

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.

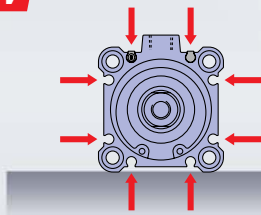


Auto switch mounting rail removed
A round slot for mounting small auto switches is provided on 4 surfaces.

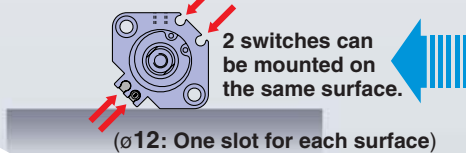
NEW

Available up to ø200

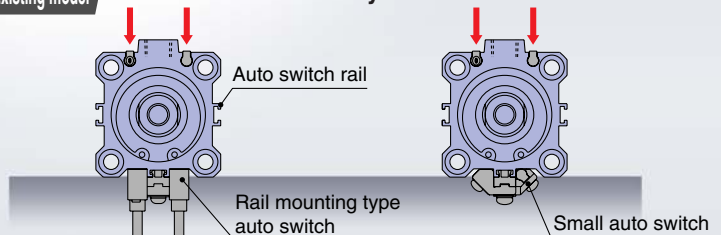
NEW ø32 to ø200



ø12 to ø25: Mountable on 2 surfaces

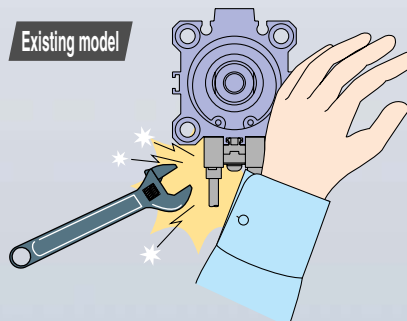


Existing model ø32 to ø50: Only one surface



No projection 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 labor 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 st 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	◆	●	●	●	●	◆	●	●	●	●	◆

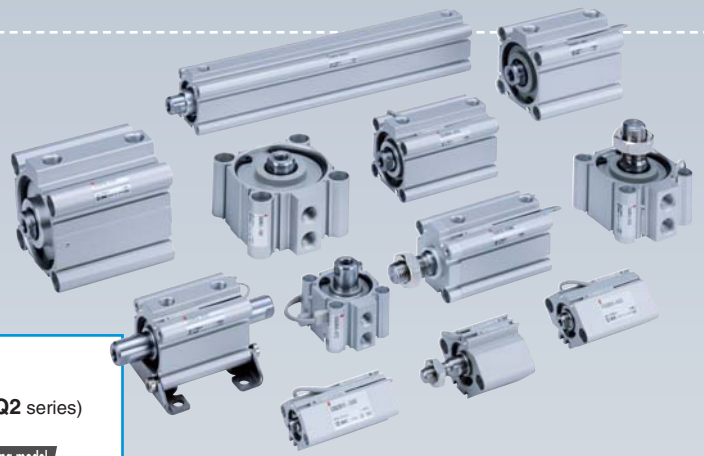
◆ Standard stroke ● Currently stocked intermediate stroke

Series CQ2



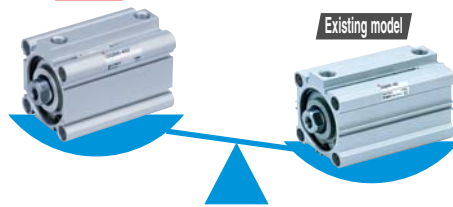
CAT.ES20-205B

NEW
Series **CQ2 Compact Cylinder**



Lighter weight

Reduced by **5 to 13%**
(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 CO₂ discharge by **1300 t** by less use of aluminum

Weight

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

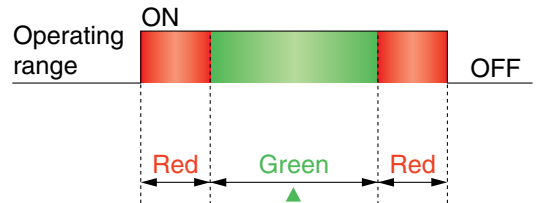
Bore size – Stroke	∅40-50 st
NEW CQ2	456(483)
Existing model CQ2	483(527)

(): With male thread

Small auto switch

2-color indication solid state auto switch

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

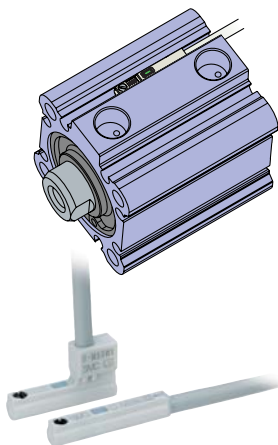


A green light lights up at the optimum operating range.

Optimum operating range

Even if 2-color indication solid state auto switches are fixed at the optimum operating range (the green light lights 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.)

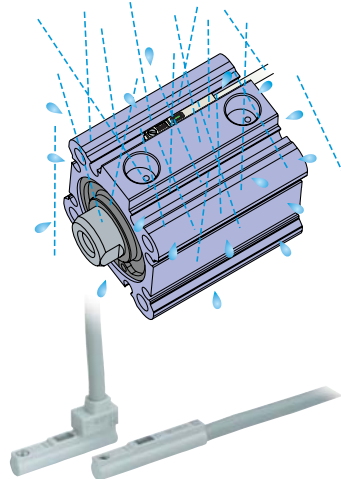
For general environments



D-M9□W(V)

Water resistant type

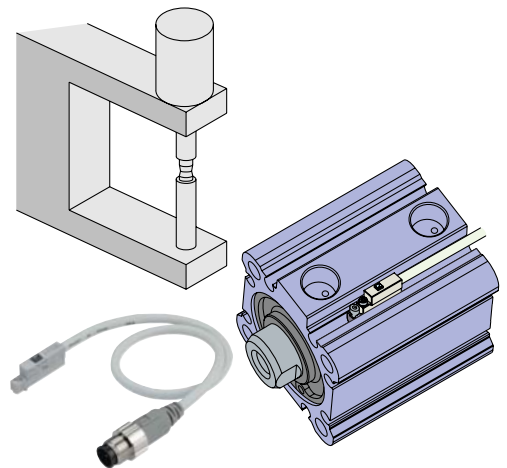
For environments exposed to water and coolant



D-M9□A(V)

Magnetic field resistant type

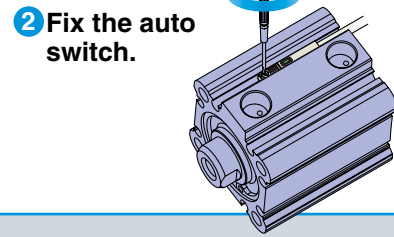
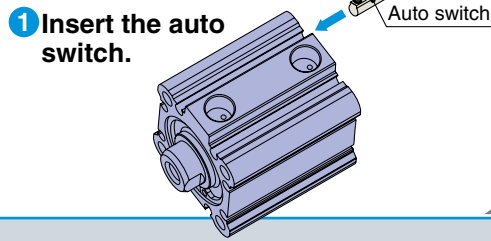
For use with AC spot welders, which generate strong magnetic field



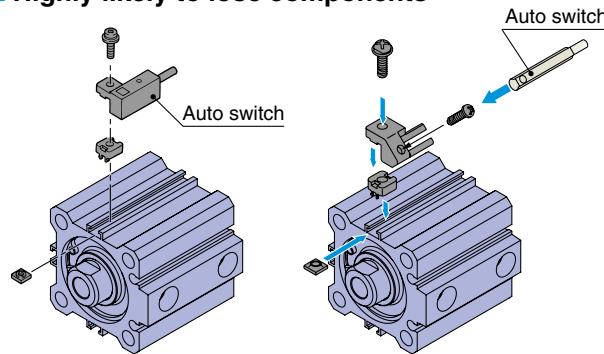
D-P3DW

Reduction in labor for work

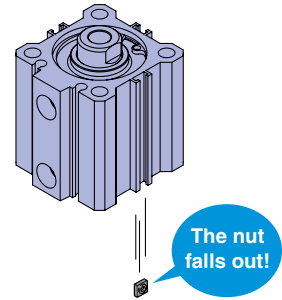
- Reduction in number of components **NEW**
- No loss of components



- Takes a lot of labor and time because there are many components. **Existing model**
- Highly likely to lose components



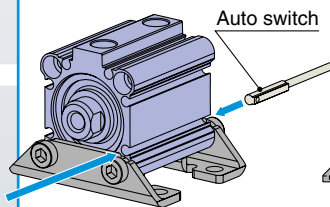
The nuts and screws may fall out when installed vertically.



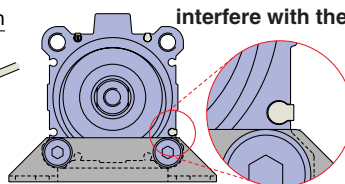
Reduction in labor for design

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

NEW

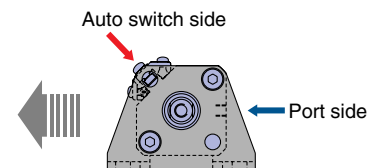
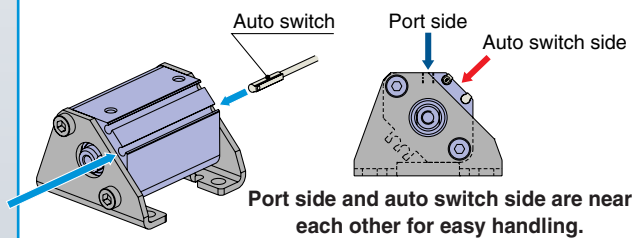
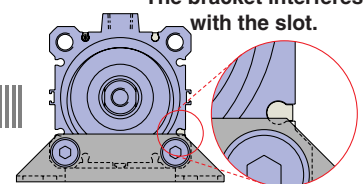


The bracket does not interfere with the slot.



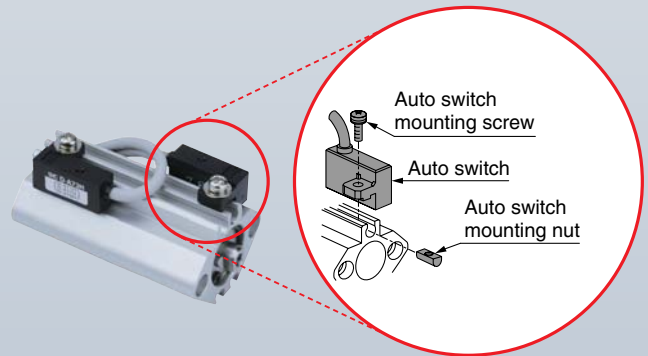
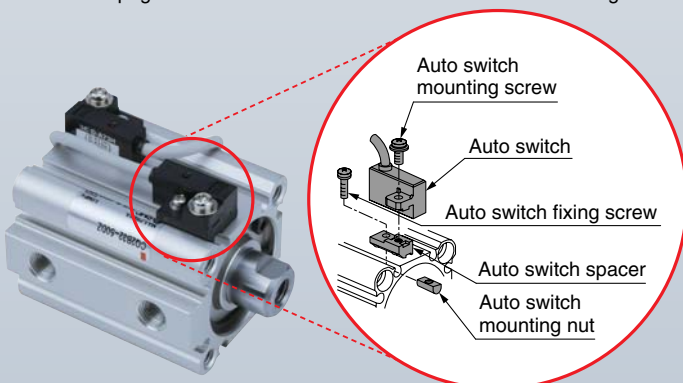
Existing model

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.





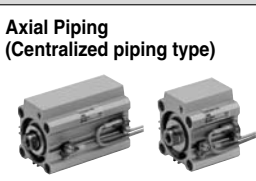







Compact Cylinder *Series CQ2*

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

Combinations of Standard Products and Made to Order Specifications

Series CQ2

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)		CQ2 (Long Stroke)	CQ2K (Non-rotating Rod)		CQP2 (Axial Piping) ^{Note 12)}			CQ2□S (Anti-lateral Load)	CBQ2 ^{Note 12)} (With End Lock)		
			Double acting		Single acting			Double acting		Double acting		Double acting	Single acting		Double acting	Double acting
			Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend		Single rod	Double rod	Single rod	Double rod	Single rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Single rod
			ø12 to ø100	ø12 to ø50	ø125 to ø200		ø32 to ø100	ø12 to ø63	ø12 to ø100	ø12 to ø50	ø32 to ø100	ø20 to ø100				
Standard	Standard product		●	●	●	●	●	●	●	●	●	●	●			
D	Built-in magnet		●	●	●	●	●	●	●	●	●	●	●			
CQ2□A	Both ends tapped	ø12 to ø100	●	●	●	●	●	● ^{Note 4)}	● ^{Note 4)}	○	○	○	●			
CQ2□-□M	Rod end male thread		●	●	●	●	●	●	●	●	●	●	●			
CQ2□-□C	With rubber bumper		●	●	○	○	● ^{Note 2)}	○ ^{Note 1)}	○ ^{Note 1)}	●	○	○	● ^{Note 2)}			
CQ2□-□F	With boss on head end		●	—	●	●	○	—	● ^{Note 3)}	● ^{Note 3)}	● ^{Note 3)}	●	○			
CQ2□F	With one-touch fittings	ø32 to ø63	●	●	●	●	○	○	○	○	○	○	○			
CQ2 ^{LF} _G	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	ø12 to ø100	●	●	●	●	○	○	○	○	○	○	○			
CQ2□ ^R	Water resistant	ø20 to ø100	●	● ^{Note 6)}	○	○	○	○	○	○	○	○	○			
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	○	○	○	○	○	○ ^{Note 4)}	○ ^{Note 4)}	○	○	○	○			
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 ^{Note 12)}	Cylinder with heat resistant auto switch	ø16 to ø63	○	○	○	○	○	○	○	○	○	○	○			
XC4	With heavy-duty scraper	ø20 to ø100	○	○ ^{Note 6)}	○	○	○	○	○	○ ^{Note 7)}	○	○	○			
XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel		○	○	○	○	○	○	○	○	○	○	○			
XC8	Adjustable stroke cylinder/Adjustable extension type		○	—	○	○	○	○	○	○	○	○	○ ^{Note 8)}			
XC9	Adjustable stroke cylinder/Adjustable retraction type		○	—	○	○	○	○	○	○	○	○	○ ^{Note 9)}			
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		○	—	○	○	○	○ ^{Note 4)}	—	○	○	○	○			
XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304		○	○	○	○	○	○	○	○	○	○	○			
XC35	With coil scraper	ø32 to ø100	○	○	○	○	○	○	○	○	○	○	○			
XC36	With boss on rod end	ø12 to ø100	○	○	○	○	○ ^{Note 10)}	○ ^{Note 10)}	○ ^{Note 10)}	○	○	○	○			
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.		—	○	—	—	—	—	—	—	—	—	—			
X525	Long stroke of adjustable extension stroke cylinder (-XC8)	ø12 to ø100	○	—	○	○	○	○	—	○	○	○	○ ^{Note 8)}			
X526	Long stroke of adjustable retraction stroke cylinder (-XC9)		○	—	○	○	○	○	—	○	○	○	○ ^{Note 9)}			
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 end	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

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.

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 -

Mounting

B Through-hole (Standard)	F Rod flange
A Both ends tapped	G Head flange
L Foot	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 5 and 10.

Type

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

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

Port thread type

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

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

Nil Without auto switch

* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z	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

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

Made to Order

Refer to the next page for details.

Body option

Nil	Standard (Rod end female thread)
F	With boss on head end
C	With rubber bumper <small>Note 4)</small>
M	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) CDQ2L32-25Z

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

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load					
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		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	●	●	●	○	—	○					
	Diagnostic indication (2-color indication)			3-wire (PNP)				M9PVV	M9PV	●	●	●	○	—	○			IC circuit		
				2-wire				M9BVV	M9BW	●	●	●	○	—	○					
				3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○				IC circuit	
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○					
	Water resistant (2-color indication)			2-wire				M9BAV**	M9BA**	○	○	●	○	—	○			—		
				2-wire (Non-polar)				—	P3DW	●	—	●	—	—	○					
				Magnetic field resistant (2-color indication)				3-wire (NPN equivalent)	A96V	A96	●	—	●	—	—				—	IC circuit
								2-wire	A93V	A93	●	—	●	—	—				—	
Reed auto switch	—	Grommet	No	2-wire	24 V	5 V	100 V	A96V	A96	●	—	●	—	—	IC circuit	Relay, PLC				
				5 V, 12 V		100 V or less	A93V	A93	●	—	●	—	—							
								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. If water resistance is needed, we recommend water resistant cylinders be used. (Page 156)

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9NVV
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ

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

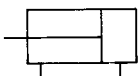
* There are other applicable auto switches other than the listed above. For details, refer to page 175.
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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



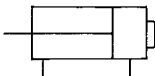
JIS Symbol

Double acting,
Single rod



Symbol

With boss on
head end



Made to Order

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

Symbol	Specifications
-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 end
-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 end

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

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

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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 (mm)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50 to 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

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

Air-hydro type

Bore size	Standard stroke (mm)
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

Standard Size
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

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.	CQ2B32-57DZ (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		○	●	○	●	○	●	○	●	○	●	○	●	○	●

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.	CQ2B32-57DZ-XB10A (uses 60 mm stroke tube) • CQ2B32-60DZ-XB10 with 3 mm width spacer inside • The B dimension is 93 mm.

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.

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.	CQ2B32-57DZ-XB10 (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. Pay sufficient attention 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 a 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 catalog. 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. A 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 Mass 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: Mass of cylinder movable parts kg

m2: Load mass kg

V: Piston speed m/s

Mass 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

Mass 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 Mass of Cylinder Movable Parts (g)

Bore size (mm)	Rod end male thread	Cylinder stroke (mm)									
		12	16	20	25	32	40	50	63	80	100
12	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 mass: CDQ2B32-20DZ101 g

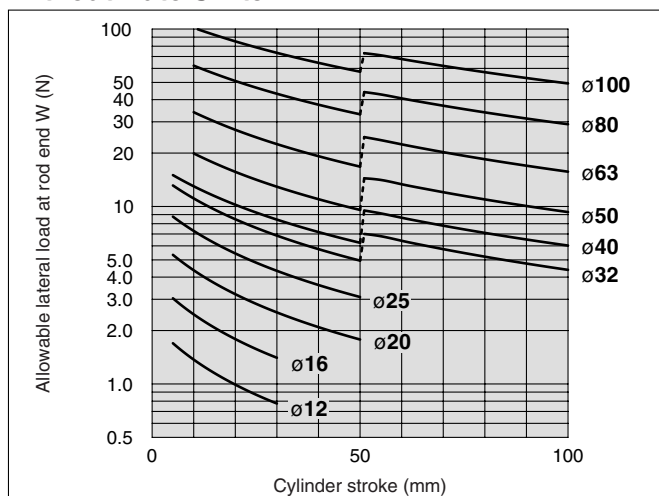
• Additional mass: Rod end male thread 43 g

With rubber bumper-3 g

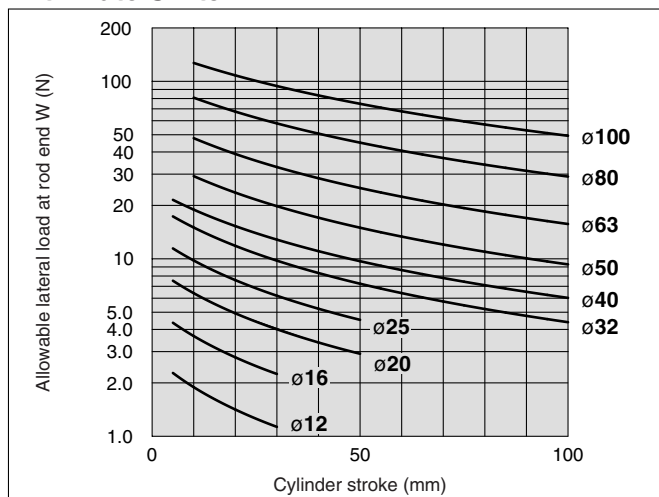
141 g

Allowable Lateral Load at Rod End

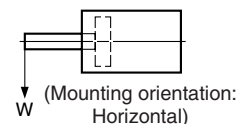
Without Auto Switch



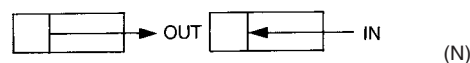
With Auto Switch



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

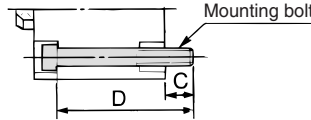
Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	29	35	41	47	54	60	—	—	—	—	—	—
16	42	50	59	67	76	84	—	—	—	—	—	—
20	63	75	88	101	114	127	140	152	165	178	—	—
25	86	100	115	129	144	158	173	187	202	216	—	—
32	125	145	165	184	204	224	244	263	283	303	448	547
40	187	208	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

Mounting Bolt for CQ2B/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CQ2B12-5D	6.5	25	CQ-M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
CQ2B16-5D	5	25	CQ-M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
CQ2B20-5D	7.5	25	CQ-M5 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
-35D		55	x 55L
-40D		60	x 60L
-45D		65	x 65L
-50D		70	x 70L
CQ2B25-5D	9.5	30	CQ-M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		45	x 45L
-25D		50	x 50L
-30D		55	x 55L
-35D		60	x 60L
-40D		65	x 65L
-45D		70	x 70L
-50D		75	x 75L
CQ2B32-5DZ	9	30	CQ-M5 x 30L
-10DZ		35	x 35L
-15DZ		40	x 40L
-20DZ		45	x 45L
-25DZ		50	x 50L
-30DZ		55	x 55L
-35DZ		60	x 60L
-40DZ		65	x 65L
-45DZ		70	x 70L
-50DZ		75	x 75L
-55DZ-XB10		90	x 90L
-60DZ-XB10		95	x 95L
-65DZ-XB10		100	x 100L
-70DZ-XB10		105	x 105L
-75DZ		110	x 110L
-80DZ-XB10		115	x 115L
-85DZ-XB10		120	x 120L
-90DZ-XB10		125	x 125L
-95DZ-XB10		130	x 130L
-100DZ		135	x 135L

Cylinder model	C	D	Mounting bolt part no.
CQ2B40-5DZ	7.5	35	CQ-M5 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ		60	x 60L
-35DZ		65	x 65L
-40DZ		70	x 70L
-45DZ		75	x 75L
-50DZ		80	x 80L
-55DZ-XB10		95	x 95L
-60DZ-XB10		100	x 100L
-65DZ-XB10		105	x 105L
-70DZ-XB10		110	x 110L
-75DZ	115	x 115L	
-80DZ-XB10	120	x 120L	
-85DZ-XB10	125	x 125L	
-90DZ-XB10	130	x 130L	
-95DZ-XB10	135	x 135L	
-100DZ	140	x 140L	
CQ2B50-10DZ	12.5	45	CQ-M6 x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
-55DZ-XB10		100	x 100L
-60DZ-XB10		105	x 105L
-65DZ-XB10		110	x 110L
-70DZ-XB10		115	x 115L
-75DZ		120	x 120L
-80DZ-XB10	125	x 125L	
-85DZ-XB10	130	x 130L	
-90DZ-XB10	135	x 135L	
-95DZ-XB10	140	x 140L	
-100DZ	145	x 145L	
CQ2B63-10DZ	14.5	50	CQ-M8 x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
-55DZ-XB10		105	x 105L
-60DZ-XB10		110	x 110L
-65DZ-XB10		115	x 115L
-70DZ-XB10		120	x 120L
-75DZ		125	x 125L
-80DZ-XB10		130	x 130L
-85DZ-XB10		135	x 135L
-90DZ-XB10	140	x 140L	
-95DZ-XB10	145	x 145L	
-100DZ	150	x 150L	

Cylinder model	C	D	Mounting bolt part no.
CQ2B80-10DZ	15	55	CQ-M10 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-55DZ-XB10		110	x 110L
-60DZ-XB10		115	x 115L
-65DZ-XB10		120	x 120L
-70DZ-XB10		125	x 125L
-75DZ		130	x 130L
-80DZ-XB10	135	x 135L	
-85DZ-XB10	140	x 140L	
-90DZ-XB10	145	x 145L	
-95DZ-XB10	150	x 150L	
-100DZ	155	x 155L	
CQ2B100-10DZ	15.5	65	CQ-M10 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-55DZ-XB10		120	x 120L
-60DZ-XB10		125	x 125L
-65DZ-XB10		130	x 130L
-70DZ-XB10		135	x 135L
-75DZ		140	x 140L
-80DZ-XB10		145	x 145L
-85DZ-XB10		150	x 150L
-90DZ-XB10	155	x 155L	
-95DZ-XB10	160	x 160L	
-100DZ	165	x 165L	

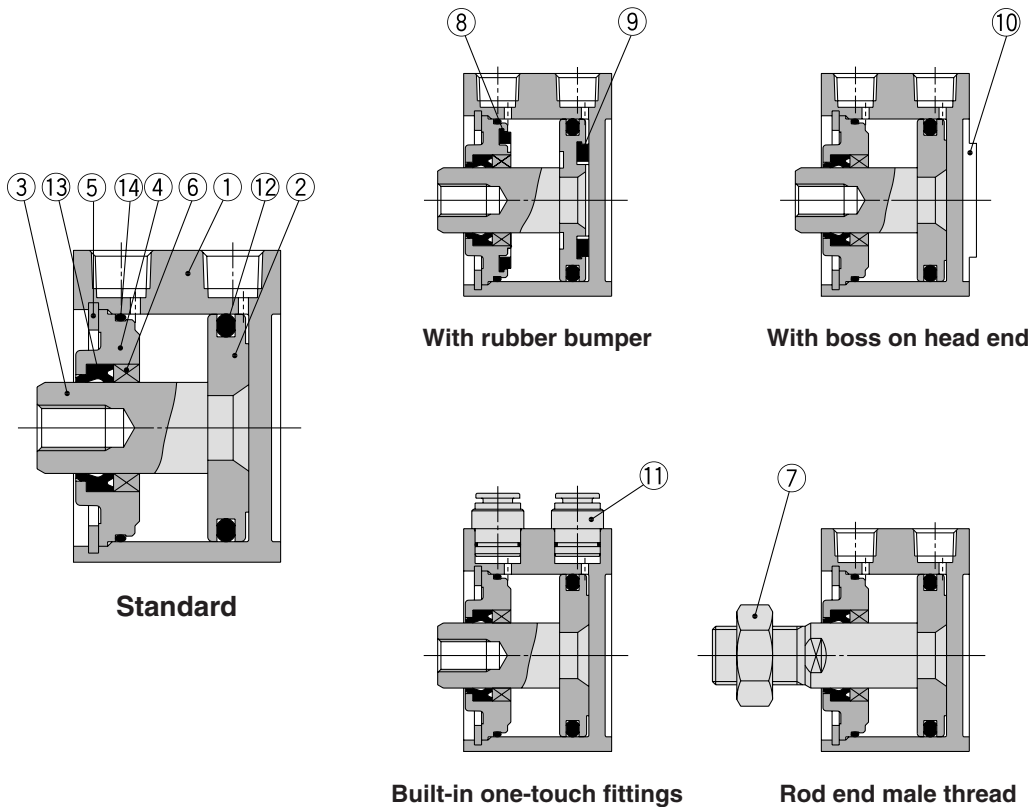
Additional Weight

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
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

Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	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	

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

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	

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)

* 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
Action	Double acting, Single rod									
Proof pressure	1.5 MPa									
Maximum operating pressure	1.0 MPa									
Cushion	None ^{Note)}									
Piston speed	30 to 400 mm/s							30 to 300 mm/s		
Mounting	Through-hole									

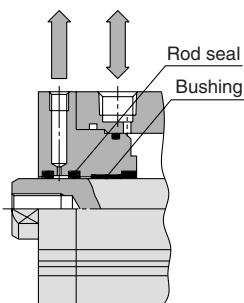
Note) $\phi 12$ with auto switch: With rubber bumper (Standard)

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

Construction

10-CQ2 series (Double seal)

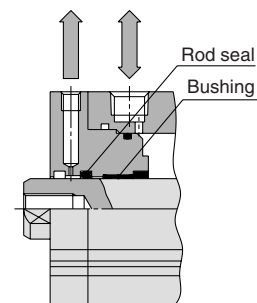
Relief port



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)

Vacuum port
(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
Action	Double acting, Single rod									
Proof pressure	1.5 MPa									
Maximum operating pressure	1.0 MPa									
Cushion	None/Rubber bumper									
Piston speed	50 to 500 mm/s									
Mounting	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**

• With auto switch
(Built-in magnet)

• Water resistant cylinder

R	NBR seals (Nitrile rubber)
V	FKM seals (Fluororubber)

• Water resistant
2-color indication
solid state auto switch

• Made to Order

• Suffix

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.



Nil	Piston rod/Retaining ring/Rod end nut material: Stainless steel
A	Piston rod/Rod end nut/Cover holding bolt material: Stainless steel

Note) -XC6A: $\phi 20$ to $\phi 32$ only

Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
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.

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

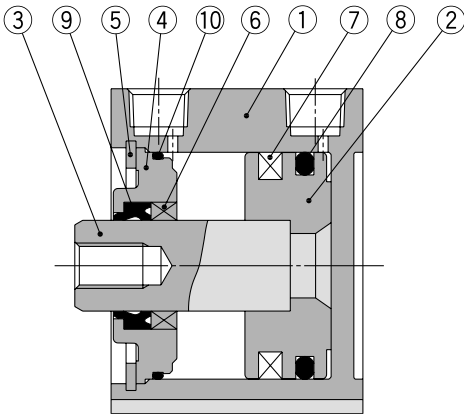
Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Both ends tapped	1	1	3	3	6	6	6	19	45	45
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53	120
	Nut	1	2	4	8	17	17	32	32	49
With boss on head end	0.7	1.3	2	3	5	7	13	25	45	96
With rubber bumper	0	0	-2	-3	-3	-7	-9	-18	-31	-56
Built-in one-touch fittings	—	—	—	—	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 anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	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	

* 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)

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.

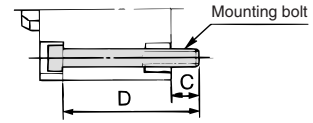
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CDQ2B/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CDQ2B12-5DZ	5.5	35	CQ-M3 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ		65	x 60L
CDQ2B16-5DZ	8	40	CQ-M3 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
CDQ2B20-5DZ	10.5	40	CQ-M5 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
CDQ2B25-5DZ	9.5	40	CQ-M5 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
CDQ2B32-5DZ	9	40	CQ-M5 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
-55DZ-XB10		90	x 90L
-60DZ-XB10		95	x 95L
-65DZ-XB10		100	x 100L
-70DZ-XB10		105	x 105L
-75DZ	110	x 110L	
-80DZ-XB10	115	x 115L	
-85DZ-XB10	120	x 120L	
-90DZ-XB10	125	x 125L	
-95DZ-XB10	130	x 130L	
-100DZ	135	x 135L	

Cylinder model	C	D	Mounting bolt part no.
CDQ2B40-5DZ	7.5	45	CQ-M5 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
-55DZ-XB10	95	x 95L	
-60DZ-XB10	100	x 100L	
-65DZ-XB10	105	x 105L	
-70DZ-XB10	110	x 110L	
-75DZ	115	x 115L	
-80DZ-XB10	120	x 120L	
-85DZ-XB10	125	x 125L	
-90DZ-XB10	130	x 130L	
-95DZ-XB10	135	x 135L	
-100DZ	140	x 140L	
CDQ2B50-10DZ	12.5	55	CQ-M6 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-55DZ-XB10		100	x 100L
-60DZ-XB10	105	x 105L	
-65DZ-XB10	110	x 110L	
-70DZ-XB10	115	x 115L	
-75DZ	120	x 120L	
-80DZ-XB10	125	x 125L	
-85DZ-XB10	130	x 130L	
-90DZ-XB10	135	x 135L	
-95DZ-XB10	140	x 140L	
-100DZ	145	x 145L	
CDQ2B63-10DZ	14.5	60	CQ-M8 x 60L
-15DZ		65	x 65L
-20DZ		70	x 70L
-25DZ		75	x 75L
-30DZ		80	x 80L
-35DZ		85	x 85L
-40DZ		90	x 90L
-45DZ		95	x 95L
-50DZ		100	x 100L
-55DZ-XB10		105	x 105L
-60DZ-XB10		110	x 110L
-65DZ-XB10		115	x 115L
-70DZ-XB10		120	x 120L
-75DZ		125	x 125L
-80DZ-XB10	130	x 130L	
-85DZ-XB10	135	x 135L	
-90DZ-XB10	140	x 140L	
-95DZ-XB10	145	x 145L	
-100DZ	150	x 150L	

Cylinder model	C	D	Mounting bolt part no.
CDQ2B80-10DZ	15	65	CQ-M10 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-55DZ-XB10		110	x 110L
-60DZ-XB10	115	x 115L	
-65DZ-XB10	120	x 120L	
-70DZ-XB10	125	x 125L	
-75DZ	130	x 130L	
-80DZ-XB10	135	x 135L	
-85DZ-XB10	140	x 140L	
-90DZ-XB10	145	x 145L	
-95DZ-XB10	150	x 150L	
-100DZ	155	x 155L	
CDQ2B100-10DZ	15.5	75	CQ-M10 x 75L
-15DZ		80	x 80L
-20DZ		85	x 85L
-25DZ		90	x 90L
-30DZ		95	x 95L
-35DZ		100	x 100L
-40DZ		105	x 105L
-45DZ		110	x 110L
-50DZ		115	x 115L
-55DZ-XB10		120	x 120L
-60DZ-XB10	125	x 125L	
-65DZ-XB10	130	x 130L	
-70DZ-XB10	135	x 135L	
-75DZ	140	x 140L	
-80DZ-XB10	145	x 145L	
-85DZ-XB10	150	x 150L	
-90DZ-XB10	155	x 155L	
-95DZ-XB10	160	x 160L	
-100DZ	165	x 165L	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

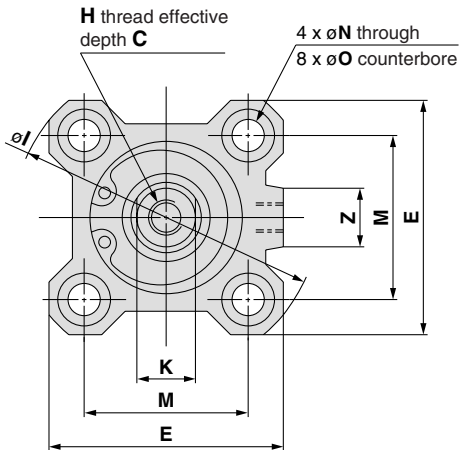
Made to Order

Series CQ2

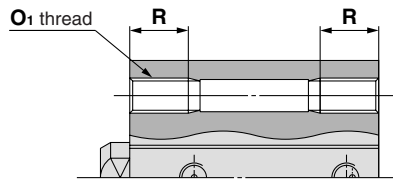
Dimensions

∅12 to ∅25/Without Auto Switch

Standard (Through-hole): CQ2B

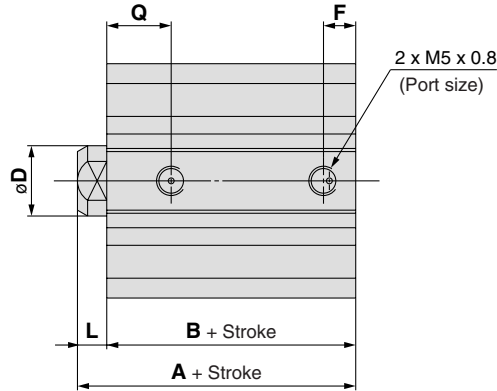


Both ends tapped: CQ2A

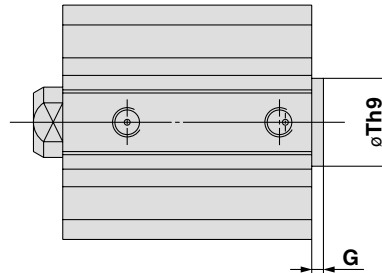


Both Ends Tapped (mm)

Bore size (mm)	O ₁	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



With boss on head end

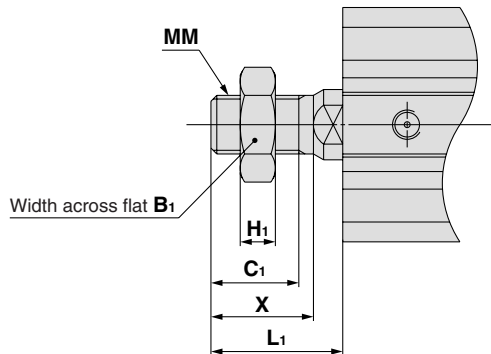


With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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 ₁	C ₁	H ₁	L ₁	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

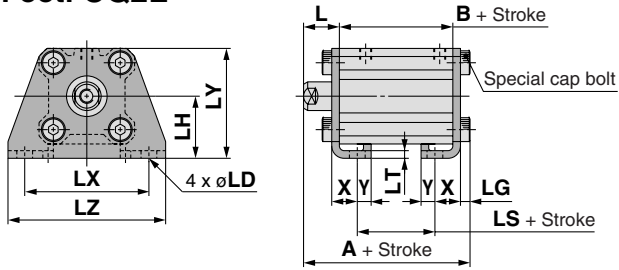
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	K	L	M	N	O	Q	Z
12	5 to 30	20.5	17	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	7.5	-
16	5 to 30	22	18.5	8	8	29	5.5	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	8	10
20	5 to 50	24	19.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	9	10
25	5 to 50	27.5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

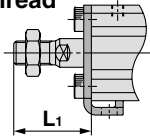
* For details about the rod end nut and accessory brackets, refer to page 19.

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

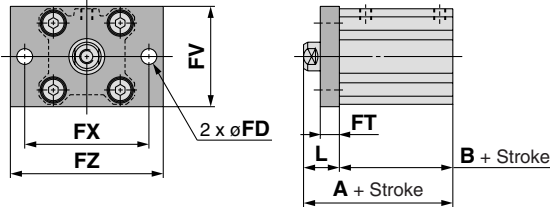
Foot: CQ2L



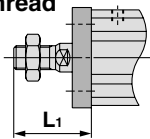
Rod end male thread



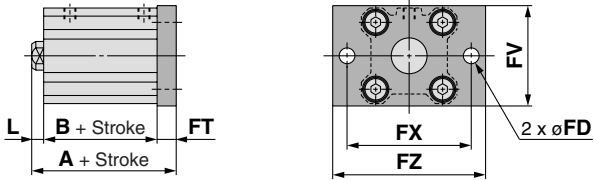
Rod flange: CQ2F



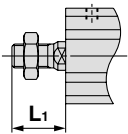
Rod end male thread



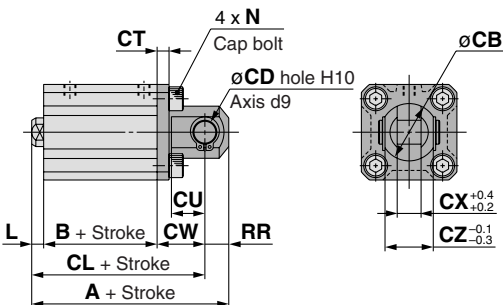
Head flange: CQ2G



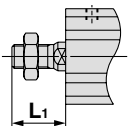
Rod end male thread



Double clevis: CQ2D



Rod end male thread



Foot

Bore size (mm)	Stroke range (mm)	A	B	L	L ₁	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 ₁
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 ₁
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 L₁ 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 ₁	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

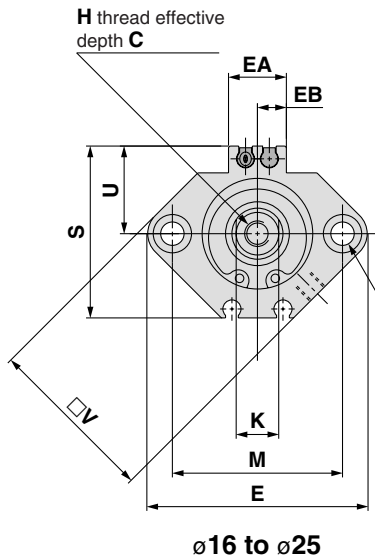
Made to Order

Series CQ2

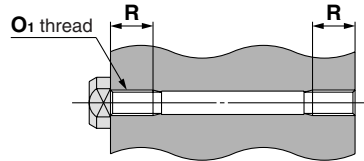
Dimensions

∅12 to ∅25/With Auto Switch

Standard (Through-hole): CDQ2B



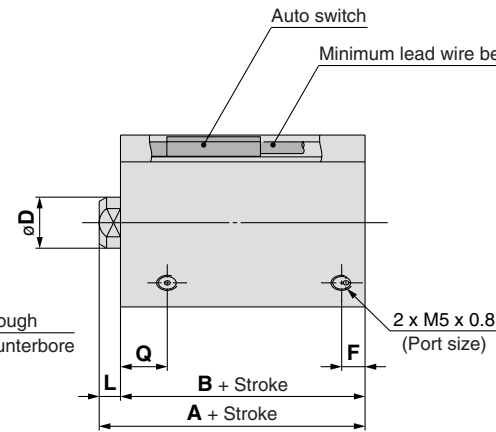
Both ends tapped: CDQ2A



Both Ends

Tapped (mm)

Bore size (mm)	O ₁	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

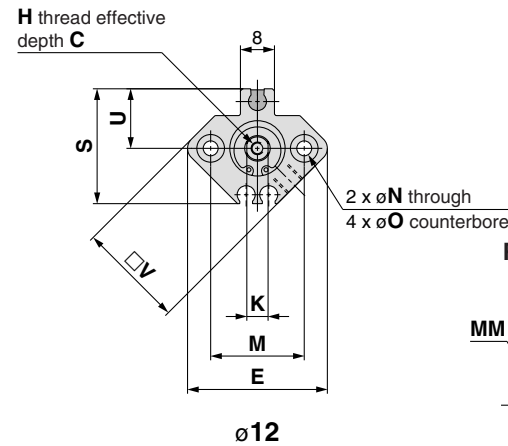


With boss on head end

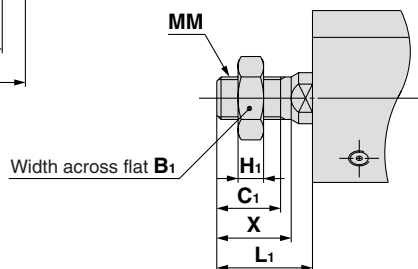
With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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 ₁	C ₁	H ₁	L ₁	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.

