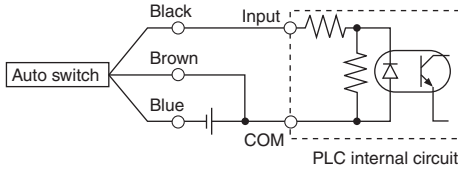


(Power supply for switch and load are separate.)

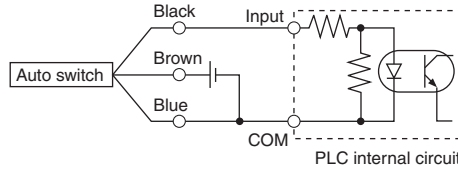


### Example of Connection with PLC (Programmable Logic Controller)

#### • Sink input specifications 3-wire, NPN

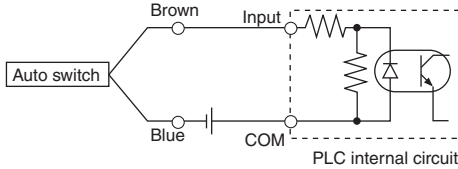


#### • Source input specifications 3-wire, PNP

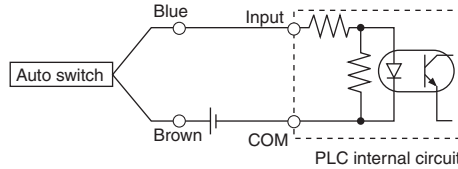


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

#### 2-wire



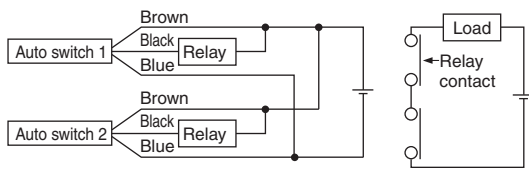
#### 2-wire



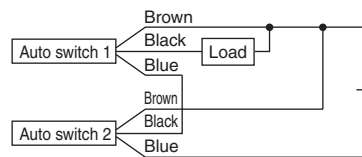
### Example of AND (Series) and OR (Parallel) Connection

#### • 3-wire

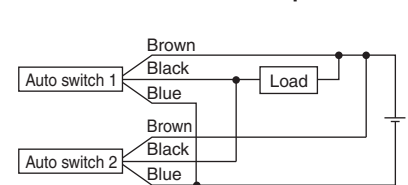
##### AND connection for NPN output (Using relays)



##### AND connection for NPN output (Performed with auto switches only)



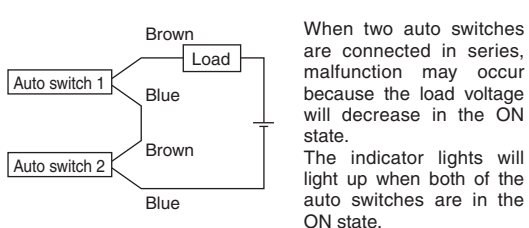
##### OR connection for NPN output



The indicator lights will light up when both of the auto switches are in the ON state.

#### • 2-wire

##### 2-wire with 2-switch AND connection

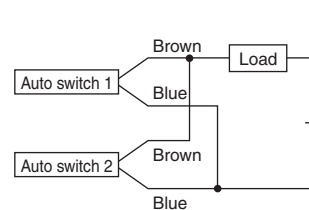


When two auto switches are connected in series, malfunction may occur because the load voltage will decrease in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

Load voltage at ON = Power supply voltage – Residual voltage x 2 pcs.  
= 24 V – 4 V x 2 pcs.  
= 16 V

Example: Power supply voltage 24 VDC  
Auto switch internal voltage drop 4 V

##### 2-wire with 2-switch OR connection



##### (Solid state)

When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase in the OFF state.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance  
= 1 mA x 2 pcs. x 3 kΩ  
= 6 V

Example: Load impedance 3 kΩ  
Auto switch leakage current 1 mA

##### (Reed)

Because there is no leakage current, the load voltage will not increase in the OFF state. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.



Please contact SMC for detailed specifications, lead times, and pricing.

## Simple Specials

The following special specifications can be ordered as a simplified made-to-order.

There is a specification sheet available on paper and CD-ROM. Please contact your SMC sales representatives if necessary.

Symbol	Specifications	CQ2 (Standard)				CQ2 (Large Bore Size)	
		Double acting		Single acting		Double acting	
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod
-XA1 to 30	Special rod end shape	●	●	●			

## Made to Order

Symbol	Specifications	CQ2 (Standard)				CQ2 (Large Bore Size)	
		Double acting		Single acting		Double acting	
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod
-XB6	Heat resistant cylinder (-10 to 150°C)	●	●				
-XB7	Cold resistant cylinder (-40 to 70°C)	●	●				
-XB9	Low-speed cylinder (10 to 50 mm/s)	●	●				
-XB10	Intermediate stroke (Exclusive body type)	●	●	●		●	●
-XB10A	Intermediate stroke (Spacer-installed type) <sup>Note 3)</sup>	●					
-XB11	Long stroke (Air-hydro type only)	●					
-XB13	Low-speed cylinder (5 to 50 mm/s)	●	●				
-XB14	Cylinder with heat resistant auto switch <sup>Note 2)</sup>	●					
-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	●					
-XC11	Dual stroke cylinder/Single rod	●					
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers	●		●	●		
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304	●		●	●		
-XC35	With coil scraper	●	●				
-XC36	With boss on rod side	●	●	●	●		
-X144	Special port location	●	●	●	●		
-X202	Full length dimension is the same as Series CQ1.	●		●	●		
-X203	L dimension from rod cover is the same as Series CQ1.	●		●	●		
-X235	Special rod end for double rod cylinder		●				●
-X271	Fluororubber seals	●	●	●	●	●	●
-X293	Full length dimension is the same as Series CQ1W.		●				
-X525	Long stroke of adjustable extension stroke cylinder (-XC8)	●					
-X526	Long stroke of adjustable retraction stroke cylinder (-XC9)	●					
-X633	Intermediate stroke of double rod cylinder		●				●
-X636	Long stroke of dual stroke single rod cylinder	●					
-X1876	Cylinder tube: With concave boss on head side	●		●	●		



# Simple Specials/Made to Order *Series CQ2*

CQ2 (Long Stroke) Double acting		CQ2K (Non-rotating Rod) Double acting		CQP2 (Axial Piping) <sup>Note 2)</sup>			CQ2□S (Anti-lateral Load) Double acting		CBQ2 (With End Lock) <sup>Note 2)</sup>		Page
Single rod		Single rod	Double rod	Double acting	Single acting		Single rod		Double acting		P.179
				Single rod	Single rod/ Spring return	Single rod/ Spring extend			Single rod		
											P.183
											P.183
											P.184
											P.185
											P.186
											P.187
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											P.202
											P.203
											P.204
											P.205
											P.205
											P.206
											P.207

Note 1) For ø40 to ø63 only. ø12 to ø32 are available as a special product. Note 2) The body shape is the same as the existing product.  
 Note 3) For ø32 to ø100 only.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2 Simple Specials 1

These changes are dealt with Simple Specials System.

## CQ2 (ø12 to ø25): Special Rod End Shape

### Applicable Series

Series	Model	Action	Special rod end shape/Symbol
CQ2 (ø12 to ø25)	Standard	CQ2	Double acting, Single rod <sup>Note)</sup>
			Single acting (Spring return)
	Non-rotating rod	CQ2W	Double acting, Double rod
		CQ2K	Double acting, Single rod
	Axial piping (Centralised piping type)	CQ2KW	Double acting, Double rod
		CQP2	Double acting, Single rod <sup>Note)</sup>
		Single acting (Spring return/extend)	
			XA1 XA2 XA6 XA7 XA11 XA17 XA18

Note) Except ø12, with rubber bumper (CQ2□12-DC, CQ2P□12-DC)

### Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "\*" will be as follows to the rod diameter (D).  
Enter any special dimension you desire.  
ø12, ø16 → D - 1 mm ø20, ø25 → D - 2 mm
- In the case of double rod, fill in the dimension when the rod is retracted.
- It is not possible to manufacture when -XA17 and -XA18 are the same male thread diameter as the piston rod external diameter.
- Contact SMC separately for the special rod end shape/symbols other than the table on the left and the cases other than the manufacturing conditions.

<p>Symbol: <b>A1</b></p>	<p>Symbol: <b>A2</b></p>	<p>Symbol: <b>A6</b></p>	<p>Symbol: <b>A7</b> With chamfer</p>
<p>Symbol: <b>A11</b></p>	<p>Symbol: <b>A17</b></p>	<p>Symbol: <b>A18</b></p>	

Symbol

**-XA1/2/6/7/11/17/18**

**Conditions of Manufacture**

Special rod end shape/Symbol	Single rod		Double rod
<b>XA1</b>	For $\varnothing 12$	$\varnothing M$ : 3 mm or more 5 mm or less	$\varnothing M$ : $\varnothing 5$ mm or less
	$\varnothing 16$	$\varnothing M$ : 3 mm or more 7 mm or less	$\varnothing M$ : $\varnothing 7$ mm or less
	$\varnothing 20$	$\varnothing M$ : 4 mm or more 8 mm or less	$\varnothing M$ : $\varnothing 8$ mm or less
	$\varnothing 25$	$\varnothing M$ : 4 mm or more 10 mm or less	$\varnothing M$ : $\varnothing 10$ mm or less
<b>XA2</b>	For $\varnothing 12$	$\varnothing J$ : 4 mm or more, $W_1$ : 6 mm or less	$\varnothing J$ : 3 mm or more, $W_1$ : 6 mm or less
	$\varnothing 16$	$\varnothing J$ : 4 mm or more, $W_1$ : 6 mm or less	$\varnothing J$ : 4 mm or more, $W_1$ : 6 mm or less
	$\varnothing 20$	$\varnothing J$ : 5 mm or more, $W_1$ : 11 mm or less	$\varnothing J$ : 5 mm or more, $W_1$ : 11 mm or less
	$\varnothing 25$	$\varnothing J$ : 6 mm or more, $W_1$ : 13 mm or less	$\varnothing J$ : 6 mm or more, $W_1$ : 13 mm or less
<b>XA6</b>	For $\varnothing 12$	H: M4 or less	H: M4 or less
	$\varnothing 16$	H: M6 or less	H: M6 or less
	$\varnothing 20$	H: M6 or less	H: M6 or less
	$\varnothing 25$	H: M8 or less	H: M8 or less
<b>XA7</b>	For $\varnothing 12$	H: M4 or less	H: M4 or less
	$\varnothing 16$	H: M5 or less	H: M5 or less
	$\varnothing 20$	H: M6 or less	H: M6 or less
	$\varnothing 25$	H: M8 or less	H: M8 or less
<b>XA11</b>	For $\varnothing 12$	SR3 mm only	SR3 mm or more
	$\varnothing 16$	SR4 mm only	SR4 mm or more
	$\varnothing 20$	SR5 mm only	SR5 mm or more
	$\varnothing 25$	SR6 mm only	SR6 mm or more
<b>XA17</b>	For $\varnothing 12$	H: M5 or more, X: 20 mm or less	H: M5 or less
	$\varnothing 16$	H: M6 or more, X: 22.5 mm or less	H: M6 or less
	$\varnothing 20$	H: M8 or more, X: 26.5 mm or less	H: M8 or less
	$\varnothing 25$	H: M10 or more, X: 33 mm or less	H: M10 or less
<b>XA18</b>	For $\varnothing 12$	H: M5 or more, X: 20 mm or less	H: M5 or less
	$\varnothing 16$	H: M6 or more, X: 22.5 mm or less	H: M6 or less
	$\varnothing 20$	H: M8 or more, X: 26.5 mm or less	H: M8 or less
	$\varnothing 25$	H: M10 or more, X: 33 mm or less	H: M10 or less

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Simple Specials 2

These changes are dealt with Simple Specials System.

### CQ2 (ø32 to ø100): Special Rod End Shape

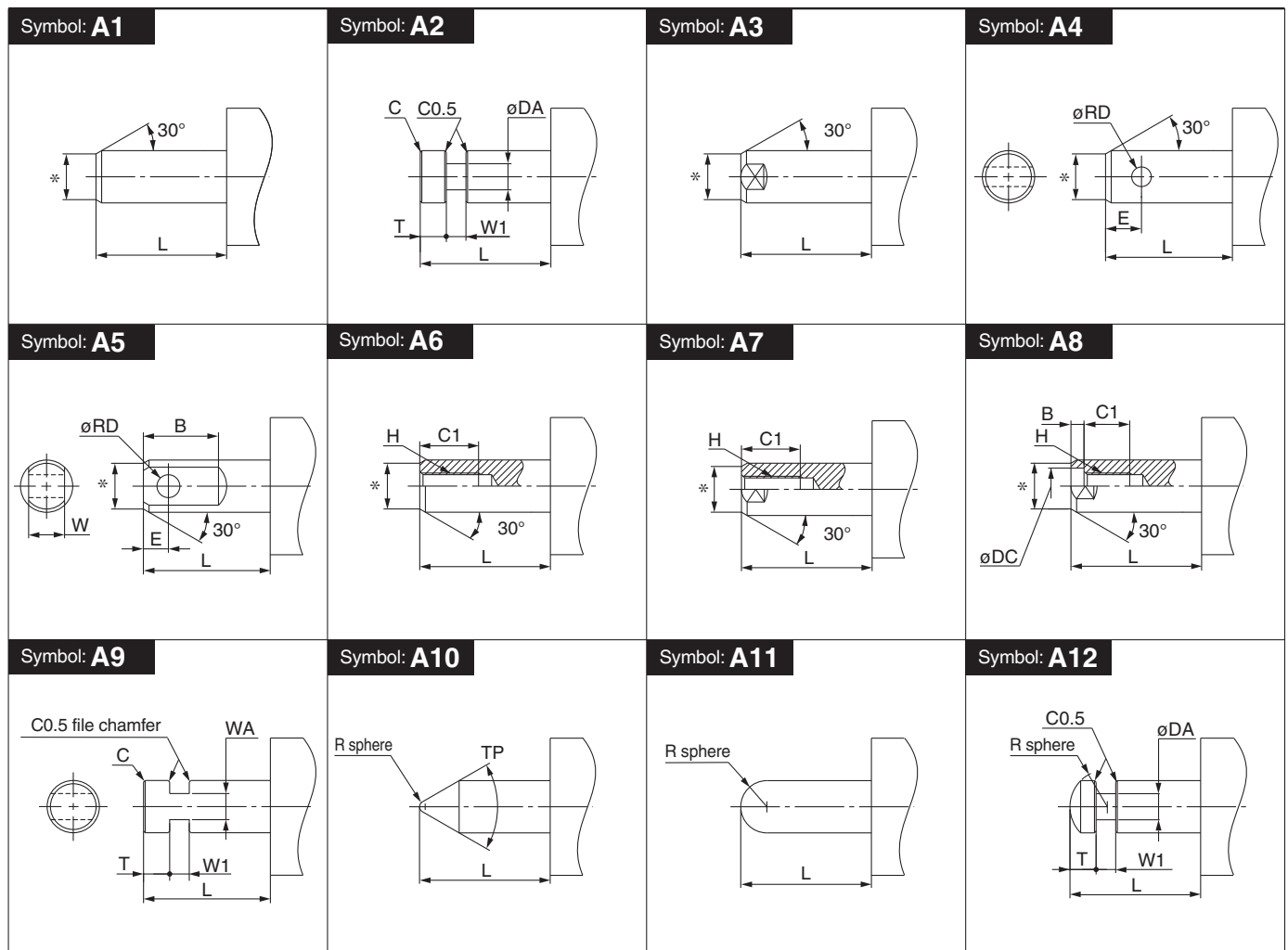
#### Applicable Series

Series	Model	Action	Special rod end shape/Symbol
CQ2	Standard	CQ2	Double acting, Single rod <sup>Note)</sup>
			Single acting (Spring return)
	Non-rotating rod	CQ2W	Double acting, Double rod <sup>Note)</sup>
		CQ2K	Double acting, Single rod
	Axial piping (Centralised piping type)	CQP2	Double acting, Single rod
			Single acting (Spring return/extend)
Anti-lateral load	CQ2S	Double acting, Single rod	

Note) Applicable for ø125 to ø200

#### Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "\*" will be as follows to the rod diameter (D).  
Enter any special dimension you desire.  
D – 2 mm
- In the case of double rod, fill in the dimension when the rod is retracted.



Symbol

**-XA1 to XA23/-XA26 to XA30**

<p>Symbol: <b>A13</b></p>	<p>Symbol: <b>A14</b></p>	<p>Symbol: <b>A15</b></p>	<p>Symbol: <b>A16</b></p>
<p>Symbol: <b>A17</b></p>	<p>Symbol: <b>A18</b></p>	<p>Symbol: <b>A19</b></p>	<p>Symbol: <b>A20</b></p>
<p>Symbol: <b>A21</b></p>	<p>Symbol: <b>A22</b></p>	<p>Symbol: <b>A23</b></p>	<p>Symbol: <b>A26</b></p>
<p>Symbol: <b>A27</b></p>	<p>Symbol: <b>A28</b></p>	<p>Symbol: <b>A29</b></p>	<p>Symbol: <b>A30</b></p>

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

# Made to Order 1

Please contact SMC for detailed dimensions, specifications, and lead times.



## Symbol

### -XB6 Heat Resistant Cylinder (-10 to 150°C)

The seal material and grease for air cylinders have been changed for high temperature tolerance, now with a range of -10 to 150°C.

#### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Except with rubber bumper
		CQ2W	
	Axial piping	CQP2	

#### How to Order

CQ2  
CQ2W  
CQP2

Standard model no. — XB6

Heat resistant cylinder

#### Specifications

Ambient temperature range	-10 to 150°C
Seal material	Fluororubber
Grease	Heat resistant grease
Specifications other than above and external dimensions	Same as standard



Note 1) Operate without lubrication from a pneumatic system lubricator.  
Note 2) For maintenance intervals for this cylinder, which differ from those of the standard cylinder, please contact SMC.

Note 3) In principle, it is not possible to make built-in magnet type and mounted auto switch models. However, for cylinders with auto switches and heat resistant cylinders with heat resistant auto switches, please contact SMC as the compatibility differs depending on the series.

Note 4) Piston speed is ranged from 50 to 500 mm/s.

Note 5) For cylinders with rubber bumper, please contact SMC.

#### Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

## Symbol

### -XB7 Cold Resistant Cylinder (-40 to 70°C)

The seal material and grease for air cylinders have been changed for low temperature use, down to -40°C.

#### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Except ø50 or more, with switch, with rubber bumper, with bracket
		CQ2W	
	Axial piping	CQP2	

#### How to Order

CQ2  
CQ2W  
CQP2

Standard model no. — XB7

Cold resistant cylinder

#### Specifications

Ambient temperature range	-40 to 70°C
Seal material	Low nitrile rubber
Grease	Cold resistant grease
Auto switch	Not mountable
External dimensions	Same as standard
Specifications other than above	Same as standard



Note 1) Operate without lubrication from a pneumatic system lubricator.  
Note 2) Use dry air which is suitable for heatless air dryer, etc. not to cause the moisture to be frozen.

Note 3) For maintenance intervals for this cylinder, which differ from those of the standard cylinder, please contact SMC.

Note 4) Mounting an auto switch is not possible.

Note 5) For cylinders with rubber bumper, please contact SMC.

#### Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Symbol

**-XB9** Low-speed Cylinder (10 to 50 mm/s)

Even if driving at lower speeds 10 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

**Applicable Series**

	Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod	
		CQ2W	Double acting, Double rod	
	Axial piping	CQP2	Double acting, Single rod	

**How to Order**

Q2  
 Q2W Standard model no. - XB9  
 QP2

Low-speed cylinder ●



Note) Operate without lubrication from a pneumatic system lubricator.

**Warning Precautions**

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

**Specifications**

Piston speed	10 to 50 mm/s
External dimensions	Same as standard
Specifications other than above	Same as standard

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order 2

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -XB10 Intermediate Stroke (Exclusive body type)

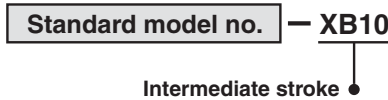
Air cylinder which can reduce the mounting space by using an exclusive body which does not use a spacer to achieve that the full length dimension could be shortened when an intermediate stroke other than the standard stroke is required.

#### Applicable Series

Series	Model	Action	Note	
CQ2	Standard	CQ2	Double acting, Single rod	
		CQ2W	Single acting (Spring return)	
	Large bore size	CQ2W	Double acting, Double rod	
		CQ2	Double acting, Single rod	
	Long stroke	CQ2	Double acting, Single rod	
		CQ2W	Double acting, Double rod	
	Non-rotating rod	CQ2K	Double acting, Single rod	Except ø12 to ø32
		CQ2KW	Double acting, Double rod	
Anti-lateral load	CQ2□S	Double acting, Single rod		

#### How to Order

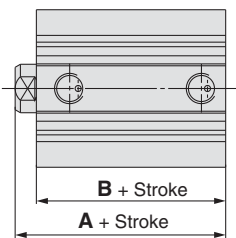
C□Q2  
C□Q2W  
C□Q2K  
C□Q2KW  
C□Q2□S



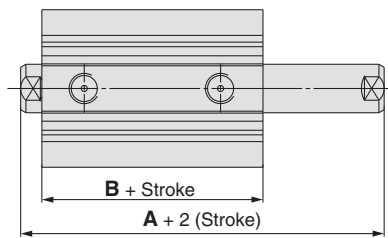
Specifications: Same as standard

#### Dimensions: Series CQ2

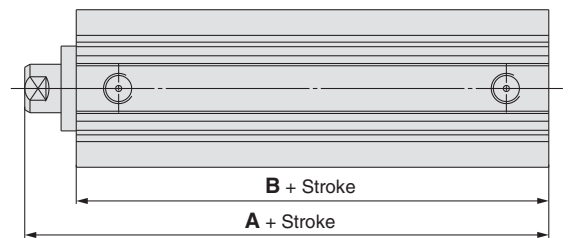
##### Double acting, Single rod



##### Double acting, Double rod



##### Double acting, Single rod/Long stroke



Bore size (mm)	Single rod				Applicable stroke range
	A		B		
	49 stroke or less	51 to 99 stroke	49 stroke or less	51 to 99 stroke	
12	20.5 (31.5)	—	17 (28)	—	6 to 29
16	22 (34)	—	18.5 (30.5)	—	
20	24 (36)	—	19.5 (31.5)	—	6 to 49
25	27.5 (37.5)	—	22.5 (32.5)	—	
32	30 (40)	40 (40)	23 (33)	33 (33)	6 to 99
40	36.5 (46.5)	46.5 (46.5)	29.5 (39.5)	39.5 (39.5)	
50	38.5 (48.5)	48.5 (48.5)	30.5 (40.5)	40.5 (40.5)	11 to 99
63	44 (54)	54 (54)	36 (46)	46 (46)	
80	53.5 (63.5)	63.5 (63.5)	43.5 (53.5)	53.5 (53.5)	
100	65 (75)	75 (75)	53 (63)	63 (63)	

(mm)

Bore size (mm)	Single rod (Long stroke)		Applicable stroke range
	A	B	
32	62.5	45.5	101 to 299
40	72	55	
50	73.5	55.5	
63	75	57	
80	86	66	
100	97.5	75.5	

(mm)

\* The dimensions are the same with or without auto switch.



\* ( ): Dimensions with auto switch

\* The dimensions other than listed are the same as those of the standard.