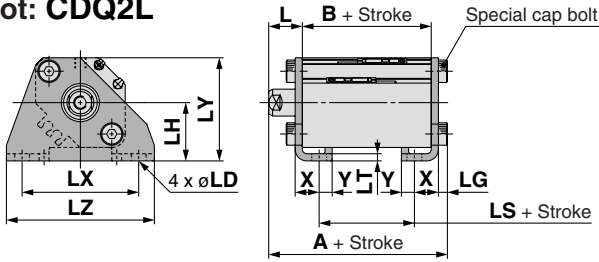
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	H	K	L	M	N	O	Q	S	U	V
12	5 to 30	31.5	28	6	6	33	—	—	6.5	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
16	5 to 30	34	30.5	8	8	37	13.2	6.6	5.5	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
20	5 to 50	36	31.5	7	10	47	13.6	6.8	5.5	M5 x 0.8	8	4.5	36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

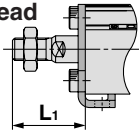
* For details about the rod end nut and accessory brackets, refer to page 19.

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

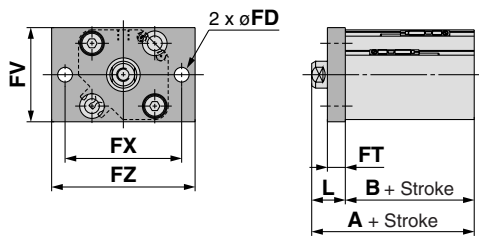
Foot: CDQ2L



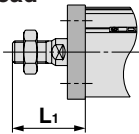
Rod end male thread



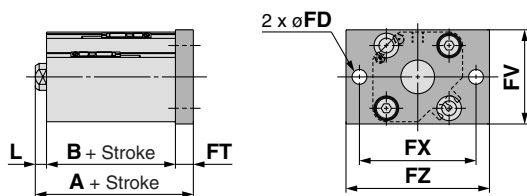
Rod flange: CDQ2F



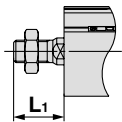
Rod end male thread



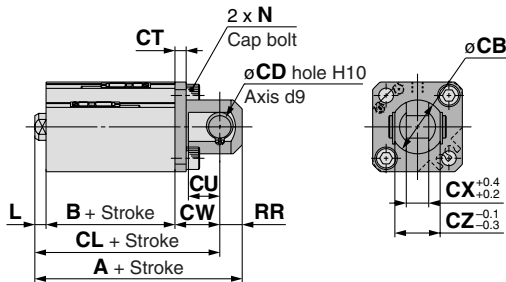
Head flange: CDQ2G



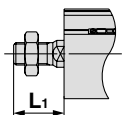
Rod end male thread



Double clevis: CDQ2D



Rod end male thread



Foot

Bore size (mm)	Stroke range (mm)	A	B	L	L ₁	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 Flange

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L	L ₁
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

Head Flange

Bore size (mm)	Stroke range (mm)	A	L	L ₁
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 L₁ 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 ₁	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.

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

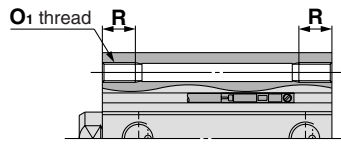
Series CQ2

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.)

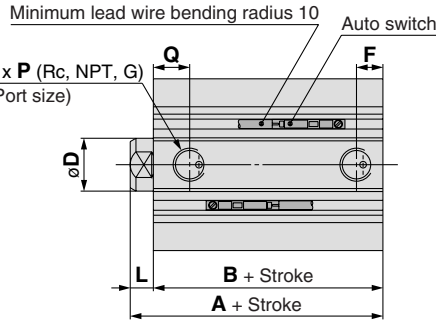
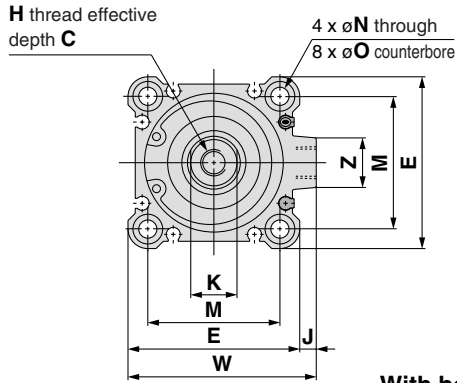
Both ends tapped: CQ2A/CDQ2A



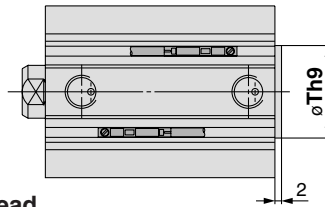
Both Ends Tapped

Bore size (mm)	O ₁	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

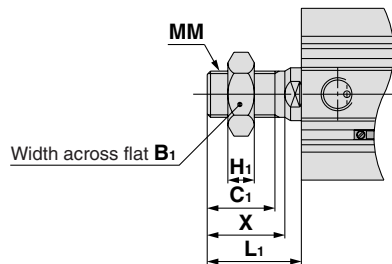


With Boss on Head End

Bore size (mm)	Th9
32	21 ⁰ _{-0.052}
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}

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

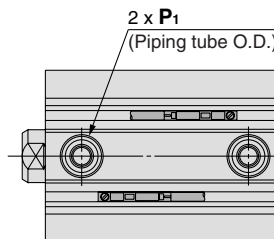
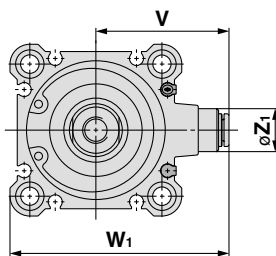
Rod end male thread



Rod End Male Thread

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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

Bore size (mm)	Z ₁	P ₁	V	W ₁
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.

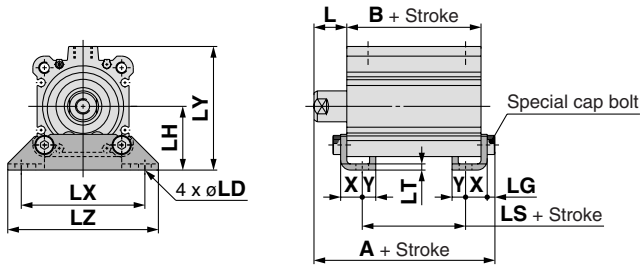
Bore size (mm)	Stroke range (mm)	Without auto switch					With auto switch					C	D	E	H	J	K	L	M	N
		A	B	F	P	Q	A	B	F	P	Q									
32	5	30	23	5.5	M5 x 0.8	11.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
	10 to 50	40	33	7.5	1/8	10.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
	75, 100	40	33	7.5	1/8	10.5	40	33	7.5	1/8	10.5	13	16	45	M8 x 1.25	4.5	14	7	34	5.5
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	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
	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
50	75, 100	48.5	40.5	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

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

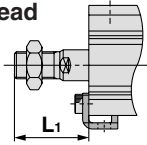
Note 2) The external dimensions with rubber bumper are same as those of the standard, as shown above.
* For details about the rod end nut and accessory brackets, refer to page 19.

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.

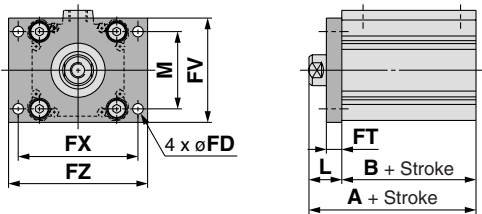
Foot: CQ2L/CDQ2L



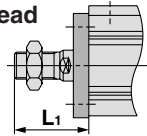
Rod end male thread



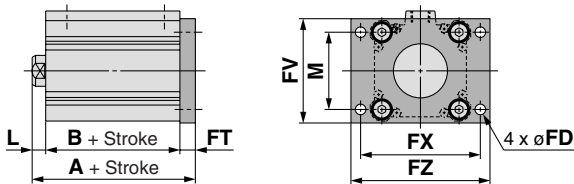
Rod flange: CQ2F/CDQ2F



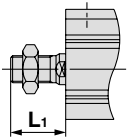
Rod end male thread



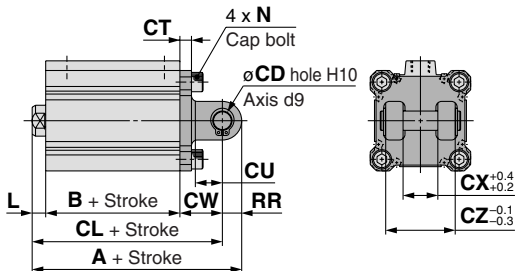
Head flange: CQ2G/CDQ2G



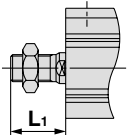
Rod end male thread



Double clevis: CQ2D/CDQ2D



Rod end male thread



Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	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 ₁	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	50	33	5.5	8	48	56	65	17	38.5	34
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	56.5	39.5	5.5	8	54	62	72	17	38.5	40
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	58.5	40.5	6.6	9	67	76	89	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		L	L ₁
		A	A	A	A		
32	5 to 50	38	38	48	48	7	28.5
	75, 100	48	48	48	48	7	28.5
40	5 to 50	44.5	44.5	54.5	54.5	7	28.5
	75, 100	54.5	54.5	54.5	54.5	7	28.5
50	10 to 50	47.5	47.5	57.5	57.5	8	33.5
	75, 100	57.5	57.5	57.5	57.5	8	33.5

(* The dimensions except A, L and L₁ 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 ₁
		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	70	33	60	10	5	14	20	18	36	7	28.5
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	78.5	39.5	68.5	10	6	14	22	18	36	7	28.5
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	90.5	40.5	76.5	14	7	20	28	22	44	8	33.5

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

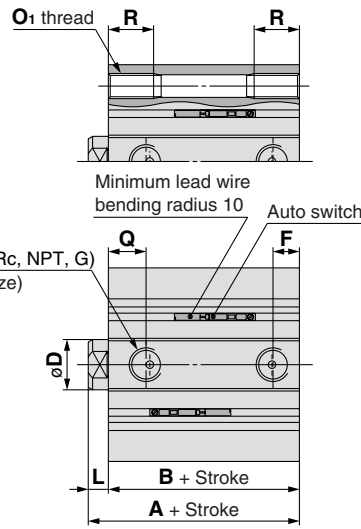
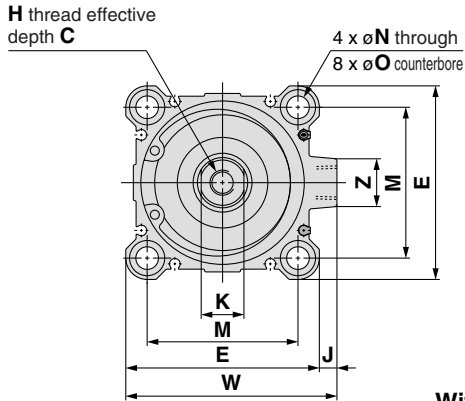
(In the case of without auto switches, the A, B dimensions will be only changed. Refer to the dimension table.)

Both ends tapped: CQ2A/CDQ2A

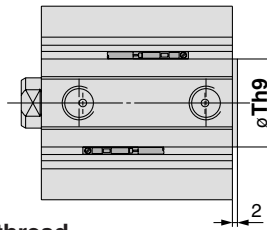
Both Ends Tapped (mm)

Bore size (mm)	O ₁	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 end

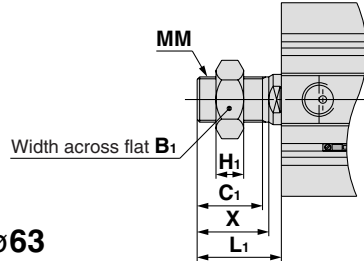


With Boss on Head End (mm)

Bore size (mm)	Th9
63	35 ⁰ _{-0.062}
80	43 ⁰ _{-0.062}
100	59 ⁰ _{-0.074}

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

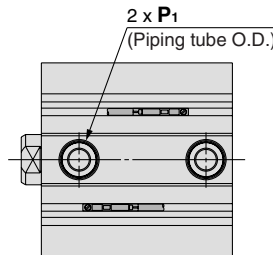
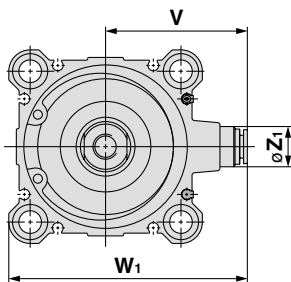
Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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 ₁	P ₁	V	W ₁
63	16	8	56.5	95

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

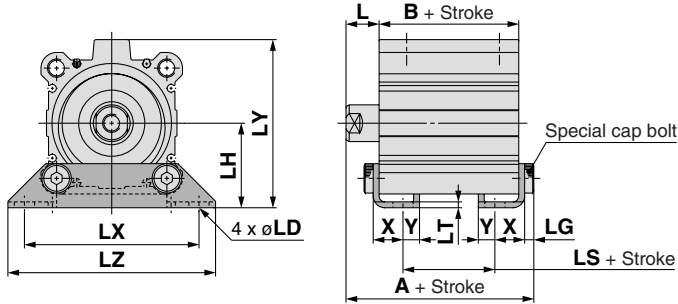
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	W	Z
		A	B	A	B															
63	10 to 50	44	36	54	46	15	20	77	10.5	M10 x 1.5	7	17	8	60	9	14 depth 10.5	1/4	15	84	19
	75, 100	54	46																	
80	10 to 50	53.5	43.5	63.5	53.5	21	25	98	12.5	M16 x 2.0	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.

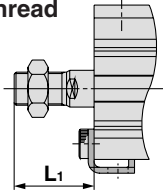
* For details about the rod end nut and accessory brackets, refer to page 19.

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

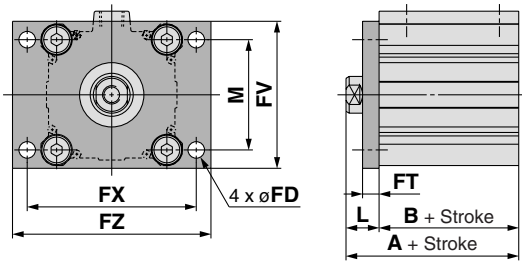
Foot: CQ2L/CDQ2L



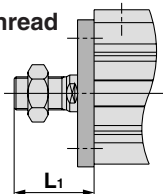
Rod end male thread



Rod flange: CQ2F/CDQ2F



Rod end male thread



Foot (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	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

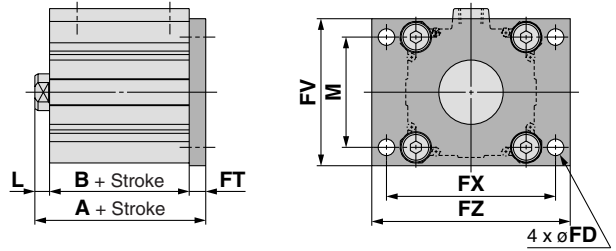
Bore size (mm)	Stroke range (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

Rod Flange (mm)

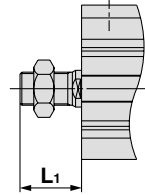
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L ₁	M
		A	B	A	B								
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

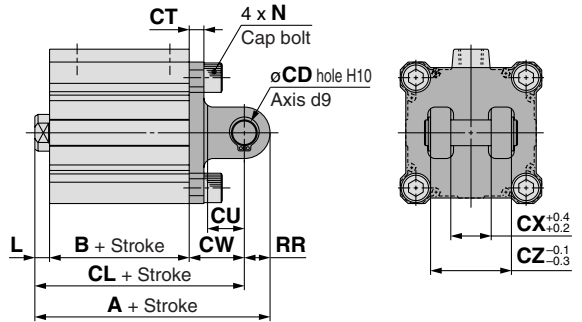
Head flange: CQ2G/CDQ2G



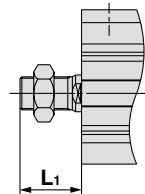
Rod end male thread



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 ₁
		A	A	A	A		
63	10 to 50	53	63	8	33.5		
	75, 100						
80	10 to 50	64.5	74.5	10	43.5		
	75, 100	74.5					
100	10 to 50	76	86	12	43.5		
	75, 100	86					

(* The dimensions except A, L and L₁ 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 ₁	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

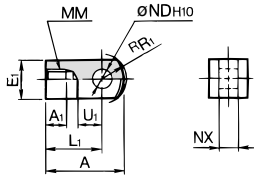
Series CQ2

Accessory Brackets

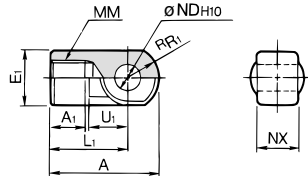
Single Knuckle Joint

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

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



Material: Carbon steel
Surface treatment: Nickel plated



Material: Cast iron
Surface treatment: Nickel plated

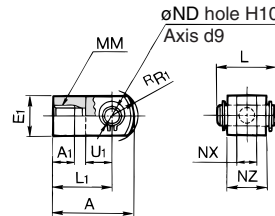
(mm)

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R _{r1}	U ₁	ND _{H10}	NX
I-G012	12	21.5	6	□10	16	M5 x 0.8	6.3	7	5 ^{+0.048} ₀	5 ^{-0.2} _{-0.4}
I-Z015A	16	32	8	□12	25	M6 x 1	8.1	14	5 ^{+0.048} ₀	6.4 ^{-0.1} _{-0.3}
I-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}
I-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}
I-G04	32, 40	42	14	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}
I-G05	50, 63	56	18	∅28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{-0.3} _{-0.5}
I-G08	80	71	21	∅38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{-0.3} _{-0.5}
I-G10	100	79	21	∅44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{-0.3} _{-0.5}

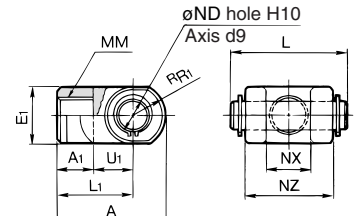
Double Knuckle Joint

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

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



Material: Carbon steel
Surface treatment: Nickel plated



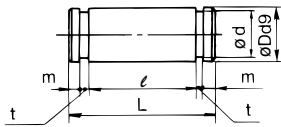
Material: Cast iron
Surface treatment: Nickel plated

(mm)

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R _{r1}	U ₁	ND _{H10}	NX	NZ	L	Applicable pin part no.
Y-G012	12	21.5	6	□10	16	M5 x 0.8	6.3	7	5 ^{+0.048} ₀	5 ^{+0.4} _{+0.2}	10	14.6	IY-G012
Y-Z015A	16	28	11	□12	21	M6 x 1	8.1	10	5 ^{+0.048} ₀	6.5 ^{+0.2} ₊₀	12	16.6	IY-J015
Y-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{+0.4} _{+0.2}	16	21	IY-G02
Y-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{+0.4} _{+0.2}	20	25.6	IY-G03
Y-G04	32, 40	42	16	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{+0.5} _{+0.3}	36	41.6	IY-G04
Y-G05	50, 63	56	20	∅28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{+0.5} _{+0.3}	44	50.6	IY-G05
Y-G08	80	71	23	∅38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{+0.5} _{+0.3}	56	64	IY-G08
Y-G10	100	79	24	∅44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{+0.5} _{+0.3}	64	72	IY-G10

* Knuckle pin and retaining rings are included.

Knuckle Pin (Common with double clevis pin)

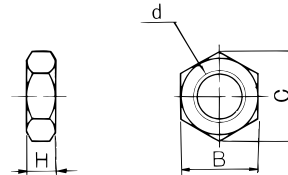


Material: Carbon steel
(mm)

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

* Type C retaining rings for axis are included.

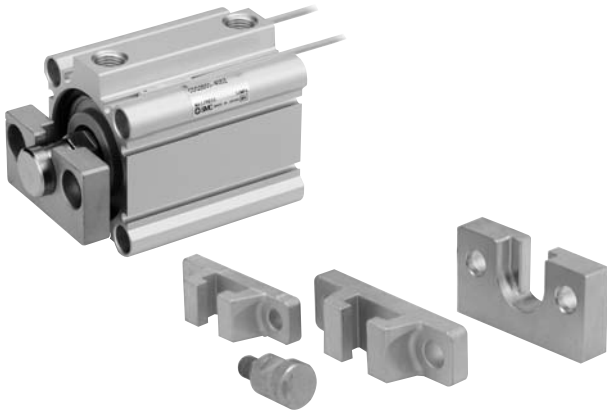
Rod End Nut



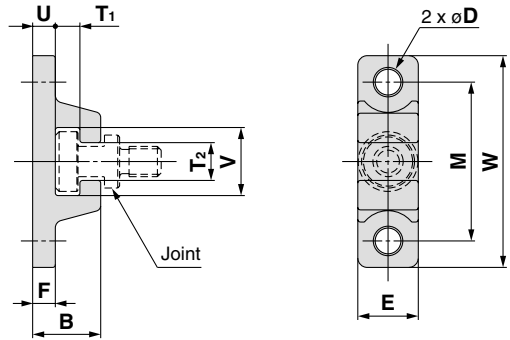
Material: Carbon steel
Surface treatment: Nickel plated
(mm)

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 ₁	T ₂
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

03	For $\phi 32, \phi 40$
05	For $\phi 50, \phi 63$
08	For $\phi 80$
10	For $\phi 100$

• Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket
YU	Joint

Allowable Eccentricity (mm)

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

<Ordering>

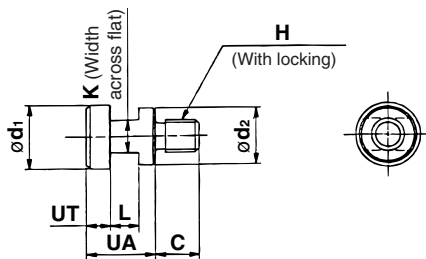
- Joints are not included with type A or B mounting brackets. Order them separately.

(Example)

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

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

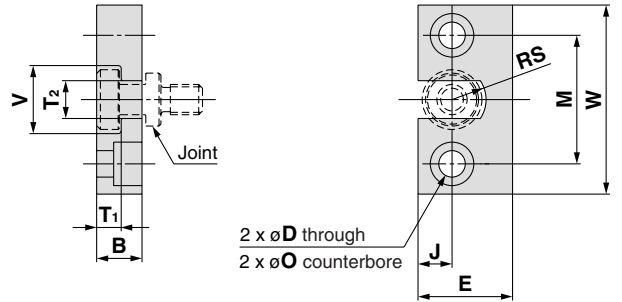
Bore size (mm)	Joint	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



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

Part no.	Applicable bore size (mm)	UA	C	d ₁	d ₂	H	K	L	UT	Weight (g)
YU-03	32, 40	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	50, 63	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	80	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	100	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	ϕO
YB-03	32, 40	12	7	25	9	34	11.5 depth 7.5
YB-05	50, 63	12	9	32	11	42	14.5 depth 8.5
YB-08	80	16	11	38	13	52	18 depth 12
YB-10	100	19	14	50	17	62	21 depth 14

Part no.	Bore size (mm)	T ₁	T ₂	V	W	RS	Weight (g)
YB-03	32, 40	6.5	10	18	50	9	80
YB-05	50, 63	6.5	12	22	60	11	120
YB-08	80	8.5	16	28	75	14	230
YB-10	100	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	Through-hole (Standard)	L	Foot
A	Both ends tapped	F	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

Nil	Pneumatic
H	Air-hydro ^{Note 1)}

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

Port thread type

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø100
	NPT	
	G	
F	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 the air-hydro type.

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

Auto switch

Nil Without auto switch

* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø100	4 surfaces

Number of auto switches

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

Made to Order

Refer to the next page for details.

Body option

Nil	Standard (Rod end female thread)
C	With rubber bumper ^{Note 4)}
M	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

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.
Applicable Auto Switches/Refer to the individual catalog (ES20-201) for the D-P3DW type.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○		
				2-wire				M9BV	M9B	●	●	●	○	—	○		—
				3-wire (NPN)				M9NVW	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	●	—	●	—	—	—	—	—
			No	2-wire		5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	Relay, PLC

** 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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ

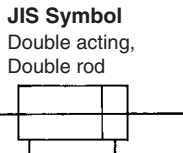
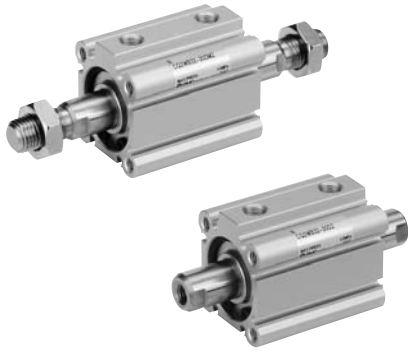
* Solid state auto switches marked with "O" are produced upon receipt of order.

* 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 end
-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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Specifications

Pneumatic type

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

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, 63	10, 15, 20, 25, 30
80, 100	35, 40, 45, 50, 75, 100

Air-hydro type (mm)

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	10, 15, 20, 25, 30
80, 100	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)
Part no.	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)
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 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	Bore size
	Stroke range	Stroke range	Stroke range
	—	12, 16	12, 16
	32 to 100	20, 25 32, 40 50 to 100	20, 25 32, 40 50 to 100
Example	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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	^{Note 1)} M5 x 0.8 Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			TN	—	—	—	—	NPT1/8	NPT1/8	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)}		—	—	—	—	$\phi 6/4$ ^{Note 2)}	$\phi 6/4$	$\phi 8/6$	$\phi 8/6$	—	—
	Rod end male thread		●	●	●	●	●	●	●	●	●	●	
	With rubber bumper		●	●	●	●	●	●	●	●	●	●	
	Air-hydro	Mounting	Through-hole (Standard)	—	—	●	●	●	●	●	●	●	
Both ends tapped			—	—	●	●	●	●	●	●	●		
Built-in magnet		—	—	●	●	●	●	●	●	●			
Piping		Pipe thread	—	—	—	M5 x 0.8	M5 x 0.8	^{Note 1)} M5 x 0.8 Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4	NPT3/8	NPT3/8	
Rod end male thread		—	—	●	●	●	●	●	●	●	●		

Note 1) $\phi 32$ without auto switch: M5 x 0.8 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 $\phi 32$ -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

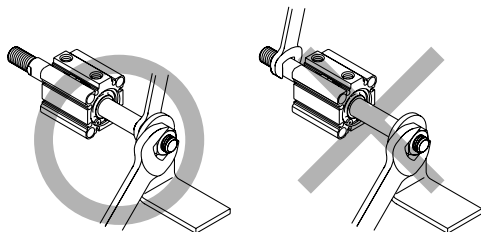
- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out 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.

$\phi 12$ 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 $\phi 100$:

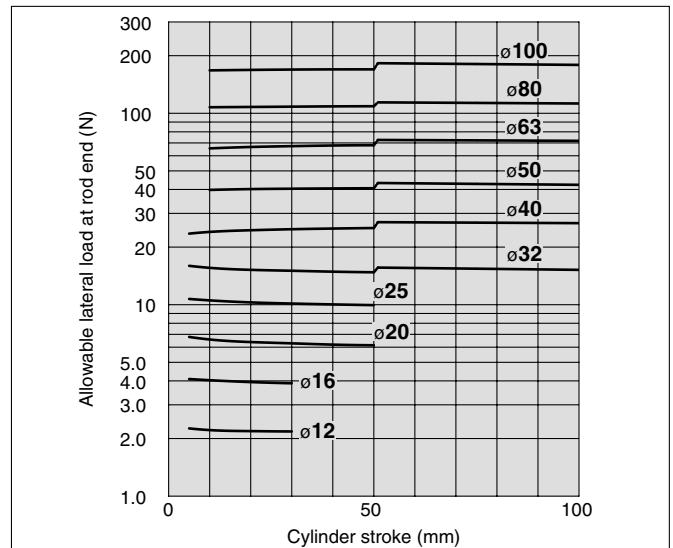
• Order 2 pieces per cylinder.

Note 5) Parts belonging to each bracket are as follows.

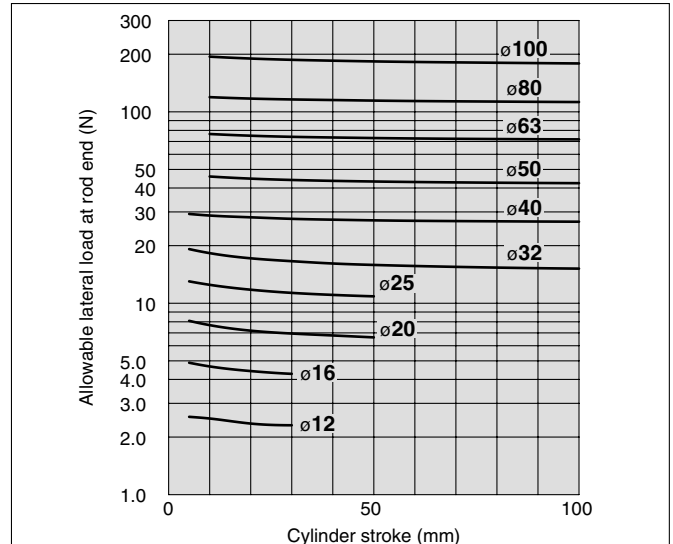
Foot or Flange: Body mounting bolts

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	350
	Nut	2	4	8	16	34	34	64	64	98	232
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	

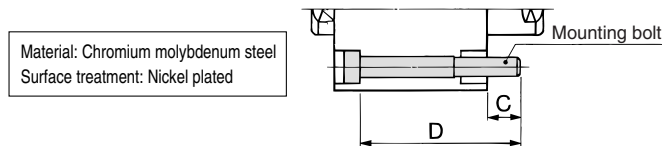
Calculation: (Example) **CQ2WF32-20DCMZ**

- 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

Mounting method: Mounting bolt for through-hole mounting of the CQ2WB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x35L 4 pcs.

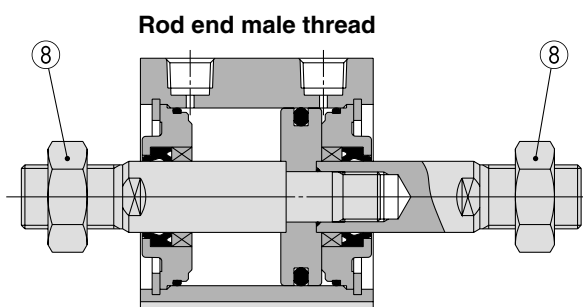
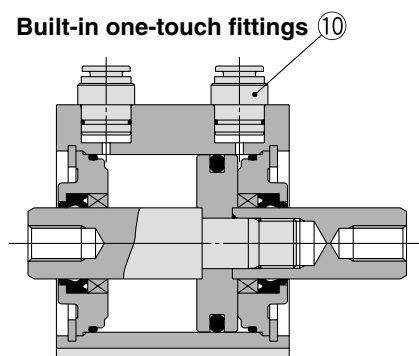
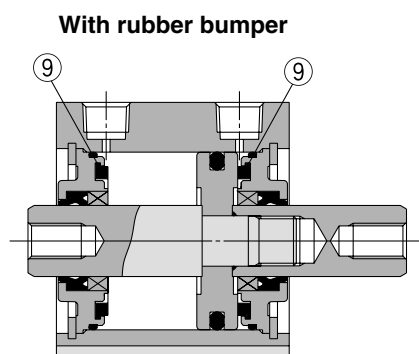
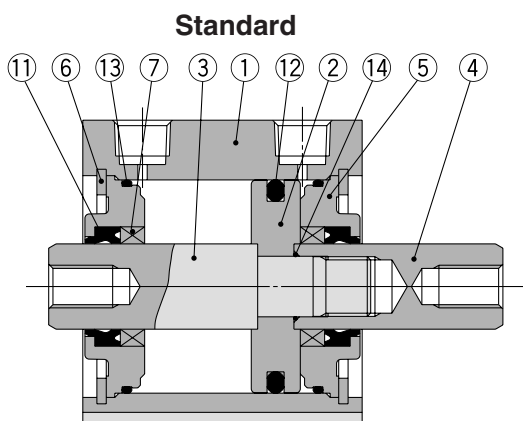


Cylinder model	C	D	Mounting bolt part no.
CQ2WB12-5D	8.3	35	CQ-M3 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
CQ2WB16-5D	7.5	35	CQ-M3 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
CQ2WB20-5D	6	30	CQ-M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		45	x 45L
-25D		50	x 50L
-30D		55	x 55L
-35D		60	x 60L
-40D		65	x 65L
-45D		70	x 70L
-50D		75	x 75L
CQ2WB25-5D	8	35	CQ-M5 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
-35D		65	x 65L
-40D		70	x 70L
-45D		75	x 75L
-50D		80	x 80L

Cylinder model	C	D	Mounting bolt part no.
CQ2WB32-5DZ	6.5	35	CQ-M5 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ		60	x 60L
-35DZ		65	x 65L
-40DZ		70	x 70L
-45DZ		75	x 75L
-50DZ		80	x 80L
CQ2WB40-5DZ	7	45	CQ-M5 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
CQ2WB50-10DZ	12.5	55	CQ-M6 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
-100DZ	155	x 155L	

Cylinder model	C	D	Mounting bolt part no.
CQ2WB63-10DZ	13.5	55	CQ-M8 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
CQ2WB80-10DZ	12.5	60	CQ-M10 x 60L
-15DZ		65	x 65L
-20DZ		70	x 70L
-25DZ		75	x 75L
-30DZ		80	x 80L
-35DZ		85	x 85L
-40DZ		90	x 90L
-45DZ		95	x 95L
-50DZ		100	x 100L
-75DZ		135	x 135L
CQ2WB100-10DZ	13	70	CQ-M10 x 70L
-15DZ		75	x 75L
-20DZ		80	x 80L
-25DZ		85	x 85L
-30DZ		90	x 90L
-35DZ		95	x 95L
-40DZ		100	x 100L
-45DZ		105	x 105L
-50DZ		110	x 110L
-75DZ		145	x 145L
-100DZ	170	x 170L	

Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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, Anodized
		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 ①, ②, 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 ①, ②, 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 ①, ②, 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 ①, ②, 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
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, 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

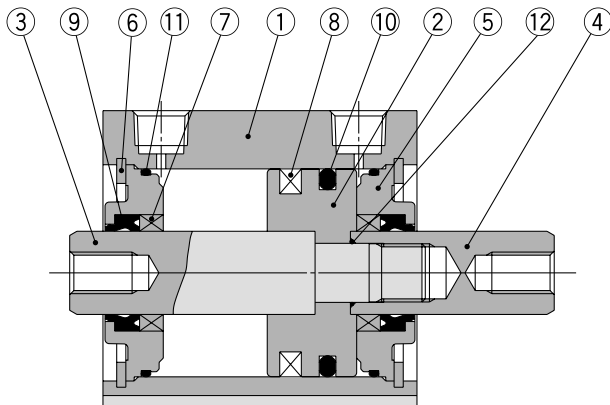
Additional Weight (g)

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 anodized
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, Anodized
		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	

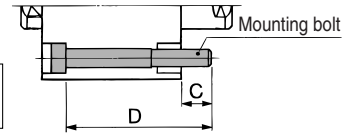
* Seal kit includes ⑨, ⑩, ⑪. Order the seal kit, based on each bore size.
* Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CDQ2WB/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2WB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x40L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CDQ2WB12-5DCZ	6.1	40	CQ-M3 x 40L
-10DCZ		45	x 45L
-15DCZ		50	x 50L
-20DCZ		55	x 55L
-25DCZ		60	x 60L
-30DCZ		65	x 65L
CDQ2WB16-5DZ	7.5	45	CQ-M3 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
CDQ2WB20-5DZ	9	45	CQ-M5 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
CDQ2WB25-5DZ	8	45	CQ-M5 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ	85	x 85L	
-50DZ	90	x 90L	

Cylinder model	C	D	Mounting bolt part no.	
CDQ2WB32-5DZ	6.5	45	CQ-M5 x 45L	
-10DZ		50	x 50L	
-15DZ		55	x 55L	
-20DZ		60	x 60L	
-25DZ		65	x 65L	
-30DZ		70	x 70L	
-35DZ		75	x 75L	
-40DZ		80	x 80L	
-45DZ		85	x 85L	
-50DZ		90	x 90L	
-75DZ	7	115	x 115L	
-100DZ		140	x 140L	
CDQ2WB40-5DZ		7	55	CQ-M5 x 55L
-10DZ			60	x 60L
-15DZ			65	x 65L
-20DZ			70	x 70L
-25DZ			75	x 75L
-30DZ			80	x 80L
-35DZ			85	x 85L
-40DZ			90	x 90L
-45DZ	95		x 95L	
-50DZ	100		x 100L	
-75DZ	12.5	125	x 125L	
-100DZ		150	x 150L	
CDQ2WB50-10DZ		12.5	65	CQ-M6 x 65L
-15DZ			70	x 70L
-20DZ			75	x 75L
-25DZ			80	x 80L
-30DZ			85	x 85L
-35DZ			90	x 90L
-40DZ			95	x 95L
-45DZ			100	x 100L
-50DZ	105		x 105L	
-75DZ	130		x 130L	
-100DZ	155	x 155L		

Cylinder model	C	D	Mounting bolt part no.
CDQ2WB63-10DZ	13.5	65	CQ-M8 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-75DZ		130	x 130L
-100DZ	155	x 155L	
CDQ2WB80-10DZ	12.5	70	CQ-M10 x 70L
-15DZ		75	x 75L
-20DZ		80	x 80L
-25DZ		85	x 85L
-30DZ		90	x 90L
-35DZ		95	x 95L
-40DZ		100	x 100L
-45DZ		105	x 105L
-50DZ		110	x 110L
-75DZ		135	x 135L
-100DZ	160	x 160L	
CDQ2WB100-10DZ	13	80	CQ-M10 x 80L
-15DZ		85	x 85L
-20DZ		90	x 90L
-25DZ		95	x 95L
-30DZ		100	x 100L
-35DZ		105	x 105L
-40DZ		110	x 110L
-45DZ		115	x 115L
-50DZ		120	x 120L
-75DZ		145	x 145L
-100DZ	170	x 170L	

Standard Size

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

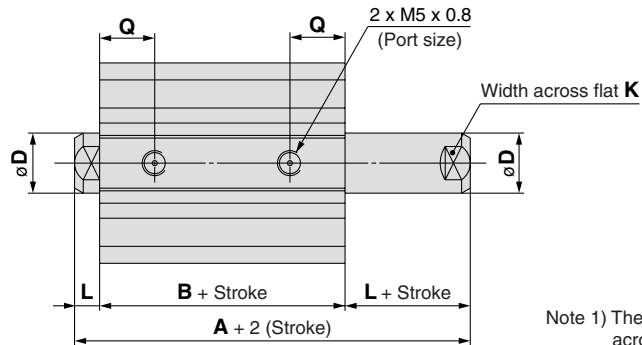
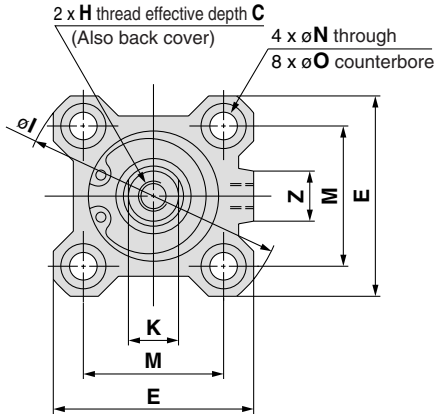
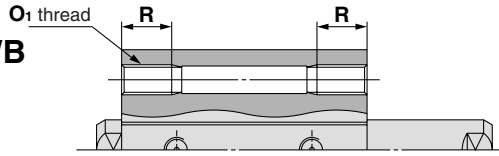
Ø12 to Ø25/Without Auto Switch

Both ends tapped: CQ2WA

Both Ends Tapped

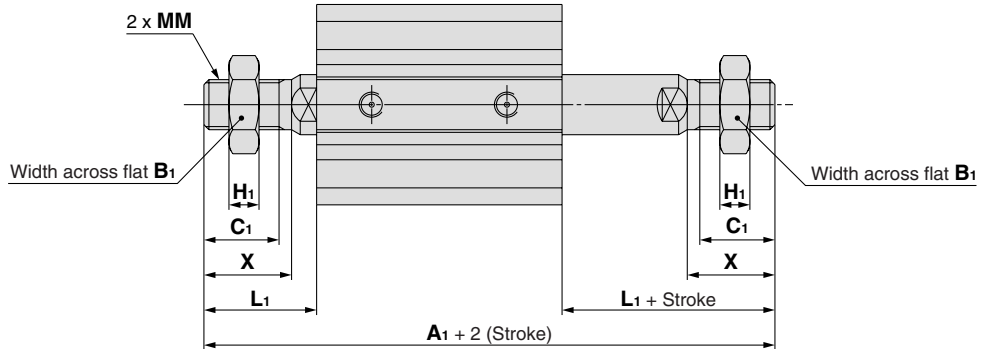
Bore size (mm)	O ₁	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

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)	A ₁	B ₁	C ₁	H ₁	L ₁	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

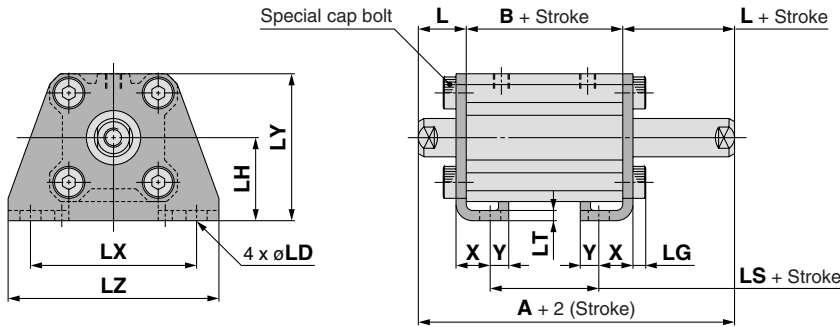
Standard

Bore size (mm)	Stroke range (mm)	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.