Note) Applicable stroke: Available in 1 mm intervals

Bore size (mm)	Double rod				Applicable stroke range
	A		B		
	49 stroke or less	51 to 99 stroke	49 stroke or less	51 to 99 stroke	
12	32.2 (39.4)	—	25.2 (32.4)	—	6 to 29
16	33 (43)	—	26 (36)	—	
20	35 (47)	—	26 (38)	—	6 to 49
25	39 (49)	—	29 (39)	—	
32	44.5 (54.5)	54.5 (54.5)	30.5 (40.5)	40.5 (40.5)	6 to 99
40	54 (64)	64 (64)	40 (50)	50 (50)	
50	56.5 (66.5)	66.5 (66.5)	40.5 (50.5)	50.5 (50.5)	11 to 99
63	58 (68)	68 (68)	42 (52)	52 (52)	
80	71 (81)	81 (81)	51 (61)	61 (61)	
100	84.5 (94.5)	94.5 (94.5)	60.5 (70.5)	70.5 (70.5)	

(mm)

Bore size (mm)	Single rod (Single acting/Spring return)		Applicable stroke range
	A	B	
12	20.5 (31.5)	17 (28)	6 to 9
16	22 (34)	18.5 (30.5)	
20	24 (36)	19.5 (31.5)	6 to 9
25	27.5 (37.5)	22.5 (32.5)	
32	30 (40)	23 (33)	6 to 9
40	36.5 (46.5)	29.5 (39.5)	
50	38.5 (48.5)	30.5 (40.5)	

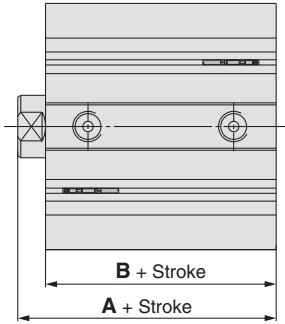
(mm)



Symbol  
**-XB10**

**Dimensions: Series CQ2**

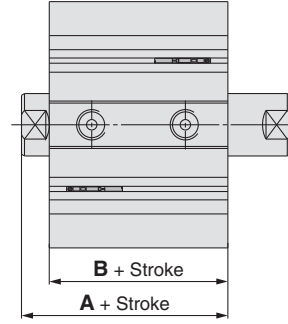
**Double acting, Single rod/Large bore size**



Bore size (mm)	Single rod		Applicable stroke range
	A	B	
125	99	83	11 to 299
140	99	83	
160	108	91	
180	119	102	
200	126	109	

\* The dimensions other than listed are the same as those of the standard.  
Note) Applicable stroke: Available in 1 mm intervals

**Double acting, Double rod/Large bore size**



Bore size (mm)	Double rod		Applicable stroke range
	A	B	
125	115	83	11 to 299
140	115	83	
160	125	91	
180	136	102	
200	143	109	

\* The dimensions other than listed are the same as those of the standard.  
Note) Applicable stroke: Available in 1 mm intervals

Symbol

**-XB10A Intermediate Stroke (Spacer-installed type)**

Intermediate stroke: Available in 1 mm intervals

A spacer is installed on tubes with a stroke longer than the specified stroke (● in the below table).

**Applicable Series**

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod ø32 to ø100

**Applicable Stroke**

Intermediate stroke with ◎: Available in 1 mm intervals

A spacer is installed on tubes with a stroke longer than the specified stroke (●).

◆: Standard stroke ●: Stroke in stock

Bore size (mm)	Stroke range	Type	Stroke															
			55	60	65	70	* 75	80	85	90	95	* 100						
32, 40	51 to 94	Spacer-installed type 2	◎	●	◎	●	◎	●	◎	●	◆	◎	●	◎	●	◎	●	◆
50 to 100	51 to 94		◎	●	◎	●	◎	●	◆	◎	●	◎	●	◎	●	◎	●	◆

**Specifications: Same as standard**

Note) Specify a spacer-installed type 1 with standard model number on page 3 for ordering intermediate stroke with a \* mark.

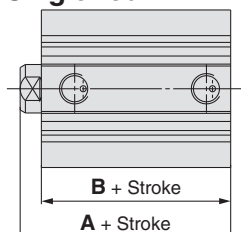
**How to Order**

C□CQ2  - XB10 A  
 Intermediate stroke ●    Spacer-installed type ◎

Order no.	<b>CQ2B32-57DZ-XB10A</b> (uses 60 mm stroke tube)
	• CQ2B32-60DZ-XB10 with 3 mm width spacer inside
	• The B dimension is 93 mm.

**Dimensions: Series CQ2**

**Double acting, Single rod**



Symbol Stroke	A									B								
	51 to 54	56 to 59	61 to 64	66 to 69	76 to 79	81 to 84	86 to 89	91 to 94	95 to 98	51 to 54	56 to 59	61 to 64	66 to 69	76 to 79	81 to 84	86 to 89	91 to 94	
Bore size 32	95	100	105	110	120	125	130	135	88	93	98	103	108	113	118	123	128	
40	101.5	106.5	111.5	116.5	126.5	131.5	136.5	141.5	94.5	99.5	104.5	109.5	114.5	119.5	124.5	129.5	134.5	
50	103.5	108.5	113.5	118.5	128.5	133.5	138.5	143.5	95.5	100.5	105.5	110.5	115.5	120.5	125.5	130.5	135.5	
63	109	114	119	124	134	139	144	149	101	106	111	116	121	126	131	136	141	
80	118.5	123.5	128.5	133.5	143.5	148.5	153.5	158.5	108.5	113.5	118.5	123.5	128.5	133.5	138.5	143.5	148.5	
100	130	135	140	145	155	160	165	170	118	123	128	133	138	143	148	153	158	

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Made to Order 3

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -XB11 Long Stroke (Air-hydro type only)

Strokes exceeding the standard stroke length

#### Applicable Series

Series	Model	Action	Note
CQ2	Air-hydro type (ø32 to ø100)	CQ2AH	Double acting, Single rod
			The external dimensions are the same as those of the CQ2 series long stroke type air cylinder.

#### How to Order

Standard model no. **-XB11**

Long stroke ●

\* Enter a symbol for stroke required.

Specifications: Same as standard

Symbol

### -XB13 Low-speed Cylinder (5 to 50 mm/s)

Even if driving at lower speeds 5 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

#### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod
		CQ2W	Double acting, Double rod
	Axial piping	CQP2	Double acting, Single rod
			Except Large bore size, Long stroke, Non-rotating rod, Anti-lateral load, With end lock
			Except Large bore size, Non-rotating rod

#### How to Order

C□Q2

C□Q2W

C□QP2

Standard model no. **-XB13**

Low-speed cylinder ●



Note 1) Operate without lubrication from a pneumatic system lubricator.

Note 2) For speed control, use the low-speed-control speed controller (Series AS-FM/AS-M).

#### Specifications

Piston speed	5 to 50 mm/s
External dimensions	Same as standard
Specifications other than above	Same as standard

#### Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Symbol

**-XB14** Cylinder with Heat Resistant Auto Switch

Heat resistant compact cylinder CDQ2 series (ø16 to ø63), which can mount heat resistant solid state switch. (D-F7NJ<sub>2</sub>, Max. 150°C)

**Applicable Series**

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod Applicable to ø16 to ø63 Except with rubber bumper Body shape: Same as the existing product

**How to Order**

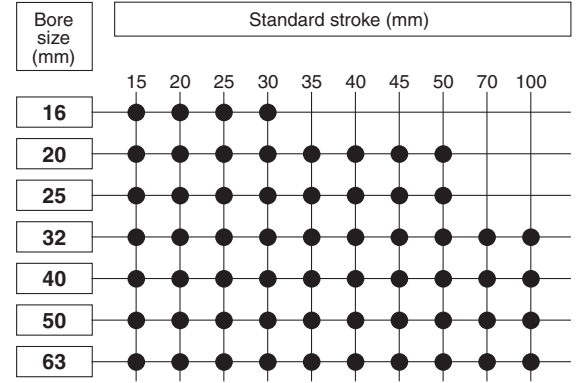
CDQ2 **Standard model no.** — F7NJL — XB14

Note) The body shape is the same as the existing product.  
"Z" is not included in the model number.

● Cylinder with heat resistant auto switch

**Specifications**

Applicable cylinder	Compact cylinder/Standard
Series	CQ2
Bore size (mm)	16, 20, 25, 32, 40, 50, 63
Type	Non-lube
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa (0.07 MPa: for ø16 only)
Ambient and fluid temperature	0 to 150°C
Rubber bumper	None
Rod end thread	Male or female thread
Stroke length tolerance	+1.0 0 mm
Piston speed	50 to 500 mm/s

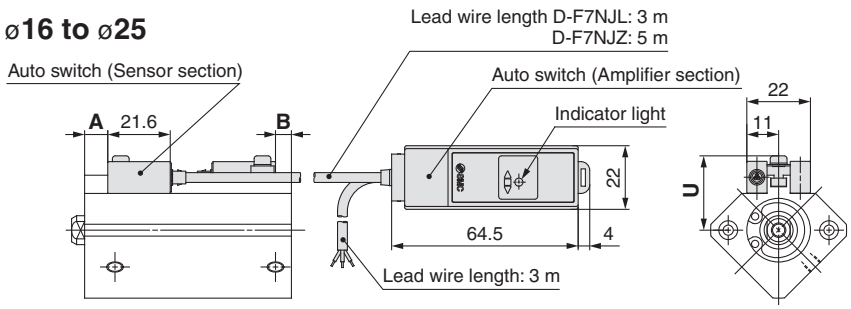


• Manufacture of intermediate strokes  
Intermediate strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.

Note) Refer to page 1319 in Best Pneumatics No. 2 for further information on auto switches.

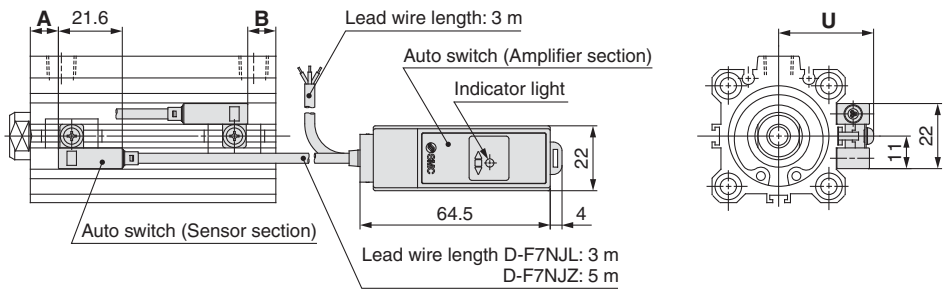
**Auto Switch Proper Mounting Position (Detection at Stroke End)**

**ø16 to ø25**



Bore size (mm)	(mm)		
	A	B	U
16	8	5.5	23.5
20	8	7	25.5
25	8	7.5	28.5
32	9.5	6.5	32.5
40	13.5	9	36
50	11.5	12	42
63	14	15	48.5

**ø32 to ø63**



**Auto Switch Mounting Bracket/Part No.**

Auto switch model	Bore size (mm)						
	16	20	25	32	40	50	63
D-F7NJL(Z)	BQ-1			BQJ1-032			

**Auto Switch Mounting Bracket/Weight**

Mounting bracket part no.	Weight (g)
BQ-1	1.5
BQJ1-032	8.5

\* The dimensions on the cylinder body is equivalent to the standard, double acting, single rod of the CDQ2 series.

Note 1) Auto switches are shipped in the same package, but not assembled in order to protect it at the time of shipment. Assemble it by referring to A, B dimensions for mounting position shown in the above table.

Note 2) The tightening torque of the auto switch mounting M3 screw must be 0.5 to 0.7 N-m.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Made to Order 4

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -XC4 With Heavy-Duty Scraper

Suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy-duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-casted equipment, construction machinery, or industrial vehicles.

#### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod ø20 to ø100
		CQ2W	
	Long stroke	CQ2	Double acting, Single rod
	Axial piping	CQP2	Double acting, Single rod ø32 to ø100

#### How to Order

CQ2  
 CQP2

Standard model no. — XC4

With heavy-duty scraper (SCB scraper)

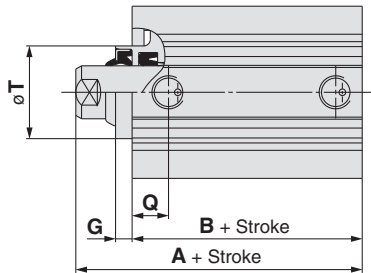
#### Specifications: Same as standard

#### ⚠ Caution

Do not replace heavy-duty scrapers.

- Since heavy-duty scrapers are press-fit, replace the entire rod cover assembly.

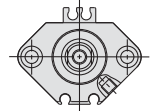
#### Series CQ2



- ( ): Dimensions with auto switch
  - The other dimensions are the same as those of the standard, CQ2 series.
  - ø32, without switch, 5 mm stroke: Q-dimension is 21.5
  - Relation between ø12 to ø32 piping port and mounting holes is as the diagram on the right.
- For models with a bracket, please contact SMC.  
Applicable stroke: Available in 5 mm intervals



Without switch: ø20 to ø32  
With switch: ø32



With switch: ø20, ø25

#### Series CQ2

Bore size (mm)	A			B			T	G		Q	
	50 stroke or less	75, 100 stroke	125 to 300 stroke	50 stroke or less	75, 100 stroke	125 to 300 stroke		100 stroke or less	125 stroke or more	50 stroke or less	125 stroke or more
20	34 (46)	—	—	29.5 (41.5)	—	—	—	—	—	19 (20.5)	—
25	37.5 (47.5)	—	—	32.5 (42.5)	—	—	—	—	—	21 (21)	—
32	40 (50)	50 (50)	67.5 (67.5)	33 (43)	43 (43)	55.5 (55.5)	—	—	—	20.5 (20.5)	—
40	46.5 (56.5)	56.5 (56.5)	77 (77)	29.5 (39.5)	39.5 (39.5)	55 (55)	28	5	10	11 (11)	14 (14)
50	48.5 (58.5)	58.5 (58.5)	78.5 (78.5)	30.5 (40.5)	40.5 (40.5)	55.5 (55.5)	35	5	10	10.5 (10.5)	14 (14)
63	54 (64)	64 (64)	80 (80)	36 (46)	46 (46)	57 (57)	35	5	10	15 (15)	16.5 (16.5)
80	63.5 (73.5)	73.5 (73.5)	91 (91)	43.5 (53.5)	53.5 (53.5)	66 (66)	43	5	10	16 (16)	19 (19)
100	75 (85)	85 (85)	102.5 (102.5)	53 (63)	63 (63)	75.5 (75.5)	59	5	10	23 (23)	23 (23)

Symbol

**-XC6** Piston Rod/Retaining Ring/Rod End Nut Material: Stainless Steel

Suitable for the cases it is likely to generate rust by water immersion or corrosion.

**Applicable Series**

Series	Model	Action	Note	
CQ2	Standard	CQ2	Double acting, Single rod	
			Single acting (Spring return/extend)	
		CQ2W	Double acting, Double rod	
	Long stroke	CQ2	Double acting, Single rod	
	Axial piping	CQP2		Double acting, Single rod
				Single acting (Spring return/extend)
Anti-lateral load	CQ2□S	Double acting, Single rod		

**How to Order**

- C□Q2
- C□Q2W
- C□QP2
- C□Q2□S

Standard model no. — **XC6**

Material: Stainless steel ●

**Specifications**

Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard



Note) Retaining ring and piston rod are made of stainless steel. Rod end nut is also made of stainless steel for rod end male thread type.

**Series CQ(P)2<sup>R</sup>**

Piston rod and rod end nut (male thread only) have been changed to stainless steel specification “-XC6”. Also, the materials for hexagon socket head cap screws to fix ø20 to ø32 rod covers have been changed to stainless steel.

**Applicable Series**

Series	Model	Action	Note
CQ2	Water resistant compact cylinder	C□Q2□ <sup>R</sup> <sub>V</sub>	Double acting, Single rod Applicable to ø20, ø25, ø32
	Water resistant, axial piping	C□QP2□ <sup>R</sup> <sub>V</sub>	Double acting, Single rod Applicable to ø32

**How to Order**

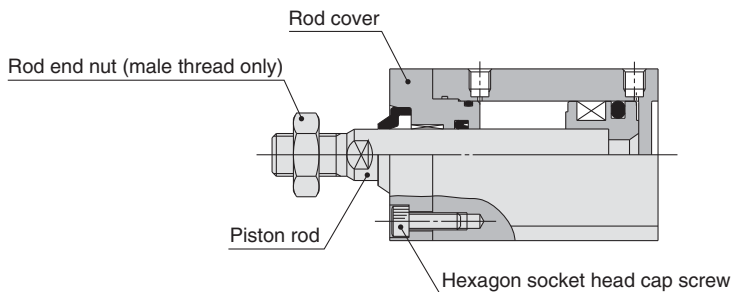
- C□Q2□<sup>R</sup><sub>V</sub>
- C□QP2□<sup>R</sup><sub>V</sub>

Standard model no. — **XC6A**

Steel parts: Stainless steel ●

**Specifications**

Parts changed to stainless steel	Piston rod, Rod end nut (male thread only), Rod cover holding hexagon socket head cap screw
Specifications other than above and external dimensions	Same as standard



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order 5

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -XC8 Adjustable Stroke Cylinder/Adjustable Extension Type

The extending stroke by the cylinder can be adjusted by the stroke adjustment mechanism equipped on the head end.

#### Applicable Series

Series	Model	Action	Note	
CQ2	Standard	CQ2	Double acting	Except with rubber bumper and with bracket
	Non-rotating rod	CQ2K	Double acting	Except with rubber bumper and with bracket
	Air-hydro type	CQ2H	Double acting	

#### How to Order

C□Q2B(H)  
C□Q2K

**Bore size** — **Stroke** D(M)(Z) — **XC8**

Adjustable stroke cylinder/Adjustable extension type

#### Specifications

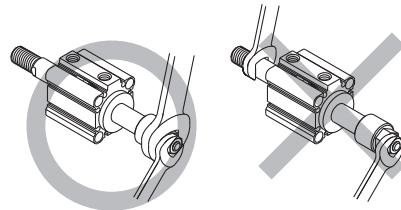
Series	Stroke adjustment range (mm)
CQ2	0 to 10

Note) The specifications other than above are the same as those of the standard.

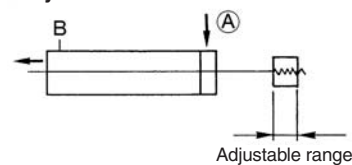
### Precautions

#### Warning

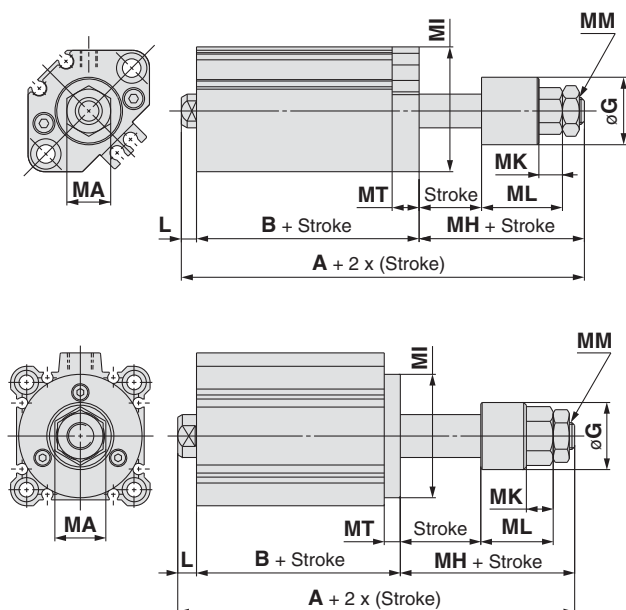
- When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
- To adjust the stroke, make sure to secure the wrench flats of the stopper bracket by a wrench, etc. before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side could loosen first. It may cause an accident or malfunction.



#### Symbol



### Series CQ2/CQ2H



Bore size	A	B	L	MH	MT	MA	MI	MM	MK	ML	øG	Stroke range
12	57.7 (64.9)	30.2 (37.4)	3.5	24	5	8	□25	M4 x 0.7	5.5	20	14	5 to 30
16	58.5 (68.5)	31 (41)	3.5	24	5	10	□28	M5 x 0.8	5.5	20	14	5 to 30
20	67.5 (79.5)	34 (46)	4.5	29	8	12	□36	M6 x 1	7	24	20	5 to 50
25	71 (81)	37 (47)	5	29	8	12	□40	M6 x 1	7	24	20	5 to 50
32	78.5 (88.5)	36.5 (46.5)	7	35	6	17	ø38	M8 x 1.25	9	28.5	25	5 to 50
	88.5	46.5										75, 100
40	88 (98)	46 (56)	7	35	6	19	ø46	M10 x 1.25	10	27	25	5 to 50
	98	56										75, 100
50	100.5 (110.5)	48.5 (58.5)	8	44	8	24	ø57	M14 x 1.5	13	31	35	10 to 50
	110.5	58.5										75, 100
63	102 (112)	52 (62)	8	42	10	24	ø68	M14 x 1.5	13	31	35	10 to 50
	112	62										75, 100
80	125 (135)	63 (73)	10	52	12	32	ø90	M20 x 1.5	16	40	45	10 to 50
	135	73										75, 100
100	138.5 (148.5)	74.5 (84.5)	12	52	14	32	ø110	M20 x 1.5	16	40	45	10 to 50
	148.5	84.5										75, 100

Note 1) ( ): Dimensions with auto switch

Note 2) Applicable stroke: Available in 5 mm intervals

Symbol

**-XC9** Adjustable Stroke Cylinder/Adjustable Retraction Type

The retracting stroke of the cylinder can be adjusted by the adjusting bolt.

Applicable Series

Series	Model	Action	Note
CQ2	Standard	Double acting, Single rod	Except with rubber bumper and with bracket
	Non-rotating rod		

How to Order

C□Q2B **Bore size** – **Stroke** D(M)(Z) – XC9  
 Adjustable stroke cylinder/Adjustable retraction type

Specifications

Series	Stroke adjustment range (mm)
CQ2	0 to 10

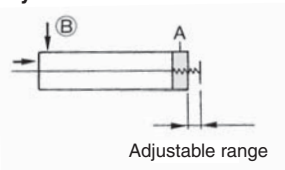
Note) The specifications other than above are the same as those of the standard.

Precautions

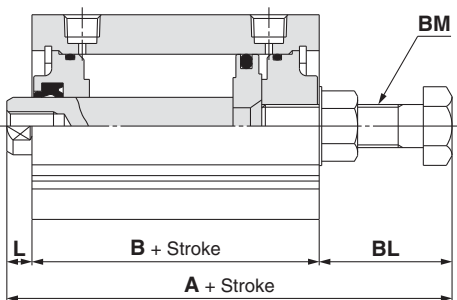
**Warning**

- When air is supplied to the cylinder, if the stroke adjusting bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjusting bolt could fly out or air could be discharged, which could cause bodily injury or damage the peripheral equipment.
- Adjust the stroke when the cylinder is not pressurized. If it is adjusted in the pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

Symbol



Series CQ2



Bore size (mm)	A	B	L	BL	BM	Stroke range (mm)
12	52 (59.2)	25.2 (32.4)	3.5	23.3	M5 x 0.8	5 to 30
16	53 (63)	26 (36)	3.5	23.5	M6 x 1	
20	61 (73)	26 (38)	4.5	30.5	M8 x 1.25	5 to 50
25	63.5 (73.5)	29 (39)	5	29.5	M8 x 1.25	
32	65.5 (75.5)	30.5 (40.5)	7	28	M8 x 1.25	
40	84 (94)	40 (50)	7	37	M12 x 1.5	10 to 50
50	84.5 (94.5)	40.5 (50.5)	8	36	M12 x 1.5	
63	88.5 (98.5)	42 (52)	8	38.5	M16 x 1.5	
80	109.5 (119.5)	51 (61)	10	48.5	M20 x 1.5	10 to 50
100	125 (135)	60.5 (70.5)	12	52.5	M24 x 1.5	

Note 1) ( ): Dimensions with auto switch  
 Note 2) Applicable stroke: Available in 5 mm intervals

Standard  
 Large Bore Size  
 Long Stroke  
 Non-rotating Rod  
 Axial Piping  
 Anti-lateral Load  
 With End Lock  
 Water Resistant  
 With Auto Switch  
 Auto Switch  
 Made to Order

# Series CQ2

# Made to Order 6

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

## -XC10 Dual Stroke Cylinder/Double Rod

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps.

### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod
	Non-rotating rod	CQ2K	
	Air-hydro type	CQ2H	

### How to Order

C□Q2B  Bore size — Stroke S<sub>1</sub> + Stroke S<sub>2</sub> D(C)(M)(Z) — XC10

Dual stroke cylinder

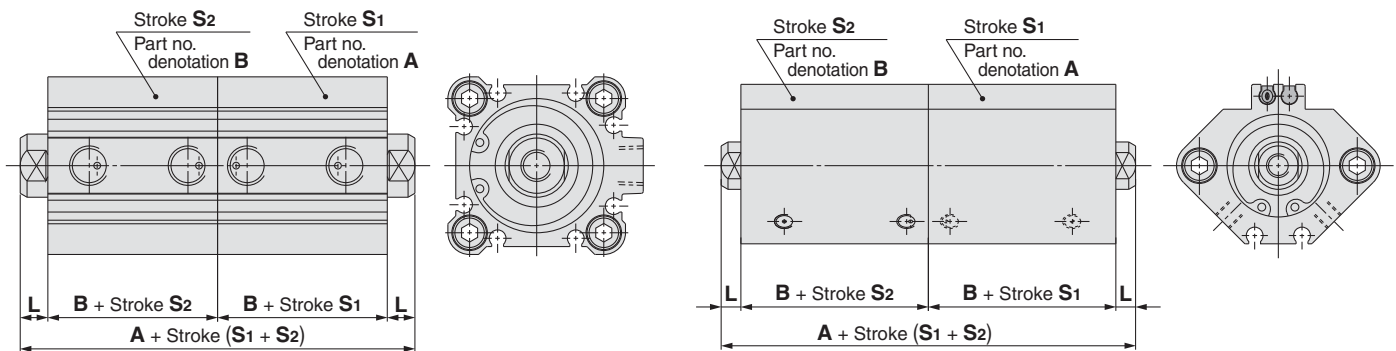
### Specifications

Series	Bore size (mm)	Max. manufacturable stroke (mm)
CQ2	12, 16	60 (Max. on single side: 30)
	20, 25	100 (Max. on single side: 50)
	32, 40	200 (Max. on single side: 100)
	50 to 100	200 (Max. on single side: 100)

Note) The specifications other than above are the same as those of the standard.

### Dimensions (Other dimensions are the same as those of the standard.)

#### Series CQ2



Note) In the case of  $\phi 12$  to  $\phi 25$  with auto switch, port directions are different.

Bore size	A		B		L	Stroke Both of S <sub>1</sub> , S <sub>2</sub>
	50 <sup>st</sup> or less	75, 100 <sup>st</sup>	50 <sup>st</sup> or less	75, 100 <sup>st</sup>		
12	41 (63)	—	17 (28)	—	3.5	5 to 30
16	44 (68)	—	18.5 (30.5)	—	3.5	
20	48 (72)	—	19.5 (31.5)	—	4.5	5 to 50
25	55 (75)	—	22.5 (32.5)	—	5	
32	60 (80)	80 (80)	23 (33)	33 (33)	7	5 to 100
40	73 (93)	93 (93)	29.5 (39.5)	39.5 (39.5)	7	
50	77 (97)	97 (97)	30.5 (40.5)	40.5 (40.5)	8	10 to 100
63	88 (108)	108 (108)	36 (46)	46 (46)	8	
80	107 (127)	127 (127)	43.5 (53.5)	53.5 (53.5)	10	
100	130 (150)	150 (150)	53 (63)	63 (63)	12	

Note 1) ( ): Dimensions with auto switch

Note 2) Applicable stroke: Available in 5 mm intervals



Symbol

**-XC11 Dual Stroke Cylinder/Single Rod**

Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.

**Applicable Series**

Series	Model	Action	Note
CQ2	Standard	Double acting, Single rod	Except with bracket
	Air-hydro type		

**How to Order**

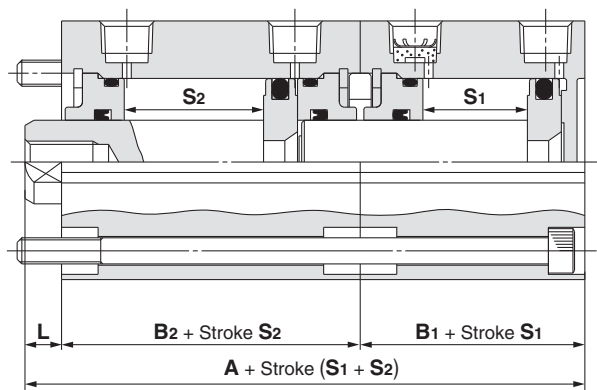
C□Q2B **Bore size** - **Stroke S<sub>1</sub>** + **Stroke S<sub>2</sub> - S<sub>1</sub>** D(C)(M)(Z) - **XC11**  
 Dual stroke cylinder/Single rod

**Specifications: Same as standard**

(For manufacturable strokes, please contact SMC.)

**Construction/Dimensions**

**Series CQ2**



Bore size (mm)	A	B <sub>1</sub>	B <sub>2</sub>	L	Stroke Both of S <sub>1</sub> , S <sub>2</sub>
12	45.7 (63.9)	17 (28)	25.2 (32.4)	3.5	5 to 30
16	48 (70)	18.5 (30.5)	26 (36)	3.5	
20	50 (74)	19.5 (31.5)	26 (38)	4.5	
25	56.5 (76.5)	22.5 (32.5)	29 (39)	5	5 to 50
32	60.5 (80.5)	23 (33)	30.5 (40.5)	7	
40	76.5 (96.5)	29.5 (39.5)	40 (50)	7	10 to 50
50	79 (99)	30.5 (40.5)	40.5 (50.5)	8	
63	86 (106)	36 (46)	42 (52)	8	
80	104.5 (124.5)	43.5 (53.5)	51 (61)	10	
100	125.5 (145.5)	53 (63)	60.5 (70.5)	12	

Note 1) ( ): Dimensions with auto switch  
 Note 2) Applicable stroke: Available in 5 mm intervals  
 Note 3) For long stroke type, please contact SMC.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

# Made to Order 7

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

## -XC26 With Split Pins for Double Clevis Pin/Double Knuckle Joint Pin and Flat Washers

A pin for double clevis (one of the mounting types) or double knuckle joint (one of the accessories) has been changed for a split pin, and split pins and flat washers have been added.

### Applicable Series

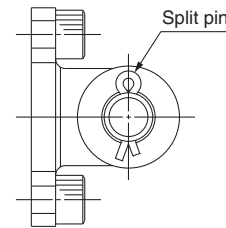
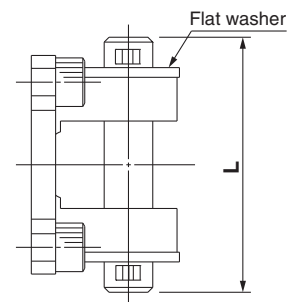
Series	Model	Action	
CQ2	Standard	Double acting, Single rod	
		Single acting (Spring return/extend)	
	Long stroke	CQ2□	Double acting, Single rod
	Non-rotating rod	CQ2K	Double acting, Single rod
	Anti-lateral load	CQ2□S	Double acting, Single rod
	With end lock	CBQ2	Double acting, Single rod
	Magnetic field resistant	CDQ2□P	Double acting, Single rod
	Copper-free compact	20-CQ2	Double acting, Single rod
			Single acting (Spring return/extend)
	Copper-free long stroke	20-CQ2□	Double acting, Single rod
Copper-free anti-lateral load	20-CQ2□S	Double acting, Single rod	

### Specifications

Mounting	Double clevis (D) only
Changed parts	Clevis pin/Knuckle pin, Split pin, Flat washer
Specifications other than above	Same as standard

### Dimensions

#### Double clevis

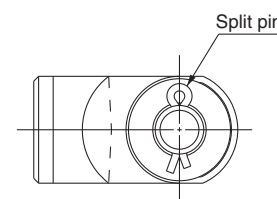
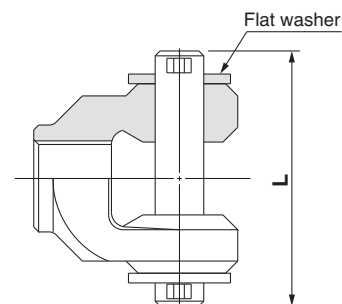


Bore size (mm)	L (mm)
12	21
16	23
20	31
25	36.5
32	52.5
40	52.5
50	66
63	66
80	78
100	86

\* For mounting bracket, split pins, clevis pin and flat washers are shipped together, (but not assembled).

\* Mounting method is the same as standard.

#### Double knuckle joint



\* For mounting bracket, split pins, knuckle pin and flat washers are shipped together, (but not assembled).

\* Mounting method is the same as standard.

### How to Order

#### ● Product

CQ2D Standard model no. - XC26

● Double clevis

With double clevis pin, split pins and flat washers

#### ● Parts assembly

CQ - D 032 - XC26

● Double clevis      ● Double clevis pin

#### Bore size

012	12 mm
016	16 mm
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Y - G012, Z015A, G02, G03  
G04, G05, G08, G10 - XC26

● Double knuckle joint

With double knuckle joint pin,  
split pins and flat washers

IY - G012, J015, G02  
G03, G04, G05, G08, G10 - XC26

● Clevis pin/Knuckle pin

With clevis pin/knuckle pin,  
split pins and flat washers

Symbol

**-XC27 Double Clevis Pin/Double Knuckle Joint Pin Material: Stainless Steel 304**

For preventing the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

**Applicable Series**

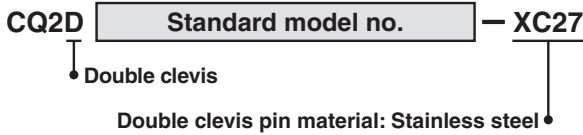
Series	Model	Action	
CQ2	Standard	Double acting, Single rod	
		Single acting (Spring return/extend)	
	Long stroke	CQ2□	Double acting, Single rod
	Non-rotating rod	CQ2K	Double acting, Single rod
	Anti-lateral load	CQ2□S	Double acting, Single rod
	Magnetic field resistant	CDQ2□P	Double acting, Single rod
	Copper-free compact	20-CQ2	Double acting, Single rod
			Single acting (Spring return/extend)
	Copper-free long stroke	20-CQ2□	Double acting, Single rod
Copper-free anti-lateral load	20-CQ2□S	Double acting, Single rod	

**Specifications**

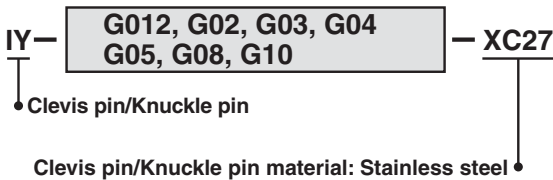
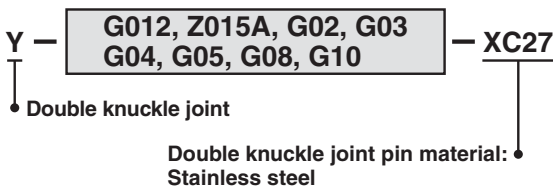
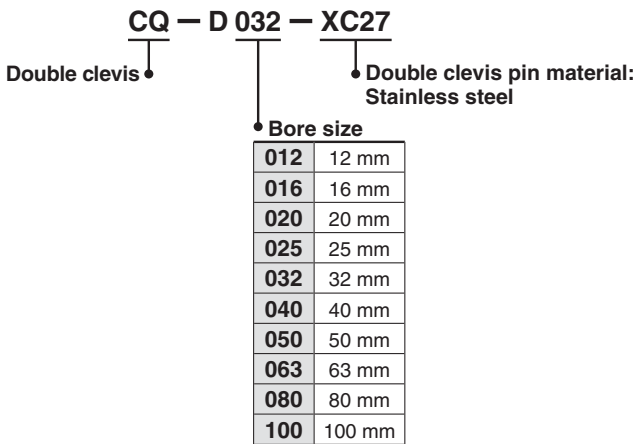
Mounting	Double clevis (D) only
Pin material	Stainless steel 304
Specifications other than above	Same as standard

**How to Order**

● **Product**



● **Parts assembly**



\* Stainless steel specification for IY-J015 is IY-J015SUS.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order 8

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -XC35 With Coil Scraper

For getting rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and for protecting the seals, etc.

#### Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod
		CQ2W	Double acting, Double rod
	Axial piping	CQP2	Double acting, Single rod

Applicable to  $\phi 32$  to  $\phi 100$ , Except with bracket

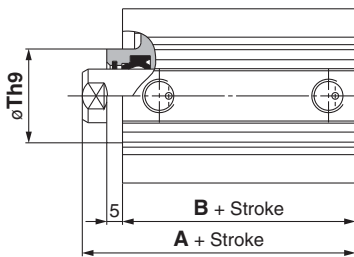
#### How to Order

Standard model no. — **XC35**

With coil scraper ●

Specifications: Same as standard

#### Series CQ2



Bore size (mm)	A		B		Th9 (mm)
	50 stroke or less	51 to 100 stroke	50 stroke or less	51 to 100 stroke	
32	35 (45)	45 (45)	23 (33)	33 (33)	23 <sup>0</sup> <sub>-0.052</sub>
40	41.5 (51.5)	51.5 (51.5)	29.5 (39.5)	39.5 (39.5)	28 <sup>0</sup> <sub>-0.052</sub>
50	43.5 (53.5)	53.5 (53.5)	30.5 (40.5)	40.5 (40.5)	35 <sup>0</sup> <sub>-0.062</sub>
63	49 (59)	59 (59)	36 (46)	46 (46)	35 <sup>0</sup> <sub>-0.062</sub>
80	58.5 (68.5)	68.5 (68.5)	43.5 (53.5)	53.5 (53.5)	43 <sup>0</sup> <sub>-0.062</sub>
100	70 (80)	80 (80)	53 (63)	63 (63)	59 <sup>0</sup> <sub>-0.074</sub>

Note 1) ( ): Dimensions with auto switch

Note 2) Applicable stroke: Available in 5 mm intervals

Symbol

### -XC36 With Boss on Rod side

Cylinder with boss on rod side

#### Applicable Series

Series	Model	Action	
CQ2	Standard	CQ2	
		CQ2W	
	Axial piping	CQP2	Double acting, Single rod
			Single acting (Spring return/extend)

Note 1) For double rod type, it comes with boss on both sides.