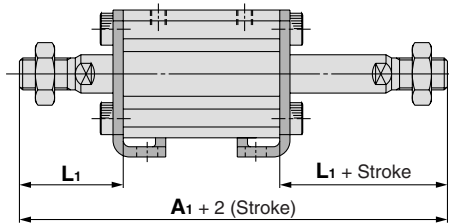
* For details about the rod end nut and accessory brackets, refer to page 19.

Foot: CQ2WL



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

Rod end male thread



Rod End Male Thread (mm)

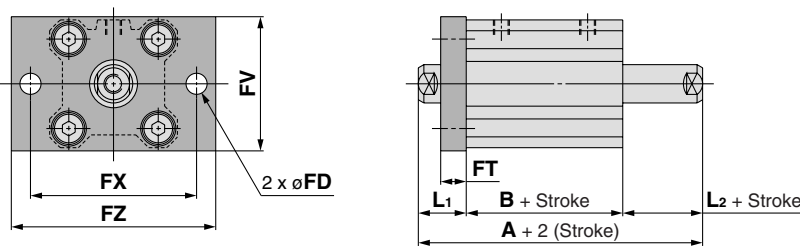
Bore size (mm)	A ₁	L ₁
12	73.2	24
16	77	25.5
20	83	28.5
25	94	32.5

Foot

Bore size (mm)	Stroke range (mm)	A	B	L	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	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

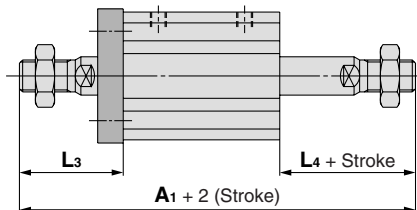
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

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 ₁	L ₃	L ₄
12	63.2	24	14
16	67	25.5	15.5
20	73	28.5	18.5
25	84	32.5	22.5

Flange

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L ₁	L ₂
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

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

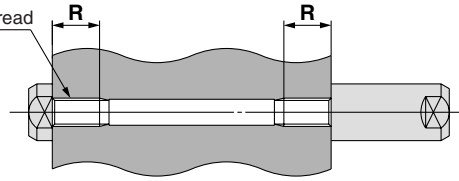
Ø12 to Ø25/With Auto Switch

Both Ends Tapped

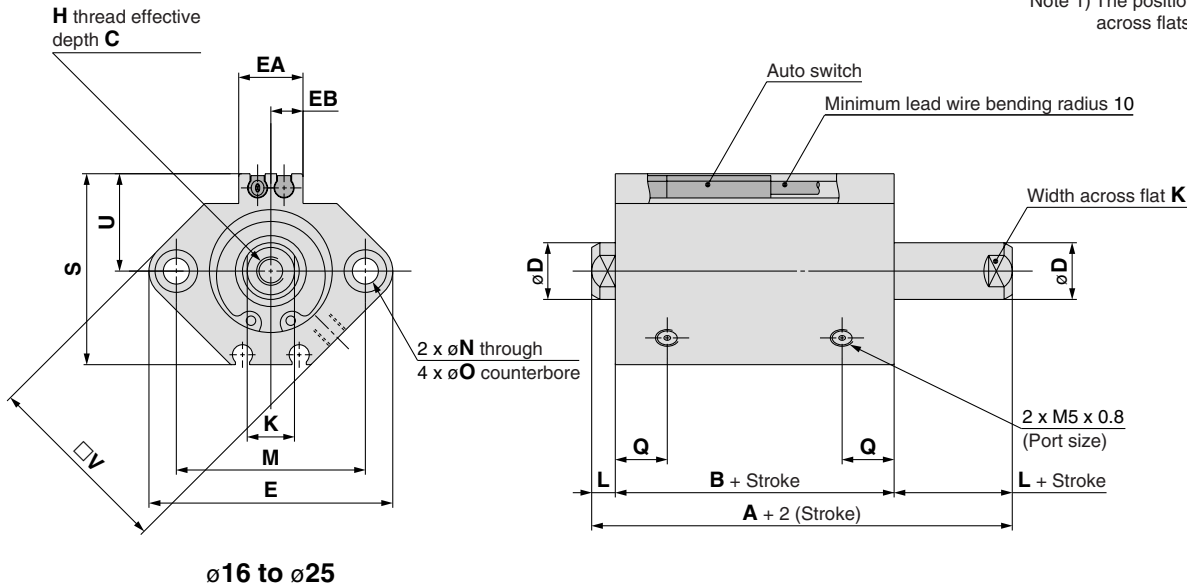
Bore size (mm)	O ₁	R
12	M4 x 0.7	7
16	M4 x 0.7	7
20	M6 x 1.0	10
25	M6 x 1.0	10

Both ends tapped: CDQ2WA

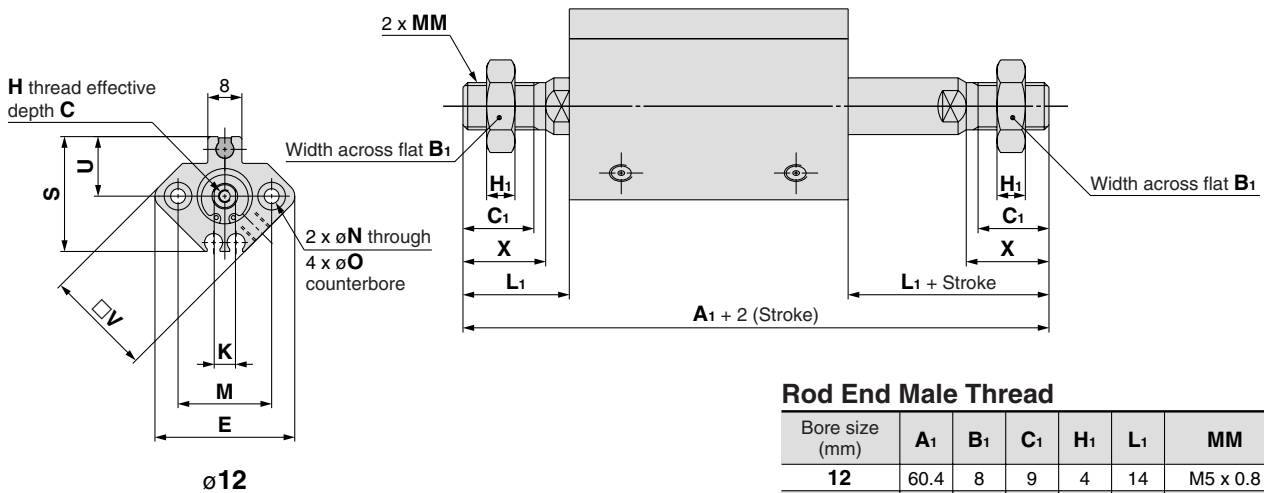
Standard (Through-hole): CDQ2WB O₁ thread



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)	A ₁	B ₁	C ₁	H ₁	L ₁	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

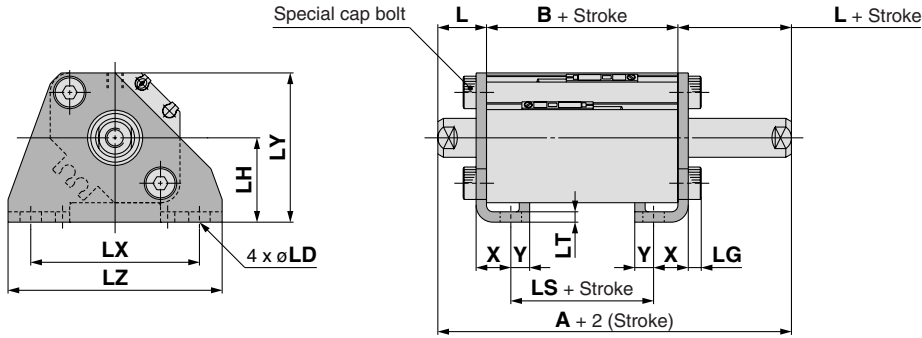
Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

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.

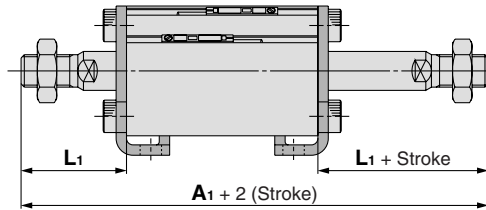
* For details about the rod end nut and accessory brackets, refer to page 19.

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 ₁	L ₁
12	80.4	24
16	87	25.5
20	95	28.5
25	104	32.5

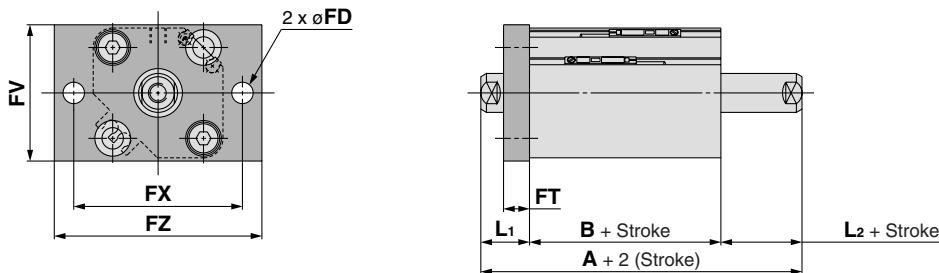
Foot

(mm)

Bore size (mm)	Stroke range (mm)	A	B	L	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
12	5 to 30	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

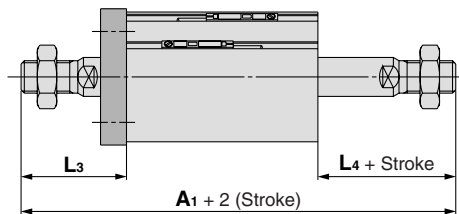
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

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 ₁	L ₃	L ₄
12	70.4	24	14
16	77	25.5	15.5
20	85	28.5	18.5
25	94	32.5	22.5

Flange

(mm)

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L ₁	L ₂
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

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

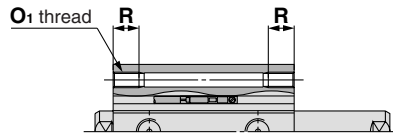
Dimensions

ø32 to ø50/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.)

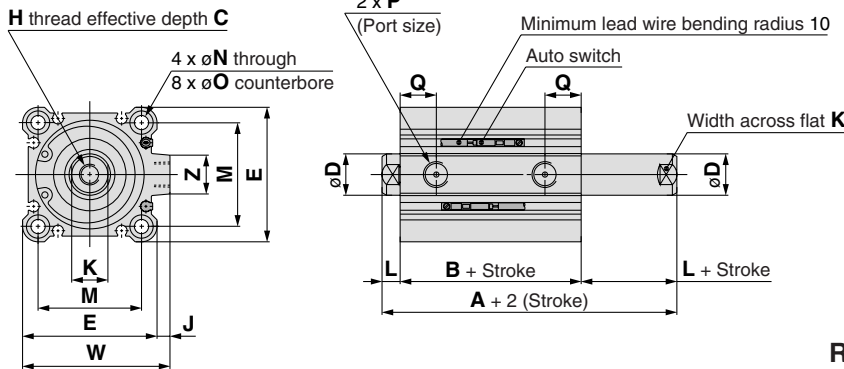
Standard (Through-hole): CQ2WB/CDQ2WB

Both ends tapped: CQ2WA/CDQ2WA



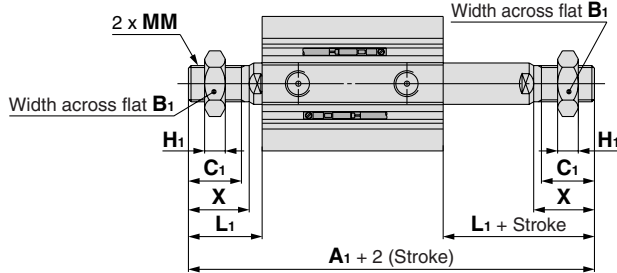
Both Ends Tapped

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



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

Rod end male thread

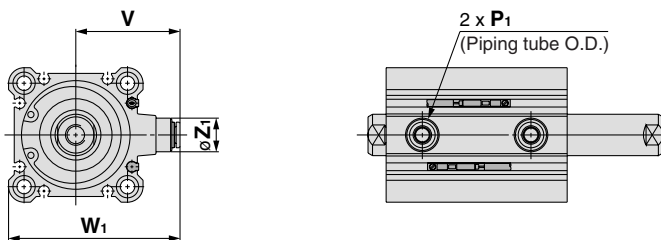


Rod End Male Thread

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

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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

Bore size (mm)	Without auto switch		With auto switch		Z ₁	P ₁
	V	W ₁	V	W ₁		
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						
	75, 100	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				

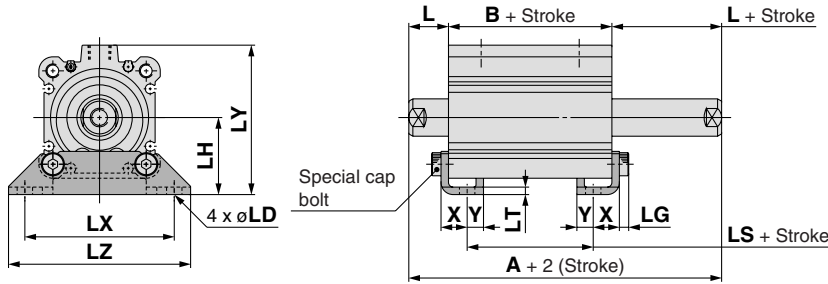
Bore size (mm)	C	D	E	H	J	K	L	M	N	O	Q	W	Z
32	13	16	45	M8 x 1.25	4.5	14	7	34	5.5	9 depth 7	12.5	49.5	14
40	13	16	52	M8 x 1.25	5	14	7	40	5.5	9 depth 7	14	57	15
50	15	20	64	M10 x 1.5	7	17	8	50	6.6	11 depth 8	14	71	19

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

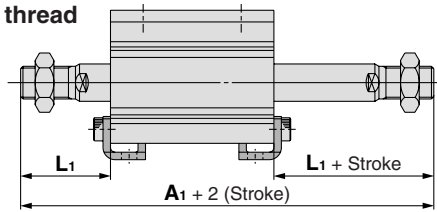
* For details about the rod end nut and accessory brackets, refer to page 19.

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 ₁
		A ₁	A ₁	
32	5 to 50	107.5	117.5	38.5
	75, 100	117.5	117.5	
40	5 to 50	117	127	38.5
	75, 100	127	127	
50	10 to 50	127.5	137.5	43.5
	75, 100	137.5	137.5	

Foot

(mm)

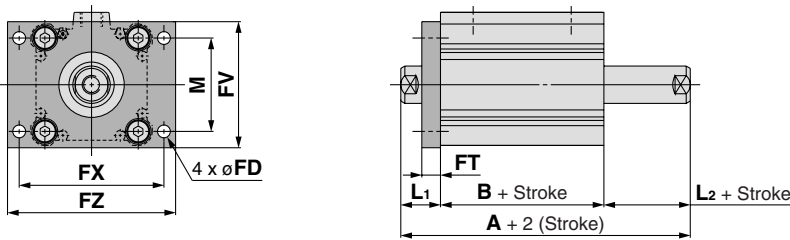
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch		
		A	B	LS	A	B	LS
32	5 to 50	64.5	30.5	14.5	74.5	40.5	24.5
	75, 100	74.5	40.5	24.5			
40	5 to 50	74	40	24	84	50	34
	75, 100	84	50	34			
50	10 to 50	76.5	40.5	17.5	86.5	50.5	27.5
	75, 100	86.5	50.5	27.5			

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

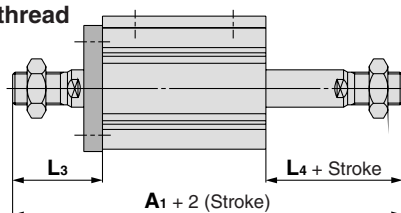
Bore size (mm)	L	LD	LG	LH	LT	LX	LY	LZ	X	Y
32	17	6.6	4	30	3.2	57	57	71	11.2	5.8
40	17	6.6	4	33	3.2	64	64	78	11.2	7
50	18	9	5	39	3.2	79	78	95	14.7	8

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)	Without auto switch	With auto switch	L ₃	L ₄
		A ₁	A ₁		
32	5 to 50	97.5	107.5	38.5	28.5
	75, 100	107.5	107.5		
40	5 to 50	107	117	38.5	28.5
	75, 100	117	117		
50	10 to 50	117.5	127.5	43.5	33.5
	75, 100	127.5	127.5		

Flange

(mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L ₁	L ₂	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

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

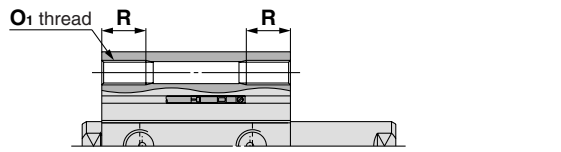
Dimensions

ø63 to ø100/With Auto Switch

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

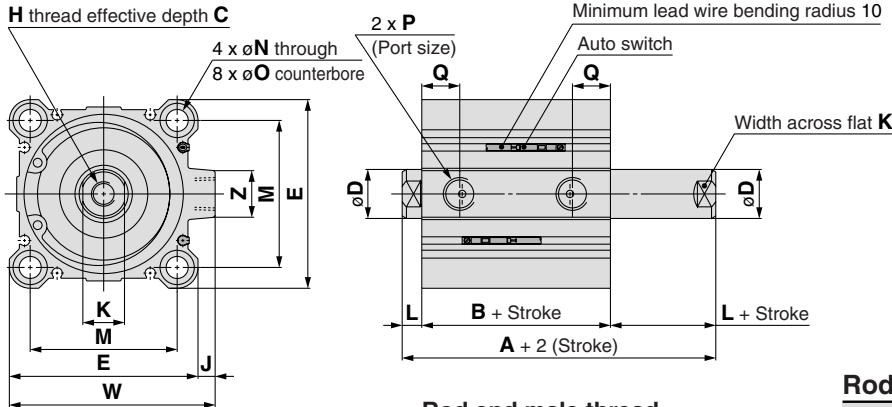
Both ends tapped: CQ2WA/CDQ2WA

Standard (Through-hole): CQ2WB/CDQ2WB

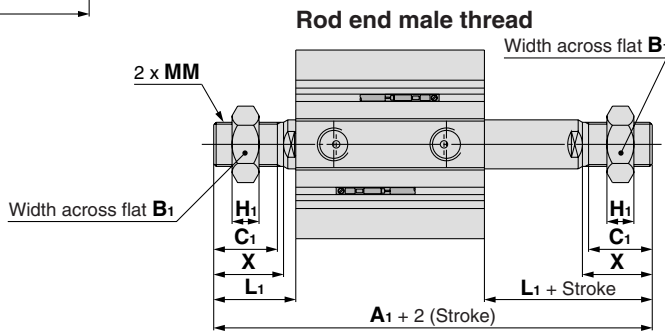


Both Ends Tapped (mm)

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



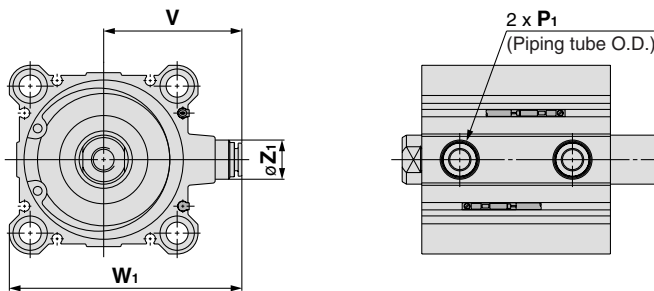
Note 1) The positions of left and right width across flats are not constant.



Rod End Male Thread (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A ₁	A ₁	A ₁	A ₁
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			

Built-in one-touch fittings



(mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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 (mm)

Bore size (mm)	Z ₁	P ₁	V	W ₁
63	16	8	56.5	95

* 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.

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

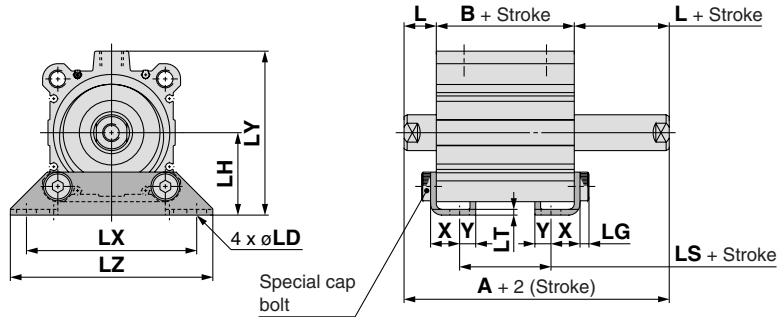
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
63	10 to 50	58	42	68	52
	75, 100	68	52		
80	10 to 50	71	51	81	61
	75, 100	81	61		
100	10 to 50	84.5	60.5	94.5	70.5
	75, 100	94.5	70.5		

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.

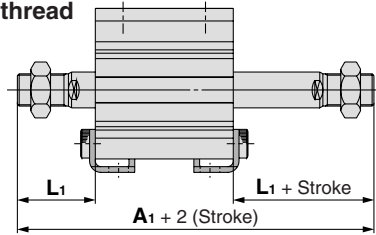
* For details about the rod end nut and accessory brackets, refer to page 19.

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 ₁
		A ₁	A ₁	
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		

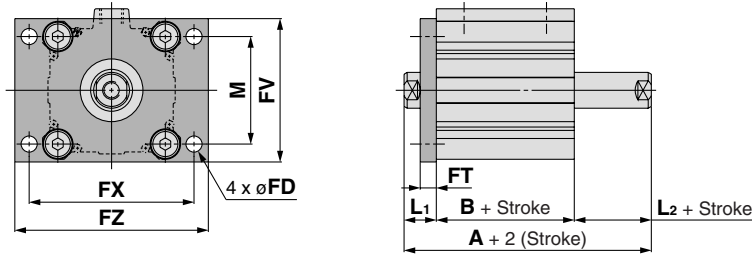
Foot

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

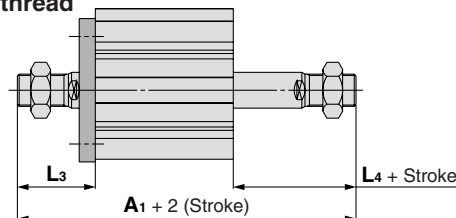
Foot bracket material:
Carbon steel
Surface treatment:
Nickel plated

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 ₃	L ₄
		A ₁	A ₁		
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 ₁	L ₂	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

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 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	Through-hole (Standard)	F	Rod flange
A	Both ends tapped	G	Head flange
L	Foot	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 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

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø50
TF	G	
F	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

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

Auto switch

Nil	Without auto switch
-----	---------------------

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

Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø50	4 surfaces

Made to Order

Refer to the next page for details.

Body option

Nil	Standard
F	With boss on head end
M	Rod end male thread

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

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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○			
				2-wire				M9BV	M9B	●	●	●	○	—	○			
	Diagnostic indication (2-color indication)			3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○		IC circuit	
				3-wire (PNP)				M9PVV	M9PV	●	●	●	○	—	○			
				2-wire				M9BVV	M9BV	●	●	●	○	—	○			
	Water resistant (2-color 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, 12 V	100 V or less	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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NZZ
- * 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.

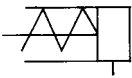
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQ2

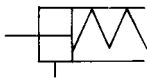


JIS Symbol

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 end
-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 end

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

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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°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, 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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 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 x 0.8 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

- 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.

Spring Force

Single Acting, Spring Return (N)

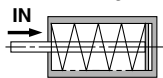
Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	13	8.6
	10	13	3.9
16	5	15	10.3
	10	15	5.9
20	5	15	10
	10	15	5.9
25	5	20	16
	10	20	11
32	5	30	23
	10	30	16
40	5	30	13
	10	39	21
50	10	50	30
	20	54	24

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

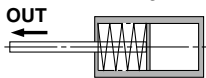
Single acting, Spring return

Spring state with first mounting load



When spring is set in cylinder

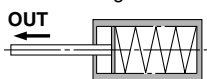
Spring state with second mounting load



When spring is compressed with air

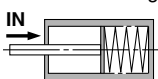
Single acting, Spring extend

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 ^{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

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

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	29	35	—	—
	16	43	50	—	—
	20	67	78	—	—
	25	92	104	—	—
	32	135	151	—	—
	40	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 end		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

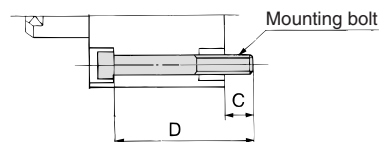
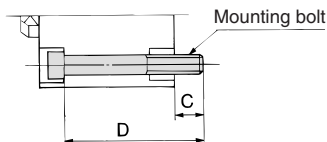
Series CQ2

Mounting Bolt for CQ2B/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



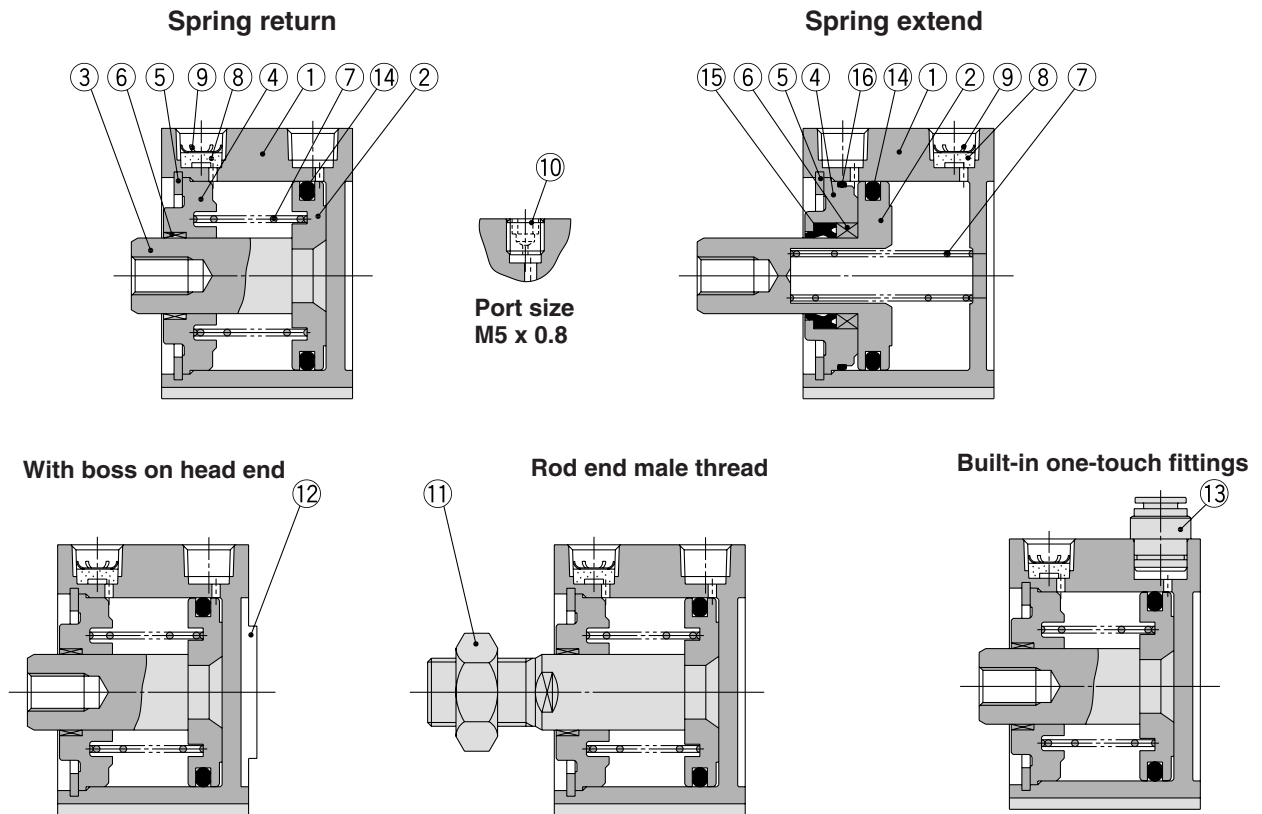
Spring Return

Cylinder model	C	D	Mounting bolt part no.
CQ2B12-5S	6.5	25	CQ-M3 x 25L
-10S		30	x 30L
CQ2B16-5S	5	25	CQ-M3 x 25L
-10S		30	x 30L
CQ2B20-5S	7.5	25	CQ-M5 x 25L
-10S		30	x 30L
CQ2B25-5S	9.5	30	CQ-M5 x 30L
-10S		35	x 35L
CQ2B32-5SZ	9	30	CQ-M5 x 30L
-10SZ		35	x 35L
CQ2B40-5SZ	7.5	35	CQ-M5 x 35L
-10SZ		40	x 40L
CQ2B50-10SZ	12.5	45	CQ-M6 x 45L
-20SZ		55	x 55L

Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CQ2B12-5T	6.5	25	CQ-M3 x 25L
-10T		30	x 30L
CQ2B16-5T	5	25	CQ-M3 x 25L
-10T		30	x 30L
CQ2B20-5T	7.5	25	CQ-M5 x 25L
-10T		30	x 30L
CQ2B25-5T	9.5	30	CQ-M5 x 30L
-10T		35	x 35L
CQ2B32-5TZ	9	30	CQ-M5 x 30L
-10TZ		35	x 35L
CQ2B40-5TZ	7.5	35	CQ-M5 x 35L
-10TZ		40	x 40L
CQ2B50-10TZ	12.5	45	CQ-M6 x 45L
-20TZ		55	x 55L

Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2*	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		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 x 0.8
11	Rod end nut	Carbon steel	Nickel plated
12	Centering location ring	Aluminum alloy	ø20 to ø50, Anodized
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 includes 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 $S_T(M)Z$
 • Copper and fluorine-free series • ø12, ø16, ø20, ø25, ø32, ø40, ø50

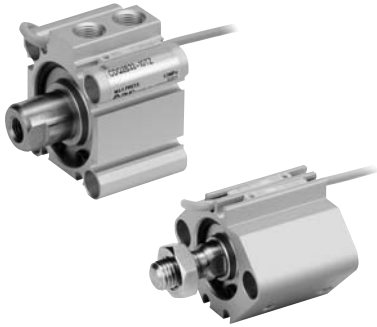
For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

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

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	—	—
	50	—	486	—	540

Additional Weight

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	27
	Nut	1	2	4	8	17	17
With boss on head end	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

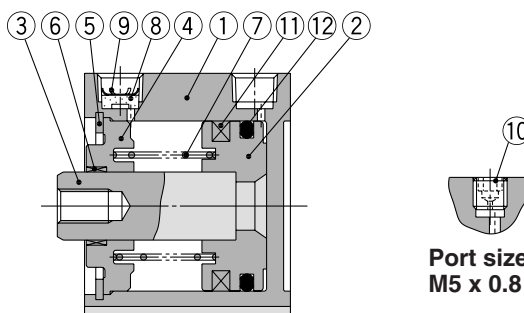
Calculation: (Example) **CDQ2D32-10SMZ**

- 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

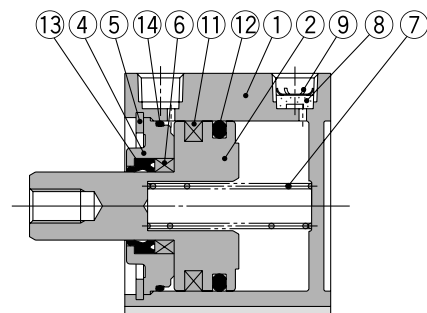
Add each weight of auto switches when auto switches are mounted.

Construction

Spring return



Spring extend



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		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 x 0.8
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.

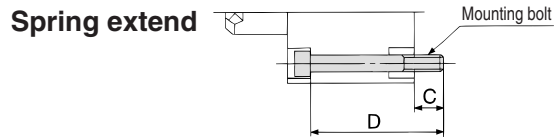
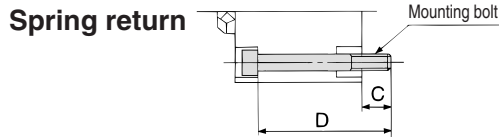
* On spring extend (Type T), piston with ø20 or more and piston rod are integrated (stainless steel).

Mounting Bolt for CDQ2B/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Spring Return

Cylinder model	C	D	Mounting bolt part no.
CDQ2B12-5SZ	5.5	35	CQ-M3 x 35L
-10SZ		40	x 40L
CDQ2B16-5SZ	8	40	CQ-M3 x 40L
-10SZ		45	x 45L
CDQ2B20-5SZ	10.5	40	CQ-M5 x 40L
-10SZ		45	x 45L
CDQ2B25-5SZ	9.5	40	CQ-M5 x 40L
-10SZ		45	x 45L
CDQ2B32-5SZ	9	40	CQ-M5 x 40L
-10SZ		45	x 45L
CDQ2B40-5SZ	7.5	45	CQ-M5 x 45L
-10SZ		50	x 50L
CDQ2B50-10SZ	12.5	55	CQ-M6 x 55L
-20SZ		65	x 65L

Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CDQ2B12-5TZ	6.1	40	CQ-M3 x 40L
-10TZ		45	x 45L
CDQ2B16-5TZ	8	40	CQ-M3 x 40L
-10TZ		45	x 45L
CDQ2B20-5TZ	10.5	40	CQ-M5 x 40L
-10TZ		45	x 45L
CDQ2B25-5TZ	9.5	40	CQ-M5 x 40L
-10TZ		45	x 45L
CDQ2B32-5TZ	9	40	CQ-M5 x 40L
-10TZ		45	x 45L
CDQ2B40-5TZ	7.5	45	CQ-M5 x 45L
-10TZ		50	x 50L
CDQ2B50-10TZ	12.5	55	CQ-M6 x 55L
-20TZ		65	x 65L

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

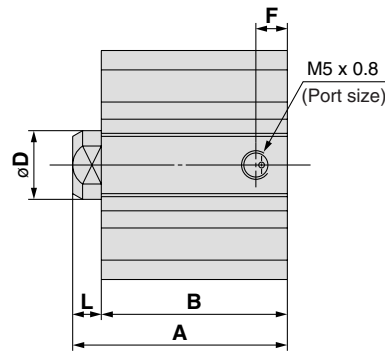
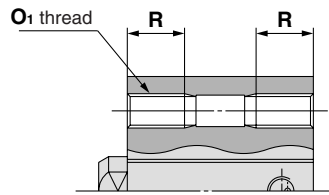
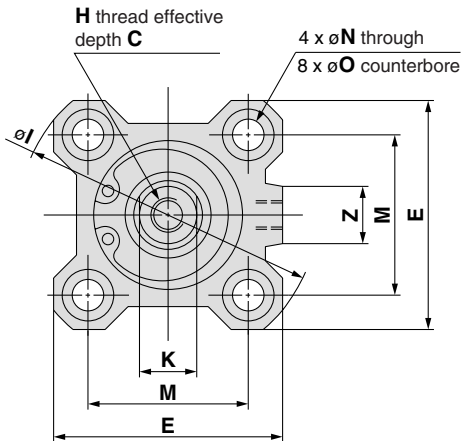
∅12 to ∅25/Spring Return Without Auto Switch

Both ends tapped: CQ2A

Both Ends Tapped (mm)

Bore size (mm)	O ₁	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

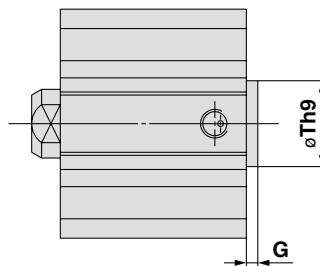


With boss on head end

With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

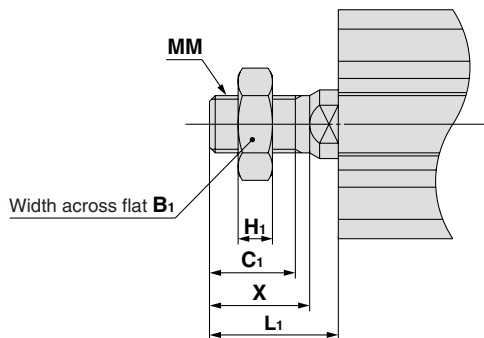
Note) With boss on rod end: Option (Suffix "-XC36" to the end of model number.)