Note 2) Except with bracket

Note 3) Except  $\phi 125$  or more

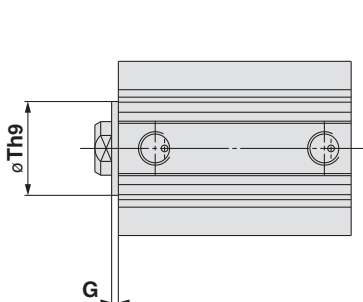
#### How to Order

Standard model no. — **XC36**

With boss on rod side ●

Specifications: Same as standard

#### Dimensions



\* The dimensions except mentioned above are the same as those of the standard.

Series	CQ2 (mm)	
	Th9	G
12	15 <sup>0</sup> <sub>-0.043</sub>	1.5
16	20 <sup>0</sup> <sub>-0.052</sub>	1.5
20	13 <sup>0</sup> <sub>-0.043</sub>	2
25	15 <sup>0</sup> <sub>-0.043</sub>	2
32	21 <sup>0</sup> <sub>-0.052</sub>	2
40	28 <sup>0</sup> <sub>-0.052</sub>	2
50	35 <sup>0</sup> <sub>-0.062</sub>	2
63	35 <sup>0</sup> <sub>-0.062</sub>	2
80	43 <sup>0</sup> <sub>-0.062</sub>	2
100	59 <sup>0</sup> <sub>-0.074</sub>	2

# Series CQ2

## Made to Order Individual Specifications 1

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -X144 Special Port Location

For changing port location ( $\phi 12$  to  $\phi 25$  with auto switch only)

#### How to Order

CDQ2 Standard model no. - X144 B

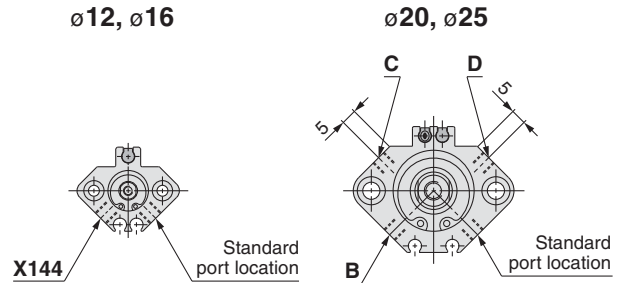
Special port location

In the case of CDQ2□20/25,  
specify the port location  
with B, C and D.

#### Applicable Model

Action	Note
Double acting, Single rod	Applicable to $\phi 12$ to $\phi 25$
Double acting, Double rod	
Single acting (Spring return/extend)	

Note) The specifications are the same as those of the CDQ2 series.



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order Individual Specifications 2

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

**-X202** Full Length Dimension is the Same as the CQ1 Series.

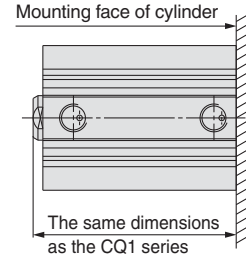
C□Q2 **Mounting** **Bore size** — **Stroke** **Action** **Option** (Z) — X202

In a single rod cylinder of the CQ2 series, the A dimension (from the head face to the rod end) and the rod end female thread size are the same as those of the CQ1 series (former model).

### Applicable Model

Action		Note
Single rod	Double acting (Rubber bumper)	Applicable to $\phi 12$ , $\phi 20$ , $\phi 32$ , $\phi 40$ , $\phi 50$ , $\phi 63$ , $\phi 80$ , $\phi 100$
	Single acting (Spring return/Spring extend)	Applicable to $\phi 12$ , $\phi 20$ , $\phi 32$ , $\phi 40$ , $\phi 50$

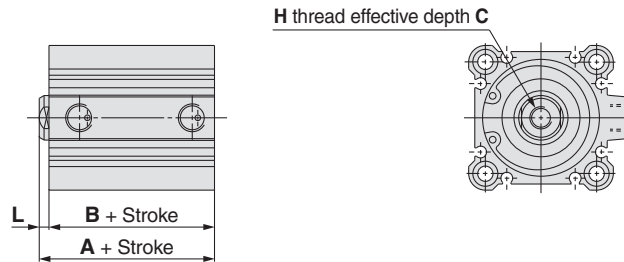
Note 1)  $\phi 16$  and  $\phi 25$  are the new models so that they are not applicable.  
Note 2) Strokes except mentioned below are available as standard products.



The specifications are the same as those of the standard, CQ2 series.

### Dimensions (Without auto switch)

Double acting,  
Single rod: Female thread



Symbol	Bore size		$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Stroke (mm)		15, 25	5, 10 20, 30 40, 50	15, 25 35, 45	5, 10 20, 30 40, 50	15, 25 35, 45	5, 10 20, 30 40, 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	
<b>A</b>			25.5	23(25)	28	26.5 (28.5)	31.5	33	38	34	39	39.5	44.5	47	52	56.5	61.5	
<b>B</b>			22	19.5	24.5	23	28	29.5	34.5	30.5	35.5	36	41	43.5	48.5	53	58	
<b>L</b>			3.5	3.5 (5.5)	3.5	3.5 (5.5)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
<b>H</b>			M3 x 0.5	M5 x 0.8		M6 x 1.0*		M6 x 1.0*		M8 x 1.25*		M10 x 1.5		M16 x 2.0		M20 x 2.5		
<b>C</b>			6	7		9*		11*		13*		15		21		27		

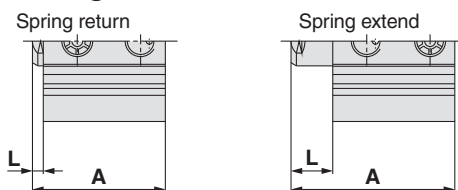
Note) (:): Stroke 10 mm \* The H/C dimensions of  $\phi 32$ ,  $\phi 40$  and  $\phi 50$  are different from those of the new CQ2 series model.

### 75 st, 100 st

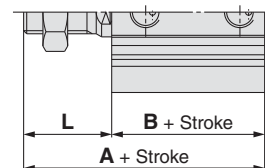
Symbol	Bore size		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Stroke		75	100	75	100	75	100	75	100	75	100	75	100
<b>A</b>			36.5	43	44	49.5	57	66.5						
<b>B</b>			33	39.5	40.5	46	53.5	63						
<b>L</b>			3.5	3.5	3.5	3.5	3.5	3.5						

Note) The H/C dimensions are the same as above.

### Single acting



### Double acting: Rod end male thread



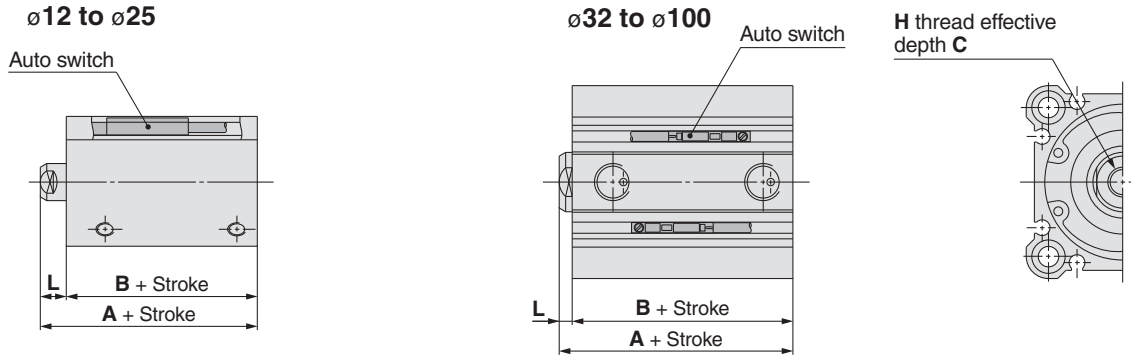
Action	Bore size		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$	
	Stroke		5	10	5	10	5	10	10	20
Single acting, Spring return	<b>A</b>		28	35	31.5	38.5	38	43	44	54
	<b>L</b>		3.5	5.5	3.5	5.5	3.5		3.5	
Single acting, Spring extend	<b>A</b>		33	45	36.5	48.5	43	53	54	74
	<b>L</b>		8.5	15.5	8.5	15.5	8.5	13.5	13.5	23.5

Symbol	Bore size		$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Stroke		15, 25	10	15, 25 35, 45	10	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45			
<b>A</b>			36	40	43	53.5	56.5	63	69	74.5	92	101.5						
<b>B</b>			22	19.5	24.5	23	28	34.5	35.5	41	48.5	58						
<b>L</b>			14	20.5	18.5	30.5	28.5	28.5	33.5	33.5	43.5	43.5						

Symbol  
**-X202**

**Dimensions (With auto switch)**

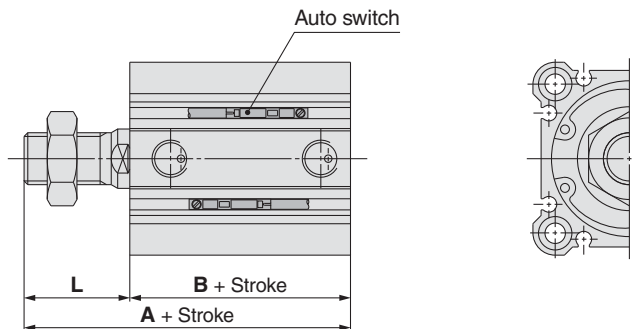
**Double acting, Single rod: Female thread**



Bore size	ø12	ø20	ø32	ø40	ø50	ø63	ø80	ø100							
Stroke (mm)	15, 25	5, 10, 20 30, 40, 50	10, 20, 30 40, 50, 75 100	5, 15, 25 35, 45	10, 20, 30 40, 50, 75 100	5, 15, 25 35, 45	10, 20, 30 40, 50, 75 100	15, 25 35, 45							
<b>A</b>	36.5	38.5	43.5	36.5	41.5	43	48	44	49	49.5	54.5	57	62	66.5	71.5
<b>B</b>	33	31.5	36.5	33	38	39.5	44.5	40.5	45.5	46	51	53.5	58.5	63	68
<b>L</b>	3.5	7	7	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
<b>H</b>	M3 x 0.5	M5 x 0.8	M6 x 1.0*	M6 x 1.0*	M8 x 1.25*	M8 x 1.25*	M10 x 1.5	M16 x 2.0	M20 x 2.5						
<b>C</b>	6	7	9*	9*	11*	11*	13*	15	21						

\* The H/C dimensions of ø32, ø40 and ø50 are different from those of the new CQ2 series model.

**Double acting: Rod end male thread**



Bore size	ø12	ø20	ø32	ø40	ø50	ø63	ø80	ø100	
Stroke (mm)	15, 25	5, 10 20, 30 40, 50	15, 25 35, 45	5, 15, 25 35, 45	5, 15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	
<b>A</b>	47	53.5	58.5	66.5	73	79	84.5	102	111.5
<b>B</b>	33	31.5	36.5	38	44.5	45.5	51	58.5	68
<b>L</b>	14	22	22	28.5	28.5	33.5	33.5	43.5	43.5

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order Individual Specifications 3

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

**-X203** L Dimension from Rod Cover is the Same as the CQ1 Series.

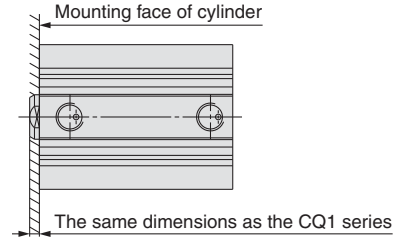
C□Q2 **Mounting** **Bore size** — 10 **Action** **Option** Z — X203

In a single rod cylinder of the CQ2 series, the L dimension (from the rod face to the rod end) and the rod end female thread size are the same as the CQ1 series (former model).