Rod end male thread

Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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



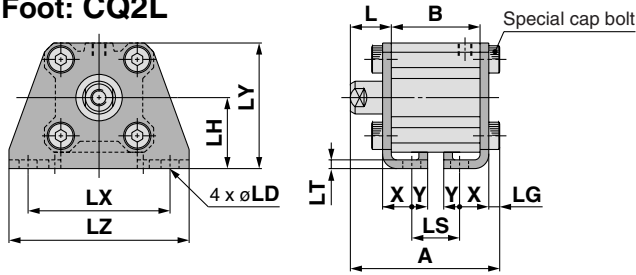
Standard

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												

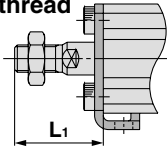
* For details about the rod end nut and accessory brackets, refer to page 19.

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

Foot: CQ2L



Rod end male thread



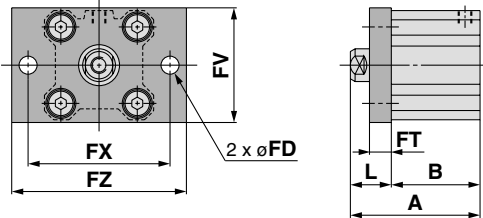
Foot

Bore size (mm)	A		B		L	L ₁	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

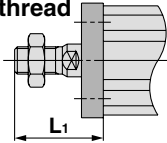
Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod flange: CQ2F



Rod end male thread

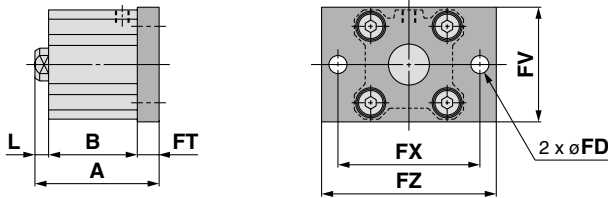


Rod Flange

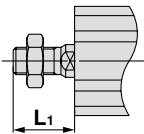
Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L	L ₁
	5st	10st	5st	10st							
12	35.5	40.5	22	27	4.5	5.5	25	45	55	13.5	24
16	37	42	23.5	28.5	4.5	5.5	30	45	55	13.5	25.5
20	39	44	24.5	29.5	6.6	8	39	48	60	14.5	28.5
25	42.5	47.5	27.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head flange: CQ2G



Rod end male thread



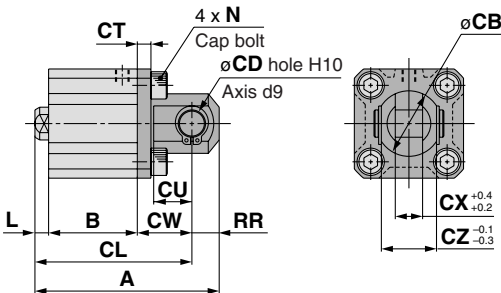
Head Flange

Bore size (mm)	A		L	L ₁
	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

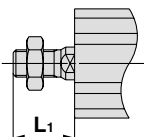
(* The dimensions except A, L and L₁ are the same as those of the rod flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double clevis: CQ2D



Rod end male thread



Double Clevis

Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW
	5st	10st	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 ₁	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

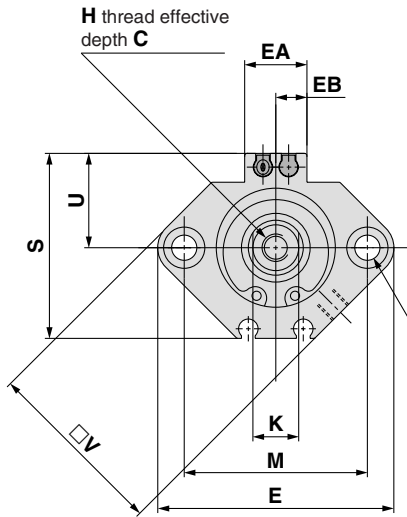
* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pin and retaining rings are included.

Series CQ2

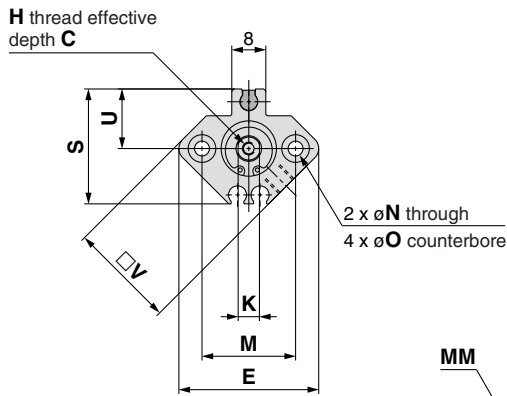
Dimensions

∅12 to ∅25/Spring Return With Auto Switch

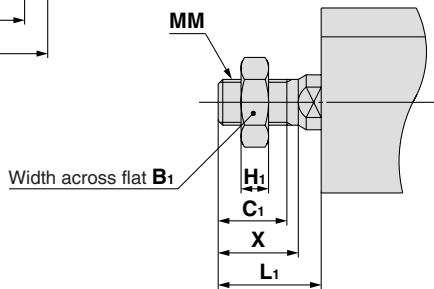
Standard (Through-hole): CDQ2B



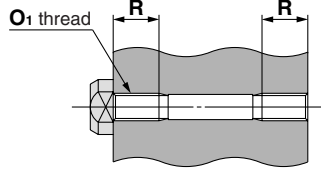
∅16 to ∅25



∅12

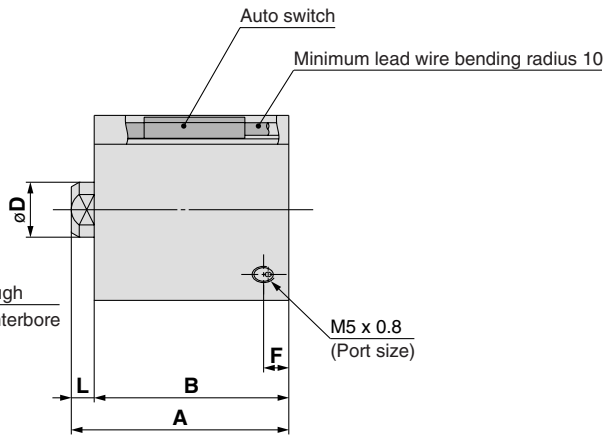


Both ends tapped: CDQ2A

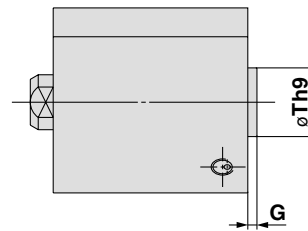


Both Ends Tapped

Bore size (mm)	O ₁	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



With boss on head end



With Boss on Head End

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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

Rod end male thread

Rod End Male Thread

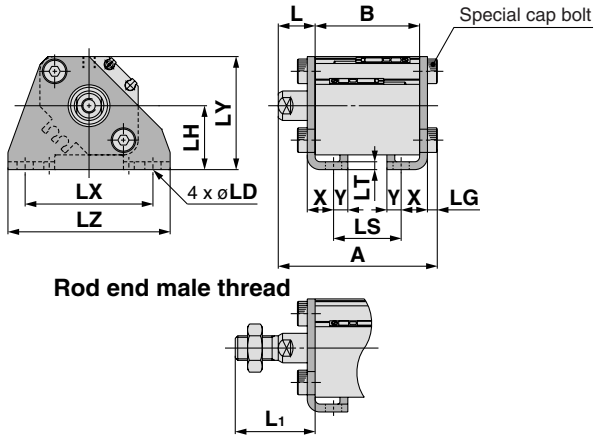
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

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															
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															
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															
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															

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

Foot: CDQ2L



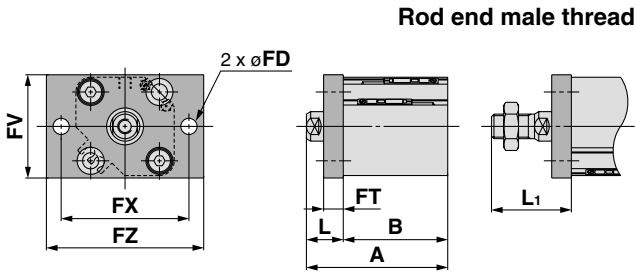
Foot

Bore size (mm)	A		B		L	L ₁	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: CDQ2F

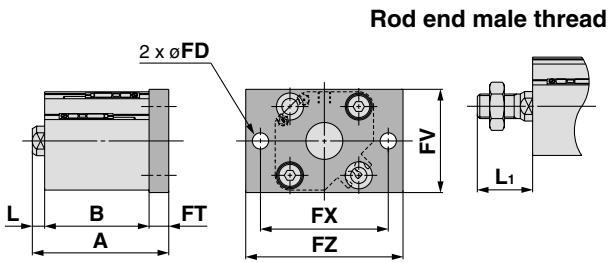


Rod Flange

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L	L ₁
	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: CDQ2G



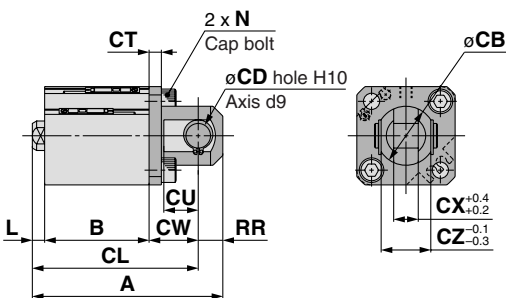
Head Flange

Bore size (mm)	A		L	L ₁
	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

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: CDQ2D



Double Clevis

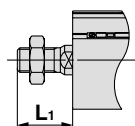
Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW
	5st	10st	5st	10st			5st	10st			
12	56.5	61.5	33	38	12	5	50.5	55.5	4	7	14
16	60	65	35.5	40.5	14	5	54	59	4	10	15
20	68	73	36.5	41.5	20	8	59	64	5	12	18
25	72.5	77.5	37.5	42.5	24	10	62.5	67.5	5	14	20

Bore size (mm)	CX	CZ	L	L ₁	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.

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

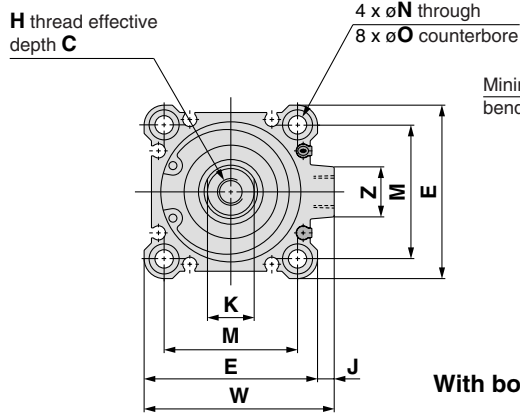
Series CQ2

Dimensions

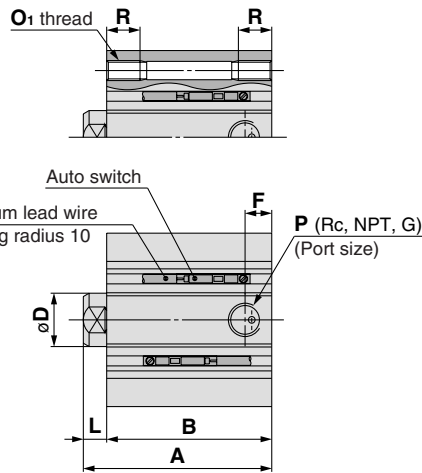
Ø32 to Ø50/Spring Return With Auto Switch

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

Standard (Through-hole): CQ2B/CDQ2B



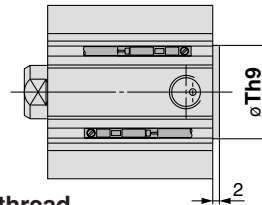
Both ends tapped: CQ2A/CDQ2A



Both Ends Tapped (mm)

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

With boss on head end

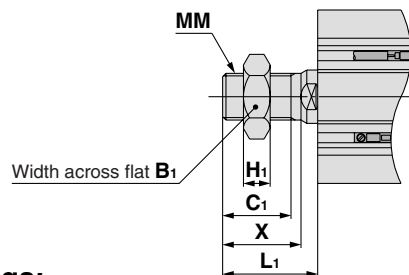


With Boss on Head End (mm)

Bore size (mm)	Th9
32	21 ⁰ _{-0.052}
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}

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

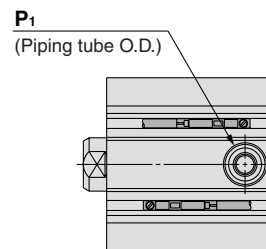
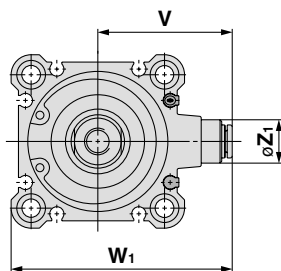
Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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 ₁	P ₁	V	W ₁
32	13	6	36.5	59
40	13	6	40.5	66.5
50	16	8	50	82

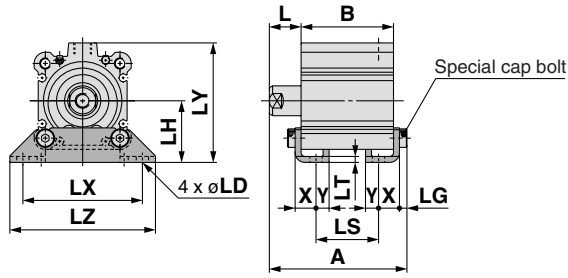
Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

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														

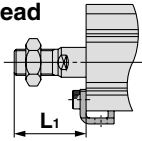
Note 2) The A, B dimensions of the Ø32-5 mm stroke with built-in one-touch fittings without auto switch are the same as those of the Ø32-10 mm stroke without auto switch.

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

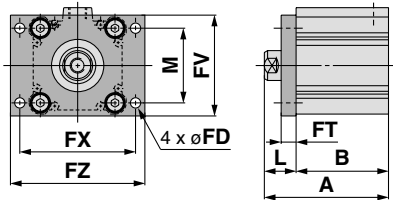
Foot: CQ2L/CDQ2L



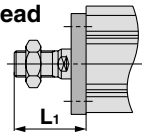
Rod end male thread



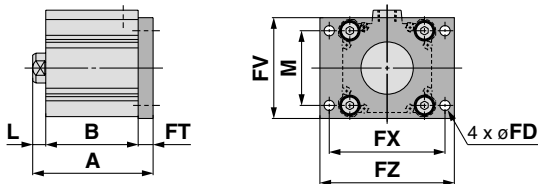
Rod flange: CQ2F/CDQ2F



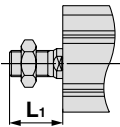
Rod end male thread



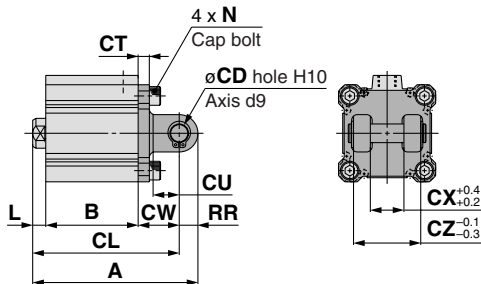
Head flange: CQ2G/CDQ2G



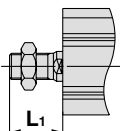
Rod end male thread



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		
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st
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 ₁	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		
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st
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 ₁	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 ₁
	A			A				
	5st	10st	20st	5st	10st	20st		
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 L₁ 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		
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st
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 ₁	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

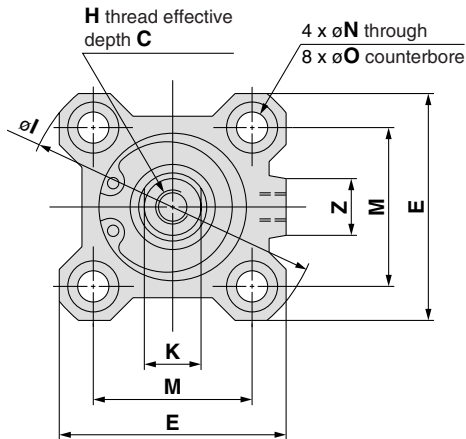
Made to Order

Series CQ2

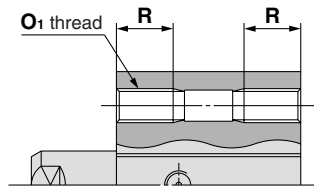
Dimensions

∅12 to ∅25/Spring Extend Without Auto Switch

Standard (Through-hole): CQ2B

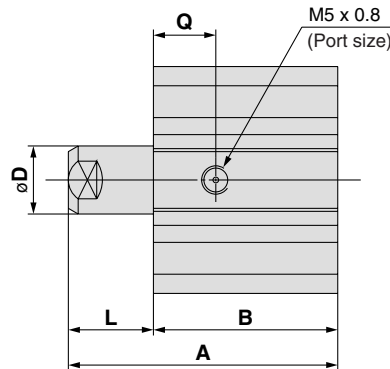


Both ends tapped: CQ2A

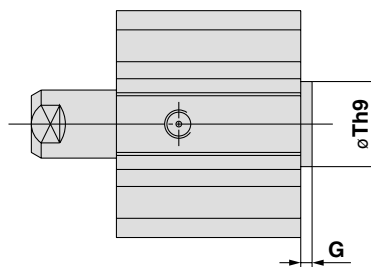


Both Ends Tapped

Bore size (mm)	O ₁	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



With boss on head end

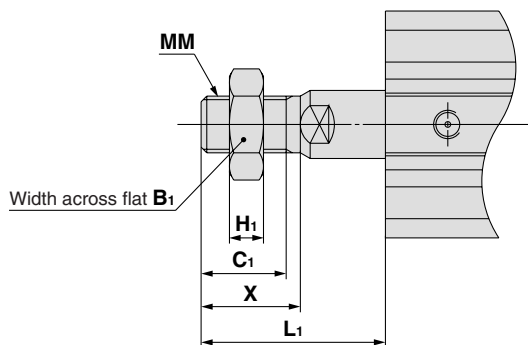


With Boss on Head End

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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

Rod end male thread



Rod End Male Thread

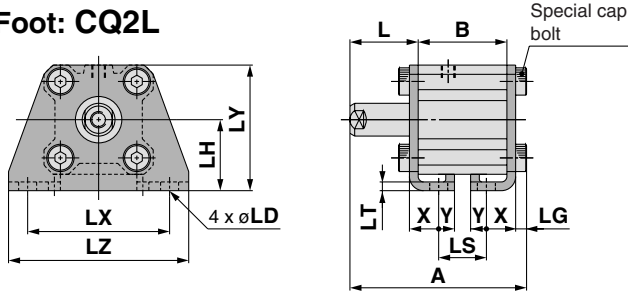
Bore size (mm)	B ₁	C ₁	H ₁	L ₁		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

Standard

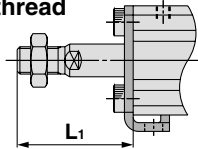
Bore size (mm)	Stroke (mm)	A	B	C	D	E	H	I	K	L	M	N	O	Q	Z
12	5	30.5	22	6	6	25	M3 x 0.5	32	5	8.5	15.5	3.5	6.5 depth 3.5	7.5	—
	10	40.5	27							13.5					
16	5	32	23.5	8	8	29	M4 x 0.7	38	6	8.5	20	3.5	6.5 depth 3.5	8	10
	10	42	28.5							13.5					
20	5	34	24.5	7	10	36	M5 x 0.8	47	8	9.5	25.5	5.5	9 depth 7	9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

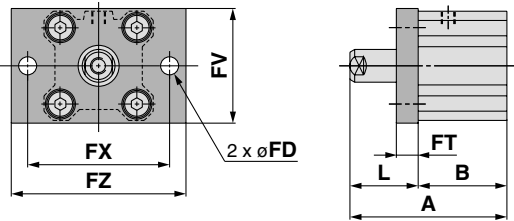
Foot: CQ2L



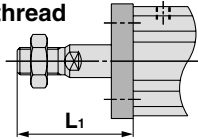
Rod end male thread



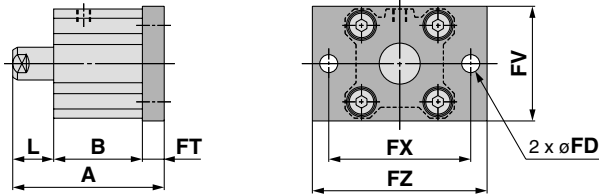
Rod flange: CQ2F



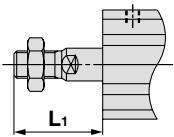
Rod end male thread



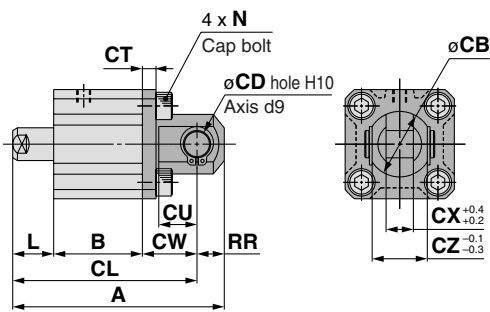
Head flange: CQ2G



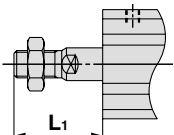
Rod end male thread



Double clevis: CQ2D



Rod end male thread



Foot

(mm)

Bore size (mm)	A		B		L		L ₁		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

(mm)

Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L		L ₁	
	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

(mm)

Bore size (mm)	A		L		L ₁	
	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

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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis

(mm)

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 ₁		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.

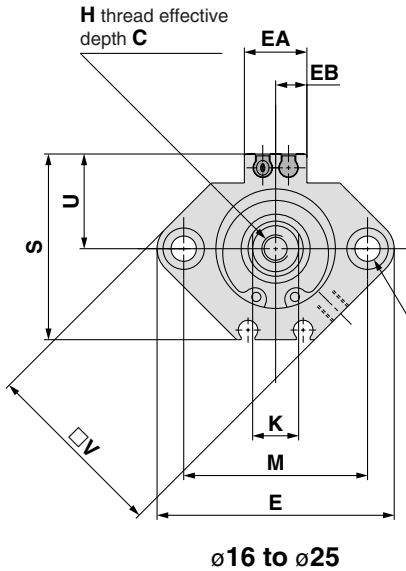
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQ2

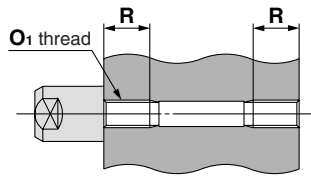
Dimensions

∅12 to ∅25/Spring Extend With Auto Switch

Standard (Through-hole): CDQ2B

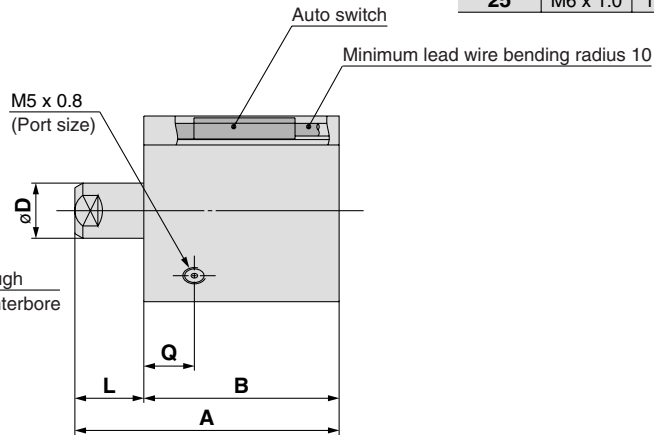


Both ends tapped: CDQ2A

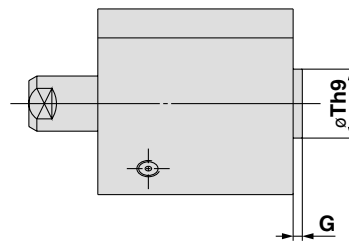


Both Ends Tapped (mm)

Bore size (mm)	O ₁	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



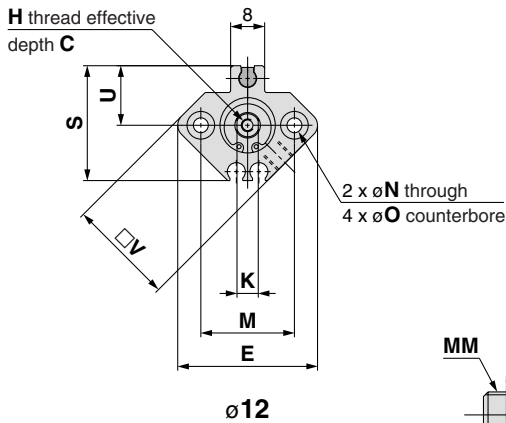
With boss on head end



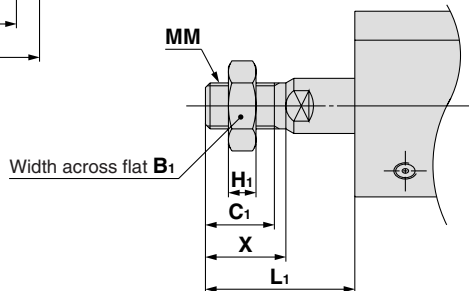
With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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



Rod end male thread



Rod End Male Thread (mm)

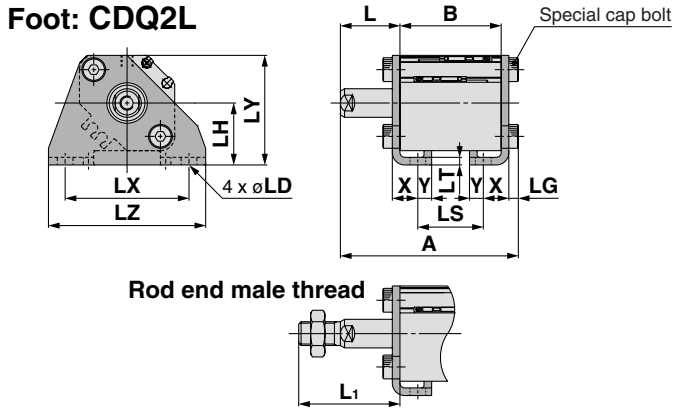
Bore size (mm)	B ₁	C ₁	H ₁	L ₁		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

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

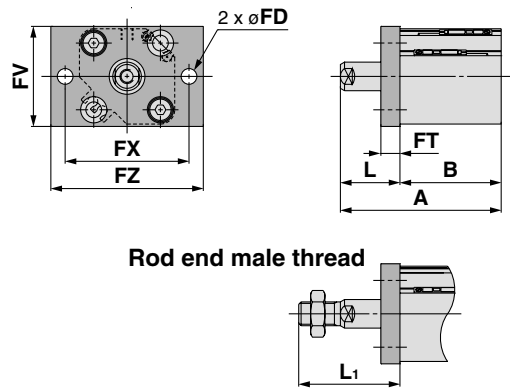
Bore size (mm)	Stroke (mm)	A	B	C	D	E	EA	EB	H	K	L	M	N	O	Q	S	U	V
12	5	45.9	37.4	6	6	33	—	—	M3 x 0.5	5	8.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
	10	55.9	42.4								13.5							
16	5	44	35.5	8	8	37	13.2	6.6	M4 x 0.7	6	8.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
	10	54	40.5								13.5							
20	5	46	36.5	7	10	47	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.

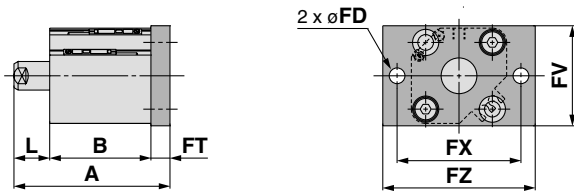
Foot: CDQ2L



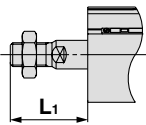
Rod flange: CDQ2F



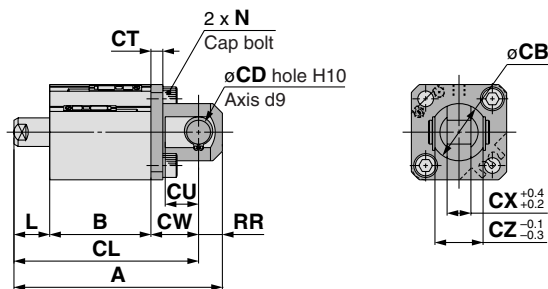
Head flange: CDQ2G



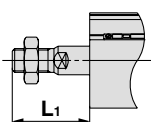
Rod end male thread



Double clevis: CDQ2D



Rod end male thread



Foot

Bore size (mm)	A		B		L		L ₁		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 ₁	
	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 ₁	
	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

* The dimensions except A, L and L₁ 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	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 ₁		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

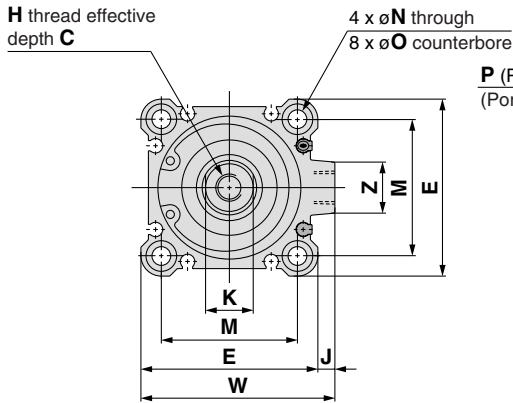
Series CQ2

Dimensions

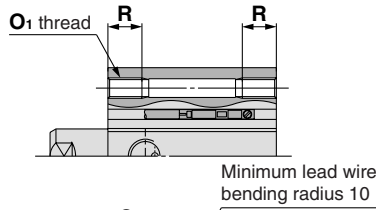
ø32 to ø50/Spring Extend With Auto Switch

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

Standard (Through-hole): CQ2B/CDQ2B

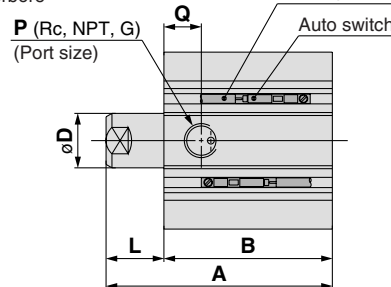


Both ends tapped: CQ2A/CDQ2A

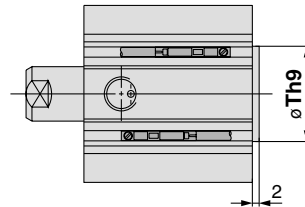


Both Ends Tapped (mm)

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



With boss on head end

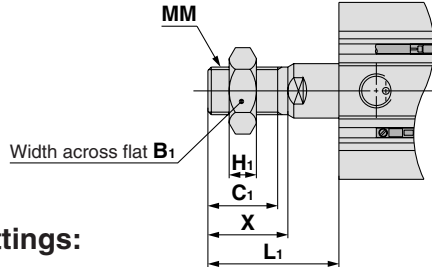


With Boss on Head End (mm)

Bore size (mm)	Th9
32	21 ⁰ _{-0.052}
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}

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

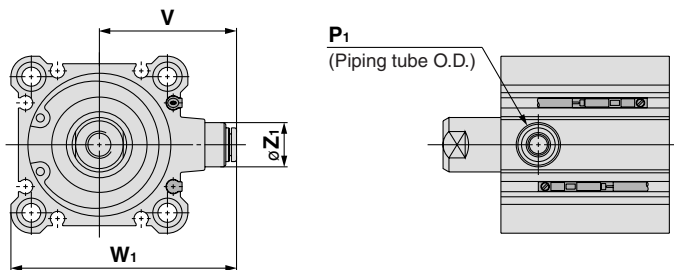
Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁			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 ₁	P ₁	V	W ₁
32	13	6	36.5	59
40	13	6	40.5	66.5
50	16	8	50	82

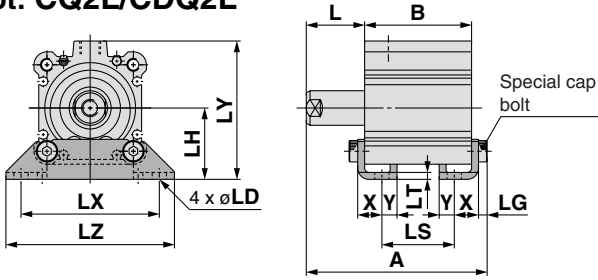
Standard For auto switch proper mounting position and its mounting height, refer to pages 169 to 175.

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	1/8	11	13	16	52	M8 x 1.25	5	14	17	40	5.5	9 depth 7	57	15
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					

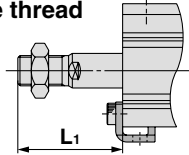
* For details about the rod end nut and accessory brackets, refer to page 19.

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

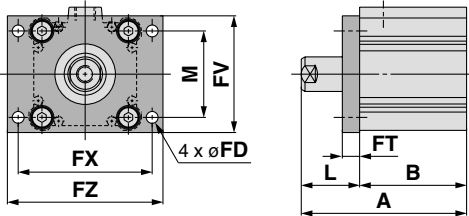
Foot: CQ2L/CDQ2L



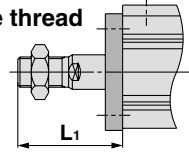
Rod end male thread



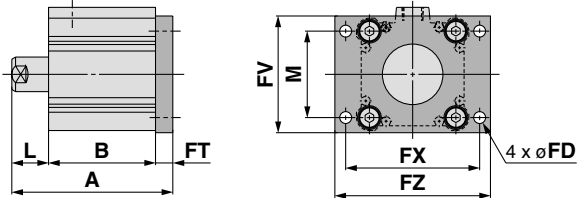
Rod flange: CQ2F/CDQ2F



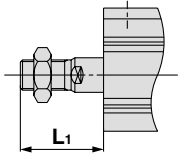
Rod end male thread



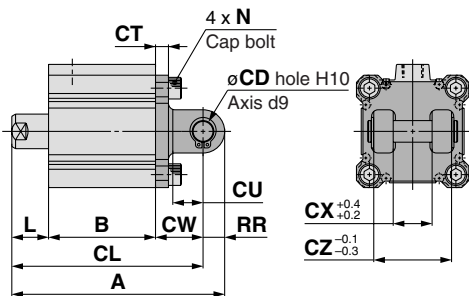
Head flange: CQ2G/CDQ2G



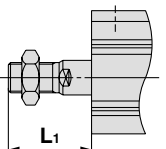
Rod end male thread



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			L ₁			LD	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						FD	FT	FV	FX	FZ
	A			B			A			B							
	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			L ₁			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			L ₁		
	A			A			L			L ₁		
	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

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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

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			L ₁			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.

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, 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

Nil	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

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

Auto switch

Nil Without auto switch

* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z ø125 to ø200 4 surfaces

Body option

Nil	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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)										
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit							
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○								
				2-wire				M9BV	M9B	●	●	●	○	—	○								
	Diagnostic indication (2-color indication)			3-wire (NPN)				24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●		○	—	○	IC circuit			
				3-wire (PNP)							M9PWV	M9PW	●	●	●		○	—	○				
				2-wire							M9WV	M9W	●	●	●		○	—	○				
	Water resistant (2-color indication)			3-wire (NPN)							24 V	5 V, 12 V	—	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										24 V	12 V, 5 V, 12 V	100 V or less	A93V	A93	●	—	●	—	
			No	2-wire	24 V	5 V, 12 V	100 V or less										A90V	A90	●	—	●	—	—

** 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 Nil (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.

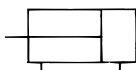
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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

Specifications



JIS 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, $\phi 125$ to $\phi 160$ only

Bore size (mm)	125	140	160	180	200
Action	Double acting, Single 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°C (No freezing) With auto switch: -10 to 60°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.	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.	

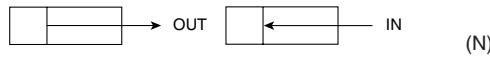
Refer to pages 169 to 175 for the specifications of cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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

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

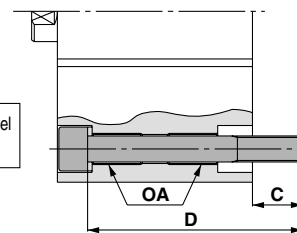
Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M12x100L 4 pcs.

Note 1) To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.

Note 2) For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.

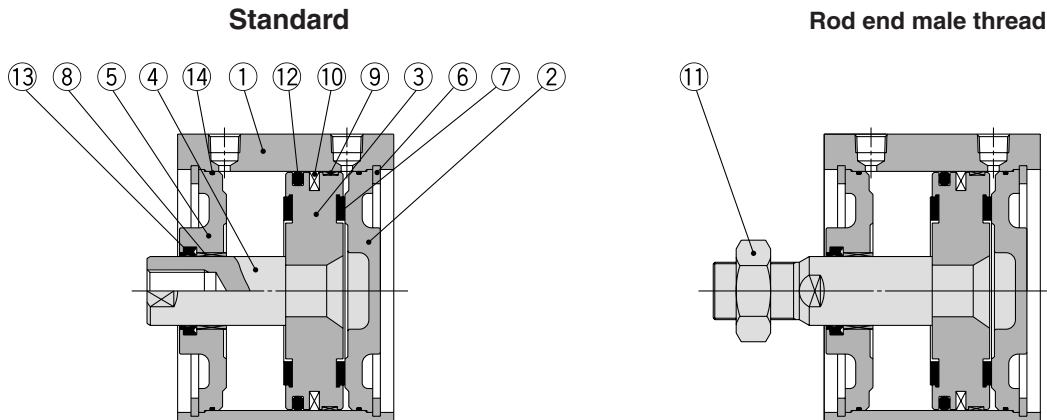
Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
C□Q2B125/140-10DCZ	22.9	100	CQ-M12 x 100L
-20DCZ		110	x 110L
-30DCZ		120	x 120L
-40DCZ		130	x 130L
-50DCZ		140	x 140L
-75DCZ		165	x 165L
-100DCZ		190	x 190L
C□Q2B160-10DCZ		27.7	110
-20DCZ	120		x 120L
-30DCZ	130		x 130L
-40DCZ	140		x 140L
-50DCZ	150		x 150L
-75DCZ	175		x 175L
-100DCZ	200		x 200L

Cylinder model	C	D	Mounting bolt part no.
C□Q2B180-10DCZ	36	125	CQ-M18 x 125L
-20DCZ		135	x 135L
-30DCZ		145	x 145L
-40DCZ		155	x 155L
-50DCZ		165	x 165L
-75DCZ		190	x 190L
-100DCZ	215	x 215L	
C□Q2B200-10DCZ	39	135	CQ-M18 x 135L
-20DCZ		145	x 145L
-30DCZ		155	x 155L
-40DCZ		165	x 165L
-50DCZ		175	x 175L
-75DCZ		200	x 200L
-100DCZ	225	x 225L	

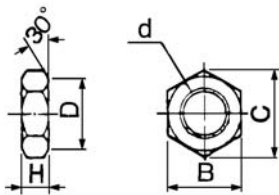
Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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	

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

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)

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

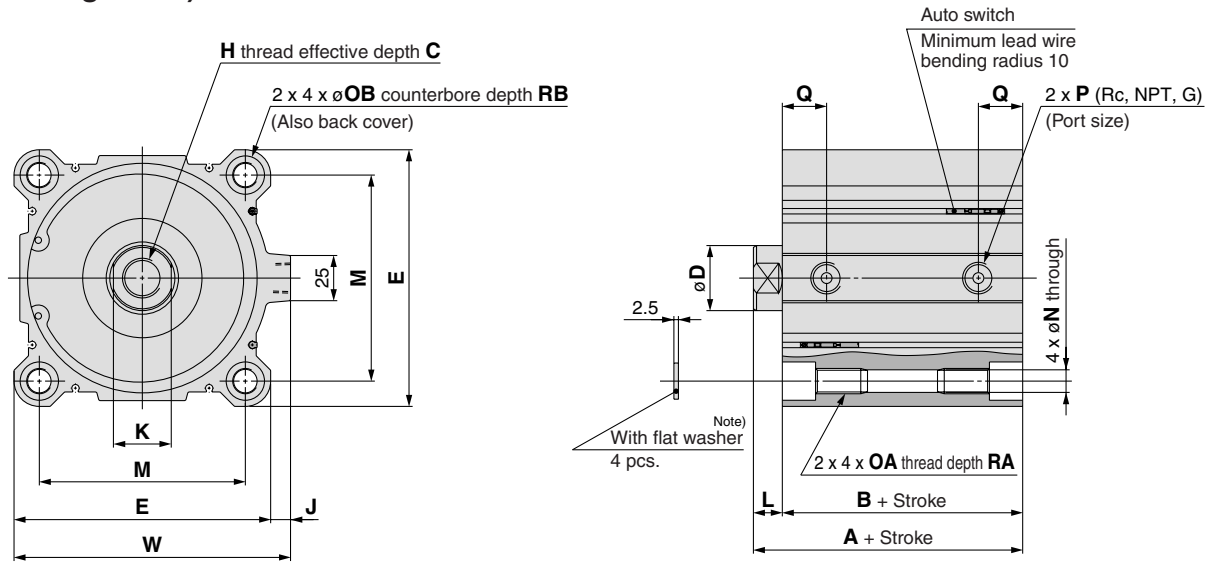
Series CQ2

Dimensions

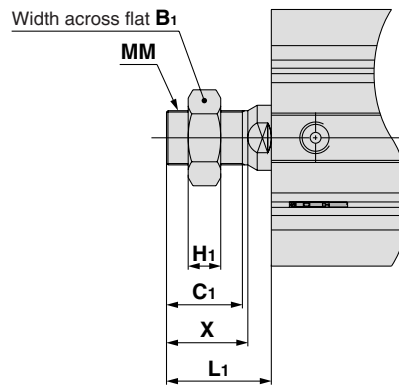
Ø125 to Ø160

Standard (Through-hole): C□Q2B

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



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

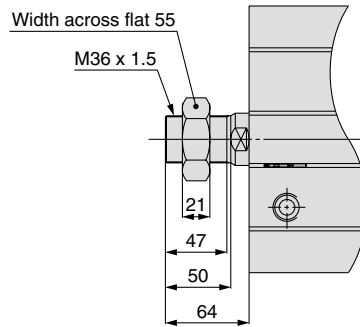
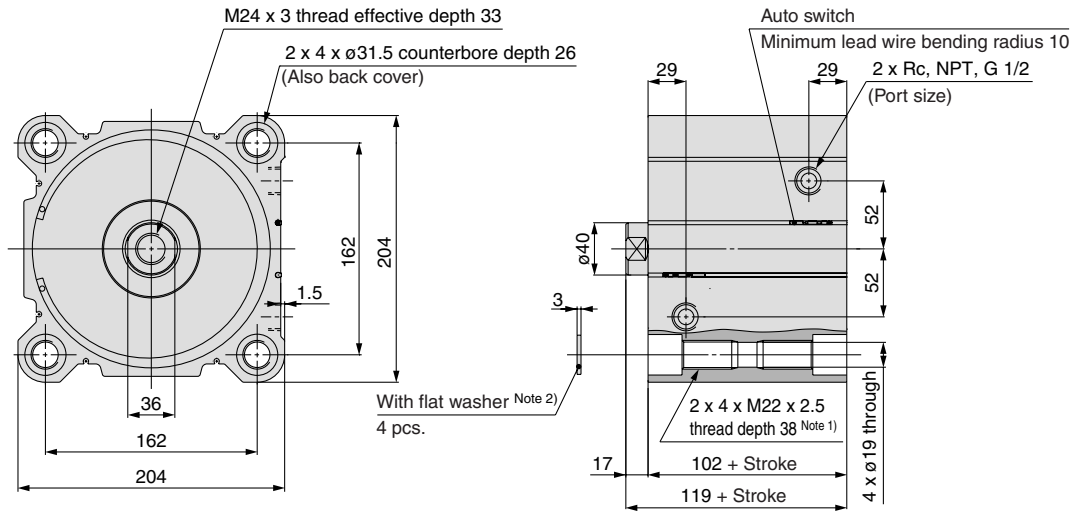
Note) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Dimensions

∅180, ∅200

∅180

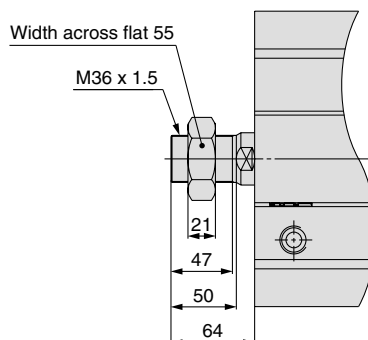
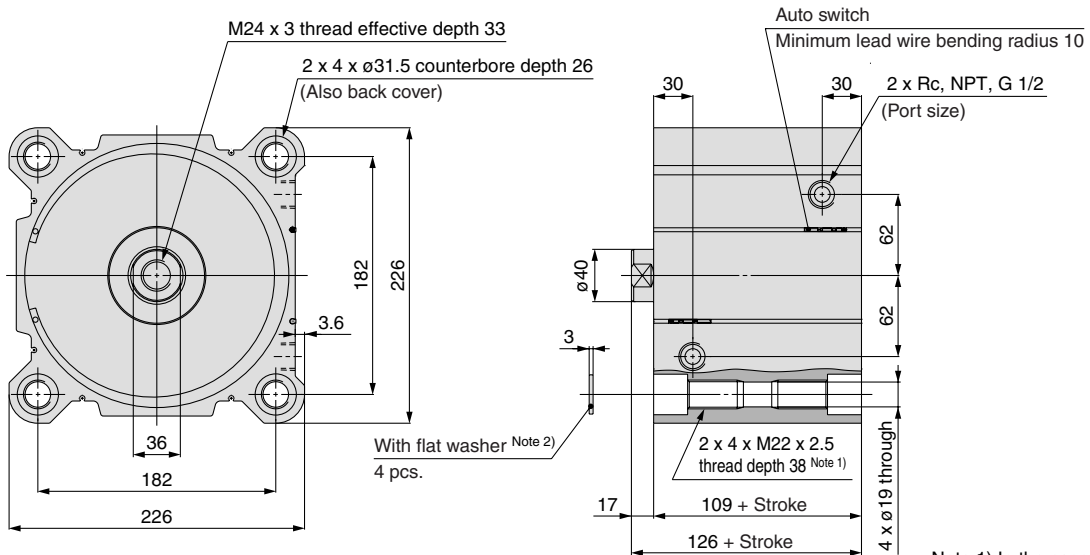
The dimensions are the same with or without an auto switch.



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

Nil	Rc
TN	NPT
TF	G

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) CDQ2WB140-30DCZ

Made to Order
Refer to the next page for details.

Number of auto switches

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

Auto switch

Nil Without auto switch

* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z ø125 to ø200 4 surfaces

Body option

Nil	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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)													
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit										
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○											
				2-wire				M9BV	M9B	●	●	●	○	—	○											
	Diagnostic indication (2-color indication)			3-wire (NPN)				24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●		○	—	○	IC circuit						
				3-wire (PNP)							M9PWV	M9PW	●	●	●		○	—	○							
				2-wire							M9B WV	M9B W	●	●	●		○	—	○							
	Water resistant (2-color indication)			3-wire (NPN)							24 V	5 V, 12 V	—	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	●	—		●	—			—	—
														5 V, 12 V	100 V or less	A90V	A90	●	—		●	—			—	

** 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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ

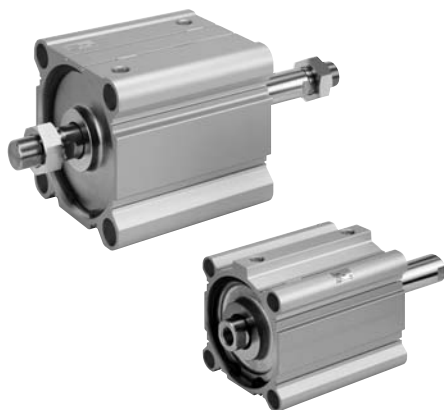
* Solid state auto switches marked with "○" are produced upon receipt of order.

* 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.

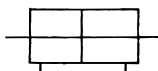
Compact Cylinder: Large Bore Size Double Acting, Double Rod *Series CQ2W*

Specifications



JIS 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°C (No freezing) With auto switch: -10 to 60°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	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>125 to 160</td> <td>5 to 295</td> </tr> </tbody> </table>	Bore size	Stroke range	125 to 160	5 to 295	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>125 to 160</td> <td>11 to 299</td> </tr> </tbody> </table>	Bore size	Stroke range	125 to 160	11 to 299
Bore size	Stroke range									
125 to 160	5 to 295									
Bore size	Stroke range									
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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Standard Size

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

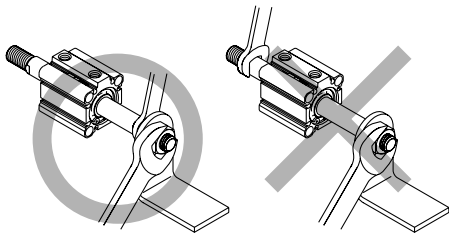
⚠ Caution

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
125	3376	5627	7878
140	4313	7188	10063
160	5655	9425	13195
180	7257	12095	16933
200	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
125	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
140	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
160	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
180	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
200	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
125	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
140	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
160	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
180	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
200	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)		125	140	160, 180, 200
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: CDQ2WB125-30DCZ6.11 kg
 - Additional weight: Rod end male thread0.94 kg
- 7.05 kg

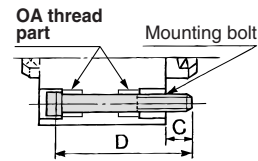
Mounting Bolt for CQ2WB

Mounting method: Mounting bolt for through-hole mounting of the CQ2WB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M12x100L 4 pcs.

- Note 1) To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.
- Note 2) For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.

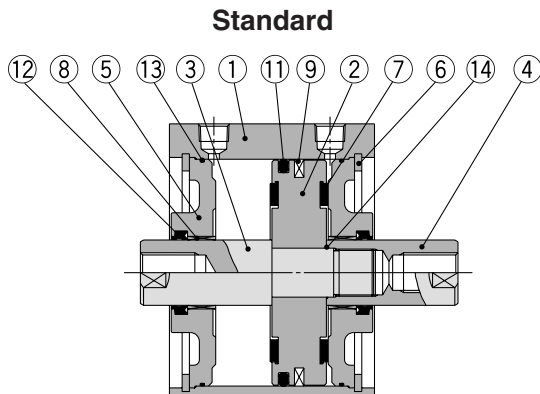
Material: Chromium molybdenum steel
Surface treatment: Nickel plated



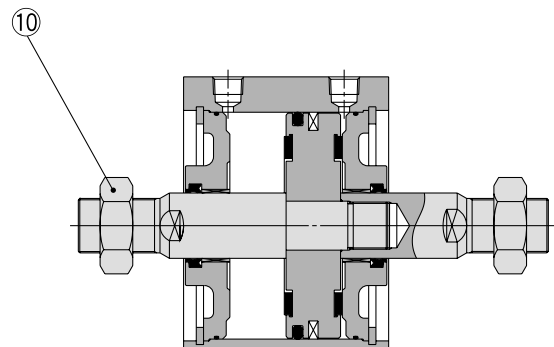
Cylinder model	C	D	Mounting bolt part no.
C□Q2WB125/140-10DCZ	22.9	100	CQ-M12 x 100L
-20DCZ		110	x 110L
-30DCZ		120	x 120L
-40DCZ		130	x 130L
-50DCZ		140	x 140L
-75DCZ		165	x 165L
-100DCZ		190	x 190L
C□Q2WB160-10DCZ	27.7	110	CQ-M14 x 110L
-20DCZ		120	x 120L
-30DCZ		130	x 130L
-40DCZ		140	x 140L
-50DCZ		150	x 150L
-75DCZ		175	x 175L
-100DCZ		200	x 200L

Cylinder model	C	D	Mounting bolt part no.
C□Q2WB180-10DCZ	36	125	CQ-M18 x 125L
-20DCZ		135	x 135L
-30DCZ		145	x 145L
-40DCZ		155	x 155L
-50DCZ		165	x 165L
-75DCZ		190	x 190L
-100DCZ		215	x 215L
C□Q2WB200-10DCZ	39	135	CQ-M18 x 135L
-20DCZ		145	x 145L
-30DCZ		155	x 155L
-40DCZ		165	x 165L
-50DCZ		175	x 175L
-75DCZ		200	x 200L
-100DCZ		225	x 225L

Construction



Rod end male thread



Component Parts

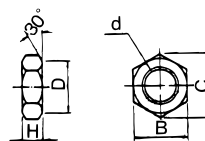
No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod A	Carbon steel	Hard chrome plated
4	Piston rod B	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	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

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

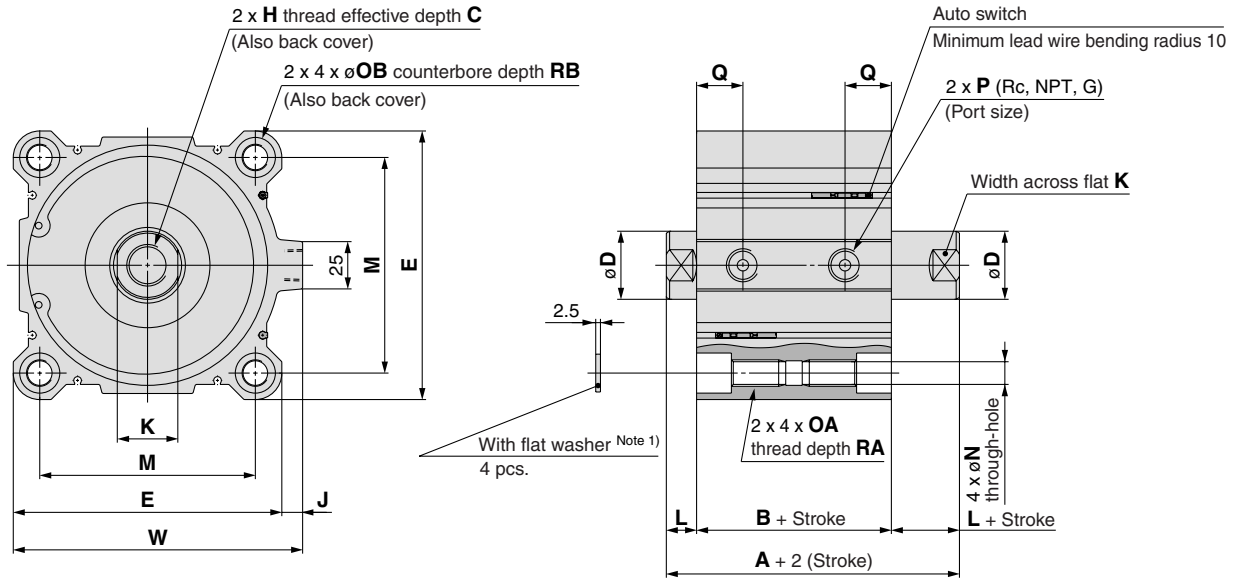
Series CQ2W

Dimensions

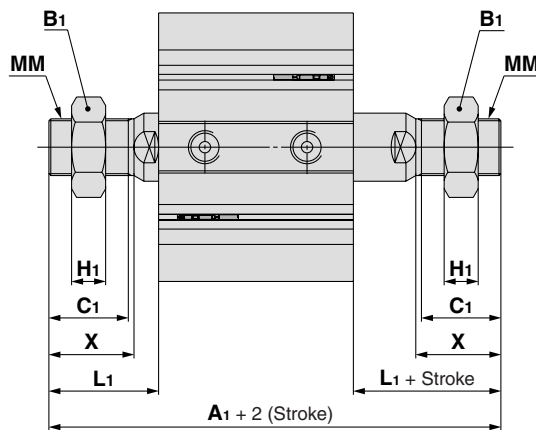
∅125 to ∅160

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

Standard (Through-hole): C□Q2WB



Rod end male thread



Rod End Male Thread

(mm)

Bore size (mm)	A ₁	B ₁	C ₁	H ₁	L ₁	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

(mm)

Bore size (mm)	Standard stroke	A	B	C ^{Note 2)}	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.

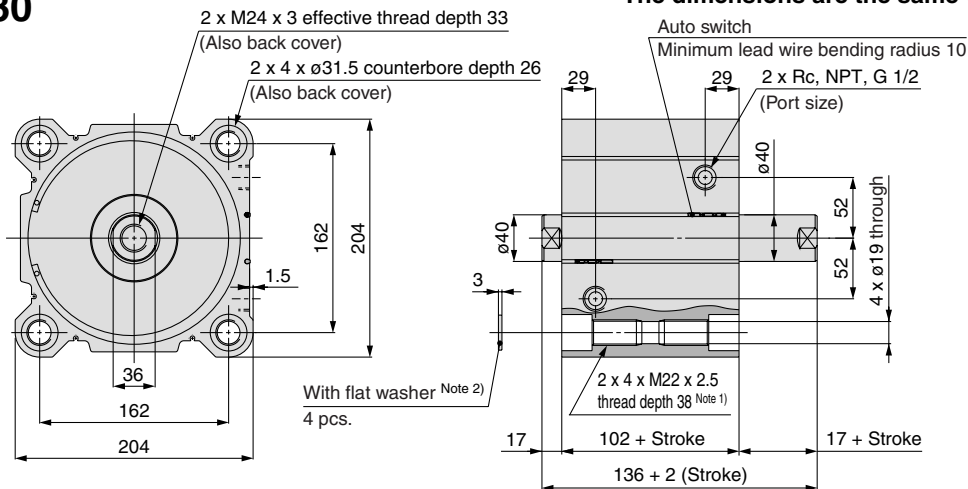
Note 2) (): Values of effective length in one side, only for 10 mm stroke model

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

Dimensions

∅180, ∅200

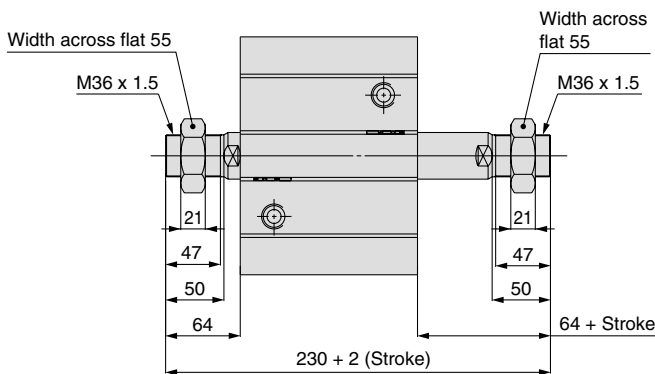
∅180



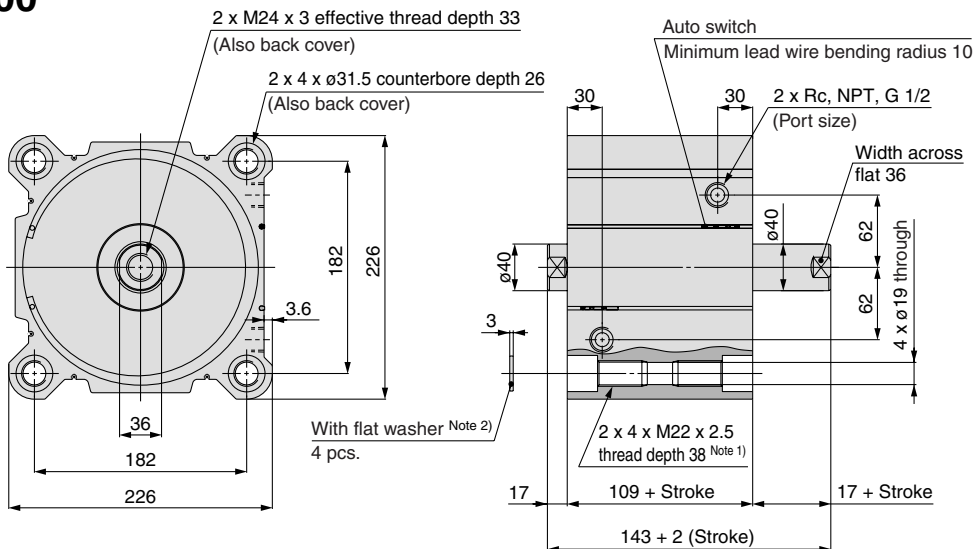
The dimensions are the same with or without an auto switch.

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.

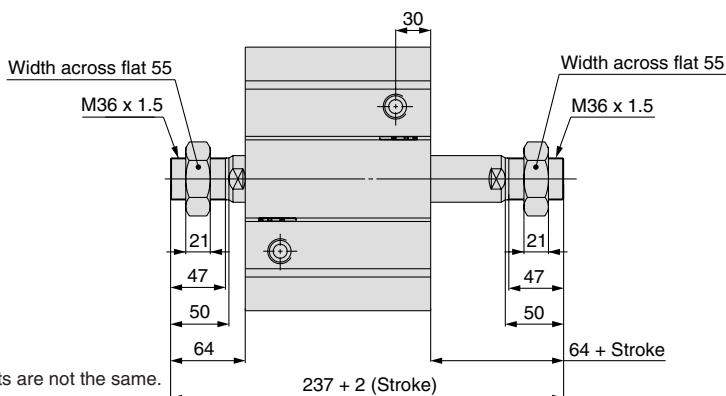


∅200



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

Nil	Rc
TN	NPT
TF	G
F	Built-in one-touch fittings (Note)

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

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

Made to Order

Refer to the next page for details.

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the below table for applicable auto switches.

Auto switch mounting groove

Z	4 surfaces
---	------------

Body option

Nil	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

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

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load										
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		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)				M9NWV	M9NW	●	●	●	○	—	○										
	3-wire (PNP)			M9PWW				M9PW	●	●	●	○	—	○	IC circuit										
	2-wire			M9BWW				M9BW	●	●	●	○	—	○											
	3-wire (NPN)			M9NAV**				M9NA**	○	○	●	○	—	○											
	3-wire (PNP)			M9PAV**				M9PA**	○	○	●	○	—	○											
	Water resistant (2-color indication)			Grommet				Yes	2-wire	24 V	5 V, 12 V	—	—	M9BAV**	M9BA**			○	○	●	○	—	○	—	—
									3-wire (NPN)					—	P3DW			●	—	●	●	—	○		
3-wire (PNP)		●	—		●	●	—		○																
2-wire		●	—		●	●	—		○																
Magnetic field resistant (2-color indication)	Grommet	No	3-wire (NPN equivalent)	24 V	5 V	—	—	A96V	A96	●	—	●	—			—	IC circuit	—							
			2-wire					A93V	A93	●	—	●	—	—	—	—	—	Relay, PLC							
Reed auto switch	—	Grommet	No	2-wire	24 V	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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NL
5 m Z (Example) M9NZ

* 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.

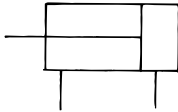
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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

Specifications



JIS Symbol
Double acting,
Single rod



Bore size (mm)	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	0.05 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)	0.29	0.52	0.91	1.54	2.71	4.54
Stroke length tolerance	+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	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>32 to 200</td> <td>101 to 299</td> </tr> </tbody> </table>	Bore size	Stroke range	32 to 200	101 to 299	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>32 to 160</td> <td>101 to 299</td> </tr> </tbody> </table>	Bore size	Stroke range	32 to 160	101 to 299
Bore size	Stroke range									
32 to 200	101 to 299									
Bore size	Stroke range									
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 ^{Note)}	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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.



Made to Order
(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

Standard Size

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
 ∅32, ∅40, ∅50, ∅63
 ∅80, ∅100

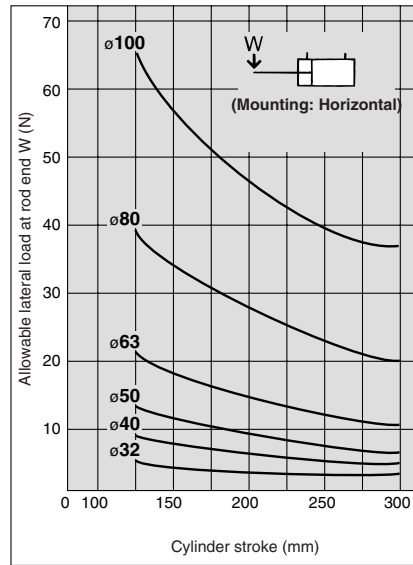
• Copper and fluorine-free series

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
Action	Double acting, Single rod					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Rubber bumper	With (Standard)					
Piping	Pipe thread, Built-in one-touch fittings					
Piston speed	50 to 500 mm/s					
Mounting	Both ends tapped					
Auto switch	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

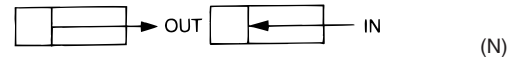
Note 1) When ordering a foot bracket, order 2 pieces per cylinder.

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

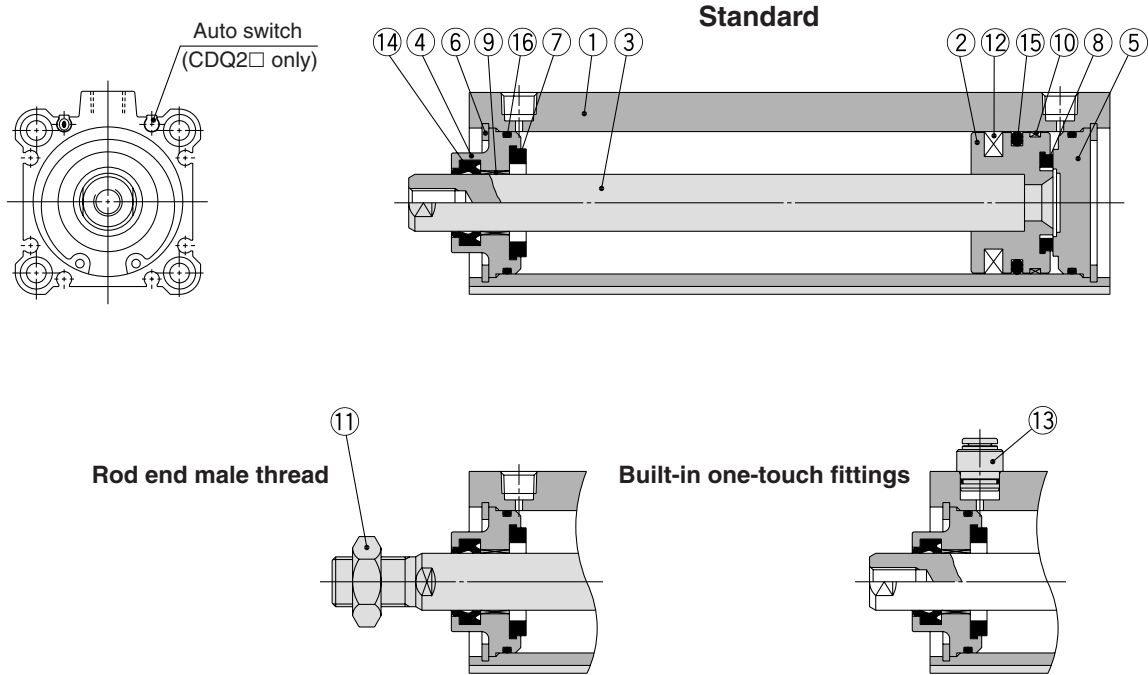
Bore size (mm)		32	40	50	63	80	100
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolts)		146	158	253	349	672	1113
Rod flange (Including mounting bolts)		165	198	348	534	1017	1309
Head flange (Including mounting bolts)		165	198	348	534	1017	1309
Double 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 anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy	Anodized
5	Bottom plate	Aluminum alloy	Anodized
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

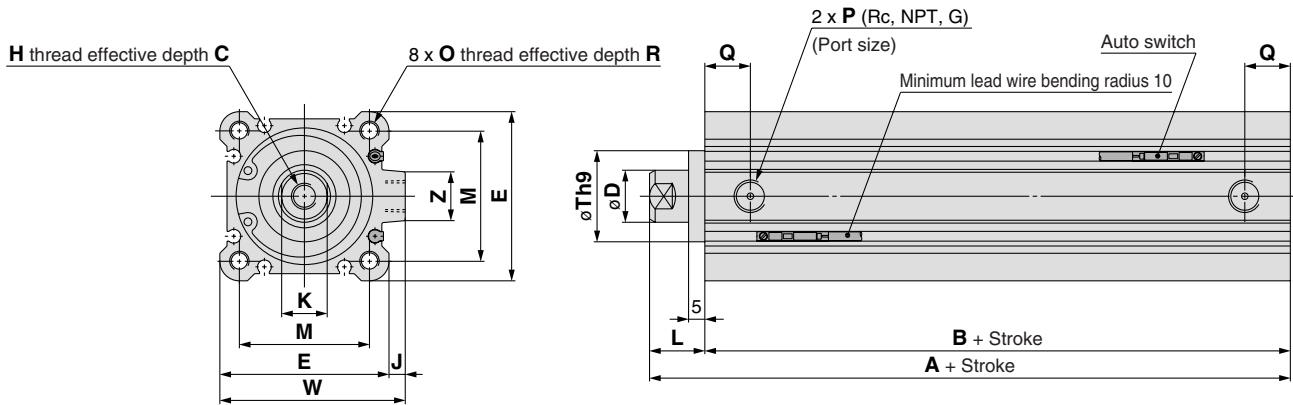
Series CQ2

Dimensions

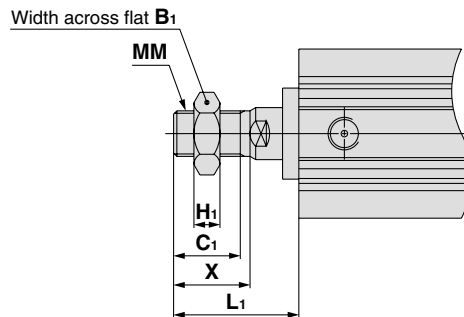
Ø32 to Ø50

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 ₁	C ₁	H ₁	L ₁	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.

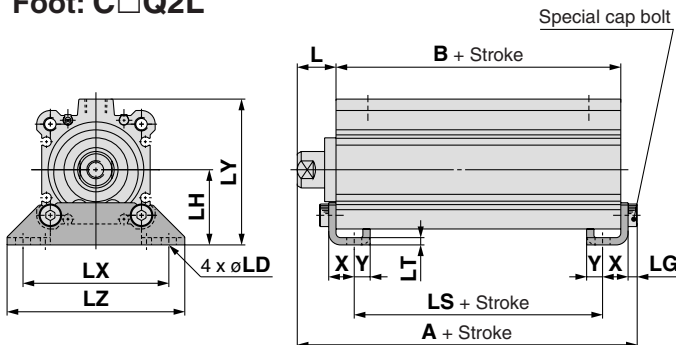
Both Ends Tapped For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	J	K	L	M	O	P	Q	R	Th9	W	Z
32	125 to 200 Note 1) 250, 300	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 ⁰ _{-0.052}	49.5	14
40		72	55	13	16	52	M8 x 1.25	5	14	17	40	M6 x 1.0	1/8	14	10	28 ⁰ _{-0.052}	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 ⁰ _{-0.062}	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



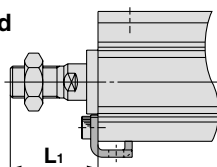
Foot (mm)

Bore size (mm)	A	B	L	L ₁	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

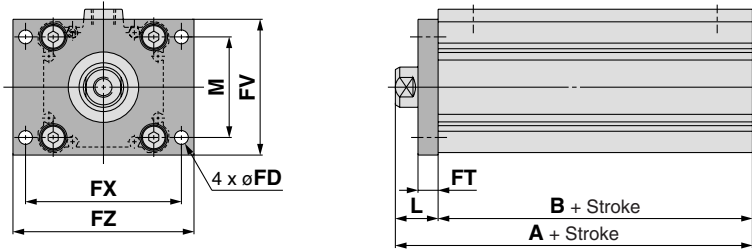
* For details about the rod end nut and accessory brackets, refer to page 19.

Rod end male thread



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

Rod flange: C□Q2F

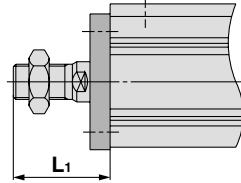


Rod Flange

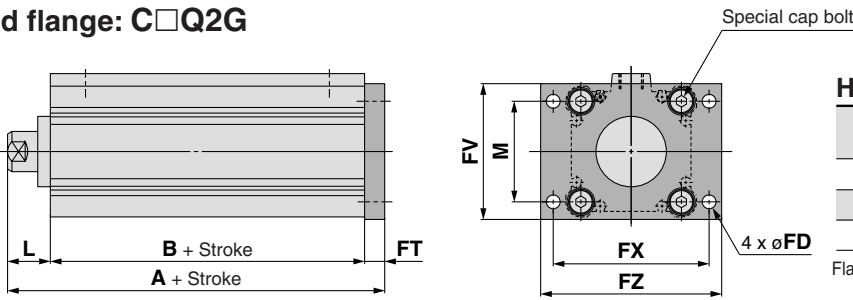
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L ₁	M
32	62.5	45.5	5.5	8	48	56	65	17	38.5	34
40	72	55	5.5	8	54	62	72	17	38.5	40
50	73.5	55.5	6.6	9	67	76	89	18	43.5	50

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head flange: C□Q2G



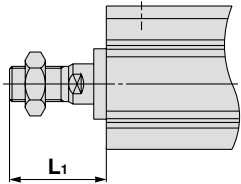
Head Flange

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

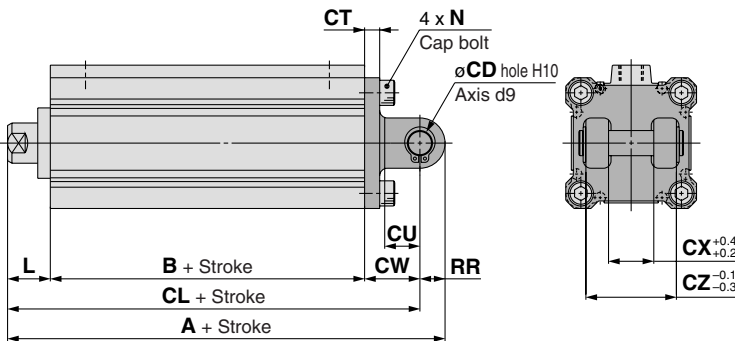
(* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Double clevis: C□Q2D



Double Clevis

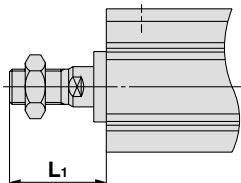
Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
32	92.5	45.5	10	82.5	5	14	20	18	36
40	104	55	10	94	6	14	22	18	36
50	115.5	55.5	14	101.5	7	20	28	22	44

Bore size (mm)	L	L ₁	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



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

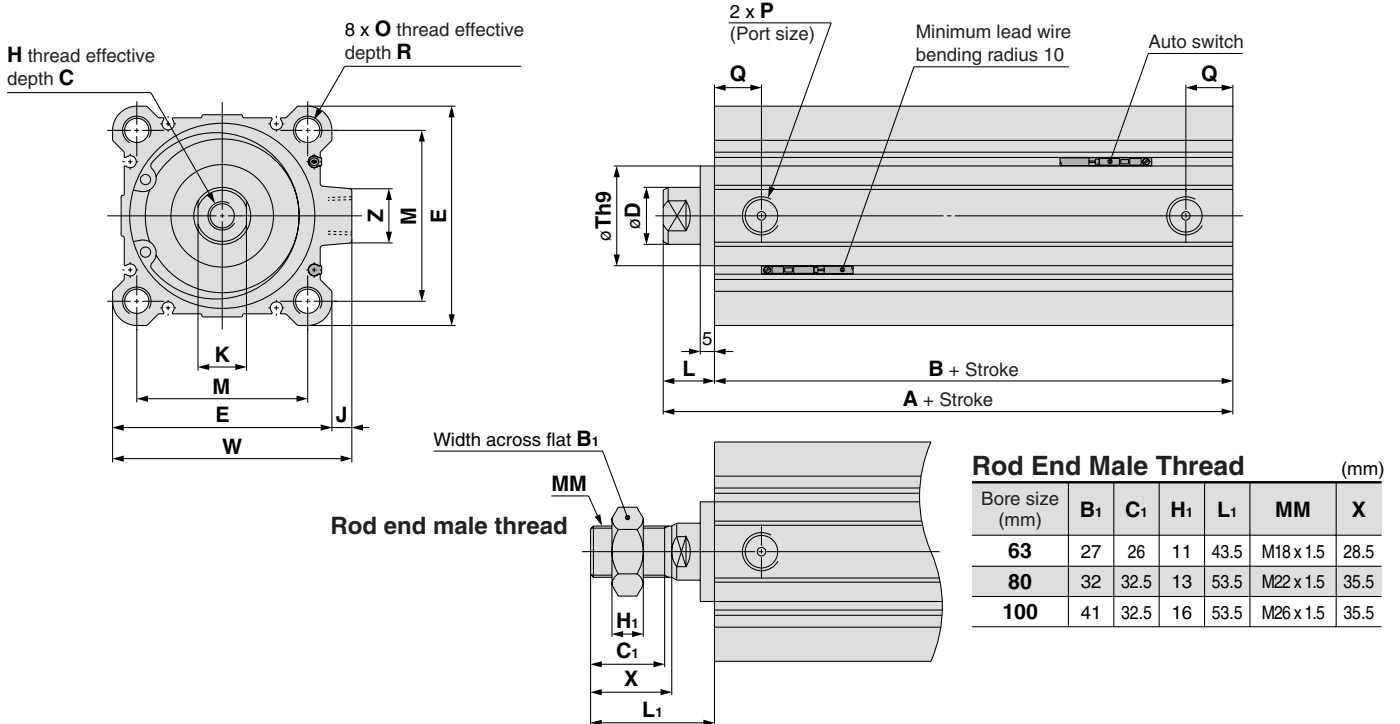
Series CQ2

Dimensions

∅63 to ∅100

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

Both ends tapped: C□Q2A



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

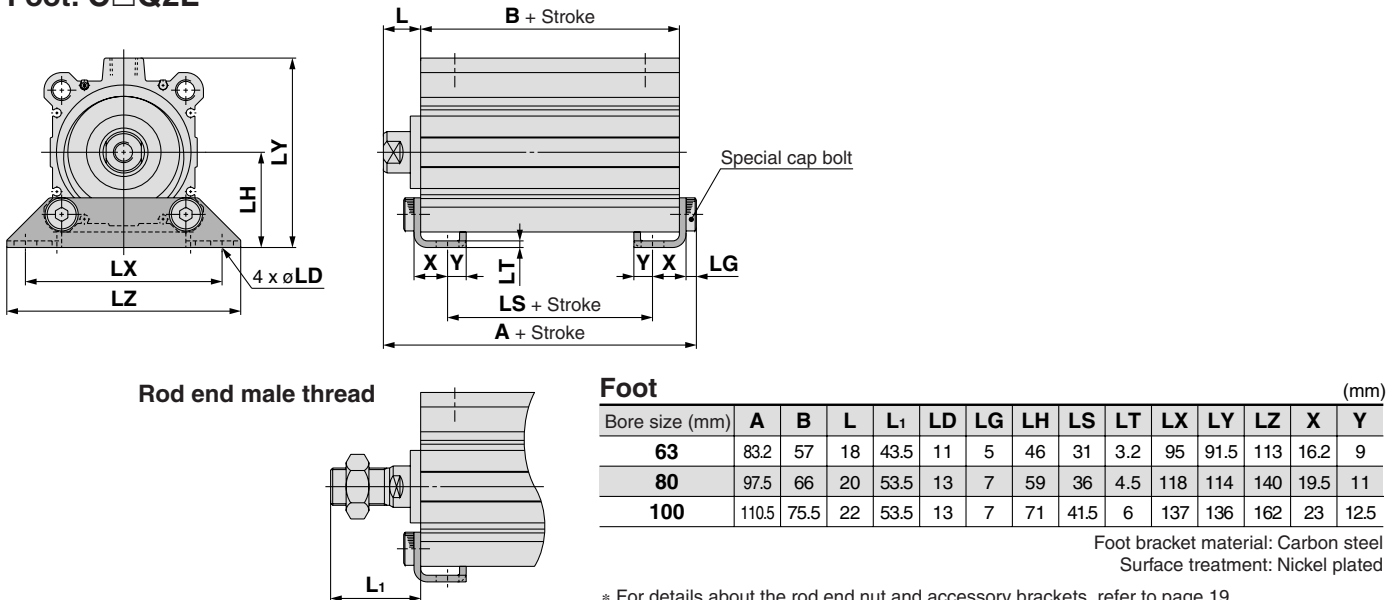
Both Ends Tapped For auto switch proper mounting position and its mounting height, refer to pages 169 to 175. (mm)

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 ⁰ _{-0.062}	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 ⁰ _{-0.062}	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 ⁰ _{-0.074}	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.