### Applicable Model

Action		Note	
Single rod	Female thread	Double acting Rubber bumper	Applicable to $\phi 20$ , $\phi 32$ , ( $\phi 40$ ), ( $\phi 50$ ), ( $\phi 63$ ), ( $\phi 80$ ), ( $\phi 100$ )
		Single acting (Spring return, Spring extend)	Applicable to $\phi 20$ , $\phi 32$ , ( $\phi 40$ ), ( $\phi 50$ )
	Male thread	Available as the standard, CQ2 series	

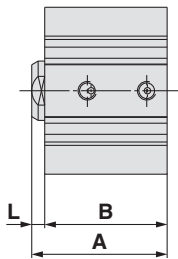
Note 1)  $\phi 16$  and  $\phi 25$  are the new models so that they are not applicable.  
Note 2) ( ): Same dimensions as for those of -X202



The specifications are the same as those of the standard, CQ2 series.

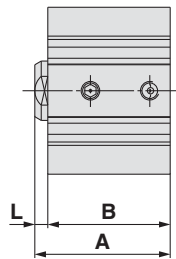
### Dimensions: Applicable to CQ2B<sup>20</sup>/<sub>32</sub>-10D(C)Z Only

#### Double acting, Single rod



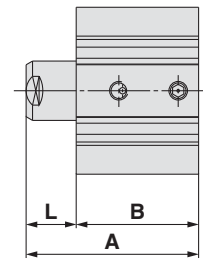
Symbol	Bore size	
	$\phi 20$	$\phi 32$
<b>A</b>	33	36.5
<b>B</b>	29.5	33
<b>L</b>	3.5	3.5

#### Single acting, Spring return



Symbol	Bore size	
	$\phi 20$	$\phi 32$
<b>A</b>	33	36.5
<b>B</b>	29.5	33
<b>L</b>	3.5	3.5

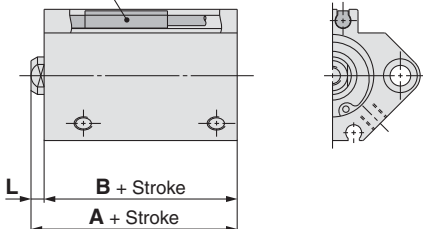
#### Single acting, Spring extend



Symbol	Bore size	
	$\phi 20$	$\phi 32$
<b>A</b>	43	46.5
<b>B</b>	29.5	33
<b>L</b>	13.5	13.5

### With Auto Switch: Applicable to CDQ2B-□D(C)Z Only

Auto switch



Symbol	Bore size $\phi 20$	
	Stroke	Stroke
<b>A</b>	5, 10 20, 30 40, 50	15, 25 35, 45
<b>B</b>	35	40
<b>L</b>	31.5	36.5
	3.5	3.5



Symbol

**-X235** Special Rod End for Double Rod Cylinder

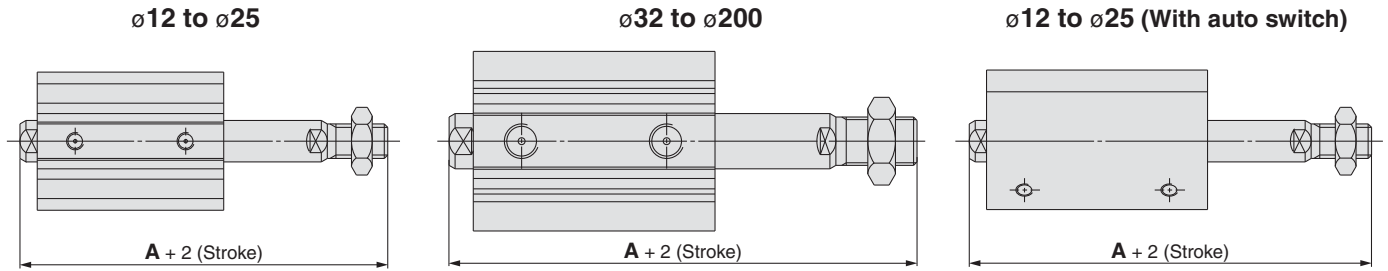
Male thread is used at one piston rod end of double rod cylinder and female thread is used at the other end.

C□Q2W Mounting Bore size — Stroke D (Z) — X235

“D” in the case of “-X235”

Piston rod end  
Male thread, Female thread

\* Specifications: Same as standard  
Note) For mounting a bracket, please contact SMC.



Bore size	12	16	20	25	32	40	50	63	80	100	125	140	160	180	200
Symbol															
A	42.7 (49.9)	45 (55)	49 (61)	56.5 (66.5)	66 (76)	75.5 (85.5)	82 (92)	83.5 (93.5)	104.5 (114.5)	116 (126)	157	157	172	183	190
Applicable stroke	5 to 30		5 to 50		5 to 100			10 to 100			10 to 300				

Note 1) Applicable stroke: Available in 5 mm intervals  
Note 2) ( ): Dimensions with auto switch

Symbol

**-X271** Fluororubber Seals

Material for seals has been changed to fluororubber.

C□Q2 Standard model no. — X271

Fluororubber seals

\* All variations except non-rotating rod is available.  
Only ø125 to ø160 is available for the large bore size type.  
The specifications are the same as for each variation of the CQ2 series.  
Note) With rubber bumper: There is no change of the bumper material.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order Individual Specifications 4

Please contact SMC for detailed dimensions, specifications, and lead times.

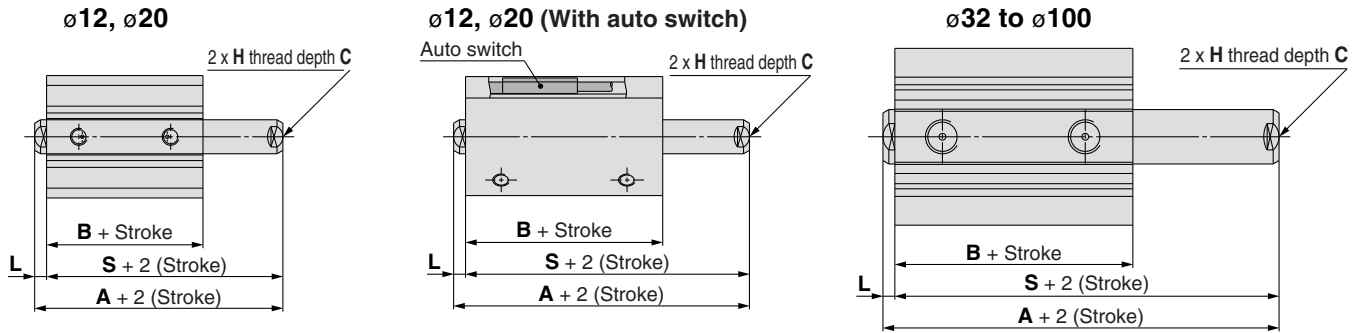


Symbol

**-X293** Full Length Dimension is the Same as the CQ1W Series.

C□Q2W Standard model no. — X293

The same dimensions as the CQ1W ↓



### Without Auto Switch

Bore size Stroke (mm)	12		20		32		40		50		63		80		100	
	5	10	5	15	5	15	5, 10	15	10, 20	15	10, 20	15	10, 20	15	10, 20	15
Symbol	5	10	5	15	5	15	5, 10	15	10, 20	15	10, 20	15	10, 20	15	10, 20	15
A	33	33	38	37	38	43	46.5	51.5	47.5	52.5	53	58	60.5	65.5	70	75
B	25.2	26	31	30.5	30.5	35.5	40	45	40.5	45.5	42	47	51	56	60.5	65.5
L	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
S	29.5	29.5	34.5	33.5	34.5	39.5	43	48	44	49	49.5	54.5	57	62	66.5	71.5
H	M3 x 0.5	M5 x 0.8	M5 x 0.8	M6 x 1	M6 x 1	M6 x 1	M6 x 1	M6 x 1	M8 x 1.25	M8 x 1.25	M10 x 1.5	M10 x 1.5	M16 x 2	M16 x 2	M20 x 2.5	M20 x 2.5
C	6	7	7	9	9	9	9	9	13	13	15	15	21	21	27	27

### With Auto Switch

Bore size Stroke (mm)	12		20		32		40		50		63		80		100	
	5	10	5	15	10	15	10	15	10	15	10	15	10	15	10	15
Symbol	5 <td>10 <td>5 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td></td></td></td></td></td>	10 <td>5 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td></td></td></td></td>	5 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td></td></td></td>	15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td></td></td>	10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td></td>	15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td></td>	10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td></td>	15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td></td>	10 <td>15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td></td>	15 <td>10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td></td>	10 <td>15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td></td>	15 <td>10 <td>15 <td>10 <td>15 </td></td></td></td>	10 <td>15 <td>10 <td>15 </td></td></td>	15 <td>10 <td>15 </td></td>	10 <td>15 </td>	15
A	40	47	52	48	53	56.5	61.5	57.5	62.5	63	68	70.5	75.5	80	85	
B	32.4	38	43	40.5	45.5	50	55	50.5	55.5	52	57	61	66	70.5	75.5	
L	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
S	36	43.5	48.5	44.5	49.5	53	58	54	59	59.5	64.5	67	72	76.5	81.5	
H	M3 x 0.5	M5 x 0.8	M5 x 0.8	M6 x 1	M6 x 1	M6 x 1	M6 x 1	M8 x 1.25	M8 x 1.25	M10 x 1.5	M10 x 1.5	M16 x 2	M16 x 2	M20 x 2.5	M20 x 2.5	
C	6	7	7	9	9	9	9	13	13	15	15	21	21	27	27	

Symbol

**-X525** Long Stroke of Adjustable Extension Stroke Cylinder (-XC8)

C□Q2 **Mounting** **Bore size** — **Stroke** D(M)(Z) — **X525**

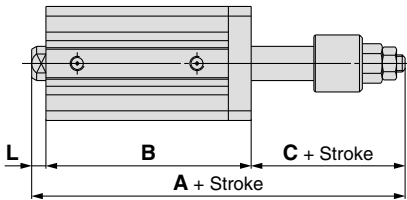
• Long stroke of -XC8

The specifications are the same as those of -XC8 of the CQ2 series.

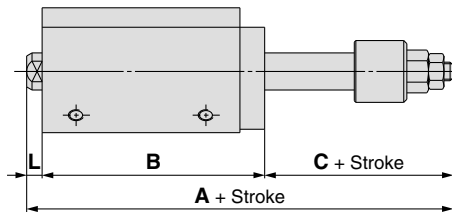
Refer to “Made to Order.”

Note) For tap mounting (ø12 to ø25—without switch) and bracket mounting, please contact SMC.

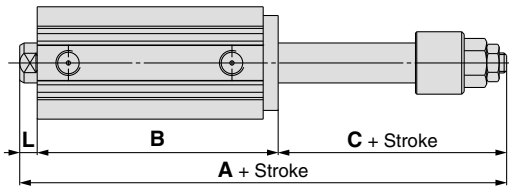
ø12 to ø25 (Without auto switch)



ø12 to ø25 (With auto switch)



ø32 to ø100



ø12, ø16

Bore size	Symbol Stroke	A				B				C	L	Applicable stroke
		35st	40st	45st	50st	35st	40st	45st	50st			
12		99.9	104.9	109.9	114.9	72.4	77.4	82.4	87.4	24	3.5	35, 40
16		104.5	109.9	114.9	119.5	77	82	87	92	24	3.5	45, 50

ø20 to ø100

Bore size	Symbol Stroke	A						B						C	L	Applicable stroke
		55 to 75st	80 to 100st	105 to 125st	130 to 150st	155 to 175st	180 to 200st	55 to 75st	80 to 100st	105 to 125st	130 to 150st	155 to 175st	180 to 200st			
20		155.5	180.5	—	—	—	—	122	147	—	—	—	—	29	4.5	55 to 100
25		156	181	—	—	—	—	122	147	—	—	—	—	29	5	
32		—	—	213.5	238.5	263.5	288.5	—	—	171.5	196.5	221.5	246.5	35	7	55 to 200
40		—	—	223	248	273	298	—	—	181	206	231	256	35	7	
50		—	—	235.5	260.5	285.5	310.5	—	—	183.5	208.5	233.5	258.5	44	8	
63		—	—	237	262	287	312	—	—	187	212	237	262	42	8	
80		—	—	260	285	310	335	—	—	198	223	248	273	52	10	
100		—	—	273.5	298.5	323.5	348.5	—	—	209.5	234.5	259.5	284.5	52	12	

Note 1) The dimensions are the same with or without auto switch.