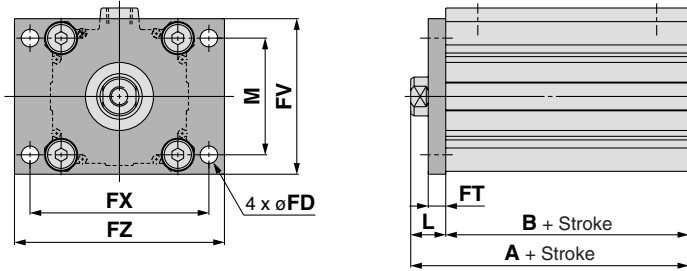
Foot: C□Q2L



* 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

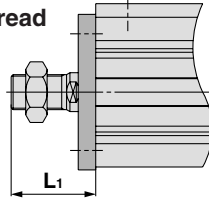


Rod Flange

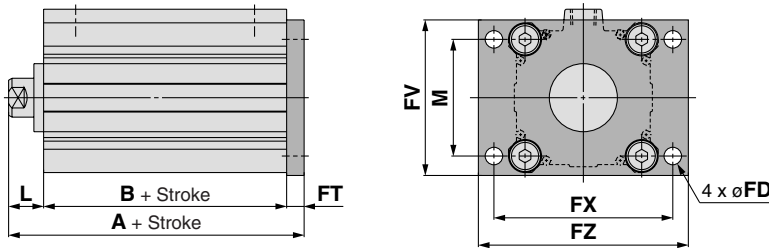
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L ₁	M
63	75	57	9	9	80	92	108	18	43.5	60
80	86	66	11	11	99	116	134	20	53.5	77
100	97.5	75.5	11	11	117	136	154	22	53.5	94

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head flange: C□Q2G



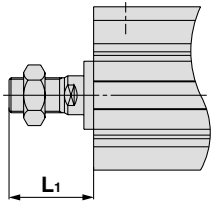
Head Flange

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

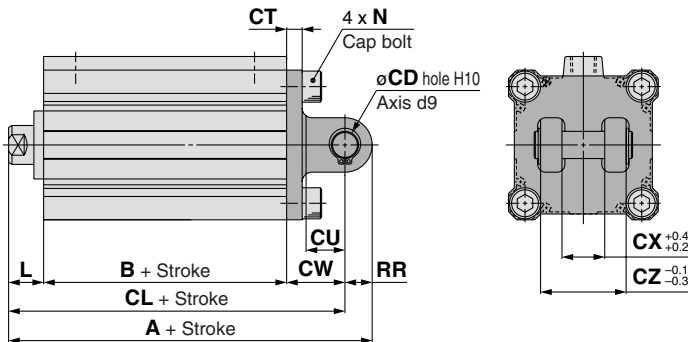
(* The dimensions except A are the same as those of the rod flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Double clevis: C□Q2D



Double Clevis

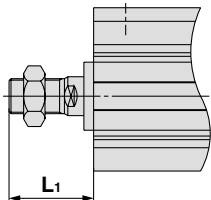
Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
63	119	57	14	105	8	20	30	22	44
80	142	66	18	124	10	27	38	28	56
100	164.5	75.5	22	142.5	13	31	45	32	64

Bore size (mm)	L	L ₁	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

* 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



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

CDQ2K B 32 - 30D Z - M9BW

With auto switch (Built-in magnet)
Non-rotating rod
Mounting

B	Through-hole (Standard)	ø12 to ø63
A	Both ends tapped	
L	Foot	
F	Rod flange	ø40, ø50, ø63
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 Note 1)	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 (ø12 with auto switch only).
 Example) CDQ2KB12-30DCZ

Port thread type

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø63
TF	G	
F	Built-in one-touch fittings Note 2)	

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

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

Auto switch
 Nil 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

Nil	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

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.
 Applicable Auto Switches/Refer to the individual catalog (ES20-201) for the D-P3DW type.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	○	○	○	IC circuit		
				3-wire (PNP)				M9PV	M9P	●	●	○	○				
				2-wire				M9BV	M9B	●	●	○	○				
				3-wire (NPN)				M9NVV	M9NV	●	●	○	○				
	Diagnostic indication (2-color indication)			3-wire (PNP)				M9PWV	M9PW	●	●	○	○	IC circuit			
				2-wire				M9BWW	M9BW	●	●	○	○				
				3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○			IC circuit	
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○				
	Water resistant (2-color indication)			2-wire				M9BAV**	M9BA**	○	○	●	○	—			
				2-wire (Non-polar)				—	P3DW	●	—	●	●				
Magnetic field resistant (2-color indication)	2-wire (Non-polar)	—	—	—	—	—	—	—	—	—	—	—	—				
	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire				A93V	A93	●	—	●	—	—	—	—	Relay, PLC
—	—	—	No	2-wire	24 V	5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	Relay, PLC

** 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 Nil (Example) M9NW
 1 m M (Example) M9NWM
 3 m L (Example) M9NWL
 5 m Z (Example) M9NWX

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

* The D-P3DW□ type is available from ø32 to ø63 only.

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

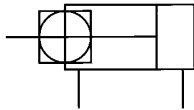
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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



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 end

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

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Specifications

Bore size (mm)	12	16	20	25	32	40	50	63
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)	0.022 0.043 Note 1)	0.038	0.055	0.09	0.15	0.26	0.46	0.77
Stroke length tolerance	+1.0 mm Note 2) 0							
Rod non-rotating accuracy	±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)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63	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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 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 x 0.8 is used for 5 mm stroke piping 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.

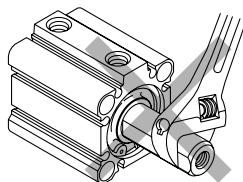
Retaining Ring Installation/Removal

⚠ 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 ^{Note 1)}	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	26	27	53	53
	Nut	1	2	4	8	17	17	32	32
With boss on head end		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

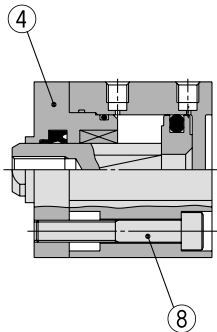
- Calculation: (Example) **CQ2KD40-20DMZ**
- Basic weight: CQ2KB40-20DZ 269 g
 - Additional weight: Both ends tapped 6 g
 - Rod end male thread..... 44 g
 - Double clevis 196 g
- 515 g

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

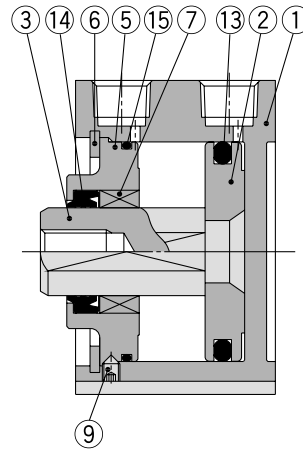
Series CQ2K

Construction

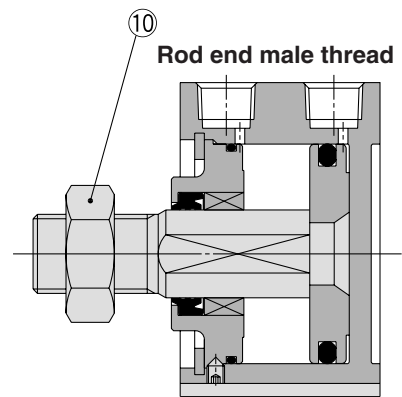
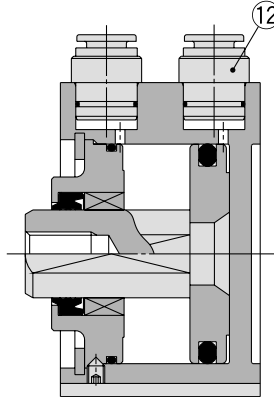
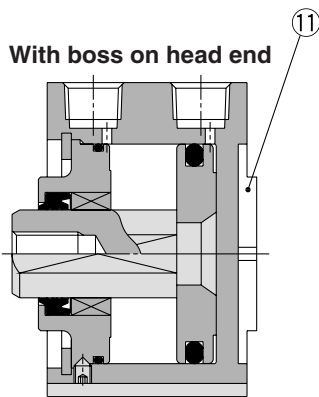
Standard (ø12 to ø32)



Standard (ø40 to ø63)



Built-in one-touch fittings



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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, Anodized
5	Collar	Aluminum alloy	ø40 to ø63, Anodized
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, Anodized
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.

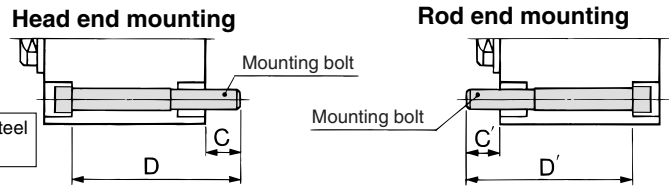
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CQ2KB/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2KB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x30L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CQ2KB12-5D	6.5	30	CQ-M3 x 30L	6.5	30	CQ-M3 x 30L
-10D		35	x 35L		35	x 35L
-15D		40	x 40L		40	x 40L
-20D		45	x 45L		45	x 45L
-25D		50	x 50L		50	x 50L
-30D		55	x 55L		55	x 55L
CQ2KB16-5D	5	30	CQ-M3 x 30L	5	30	CQ-M3 x 30L
-10D		35	x 35L		35	x 35L
-15D		40	x 40L		40	x 40L
-20D		45	x 45L		45	x 45L
-25D		50	x 50L		50	x 50L
-30D		55	x 55L		55	x 55L
CQ2KB20-5D	8	35	CQ-M5 x 35L	9.5	35	CQ-M5 x 35L
-10D		40	x 40L		40	x 40L
-15D		45	x 45L		45	x 45L
-20D		50	x 50L		50	x 50L
-25D		55	x 55L		55	x 55L
-30D		60	x 60L		60	x 60L
-35D		65	x 65L		65	x 65L
-40D		70	x 70L		70	x 70L
-45D		75	x 75L		75	x 75L
-50D		80	x 80L		80	x 80L
CQ2KB25-5D		10	40		CQ-M5 x 40L	6.5
-10D	45		x 45L	40	x 40L	
-15D	50		x 50L	45	x 45L	
-20D	55		x 55L	50	x 50L	
-25D	60		x 60L	55	x 55L	
-30D	65		x 65L	60	x 60L	
-35D	70		x 70L	65	x 65L	
-40D	75		x 75L	70	x 70L	
-45D	80		x 80L	75	x 75L	
-50D	85		x 85L	80	x 80L	
CQ2KB32-5DZ	8.5	40	CQ-M5 x 40L	10	40	CQ-M5 x 40L
-10DZ		45	x 45L		45	x 45L
-15DZ		50	x 50L		50	x 50L
-20DZ		55	x 55L		55	x 55L
-25DZ		60	x 60L		60	x 60L
-30DZ		65	x 65L		65	x 65L
-35DZ		70	x 70L		70	x 70L
-40DZ		75	x 75L		75	x 75L
-45DZ		80	x 80L		80	x 80L
-50DZ		85	x 85L		85	x 85L
-75DZ		120	x 120L		120	x 120L
-100DZ	145	x 145L	145	x 145L		

Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CQ2KB40-5DZ	7.5	35	CQ-M5 x 35L	7.5	35	CQ-M5 x 35L
-10DZ		40	x 40L		40	x 40L
-15DZ		45	x 45L		45	x 45L
-20DZ		50	x 50L		50	x 50L
-25DZ		55	x 55L		55	x 55L
-30DZ		60	x 60L		60	x 60L
-35DZ		65	x 65L		65	x 65L
-40DZ		70	x 70L		70	x 70L
-45DZ		75	x 75L		75	x 75L
-50DZ		80	x 80L		80	x 80L
-75DZ	115	x 115L	115	x 115L		
-100DZ	140	x 140L	140	x 140L		
CQ2KB50-10DZ	12.5	45	CQ-M6 x 45L	12.5	45	CQ-M6 x 45L
-15DZ		50	x 50L		50	x 50L
-20DZ		55	x 55L		55	x 55L
-25DZ		60	x 60L		60	x 60L
-30DZ		65	x 65L		65	x 65L
-35DZ		70	x 70L		70	x 70L
-40DZ		75	x 75L		75	x 75L
-45DZ		80	x 80L		80	x 80L
-50DZ		85	x 85L		85	x 85L
-75DZ		120	x 120L		120	x 120L
-100DZ		145	x 145L		145	x 145L
CQ2KB63-10DZ	14.5	50	CQ-M8 x 50L	14.5	50	CQ-M8 x 50L
-15DZ		55	x 55L		55	x 55L
-20DZ		60	x 60L		60	x 60L
-25DZ		65	x 65L		65	x 65L
-30DZ		70	x 70L		70	x 70L
-35DZ		75	x 75L		75	x 75L
-40DZ		80	x 80L		80	x 80L
-45DZ		85	x 85L		85	x 85L
-50DZ		90	x 90L		90	x 90L
-75DZ		125	x 125L		125	x 125L
-100DZ	150	x 150L	150	x 150L		

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

20 — CQ2KB Bore size — Stroke D(M)Z

• Copper and fluorine-free series • $\varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32$
 $\varnothing 40, \varnothing 50, \varnothing 63$

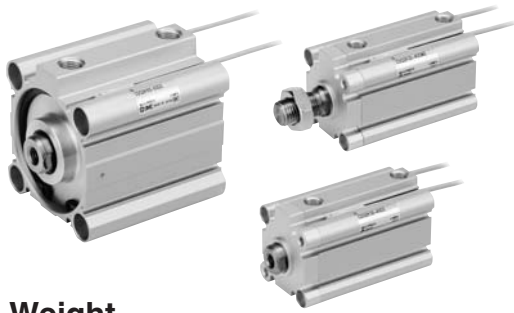
For preventing the influence of copper ions or halogen ions during CRT manufacturing processes, copper and fluorine materials are not used in the component parts.

Specifications

Bore size (mm)	16	20	25	32	40	50	63
Action	Double acting, 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

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
12	71	77	83	89	96	102	—	—	—	—	—	—
16	74	82	89	97	105	113	—	—	—	—	—	—
20	119	132	144	156	168	180	192	204	217	229	—	—
25	162	177	192	208	223	238	254	269	284	300	—	—
32	227	247	266	286	306	326	345	365	385	404	504	604
40	240	261	283	305	326	348	369	391	413	434	546	658
50	—	433	466	499	532	565	598	630	663	697	869	1041
63	—	622	660	698	736	774	812	850	888	926	1124	1321

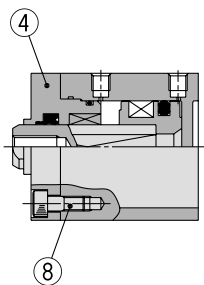
Additional Weight

Bore size (mm)	(g)							
	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 end	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

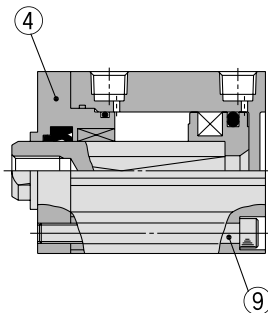
Calculation: (Example) **CDQ2KD40-25DMZ** Add each weight of auto switches when auto switches are mounted.
 • Basic weight: CDQ2KB40-25DZ 326 g
 • Additional weight: Both ends tapped 6 g
 Rod end male thread 44 g
 Double clevis 196 g
 572 g

Construction

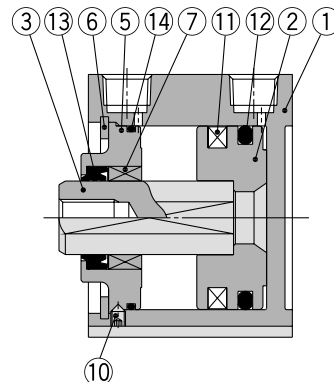
ø12 to ø25



ø32



ø40 to ø63



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plated
4	Rod cover	Brass	ø12, Electroless nickel plated
		Aluminum alloy	ø16 to ø32, Anodized
5	Collar	Aluminum alloy	ø40 to ø63, Anodized
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
12	CQ2KB12-PS	Kits include items 12, 13, 14 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 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)

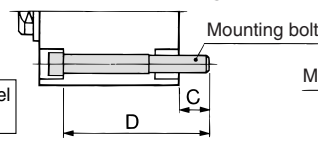
Mounting Bolt for CDQ2KB/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2KB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

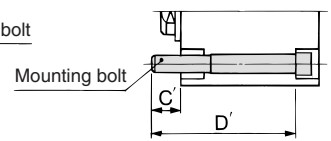
Example) CQ-M3x35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Head end mounting



Rod end mounting



Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CDQ2KB12-5DCZ	5.5	35	CQ-M3 x 35L	5.5	40	CQ-M3 x 40L
-10DCZ		40	x 40L		45	x 45L
-15DCZ		45	x 45L		50	x 50L
-20DCZ		50	x 50L		55	x 55L
-25DCZ		55	x 55L		60	x 60L
-30DCZ		60	x 60L		65	x 65L
CDQ2KB16-5DZ	8	40	CQ-M3 x 40L	8	45	CQ-M3 x 45L
-10DZ		45	x 45L		50	x 50L
-15DZ		50	x 50L		55	x 55L
-20DZ		55	x 55L		60	x 60L
-25DZ		60	x 60L		65	x 65L
-30DZ		65	x 65L		70	x 70L
CDQ2KB20-5DZ	10.5	40	CQ-M5 x 40L	7.5	45	CQ-M5 x 45L
-10DZ		45	x 45L		50	x 50L
-15DZ		50	x 50L		55	x 55L
-20DZ		55	x 55L		60	x 60L
-25DZ		60	x 60L		65	x 65L
-30DZ		65	x 65L		70	x 70L
-35DZ		70	x 70L		75	x 75L
-40DZ		75	x 75L		80	x 80L
-45DZ		80	x 80L		85	x 85L
-50DZ		85	x 85L		90	x 90L
CDQ2KB25-5DZ	9.5	40	CQ-M5 x 40L	6.5	45	CQ-M5 x 45L
-10DZ		45	x 45L		50	x 50L
-15DZ		50	x 50L		55	x 55L
-20DZ		55	x 55L		60	x 60L
-25DZ		60	x 60L		65	x 65L
-30DZ		65	x 65L		70	x 70L
-35DZ		70	x 70L		75	x 75L
-40DZ		75	x 75L		80	x 80L
-45DZ		80	x 80L		85	x 85L
-50DZ		85	x 85L		90	x 90L
CDQ2KB32-5DZ	8.5	50	CQ-M5 x 50L	10	50	CQ-M5 x 50L
-10DZ		55	x 55L		55	x 55L
-15DZ		60	x 60L		60	x 60L
-20DZ		65	x 65L		65	x 65L
-25DZ		70	x 70L		70	x 70L
-30DZ		75	x 75L		75	x 75L
-35DZ		80	x 80L		80	x 80L
-35DZ		80	x 80L		80	x 80L

Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CDQ2KB32-40DZ	8.5	85	CQ-M5 x 85L	10	85	CQ-M5 x 85L
-45DZ		90	x 90L		90	x 90L
-50DZ		95	x 95L		95	x 95L
-75DZ		120	x 120L		120	x 120L
-100DZ		145	x 145L		145	x 145L
CDQ2KB40-5DZ	7.5	45	CQ-M5 x 45L	7.5	45	CQ-M5 x 45L
-10DZ		50	x 50L		50	x 50L
-15DZ		55	x 55L		55	x 55L
-20DZ		60	x 60L		60	x 60L
-25DZ		65	x 65L		65	x 65L
-30DZ		70	x 70L		70	x 70L
-35DZ		75	x 75L		75	x 75L
-40DZ		80	x 80L		80	x 80L
-45DZ		85	x 85L		85	x 85L
-50DZ		90	x 90L		90	x 90L
-75DZ	115	x 115L	115	x 115L		
-100DZ	140	x 140L	140	x 140L		
CDQ2KB50-10DZ	12.5	55	CQ-M6 x 55L	12.5	55	CQ-M6 x 55L
-15DZ		60	x 60L		60	x 60L
-20DZ		65	x 65L		65	x 65L
-25DZ		70	x 70L		70	x 70L
-30DZ		75	x 75L		75	x 75L
-35DZ		80	x 80L		80	x 80L
-40DZ		85	x 85L		85	x 85L
-45DZ		90	x 90L		90	x 90L
-50DZ		95	x 95L		95	x 95L
-75DZ		120	x 120L		120	x 120L
-100DZ	145	x 145L	145	x 145L		
CDQ2KB63-10DZ	14.5	60	CQ-M8 x 60L	14.5	60	CQ-M8 x 60L
-15DZ		65	x 65L		65	x 65L
-20DZ		70	x 70L		70	x 70L
-25DZ		75	x 75L		75	x 75L
-30DZ		80	x 80L		80	x 80L
-35DZ		85	x 85L		85	x 85L
-40DZ		90	x 90L		90	x 90L
-45DZ		95	x 95L		95	x 95L
-50DZ		100	x 100L		100	x 100L
-75DZ		125	x 125L		125	x 125L
-100DZ	150	x 150L	150	x 150L		

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

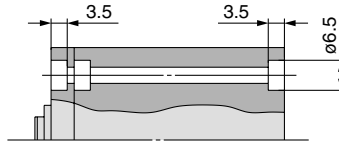
Series CQ2K

Dimensions

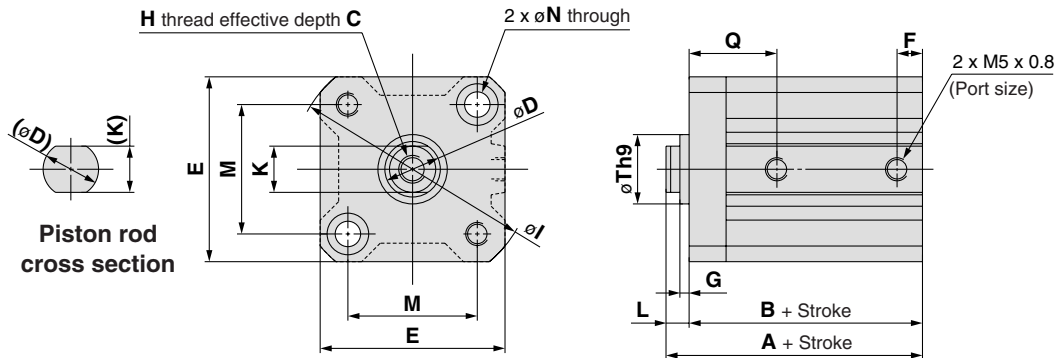
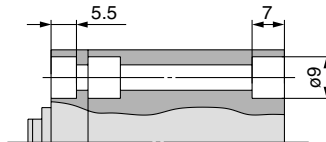
Ø12 to Ø25/Without Auto Switch

Standard (Through-hole): CQ2KB

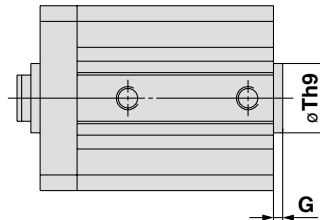
Ø12, Ø16



Ø20, Ø25



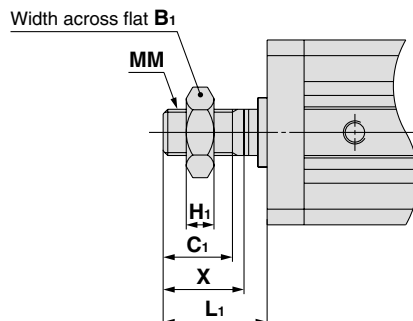
With boss on head end



With Boss on Head End (mm)

Bore size (mm)	G	Th9
12	1.5	15 ⁰ _{-0.043}
16	1.5	20 ⁰ _{-0.052}
20	2	13 ⁰ _{-0.043}
25	2	15 ⁰ _{-0.043}

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 ⁰ _{-0.043}
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 ⁰ _{-0.052}
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 ⁰ _{-0.043}
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 ⁰ _{-0.043}

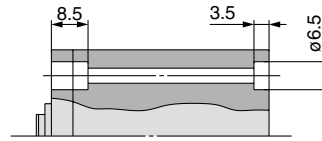
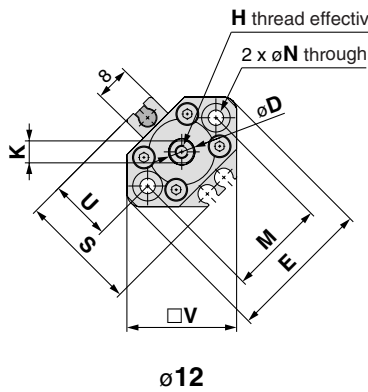
* For details about the rod end nut and accessory brackets, refer to page 19.

Dimensions

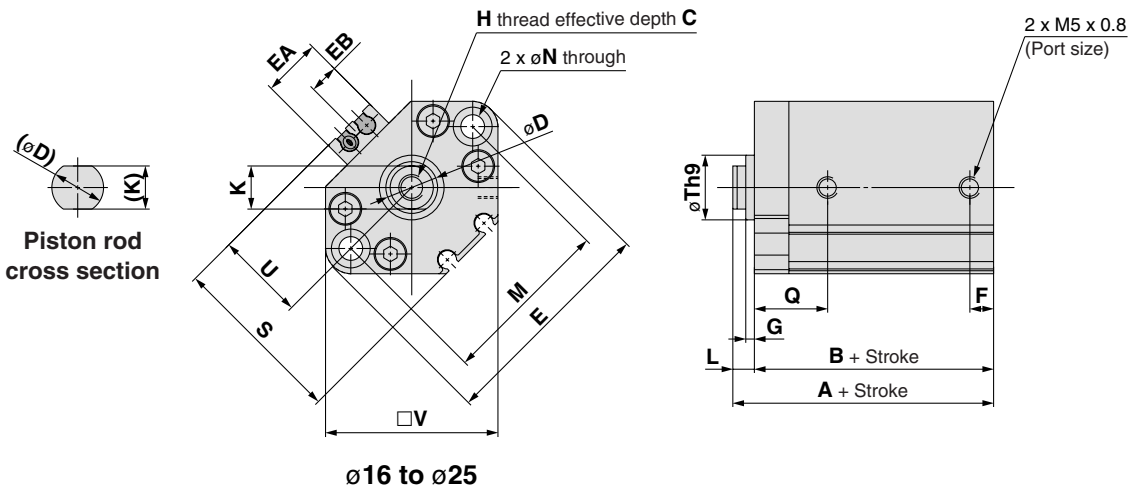
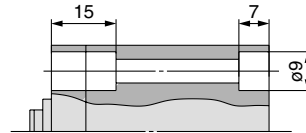
∅12 to ∅25/With Auto Switch

Standard (Through-hole): CDQ2KB

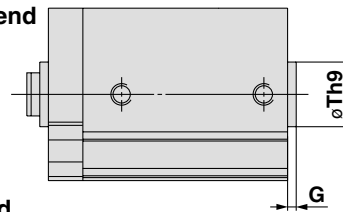
∅12, ∅16



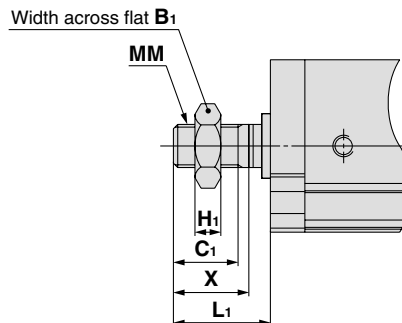
∅20, ∅25



With boss on head end



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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	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 ⁰ _{-0.043}	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 ⁰ _{-0.052}	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 ⁰ _{-0.043}	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 ⁰ _{-0.043}	21	40

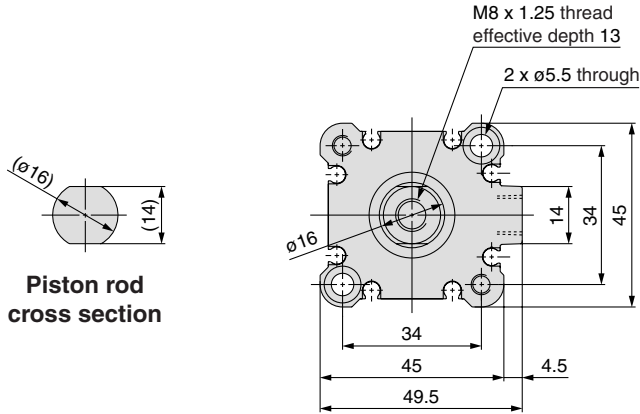
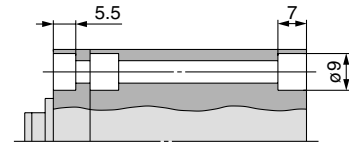
* For details about the rod end nut and accessory brackets, refer to page 19.

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

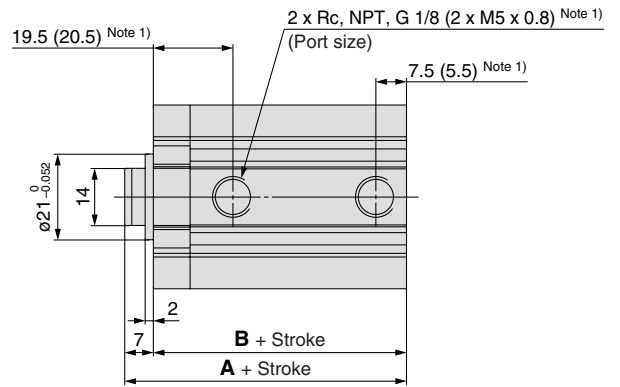
Series CQ2K

Dimensions

Ø32/Without Auto Switch



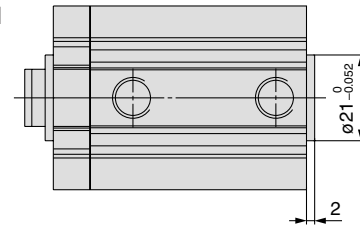
Piston rod cross section



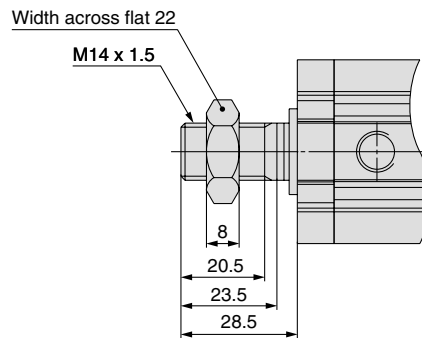
Note 1) (): Stroke 5 mm

Stroke range (mm)	(mm)	
	A	B
5 to 50	39	32
75, 100	49	42

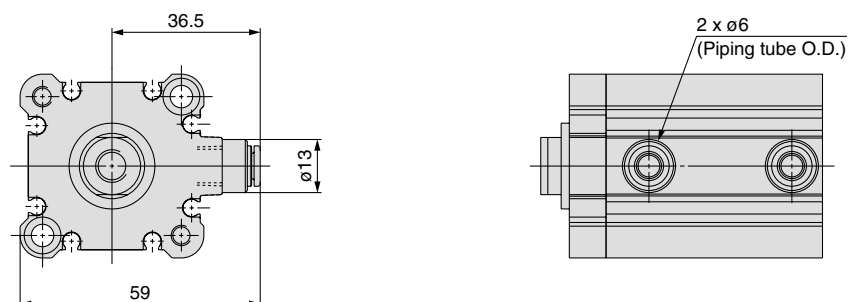
With boss on head end



Rod end male thread



Built-in one-touch fittings: Ø32

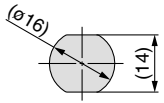


Note 2) The dimensions of the Ø32-5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube.

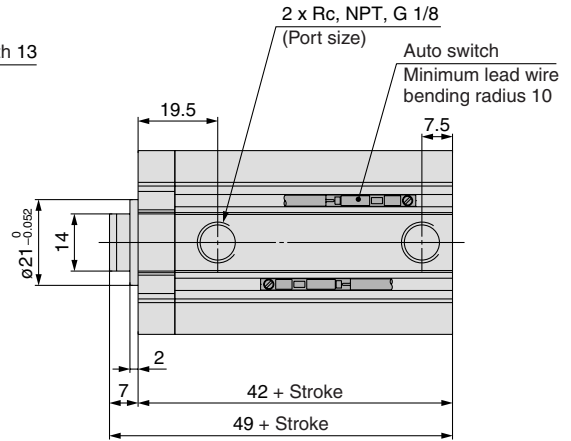
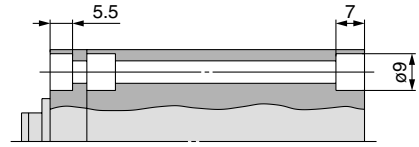
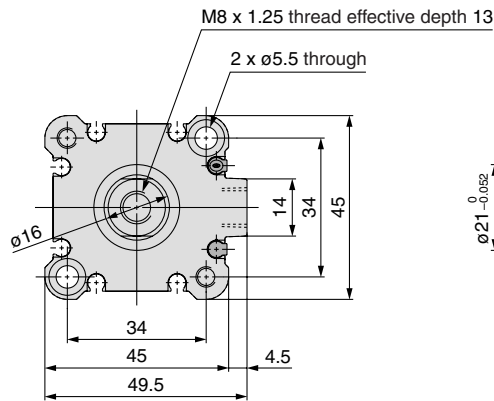
* For details about the rod end nut and accessory brackets, refer to page 19.

Dimensions

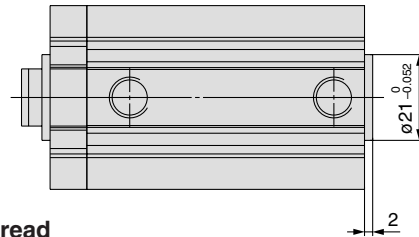
Ø32/With Auto Switch



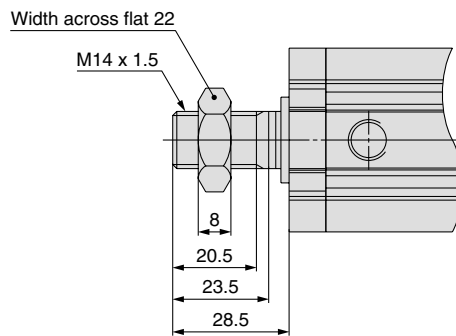
Piston rod cross section



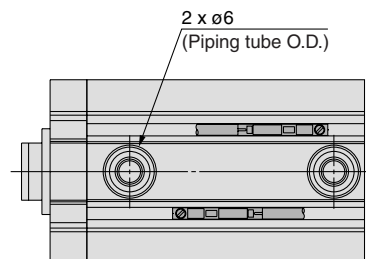
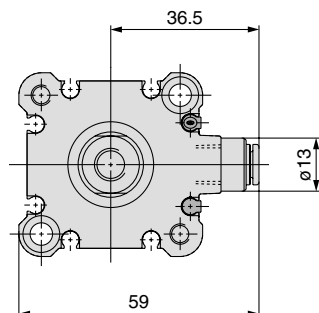
With boss on head end



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

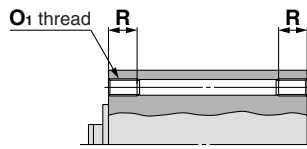
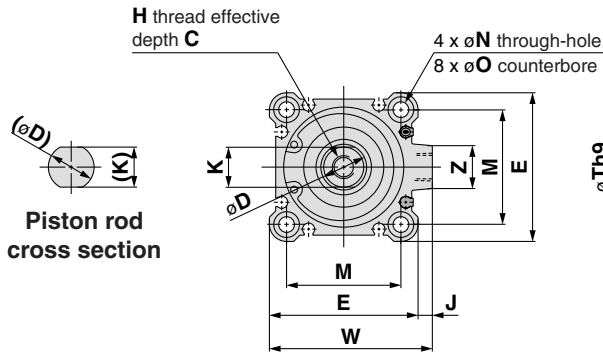
Dimensions

Ø40 to Ø63/With Auto Switch

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

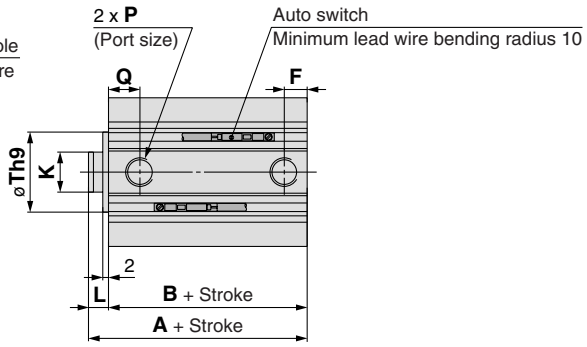
Both ends tapped: CDQ2KA

Standard (Through-hole): CDQ2KB

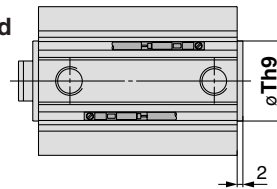


Both Ends Tapped (mm)

Bore size (mm)	O ₁	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18



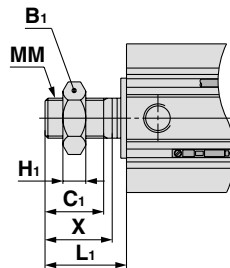
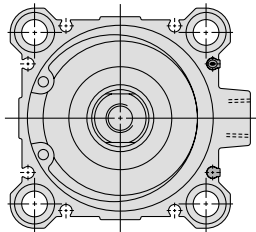
With boss on head end



With Boss on Head End (mm)

Bore size (mm)	Th9
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}
63	35 ⁰ _{-0.062}

Rod end male thread

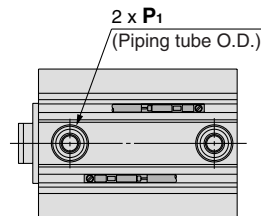
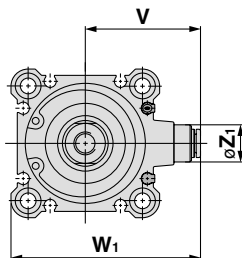


Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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

Cylinder tube form ø63

Built-in one-touch fittings: ø40 to ø63



Built-in One-touch Fittings (mm)

Bore size (mm)	Z ₁	P ₁	V	W ₁
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

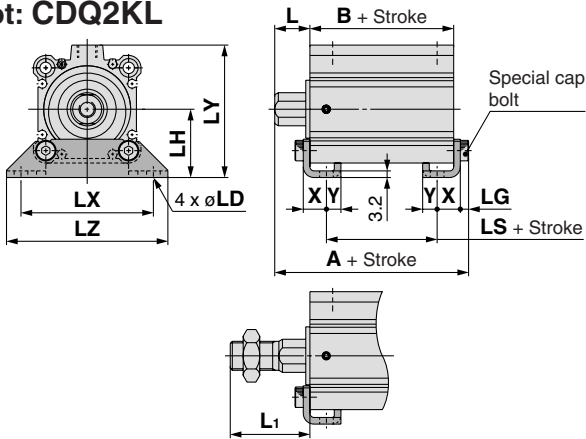
Standard

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 ⁰ _{-0.052}	57	15
	75, 100	46.5	39.5	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 ⁰ _{-0.052}	57	15
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 ⁰ _{-0.062}	71	19
	75, 100	48.5	40.5	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 ⁰ _{-0.062}	71	19
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 ⁰ _{-0.062}	84	19
	75, 100	54	46	54	46	15	20	77	10.5	M10 x 1.5	7	18	8	60	9	14 depth 10.5	1/4	15	35 ⁰ _{-0.062}	84	19

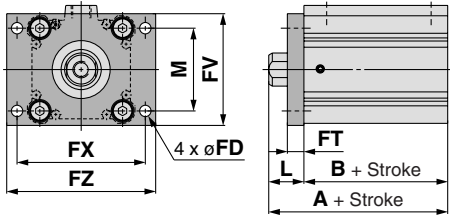
* For details about the rod end nut and accessory brackets, refer to page 19.

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

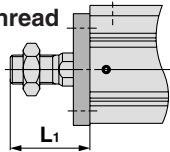
Foot: CDQ2KL



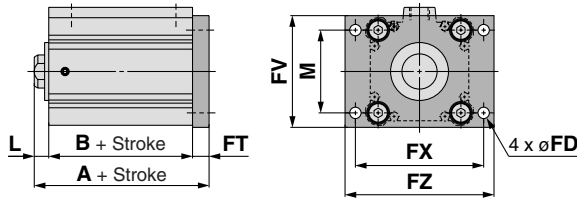
Rod flange: CDQ2KF



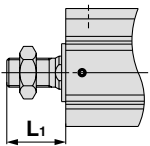
Rod end male thread



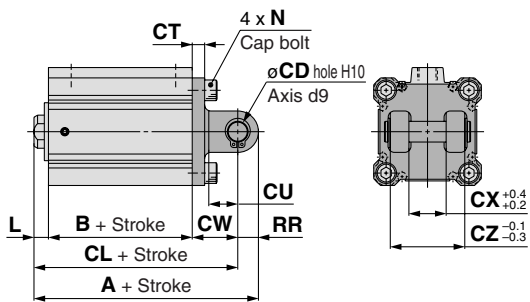
Head flange: CDQ2KG



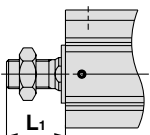
Rod end male thread



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 ₁	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 ₁	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		L	L ₁
		A	B	A	B		
40	5 to 50	44.5	29.5	54.5	39.5	7	28.5
	75, 100	54.5	39.5				
50	10 to 50	47.5	30.5	57.5	40.5	8	33.5
	75, 100	57.5	40.5				
63	10 to 50	53	36	63	46	8	33.5
	75, 100	63	46				

(* The dimensions except A, L and L₁ 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 ₁	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

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, 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)

Mounting

B	Through-hole (Standard)	ø12 to ø63
A	Both ends tapped	ø40 to ø63
L	Foot	
F	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)Q2KWB" on pages 96 and 98.

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

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø63
	G	
TF	G	
F	Built-in one-touch fittings ^(Note)	

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.

Number of auto switches

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

Auto switch

Nil 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

Nil	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

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

Applicable Auto Switches

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	Relay, PLC	IC circuit
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○		
				2-wire				M9BV	M9B	●	●	●	○	—	○		
				3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○		
	Diagnostic indication (2-color indication)			3-wire (PNP)	M9PWV	M9PW	●	●	●	○	—	○	IC circuit				
				2-wire	M9BWW	M9BW	●	●	●	○	—	○					
				3-wire (NPN)	M9NAV**	M9NA**	○	○	●	○	—	○		IC circuit			
				3-wire (PNP)	M9PAV**	M9PA**	○	○	●	○	—	○					
	Water resistant (2-color indication)			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 or less	A96V	A96	●	—	●	—	—	IC circuit	—	
				2-wire				A93V	A93	●	—	●	—	—			Relay, PLC
								A90V	A90	●	—	●	—	—			

* * 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 Nil (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.
* 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.

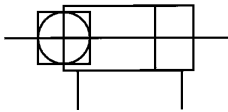
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

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
Action	Double acting, Double 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)	0.022 0.043 Note 1)	0.038	0.055	0.09	0.15	0.26	0.46	0.77
Stroke length tolerance	+1.0 mm Note 2) 0							
Rod non-rotating accuracy	$\pm 2^\circ$		$\pm 1^\circ$			$\pm 0.8^\circ$		

* $\phi 12$ 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 (mm)
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63	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	Bore size: 32 to 63 Stroke range: 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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8 Rc1/8	Rc1/8	Rc1/4
			TN	—	—	—	—	NPT1/8	NPT1/8	NPT1/4
		TF	—	—	—	—	G1/8	G1/8	G1/4	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 x 0.8 is used for 5 mm stroke piping 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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Retaining Ring Installation/Removal

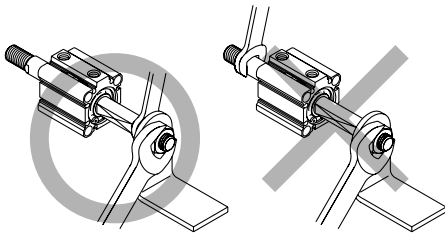
⚠ Caution

- 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

- 1. 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.



- 2. 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 <small>Note 1)</small>	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

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

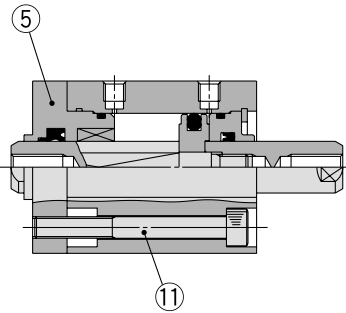
Auto Switch

Made to Order

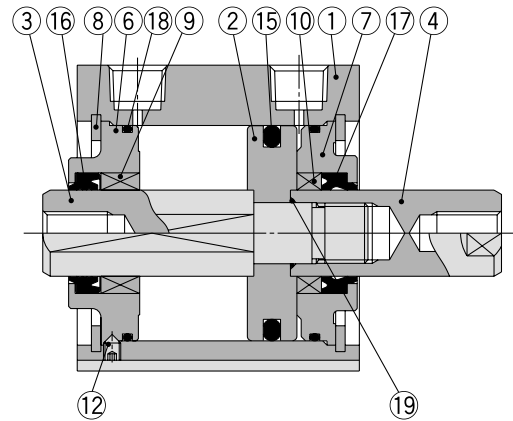
Series CQ2KW

Construction

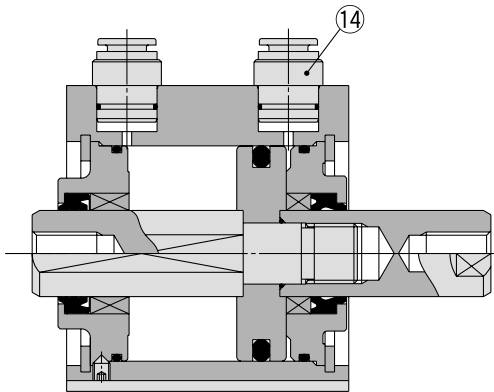
Standard (ø12 to ø32)



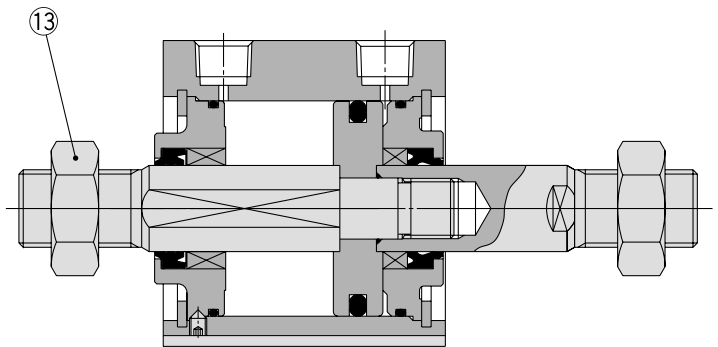
Standard (ø40 to ø63)



Built-in one-touch fittings



Rod end male thread



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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, Anodized
6	Collar for non-rotating	Aluminum alloy	ø40 to ø63, Anodized
7	Collar	Aluminum alloy	ø12 to ø40, Anodized
		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.

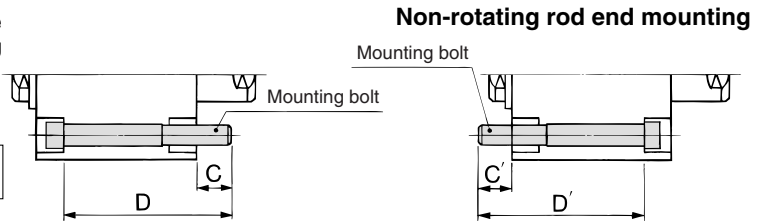
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CQ2KWB/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2KWB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x40L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CQ2KWB12-5D	8.3	40	CQ-M3 x 40L	8.3	40	CQ-M3 x 40L
-10D		45	x 45L		45	x 45L
-15D		50	x 50L		50	x 50L
-20D		55	x 55L		55	x 55L
-25D		60	x 60L		60	x 60L
-30D		65	x 65L		65	x 65L
CQ2KWB16-5D	7.5	40	CQ-M3 x 40L	7.5	40	CQ-M3 x 40L
-10D		45	x 45L		45	x 45L
-15D		50	x 50L		50	x 50L
-20D		55	x 55L		55	x 55L
-25D		60	x 60L		60	x 60L
-30D		65	x 65L		65	x 65L
CQ2KWB20-5D	6.5	40	CQ-M5 x 40L	8	40	CQ-M5 x 40L
-10D		45	x 45L		45	x 45L
-15D		50	x 50L		50	x 50L
-20D		55	x 55L		55	x 55L
-25D		60	x 60L		60	x 60L
-30D		65	x 65L		65	x 65L
-35D		70	x 70L		70	x 70L
-40D		75	x 75L		75	x 75L
-45D		80	x 80L		80	x 80L
-50D		85	x 85L		85	x 85L
CQ2KWB25-5D	8.5	45	CQ-M5 x 45L	10	45	CQ-M5 x 45L
-10D		50	x 50L		50	x 50L
-15D		55	x 55L		55	x 55L
-20D		60	x 60L		60	x 60L
-25D		65	x 65L		65	x 65L
-30D		70	x 70L		70	x 70L
-35D		75	x 75L		75	x 75L
-40D		80	x 80L		80	x 80L
-45D		85	x 85L		85	x 85L
-50D		90	x 90L		90	x 90L
CQ2KWB32-5DZ	11	50	CQ-M5 x 50L	7.5	45	CQ-M5 x 45L
-10DZ		55	x 55L		50	x 50L
-15DZ		60	x 60L		55	x 55L
-20DZ		65	x 65L		60	x 60L
-25DZ		70	x 70L		65	x 65L
-30DZ		75	x 75L		70	x 70L
-35DZ		80	x 80L		75	x 75L
-40DZ		85	x 85L		80	x 80L
-45DZ		90	x 90L		85	x 85L
-50DZ		95	x 95L		90	x 90L
-75DZ		130	x 130L		125	x 125L
-100DZ	155	x 155L	150	x 150L		

Cylinder model	C	D	Mounting bolt part no.
CQ2KWB40-5DZ	7	45	CQ-M5 x 45L
-10DZ		50	x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
-75DZ	125	x 125L	
-100DZ	150	x 150L	
CQ2KWB50-10DZ	12.5	55	CQ-M6 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
-100DZ	155	x 155L	
CQ2KWB63-10DZ	13.5	55	CQ-M8 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
-100DZ	155	x 155L	

* 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

Non-rotating Rod: Double Acting, Double Rod Series **CDQ2KW** 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)											(g)	
	5	10	15	20	25	30	35	40	45	50	75		100
12	76	83	90	98	105	113	—	—	—	—	—	—	—
16	89	99	109	118	128	138	—	—	—	—	—	—	—
20	148	164	179	194	210	225	240	256	271	286	—	—	—
25	213	228	244	259	275	291	306	322	337	353	—	—	—
32	259	282	305	328	351	374	397	420	443	466	580	695	—
40	441	471	500	530	559	588	618	647	677	706	853	1000	—
50	—	642	684	726	767	809	851	892	934	976	1184	1393	—
63	—	871	907	943	979	1015	1051	1088	1124	1160	1341	1521	—

Additional Weight

Bore size (mm)		12	16	20	25	32	40	50	63	(g)
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	

Calculation: (Example) **CDQ2KWA40-20DMZ**

- Basic weight: CDQ2KWB40-20DZ.....530 g
- Additional weight: Both ends tapped6 g
Rod end male thread88 g
624 g

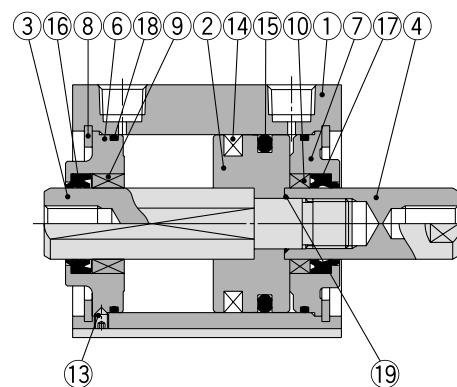
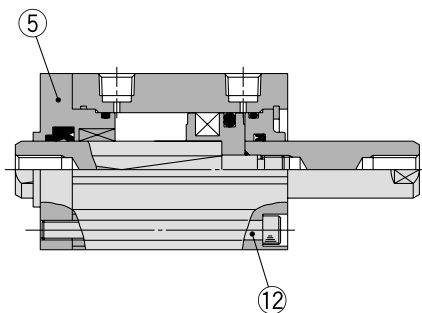
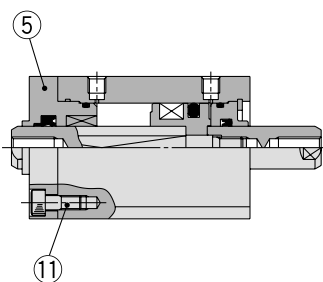
Add each weight of auto switches when auto switches are mounted.

Construction

ø12 to ø25

ø32

ø40 to ø63



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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, Anodized
6	Collar for non-rotating	Aluminum alloy	ø40 to ø63, Anodized
7	Collar	Aluminum alloy	ø12 to ø40, Anodized
		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 ø25, Nickel plated
12	Hexagon socket head cap screw	Alloy steel	ø32, Nickel plated
13	Hexagon socket head set screw	Alloy steel	ø40 to ø63, Nickel plated
14	Magnet	—	—

No.	Description	Material	Note
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	

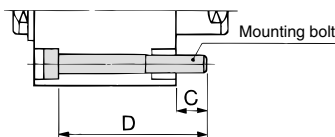
- * Seal kit includes 15, 16, 17, 18. Order the seal kit based on each bore size.
- * Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Mounting Bolt for CDQ2KWB/With Auto Switch

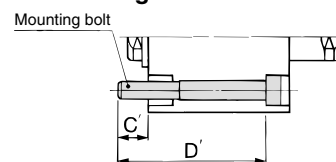
Mounting method: Mounting bolt for through-hole mounting of the CDQ2KWB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x40L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Non-rotating rod end mounting



Cylinder model	C	D	Mounting bolt part no.	C'	D'	Mounting bolt part no.
CDQ2KWB12-5DCZ	6.1	40	CQ-M3 x 40L	6.1	45	CQ-M3 x 45L
-10DCZ		45	x 45L		50	x 50L
-15DCZ		50	x 50L		55	x 55L
-20DCZ		55	x 55L		60	x 60L
-25DCZ		60	x 60L		65	x 65L
-30DCZ		65	x 65L		70	x 70L
CDQ2KWB16-5DZ	7.5	45	CQ-M3 x 45L	7.5	50	CQ-M3 x 50L
-10DZ		50	x 50L		55	x 55L
-15DZ		55	x 55L		60	x 60L
-20DZ		60	x 60L		65	x 65L
-25DZ		65	x 65L		70	x 70L
-30DZ		70	x 70L		75	x 75L
CDQ2KWB20-5DZ	9	45	CQ-M5 x 45L	11	55	CQ-M5 x 55L
-10DZ		50	x 50L		60	x 60L
-15DZ		55	x 55L		65	x 65L
-20DZ		60	x 60L		70	x 70L
-25DZ		65	x 65L		75	x 75L
-30DZ		70	x 70L		80	x 80L
-35DZ		75	x 75L		85	x 85L
-40DZ		80	x 80L		90	x 90L
-45DZ		85	x 85L		95	x 95L
-50DZ		90	x 90L		100	x 100L
CDQ2KWB25-5DZ	8	45	CQ-M5 x 45L	10	55	CQ-M5 x 55L
-10DZ		50	x 50L		60	x 60L
-15DZ		55	x 55L		65	x 65L
-20DZ		60	x 60L		70	x 70L
-25DZ		65	x 65L		75	x 75L
-30DZ		70	x 70L		80	x 80L
-35DZ		75	x 75L		85	x 85L
-40DZ		80	x 80L		90	x 90L
-45DZ		85	x 85L		95	x 95L
-50DZ		90	x 90L		100	x 100L
CDQ2KWB32-5DZ	11	60	CQ-M5 x 60L	7.5	55	CQ-M5 x 55L
-10DZ		65	x 65L		60	x 60L
-15DZ		70	x 70L		65	x 65L
-20DZ		75	x 75L		70	x 70L
-25DZ		80	x 80L		75	x 75L
-30DZ		85	x 85L		80	x 80L
-35DZ		90	x 90L		85	x 85L
-40DZ		95	x 95L		90	x 90L
-45DZ		100	x 100L		95	x 95L
-50DZ		105	x 105L		100	x 100L
-75DZ	130	x 130L	125	x 125L		
-100DZ	155	x 155L	150	x 150L		

Cylinder model	C	D	Mounting bolt part no.
CDQ2KWB40-5DZ	7	55	CQ-M5 x 55L
-10DZ		60	x 60L
-15DZ		65	x 65L
-20DZ		70	x 70L
-25DZ		75	x 75L
-30DZ		80	x 80L
-35DZ		85	x 85L
-40DZ		90	x 90L
-45DZ		95	x 95L
-50DZ		100	x 100L
-75DZ	125	x 125L	
-100DZ	150	x 150L	
CDQ2KWB50-10DZ	12.5	65	CQ-M6 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-75DZ		130	x 130L
-100DZ	155	x 155L	
CDQ2KWB63-10DZ	13.5	65	CQ-M8 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-75DZ		130	x 130L
-100DZ	155	x 155L	

* 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

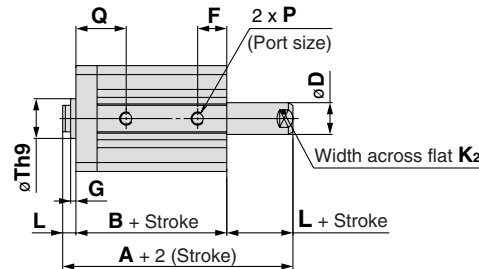
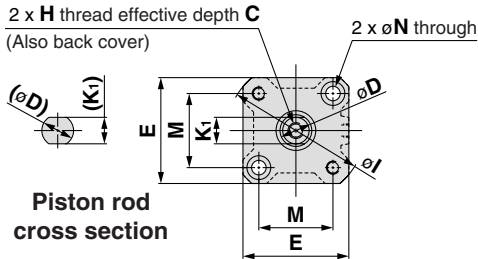
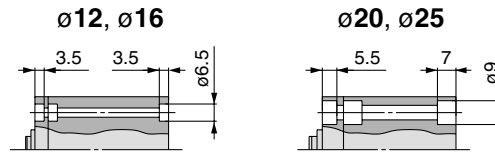
Series CQ2KW

Dimensions

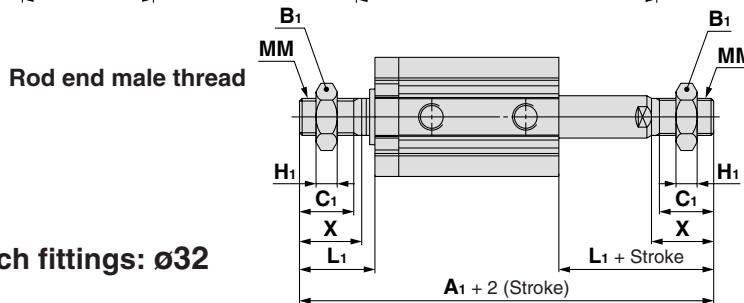
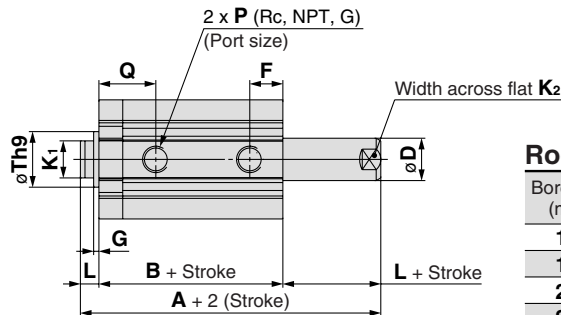
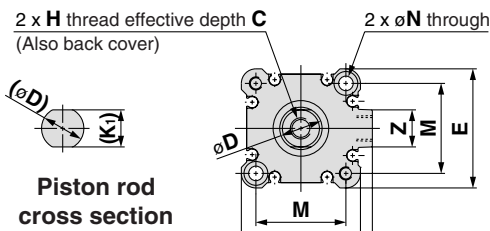
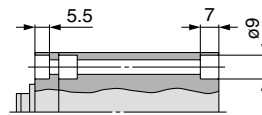
∅12 to ∅32/Without Auto Switch

Standard (Through-hole): CQ2KWB

∅12 to ∅25



∅32

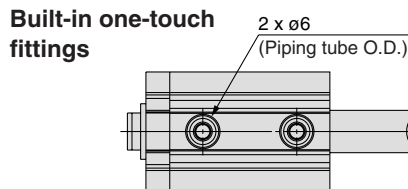
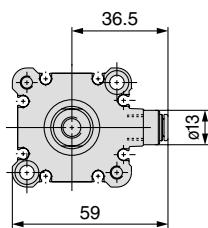


Rod End Male Thread (mm)

Bore size (mm)	Stroke range (mm)	A ₁	B ₁	C ₁	H ₁
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 ₁	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: ∅32



* The dimensions of ∅32-5 mm stroke with built-in one-touch fittings are the same as those of the 10 mm stroke cylinder tube. (mm)

Standard

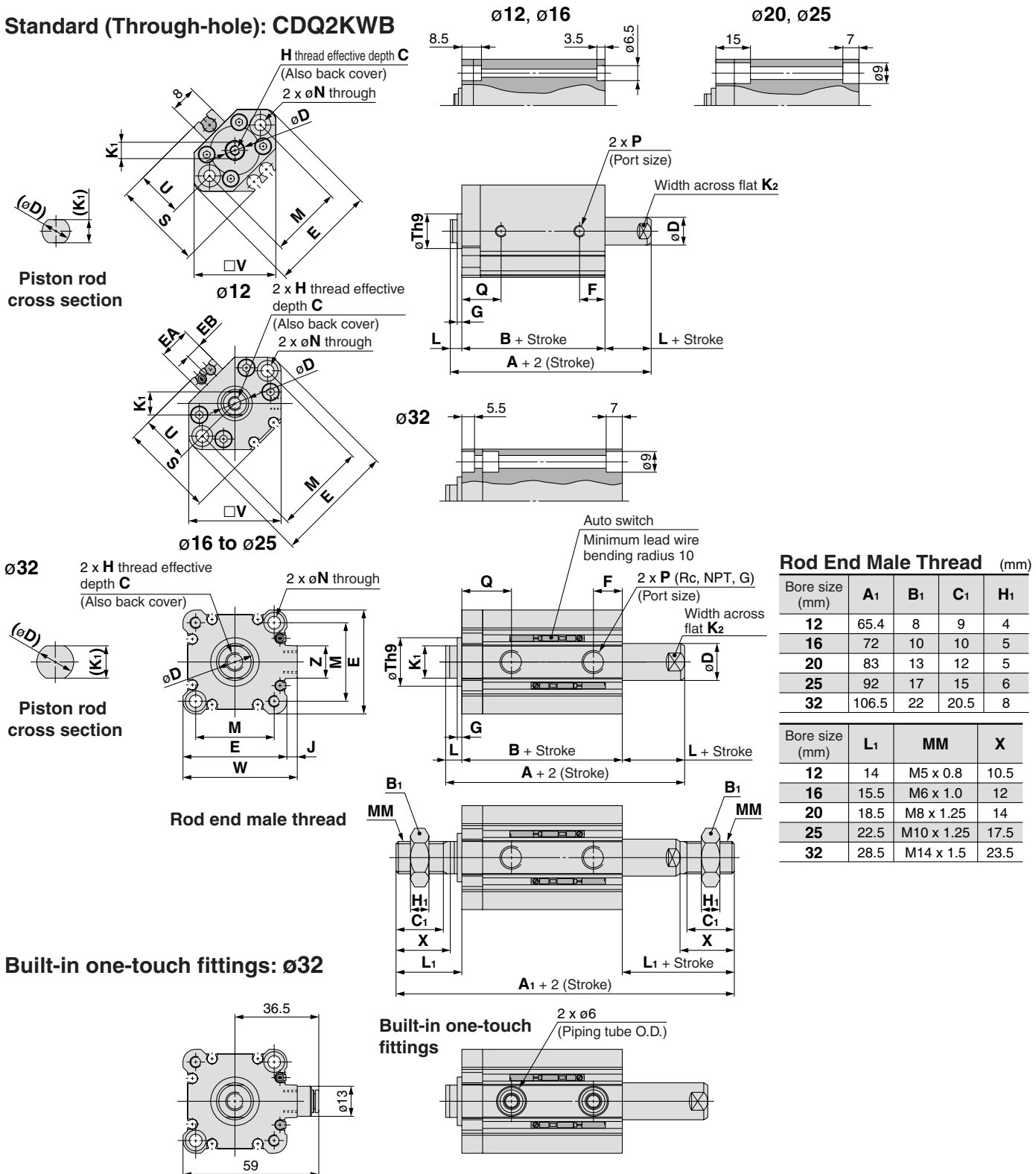
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	G	H	I	J	K ₁	K ₂	L	M	N	P	Q	Th9	W	Z
12	5 to 30	37.2	30.2	6	6	25	10	1.5	M3 x 0.5	32	—	5.2	5	3.5	15.5	3.5	M5 x 0.8	15	15 ⁰ _{-0.043}	—	—
16	5 to 30	38	31	8	8	29	10	1.5	M4 x 0.7	38	—	6	6	3.5	20	3.5	M5 x 0.8	15	20 ⁰ _{-0.052}	—	—
20	5 to 50	43	34	7	10	36	9.5	2	M5 x 0.8	47	—	8	8	4.5	25.5	5.5	M5 x 0.8	17.5	13 ⁰ _{-0.043}	—	—
25	5 to 50	47	37	12	12	40	11	2	M6 x 1.0	52	—	10	10	5	28	5.5	M5 x 0.8	19	15 ⁰ _{-0.043}	—	—
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 x 0.8	21.5	21 ⁰ _{-0.052}	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 (K₂) are not constant.

Dimensions

∅12 to ∅32/With Auto Switch

Standard (Through-hole): CDQ2KWB

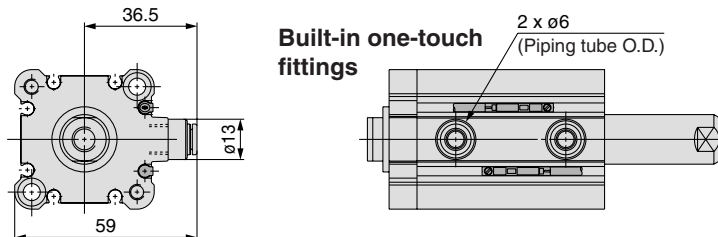


Rod End Male Thread (mm)

Bore size (mm)	A ₁	B ₁	C ₁	H ₁
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 ₁	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: ∅32



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	J	K ₁	K ₂	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 x 0.8	15.5	27.5	15 ⁰ _{-0.043}	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 x 0.8	15	29.5	20 ⁰ _{-0.052}	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 x 0.8	18.5	35.5	13 ⁰ _{-0.043}	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 x 0.8	19	40.5	15 ⁰ _{-0.043}	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 ⁰ _{-0.052}	—	—	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 (K₂) 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

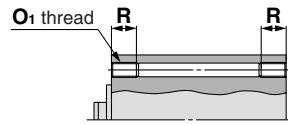
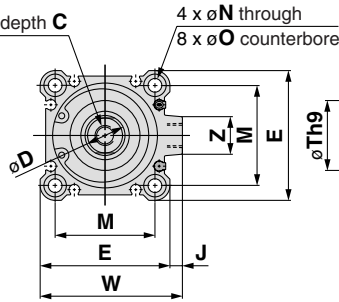
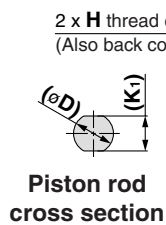
Dimensions

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.)

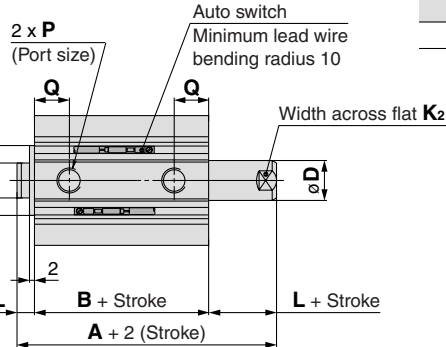
Both ends tapped: CQ2KWA/CDQ2KWA

Standard (Through-hole): CQ2KWB/CDQ2KWB

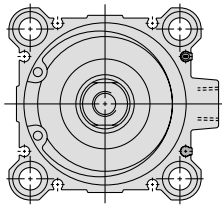
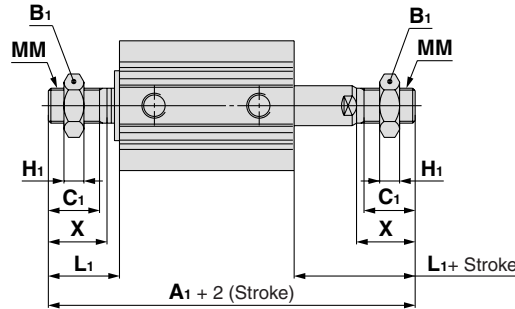


Both Ends Tapped

Bore size (mm)	O ₁	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18



Rod end male thread

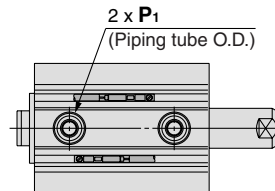
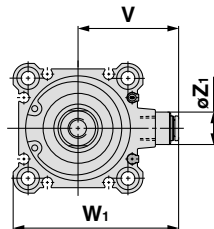


Cylinder tube form
ø63

Rod End Male Thread

Bore size (mm)	Without auto switch		With auto switch		B ₁	C ₁	H ₁	L ₁	MM	X
	A ₁	A ₁	A ₁	A ₁						
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

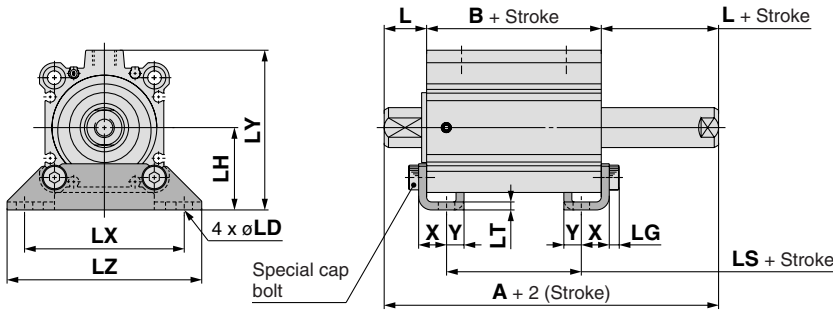
Bore size (mm)	Z ₁	P ₁	V	W ₁
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

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

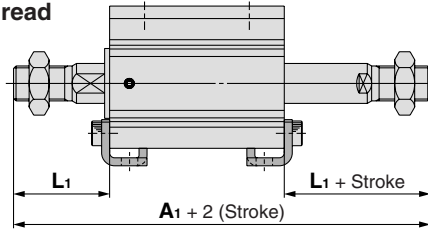
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	H	J	K ₁	K ₂	L	M	N	O	P	Q	Th9	W	Z
		A	B	A	B																
40	5 to 50	54	40	64	50	13	16	52	M8 x 1.25	5	14	14	7	40	5.5	9 depth 7	1/8	14	28 ⁰ _{-0.052}	57	15
	75, 100	64	50																		
50	10 to 50	56.5	40.5	66.5	50.5	15	20	64	M10 x 1.5	7	18	17	8	50	6.6	11 depth 8	1/4	14	35 ⁰ _{-0.062}	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 ⁰ _{-0.062}	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 (K₂) are not constant.

Foot: CQ2KWL/CDQ2KWL



Rod end male thread



Rod End Male Thread (mm)

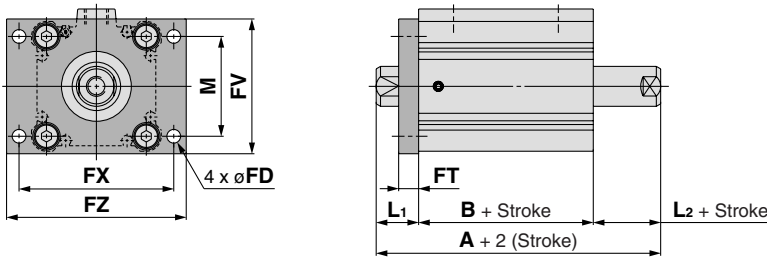
Bore size (mm)	Without auto switch	With auto switch	L ₁
	A ₁	A ₁	
40	117	127	38.5
50	127.5	137.5	43.5
63	129	139	43.5

Foot (mm)

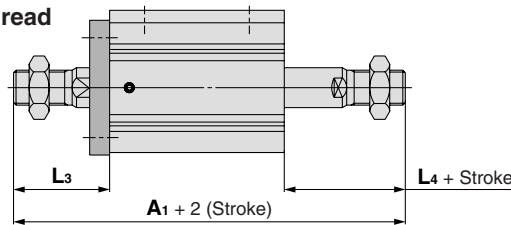
Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
40	5 to 50	74	40	24	84	50	34	17	6.6	4	33	3.2	64	68	78	11.2	7
	75, 100	84	50	34													
50	10 to 50	76.5	40.5	17.5	86.5	50.5	27.5	18	9	5	39	3.2	79	78	95	14.7	8
	75, 100	86.5	50.5	27.5													
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													

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Flange: CQ2KWF/CDQ2KWF



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	Without auto switch	With auto switch	L ₃	L ₄
	A ₁	A ₁		
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 ₁	L ₂	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										
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										
63	10 to 50	68	42	78	52	9	9	80	92	108	18	8	60
	75, 100	78	52										

* 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	
Nil	Pneumatic
H	Air-hydro ^{Note 1)}

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

Port thread type

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø100
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) CDQP2B32-30D

Made to Order

Refer to the next page for details.

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the below table for applicable auto switches.

Body option

Nil	Standard (Rod end female thread)
C	With rubber bumper ^{Note 2)}
M	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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)								
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC				
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○						
		Connector		2-wire				M9BV	M9B	●	●	●	○	—	○			—			
				—				J79C	—	●	—	●	●	—	—			—			
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NVV	M9NV	●	●	●	○	—	○	IC circuit					
				3-wire (PNP)				M9PVV	M9PV	●	●	●	○	—	○						
				2-wire				M9BVV	M9BV	●	●	●	○	—	○						
				3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○			IC circuit			
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○						
				2-wire				M9BAV**	M9BA**	○	○	●	○	—	○			—			
With diagnostic output (2-color indication)	—	—	4-wire	5 V, 12 V	—	F79F	—	●	—	●	○	—	○	IC circuit							
Magnetic field resistant (2-color indication)	—	—	2-wire (Non-polar)	—	—	P4DW	—	—	●	●	—	—	—	—							
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	Relay, PLC				
				Connector				—	200 V	A72	A72H	●	—	●	—			—	—	—	
								12 V	100 V	A93V	A93	●	—	●	—			—	—	—	
		Grommet		Yes				2-wire	5 V, 12 V	100 V or less	A90V	A90	●	—	●	—		—	—	—	IC circuit
								12 V	—	A73C	—	●	—	●	●	●		—	—		
								5 V, 12 V	24 V or less	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 Nil (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.

* 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**

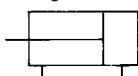
Specifications



Rod end male thread

JIS Symbol

Double acting,
Single rod



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 end
-X271	Fluororubber seals

Refer to pages 123 to 127 for the specifications of cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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)	Without cushion	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
	With rubber bumper	0.043	0.075	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54
Stroke length tolerance	+1.0 mm (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 (Non-lube) (mm)

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, 63 80, 100	10, 15, 20, 25, 30, 35, 40 45, 50, 75, 100

Air-hydro type (mm)

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

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. 103)	
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 100	1 to 99
Example	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.