Note 2) Applicable stroke: Available in 5 mm intervals

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Made to Order Individual Specifications 5

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -X526 Long Stroke of Adjustable Retraction Stroke Cylinder (-XC9)

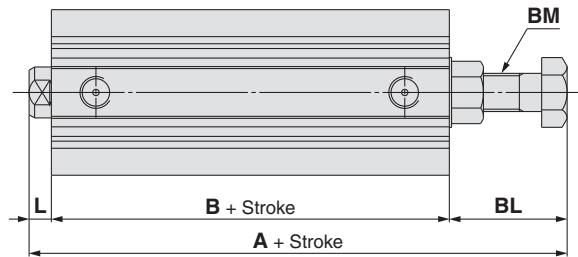
C□Q2 Mounting Bore size — Stroke D(M)(Z) — X526

Long stroke of -XC9

The specifications are the same as those of -XC9 of the CQ2 series. Refer to "Made to Order."

Note) For models with a bracket, please contact SMC.

### Dimensions



Bore size	Symbol	A	B	L	BL	BM	Applicable stroke
12		59.2 (56.4)	32.4	3.5	23.3 (20.5)	M5 x 0.8	35, 40, 45, 50
16		64	37	3.5	23.5	M6 x 1.0	
20		74	39	4.5	30.5	M8 x 1.25	75, 100
25		73.5	39	5	29.5	M8 x 1.25	
32		75.5	40.5	7	28	M8 x 1.25	75, 100, 125
40		94	50	7	37	M12 x 1.5	
50		94.5	50.5	8	36	M12 x 1.5	
63		98.5	52	8	38.5	M16 x 1.5	
80		119.5	91	10	48.5	M20 x 1.5	150, 175, 200
100		135	70.5	12	52.5	M24 x 1.5	

Note 1) ( ): Dimensions with auto switch

Note 2) Intermediate strokes (available in 5 mm intervals) are available with a spacer.

The dimensions are the same as those of 75, 100, 125, 150, 175, 200 mm strokes.

Symbol

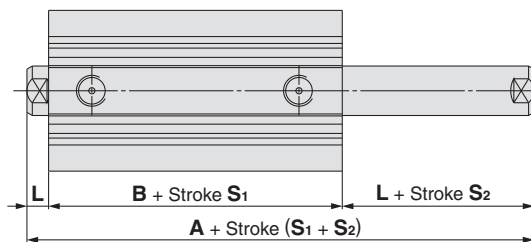
### -X633 Intermediate Stroke of Double Rod Cylinder

C□Q2W Standard model no. — X633  
C□Q2KW

\* Specifications: Same as standard

Note) For models with a bracket, please contact SMC.

### Dimensions



Bore size	Symbol	A	B	L	Stroke S1	Stroke S2
12		32.2 (39.4)	25.2 (32.4)	3.5	In the case of 5 to 30 stroke, 5 mm intervals	In the case of 5 to 30 stroke, 1 mm intervals
16		33 (43)	26 (36)	3.5		
20		35 (47)	26 (38)	4.5	In the case of 5 to 50 stroke, 5 mm intervals	In the case of 5 to 50 stroke, 1 mm intervals
25		39 (49)	29 (39)	5		
32		44.5 (54.5)	30.5 (40.5)	7	In the case of 5 to 50 stroke, 5 mm intervals In the case of 50 to 100 stroke, 25 mm intervals	In the case of 5 to 100 stroke, 1 mm intervals
40		54 (64)	40 (50)	7		
50		56.5 (66.5)	40.5 (50.5)	8	In the case of 10 to 50 stroke, 5 mm intervals	In the case of 10 to 100 stroke, 1 mm intervals
63		58 (68)	42 (52)	8		
80		71 (81)	51 (61)	10	In the case of 50 to 100 stroke, 25 mm intervals	In the case of 10 to 300 stroke, 1 mm intervals
100		84.5 (94.5)	60.5 (70.5)	12		
125		115	83	16	In the case of 10 to 50 stroke, 10 mm intervals	In the case of 10 to 300 stroke, 1 mm intervals
140		115	83	16		
160		125	91	17	In the case of 50 to 200 stroke, 25 mm intervals	In the case of 10 to 300 stroke, 1 mm intervals
180		136	102	17		
200		143	109	17	In the case of 200 to 300 stroke, 50 mm intervals	

Note 1) ( ): Dimensions with auto switch  
Note 2) Installing a spacer inside the standard cylinder tube, stroke S<sub>1</sub> has 5 mm intervals for controlling intermediate strokes in 1 mm intervals.

Example) In the case of CDQ2WB40-18DZ, stroke S<sub>1</sub> is 20 mm and stroke S<sub>2</sub> is 18 mm.

Note 3) For ø40 to ø100 cylinders with bumper, please consult with SMC.

Symbol

**-X636** Long Stroke of Dual Stroke Single Rod Cylinder

C□Q2B **Bore size** – **Stroke S<sub>1</sub>** + **Stroke S<sub>2</sub>–S<sub>1</sub>** (C)(M)(Z) – **X636**

Long stroke of -XC11

**Applicable Stroke** (mm)

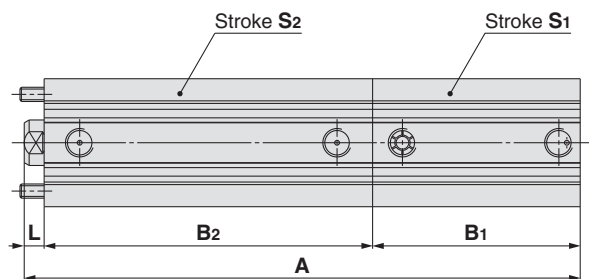
Bore size	Stroke
ø12, ø16	Stroke S <sub>2</sub> : Up to 50 mm
ø20 to ø100	Stroke S <sub>2</sub> : Up to 100 mm

The specifications are the same as those of -XC11 of the CQ2 series.

Refer to "Made to Order."

Note) For tap mounting and bracket mounting, please contact SMC.

**Series CQ2**



**Bore Size: ø12, ø16** (mm)

Symbol Bore size	A	B <sub>1</sub>	B <sub>2</sub>	L	Stroke range	
					S <sub>1</sub>	S <sub>2</sub>
ø12	52.9 (63.9) + Stroke (S <sub>1</sub> + S <sub>2</sub> )	17 (28) + Stroke S <sub>1</sub>	32.4 + Stroke S <sub>2</sub>	3.5	5 to 30	35 to 50
ø16	58 (70) + Stroke (S <sub>1</sub> + S <sub>2</sub> )	18.5 (30.5) + Stroke S <sub>1</sub>	36 + Stroke S <sub>2</sub>	3.5	5 to 30	35 to 50

**Bore Size: ø20, ø25** (mm)

Symbol Bore size	A		B <sub>1</sub>	B <sub>2</sub>		L	Stroke range	
	Stroke S <sub>2</sub>			Stroke S <sub>2</sub>			S <sub>1</sub>	S <sub>2</sub>
	55 to 75	80 to 100		55 to 75	80 to 100			
ø20	137 (149) + Stroke S <sub>1</sub>	162 (174) + Stroke S <sub>1</sub>	19.5 (31.5) + Stroke S <sub>1</sub>	113	138	4.5	5 to 50	55 to 100
ø25	141.5 (151.5) + Stroke S <sub>1</sub>	166.5 (176.5) + Stroke S <sub>1</sub>	22.5 (32.5) + Stroke S <sub>1</sub>	114	139	5	5 to 50	55 to 100

**Bore Size: ø32 to ø100** (mm)

Symbol Bore size	A					B <sub>1</sub>			B <sub>2</sub>		L	Stroke range	
	Stroke S <sub>2</sub> 55 to 75		Stroke S <sub>2</sub> 80 to 100			Stroke S <sub>1</sub>			Stroke S <sub>2</sub>			S <sub>1</sub>	S <sub>2</sub>
	Stroke S <sub>1</sub>		Stroke S <sub>1</sub>			50	55 to 75	80 to 100	55 to 75	80 to 100			
	55	55 to 75	50	55 to 75	80 to 100								
ø32	145.4 (155.5) + Stroke S <sub>1</sub>	230.5	170.5 (180.5) + Stroke S <sub>1</sub>	255.5	280.5	23 (33) + Stroke S <sub>1</sub>	108	133	115.5	140.5	7	5 to 100	55 to 100
ø40	161.5 (171.5) + Stroke S <sub>1</sub>	246.5	186.5 (196.5) + Stroke S <sub>1</sub>	271.5	296.5	29.5 (39.5) + Stroke S <sub>1</sub>	114.5	139.5	125	150	7	5 to 100	55 to 100
ø50	164 (174) + Stroke S <sub>1</sub>	249	189 (199) + Stroke S <sub>1</sub>	274	299	30.5 (40.5) + Stroke S <sub>1</sub>	115.5	140.5	125.5	150.5	8	10 to 100	55 to 100
ø63	171 (181) + Stroke S <sub>1</sub>	256	196 (206) + Stroke S <sub>1</sub>	281	306	36 (46) + Stroke S <sub>1</sub>	121	146	127	152	8	10 to 100	55 to 100
ø80	189.5 (199.5) + Stroke S <sub>1</sub>	274.5	214.5 (224.5) + Stroke S <sub>1</sub>	299.5	324.5	43.5 (53.5) + Stroke S <sub>1</sub>	128.5	153.5	136	161	10	10 to 100	55 to 100
ø100	210.5 (220.5) + Stroke S <sub>1</sub>	295.5	235.5 (245.5) + Stroke S <sub>1</sub>	320.5	345.5	53 (63) + Stroke S <sub>1</sub>	138	163	145.5	170.5	12	10 to 100	55 to 100

Note 1) ( ): Dimensions with auto switch

Note 2) Applicable stroke: Available in 5 mm intervals

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

# Series CQ2

## Made to Order Individual Specifications 6

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

### -X1876 Cylinder Tube: With Concave Boss on Head Side

C□Q2  
C□Q2K  
C□Q2□S

Mounting

Bore size

Stroke

D(C)(M)(Z)

S(M)(Z)

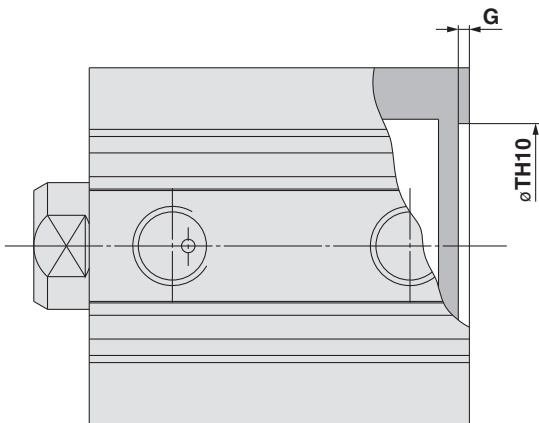
T(M)(Z)

— X1876

• With concave boss on head side

The specifications are the same as those of the CQ2 series.

Note) Except  $\phi 12$ ,  $\phi 16$  and  $\phi 125$  to  $\phi 200$






Bore size (mm)	TH10	G
20	19.3 <sup>+0.084</sup> <sub>0</sub>	1.4
25	23.8 <sup>+0.084</sup> <sub>0</sub>	1.4
32	30.9 <sup>+0.100</sup> <sub>0</sub>	1.4
40	39.3 <sup>+0.100</sup> <sub>0</sub>	1.3
50	48.7 <sup>+0.100</sup> <sub>0</sub>	2.1
63	61.5 <sup>+0.120</sup> <sub>0</sub>	2.4
80	78.3 <sup>+0.120</sup> <sub>0</sub>	2.7
100	98.9 <sup>+0.140</sup> <sub>0</sub>	2.8



## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- \*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots - Safety.  
etc.

### Warning

- 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**  
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 2. Only personnel with appropriate training should operate machinery and equipment.**  
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
  1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
  2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
  3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
  1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
  2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
  3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
  4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

- 1. The product is provided for use in manufacturing industries.**  
The product herein described is basically provided for peaceful use in manufacturing industries.  
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.  
If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

\*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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