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

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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	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	●	●	●	●	●	●	●	●	●	●	
Air-hydro	Mounting Through-hole (Standard)	—	—	●	●	●	●	●	●	●	●	
	Built-in magnet	—	—	●	●	●	●	●	●	●	●	
	Piping	Pipe thread	—	—	M5 x 0.8	M5 x 0.8	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

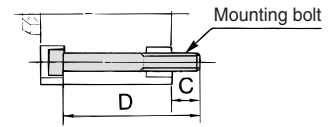
262 g

Mounting Bolt for CQP2B/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQP2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x25L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CQP2B12-5D	6.5	25	CQ-M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
CQP2B16-5D	5	25	CQ-M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
CQP2B20-5D	7.5	25	CQ-M5 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
-35D		55	x 55L
-40D		60	x 60L
-45D		65	x 65L
-50D		70	x 70L
CQP2B25-5D	9.5	30	CQ-M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		45	x 45L
-25D		50	x 50L
-30D		55	x 55L
-35D		60	x 60L
-40D		65	x 65L
-45D		70	x 70L
-50D		75	x 75L

Cylinder model	C	D	Mounting bolt part no.	
CQP2B32-5D	9	30	CQ-M5 x 30L	
-10D		35	x 35L	
-15D		40	x 40L	
-20D		45	x 45L	
-25D		50	x 50L	
-30D		55	x 55L	
-35D		60	x 60L	
-40D		65	x 65L	
-45D		70	x 70L	
-50D		75	x 75L	
CQP2B40-5D	7.5	35	CQ-M5 x 35L	
-10D		40	x 40L	
-15D		45	x 45L	
-20D		50	x 50L	
-25D		55	x 55L	
-30D		60	x 60L	
-35D		65	x 65L	
-40D		70	x 70L	
-45D		75	x 75L	
-50D		80	x 80L	
-75D		115	x 115L	
-100D		140	x 140L	
CQP2B50-10D		12.5	45	CQ-M6 x 45L
-15D			50	x 50L
-20D	55		x 55L	
-25D	60		x 60L	
-30D	65		x 65L	
-35D	70		x 70L	
-40D	75		x 75L	
-45D	80		x 80L	
-50D	85		x 85L	
-75D	120		x 120L	
-100D	145		x 145L	

Cylinder model	C	D	Mounting bolt part no.
CQP2B63-10D	14.5	50	CQ-M8 x 50L
-15D		55	x 55L
-20D		60	x 60L
-25D		65	x 65L
-30D		70	x 70L
-35D		75	x 75L
-40D		80	x 80L
-45D		85	x 85L
-50D		90	x 90L
-75D		125	x 125L
-100D	150	x 150L	
CQP2B80-10D	15	55	CQ-M10 x 55L
-15D		60	x 60L
-20D		65	x 65L
-25D		70	x 70L
-30D		75	x 75L
-35D		80	x 80L
-40D		85	x 85L
-45D		90	x 90L
-50D		95	x 95L
-75D		130	x 130L
-100D	155	x 155L	
CQP2B100-10D	15.5	65	CQ-M10 x 65L
-15D		70	x 70L
-20D		75	x 75L
-25D		80	x 80L
-30D		85	x 85L
-35D		90	x 90L
-40D		95	x 95L
-45D		100	x 100L
-50D		105	x 105L
-75D		140	x 140L
-100D	165	x 165L	

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

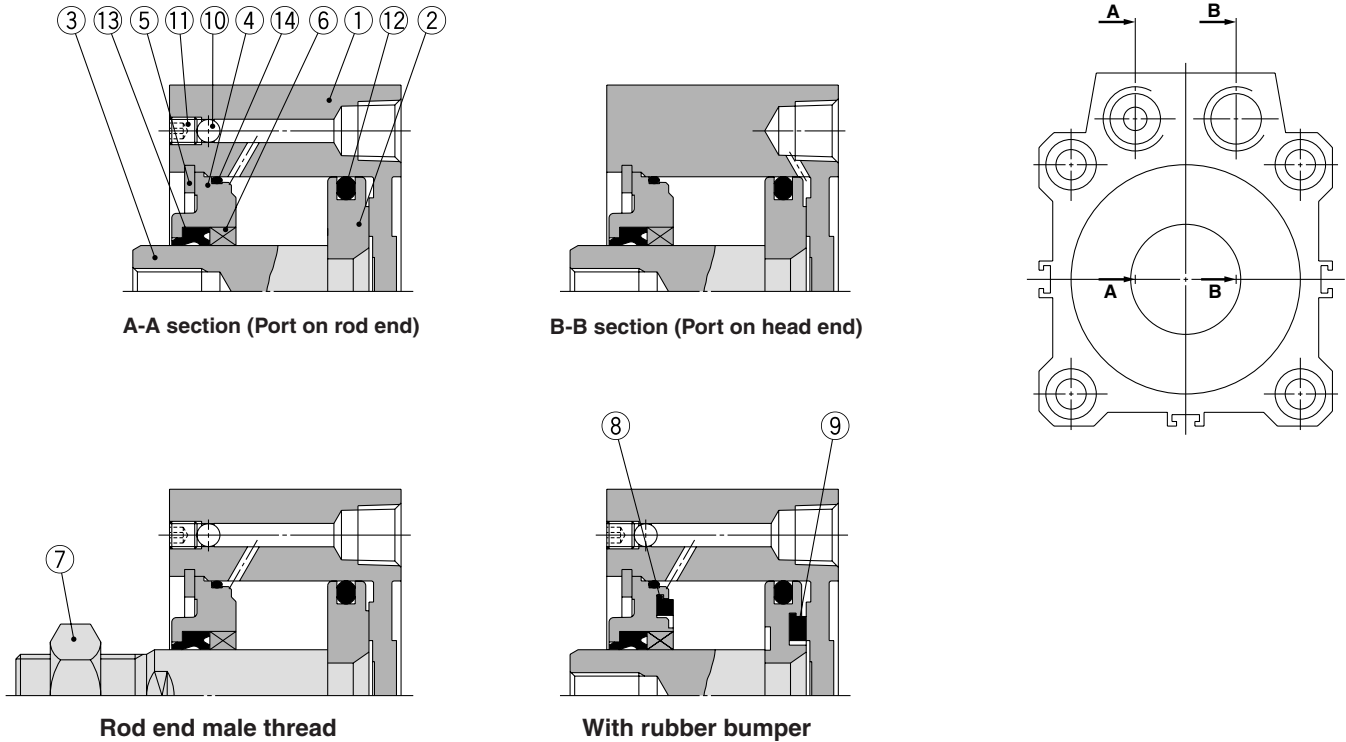
Auto Switch

Made to Order

Series CQP2

Construction

Standard



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	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)

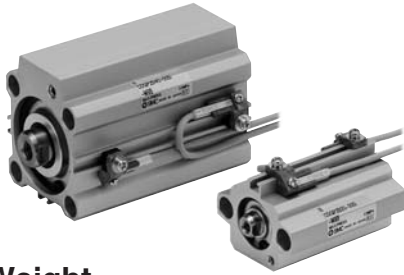
20 — CQP2B Bore size — Stroke D
 Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

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	1.5	3	6	12	26
male thread	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	27	53	53	120	175
male thread	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

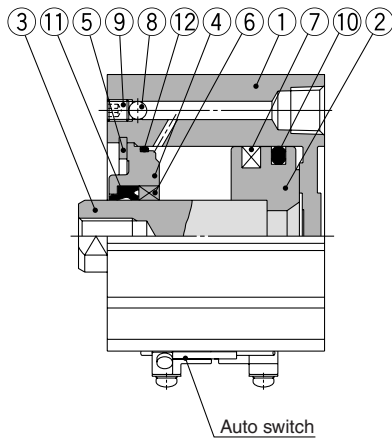
Calculation: (Example) CDQP2B32-20DCM
 • Basic weight: CDQP2B32-20D 290 g
 • Additional weight: Rod end male thread... 43 g
 With rubber bumper... -3 g
 330 g

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

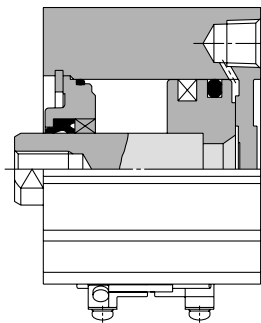
Auto Switch Mounting Bracket/Weight

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

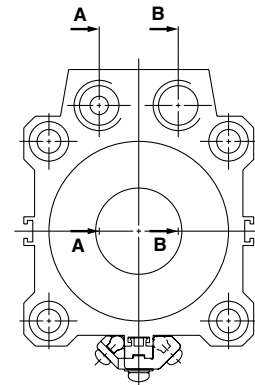
Construction



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 anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	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.

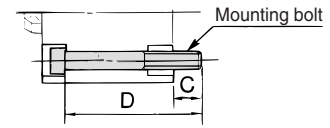
Grease pack part no.: GR-S-010 (10 g)

Series CQP2

Mounting Bolt for CDQP2B/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQP2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Example) CQ-M3x35L 2 pcs.

Cylinder model	C	D	Mounting bolt part no.
CDQP2B12-5D	5.5	35	CQ-M3 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
CDQP2B16-5D	8	40	CQ-M3 x 40L
-10D		45	x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D		65	x 65L
CDQP2B20-5D	10.5	40	CQ-M5 x 40L
-10D		45	x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D		65	x 65L
-35D		70	x 70L
-40D		75	x 75L
-45D		80	x 80L
-50D		85	x 85L
CDQP2B25-5D	9.5	40	CQ-M5 x 40L
-10D		45	x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D		65	x 65L
-35D		70	x 70L
-40D		75	x 75L
-45D		80	x 80L
-50D		85	x 85L

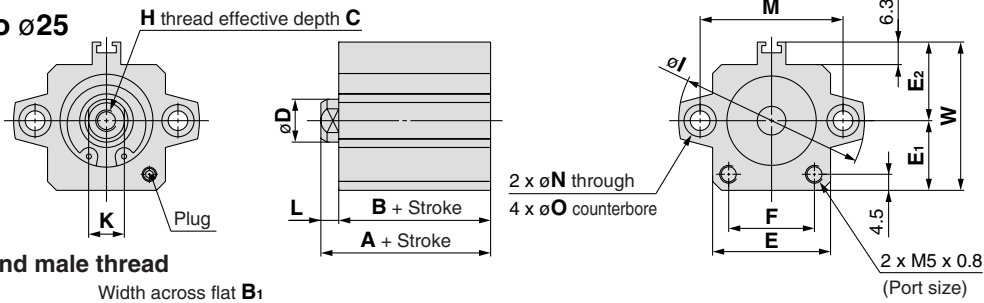
Cylinder model	C	D	Mounting bolt part no.	
CDQP2B32-5D	9	40	CQ-M5 x 40L	
-10D		45	x 45L	
-15D		50	x 50L	
-20D		55	x 55L	
-25D		60	x 60L	
-30D		65	x 65L	
-35D		70	x 70L	
-40D		75	x 75L	
-45D		80	x 80L	
-50D		85	x 85L	
-75D	110	x 110L		
-100D	135	x 135L		
CDQP2B40-5D	7.5	45	CQ-M5 x 45L	
-10D		50	x 50L	
-15D		55	x 55L	
-20D		60	x 60L	
-25D		65	x 65L	
-30D		70	x 70L	
-35D		75	x 75L	
-40D		80	x 80L	
-45D		85	x 85L	
-50D		90	x 90L	
-75D		115	x 115L	
-100D		140	x 140L	
CDQP2B50-10D		12.5	55	CQ-M6 x 55L
-15D			60	x 60L
-20D	65		x 65L	
-25D	70		x 70L	
-30D	75		x 75L	
-35D	80		x 80L	
-40D	85		x 85L	
-45D	90		x 90L	
-50D	95		x 95L	
-75D	120		x 120L	
-100D	145	x 145L		

Cylinder model	C	D	Mounting bolt part no.
CDQP2B63-10D	14.5	60	CQ-M8 x 60L
-15D		65	x 65L
-20D		70	x 70L
-25D		75	x 75L
-30D		80	x 80L
-35D		85	x 85L
-40D		90	x 90L
-45D		95	x 95L
-50D		100	x 100L
-75D		125	x 125L
-100D	150	x 150L	
CDQP2B80-10D	15	65	CQ-M10 x 65L
-15D		70	x 70L
-20D		75	x 75L
-25D		80	x 80L
-30D		85	x 85L
-35D		90	x 90L
-40D		95	x 95L
-45D		100	x 100L
-50D		105	x 105L
-75D		130	x 130L
-100D	155	x 155L	
CDQP2B100-10D	15.5	75	CQ-M10 x 75L
-15D		80	x 80L
-20D		85	x 85L
-25D		90	x 90L
-30D		95	x 95L
-35D		100	x 100L
-40D		105	x 105L
-45D		110	x 110L
-50D		115	x 115L
-75D		140	x 140L
-100D	165	x 165L	

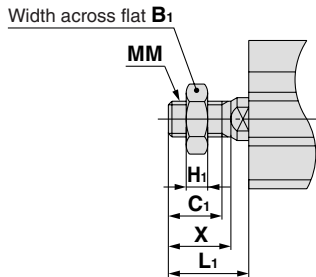
Dimensions

∅12 to ∅100/Without Auto Switch

∅12 to ∅25



Rod end male thread



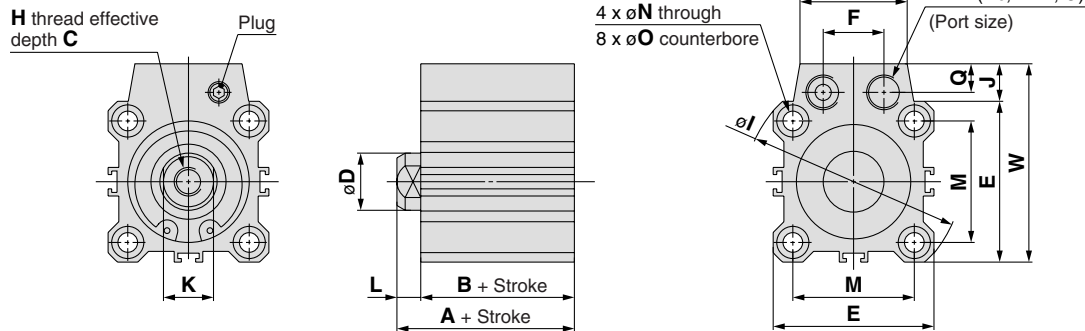
Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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

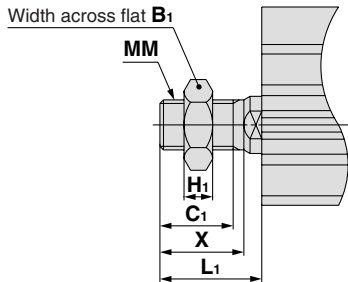
Standard

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E ₁	E ₂	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 ₁	C ₁	H ₁	L ₁	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.

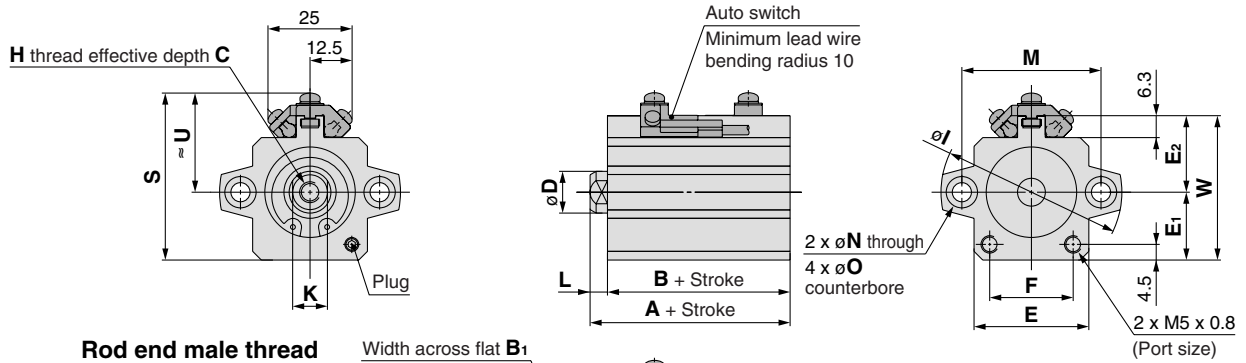
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQP2

Dimensions

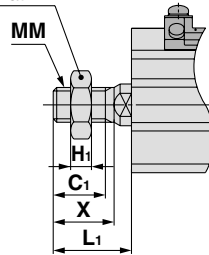
∅12 to ∅100/With Auto Switch

∅12 to ∅25



Rod end male thread

Width across flat B₁



Rod End Male Thread

(mm)

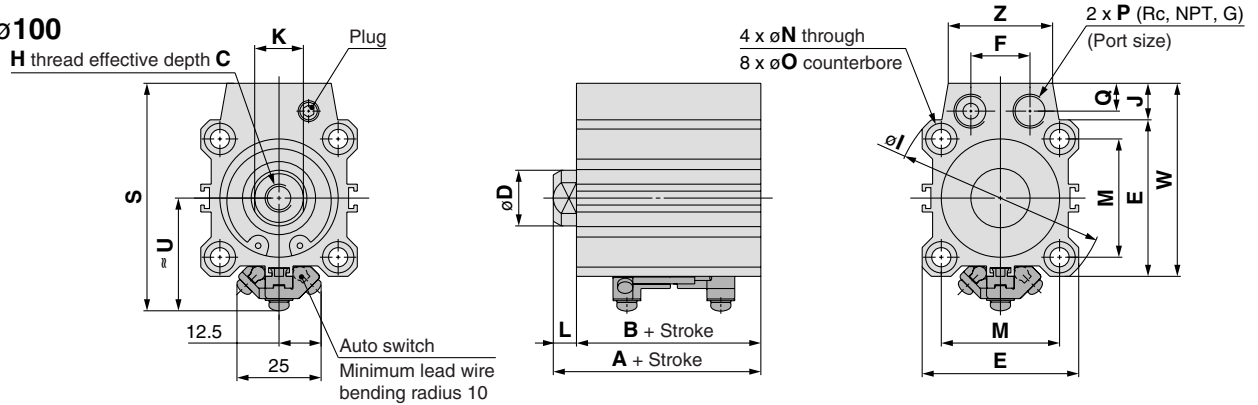
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

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 ₁	E ₂	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

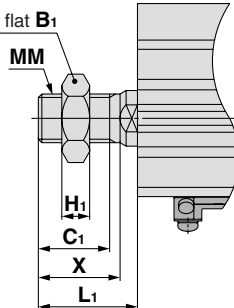
Note) The external dimensions with rubber bumper are the same as those of the standard, as shown above.

∅32 to ∅100



Rod end male thread

Width across flat B₁



Rod End Male Thread

(mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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 CQP2B50-10T

With auto switch CDQP2B50-10T-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.

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

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø50
TF	G	

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the below table for applicable auto switches.

Body option

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

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Number of auto switches

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

Made to Order
Refer to the next page for details.

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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)				
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-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	—	○		
		2-wire		M9BWW				M9BW	●	●	●	○	—	○	—		
		3-wire (NPN)		M9NAV**				M9NA**	○	○	●	○	—	○			
		3-wire (PNP)		M9PAV**				M9PA**	○	○	●	○	—	○	IC circuit		
		2-wire		M9BAV**				M9BA**	○	○	●	○	—	○			
With diagnostic output (2-color indication)			4-wire	5 V, 12 V	—	F79F	—	●	—	●	○	—	○	IC circuit			
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	●	—	●	—	—	
		Connector	No	2-wire	12 V	—	A73C	—	●	—	●	●	—	—	—	IC circuit	
					5 V, 12 V	24 V or less	A80C	—	●	—	●	●	—	IC circuit			
						—	—	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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ
None N (Example) J79CN

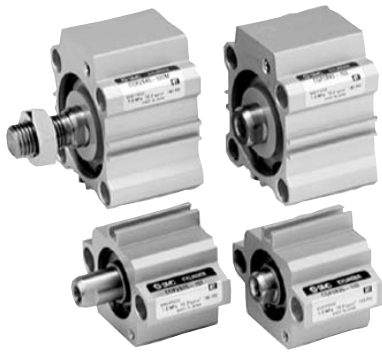
* Solid state auto switches marked with "○" are produced upon receipt of order.

* 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.

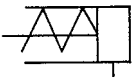
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQP2

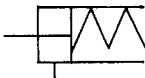


JIS Symbol

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 end
-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 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Rc1/8	Rc1/8	Rc1/4
							NPT1/8	NPT1/8	NPT1/4
	Rod end male thread	●	●	●	●	●	●	●	

Refer to pages 123 to 127 for the specifications of cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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
	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

(g)

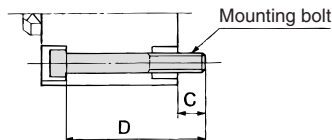
Action	Bore size (mm)	Cylinder stroke (mm)			
		5	10	15	20
Spring return	12	33	40	—	—
	16	55	64	—	—
	20	68	83	—	—
	25	103	118	—	—
	32	149	173	—	—
	40	236	262	—	—
	50	—	426	—	691
Spring extend	12	33	40	—	—
	16	55	64	—	—
	20	73	87	—	—
	25	109	124	—	—
	32	160	180	—	—
	40	262	284	—	—
	50	—	468	—	540

Mounting Bolt for CQP2B/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQP2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

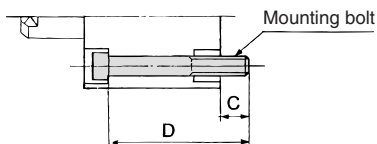
Example) CQ-M3x25L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Spring Return

Cylinder model	C	D	Mounting bolt part no.
CQP2B12-5S	6.5	25	CQ-M3 x 25L
-10S		30	x 30L
CQP2B16-5S	5	25	CQ-M3 x 25L
-10S		30	x 30L
CQP2B20-5S	7.5	25	CQ-M5 x 25L
-10S		30	x 30L
CQP2B25-5S	9.5	30	CQ-M5 x 30L
-10S		35	x 35L
CQP2B32-5S	9	30	CQ-M5 x 30L
-10S		35	x 35L
CQP2B40-5S	7.5	35	CQ-M5 x 35L
-10S		40	x 40L
CQP2B50-10S	12.5	45	CQ-M6 x 45L
-20S		55	x 55L



Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CQP2B12-5T	6.5	25	CQ-M3 x 25L
-10T		30	x 30L
CQP2B16-5T	5	25	CQ-M3 x 25L
-10T		30	x 30L
CQP2B20-5T	7.5	25	CQ-M5 x 25L
-10T		30	x 30L
CQP2B25-5T	9.5	30	CQ-M5 x 30L
-10T		35	x 35L
CQP2B32-5T	9	30	CQ-M5 x 30L
-10T		35	x 35L
CQP2B40-5T	7.5	35	CQ-M5 x 35L
-10T		40	x 40L
CQP2B50-10T	12.5	45	CQ-M6 x 45L
-20T		55	x 55L

Additional Weight

(g)

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: CQP2B32-10S173 g
 - Additional weight: Rod end male thread 43 g
- 216 g

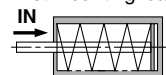
Spring Force

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

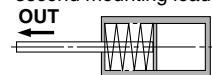
Single acting, Spring return

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

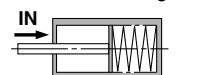
Single acting, Spring extend

Spring state with first mounting load



When spring is set in cylinder

Spring state with second mounting load



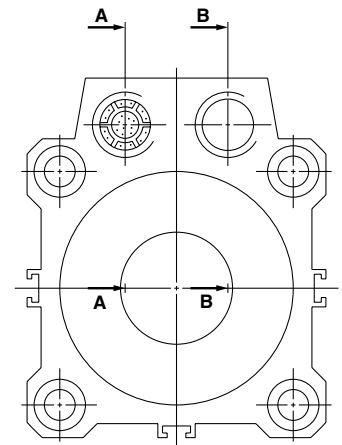
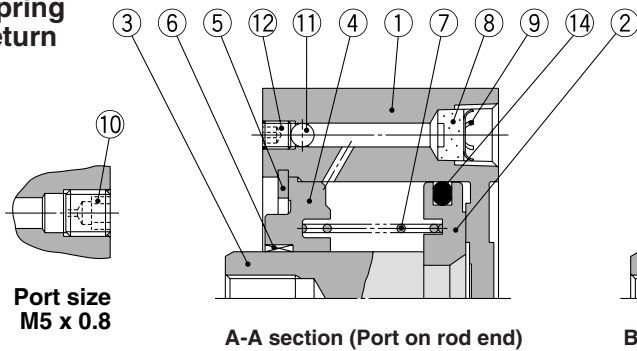
When spring is compressed with air

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

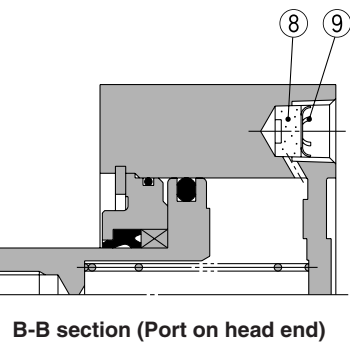
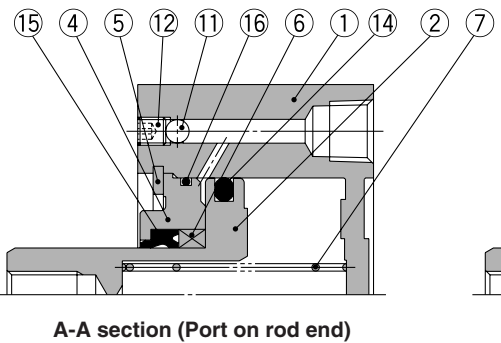
Series CQP2

Construction

Spring return



Spring extend



Rod end male thread

Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2*	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø50, Hard chrome plated
4	Collar	Aluminum alloy	ø12 to ø40, Anodized
		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 x 0.8
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)

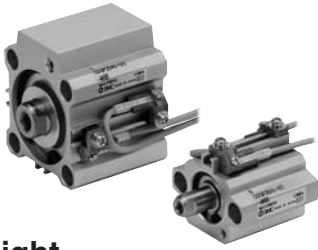
20 — CQP2B Bore size — Stroke $\frac{S}{T}(M)$
 Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50

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 (g)

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	—	—
	50	—	558	—	641
Spring extend	12	61	69	—	—
	16	92	100	—	—
	20	126	140	—	—
	25	184	197	—	—
	32	228	253	—	—
	40	349	375	—	—
	50	—	600	—	683

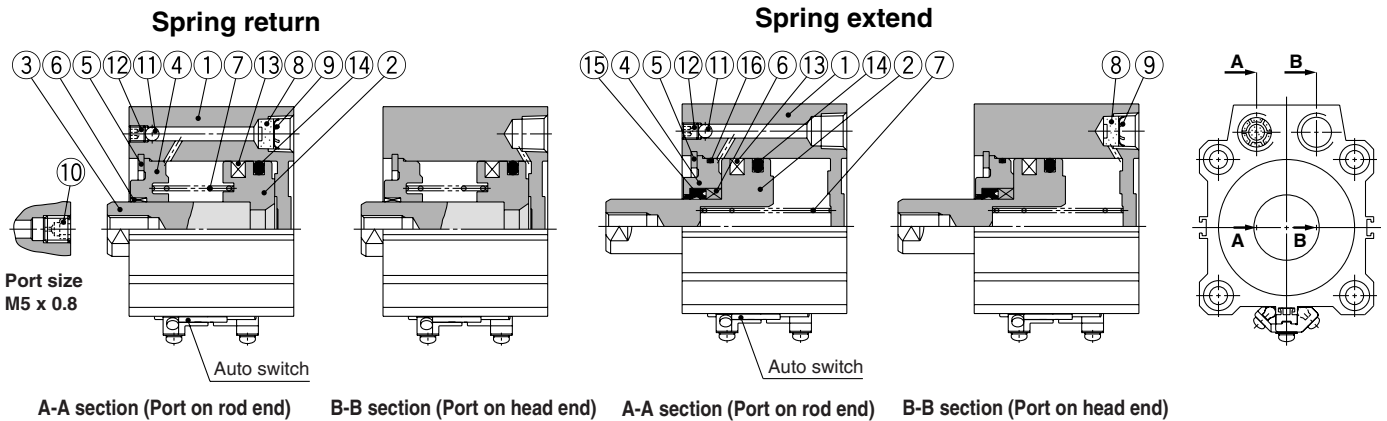
Additional Weight (g)

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
 285 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 anodized
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, Anodized
		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 x 0.8
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)

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

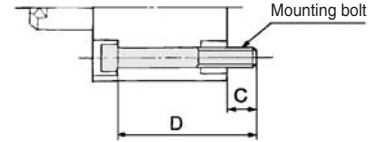
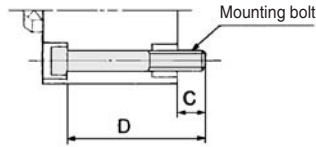
Series CQP2

Mounting Bolt for CDQP2B/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQP2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Spring Return

Cylinder model	C	D	Mounting bolt part no.
CDQP2B12-5S	5.5	35	CQ-M3 x 35L
-10S		40	x 40L
CDQP2B16-5S	8	40	CQ-M3 x 40L
-10S		45	x 45L
CDQP2B20-5S	10.5	40	CQ-M5 x 40L
-10S		45	x 45L
CDQP2B25-5S	9.5	40	CQ-M5 x 40L
-10S		45	x 45L
CDQP2B32-5S	9	40	CQ-M5 x 40L
-10S		45	x 45L
CDQP2B40-5S	7.5	45	CQ-M5 x 45L
-10S		50	x 50L
CDQP2B50-10S	12.5	55	CQ-M6 x 55L
-20S		60	x 60L

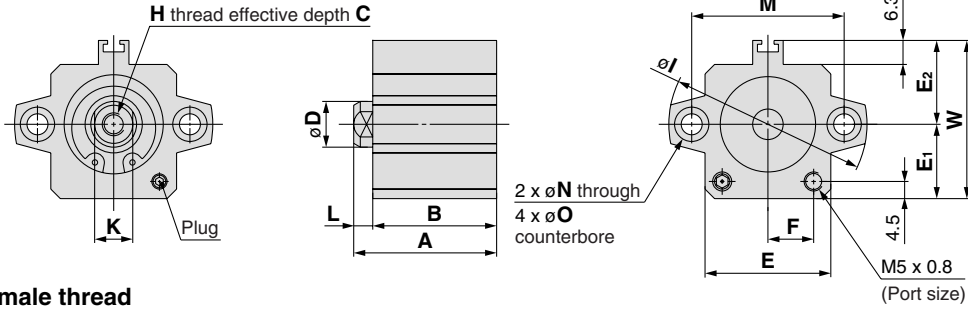
Spring Extend

Cylinder model	C	D	Mounting bolt part no.
CDQP2B12-5T	6.1	40	CQ-M3 x 40L
-10T		45	x 45L
CDQP2B16-5T	8	40	CQ-M3 x 40L
-10T		45	x 45L
CDQP2B20-5T	10.5	40	CQ-M5 x 40L
-10T		45	x 45L
CDQP2B25-5T	9.5	40	CQ-M5 x 40L
-10T		45	x 45L
CDQP2B32-5T	9	40	CQ-M5 x 40L
-10T		45	x 45L
CDQP2B40-5T	7.5	45	CQ-M5 x 45L
-10T		50	x 50L
CDQP2B50-10T	12.5	55	CQ-M6 x 55L
-20T		65	x 65L

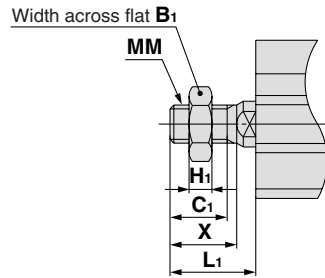
Dimensions

∅12 to ∅50/Spring Return Without Auto Switch

∅12 to ∅25



Rod end male thread



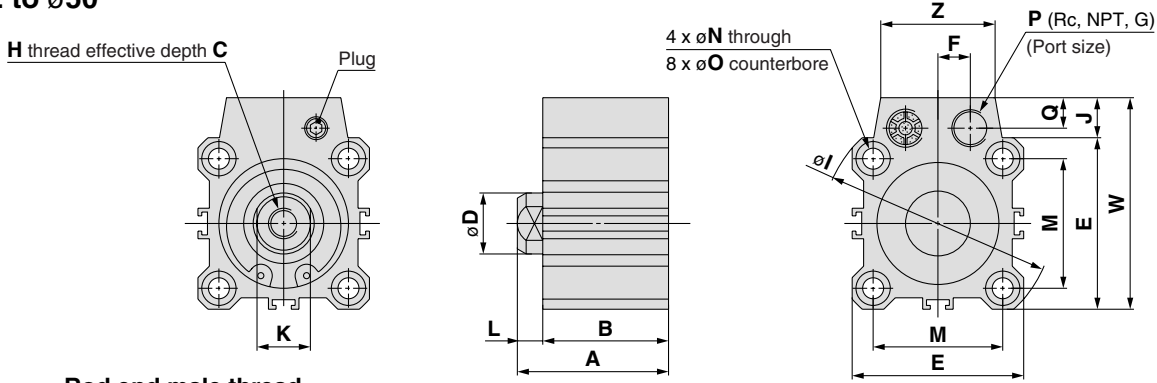
Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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

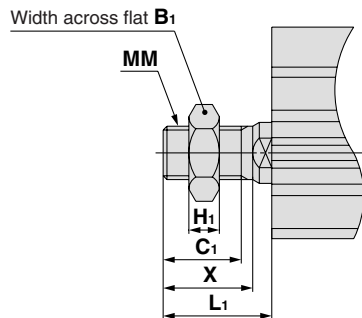
Standard

Bore size (mm)	A		B			C	D	E	E ₁	E ₂	F	H	I	K	L	M	N	O	W
	5st	10st	5st	10st	20st														
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 (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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.

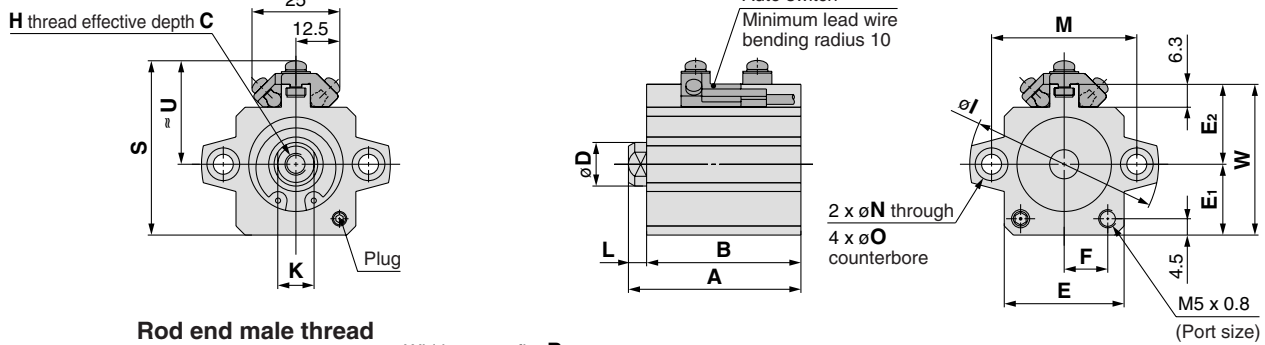
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQP2

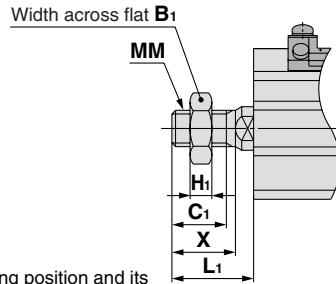
Dimensions

Ø12 to Ø50/Spring Return With Auto Switch

Ø12 to Ø25



Rod end male thread



Rod End Male Thread (mm)

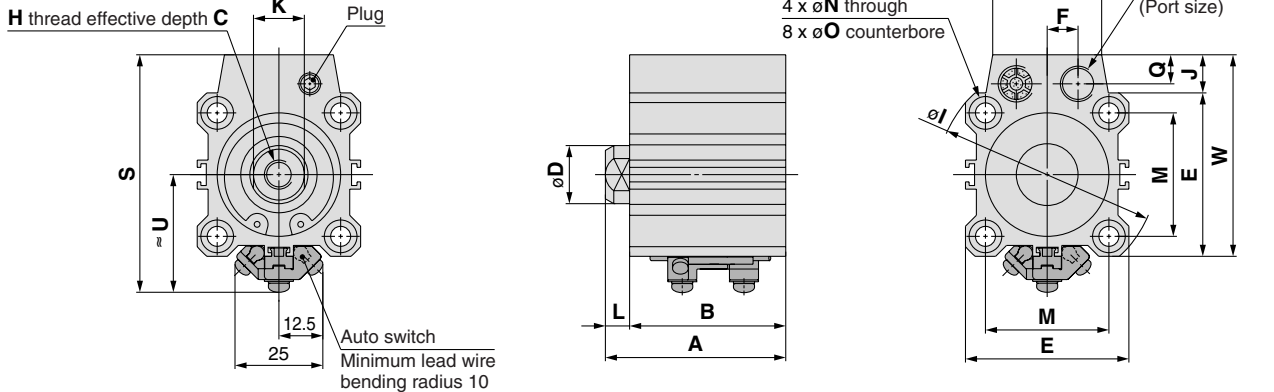
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Standard

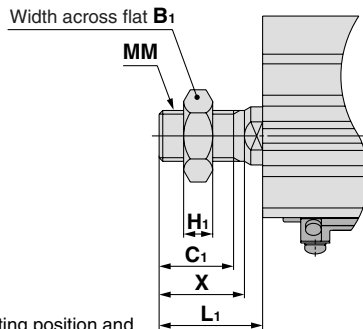
For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

Bore size (mm)	A		B		C	D	E	E ₁	E ₂	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 (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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.

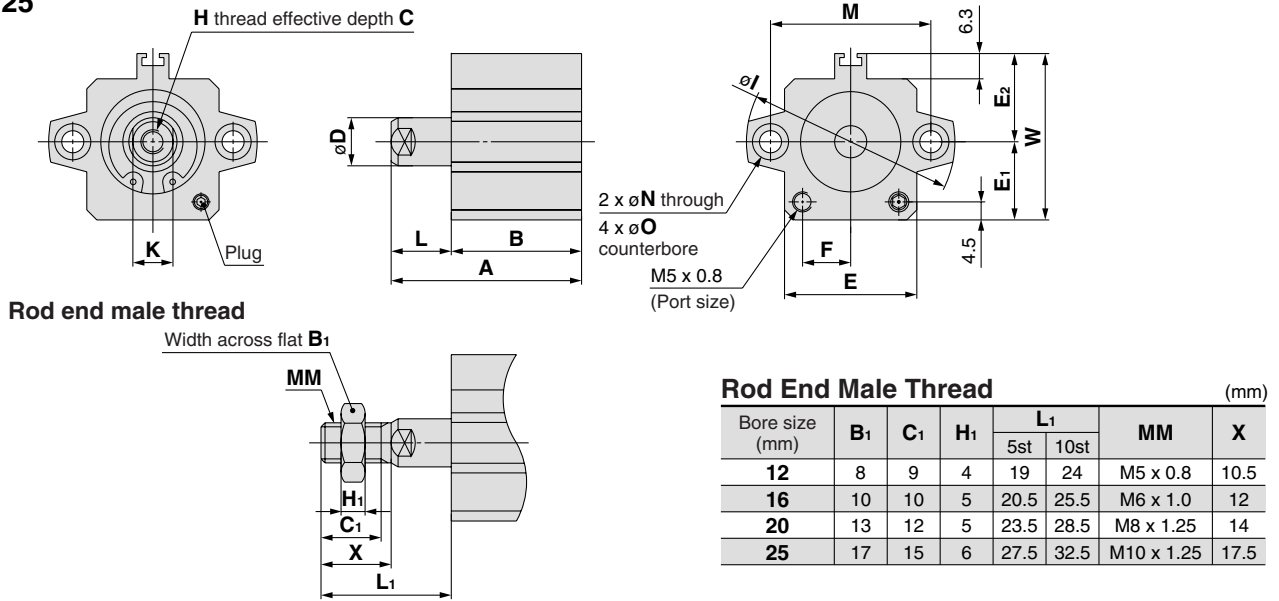
Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S	U	W	Z
	5st	10st	20st	5st	10st	20st																		
32	45	50	—	38	43	—	13	16	45	8.5	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	65.5	32.5	55.5	30
40	51.5	56.5	—	44.5	49.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	72	36	62	30
50	—	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

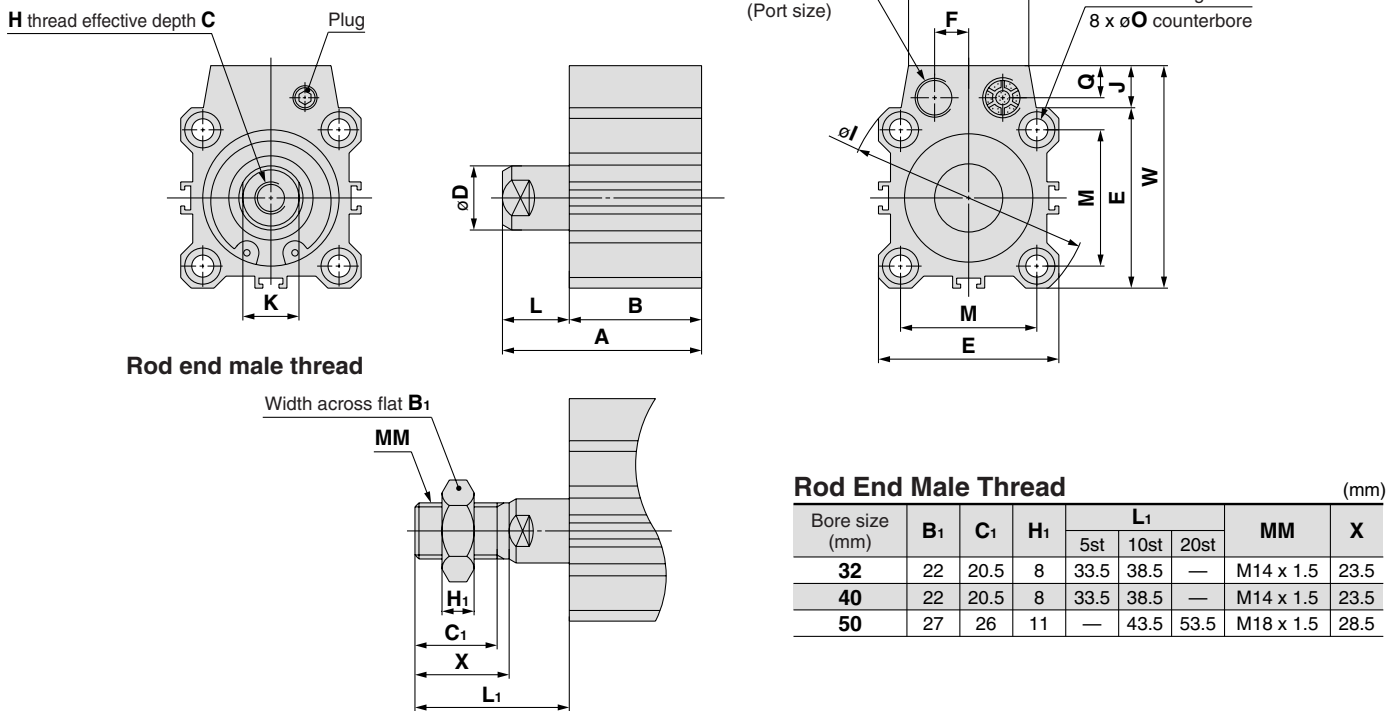
∅12 to ∅25



Standard

Bore size (mm)	A		B			C	D	E	E ₁	E ₂	F	H	I	K	L		M	N	O	W
	5st	10st	5st	10st	20st										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



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.

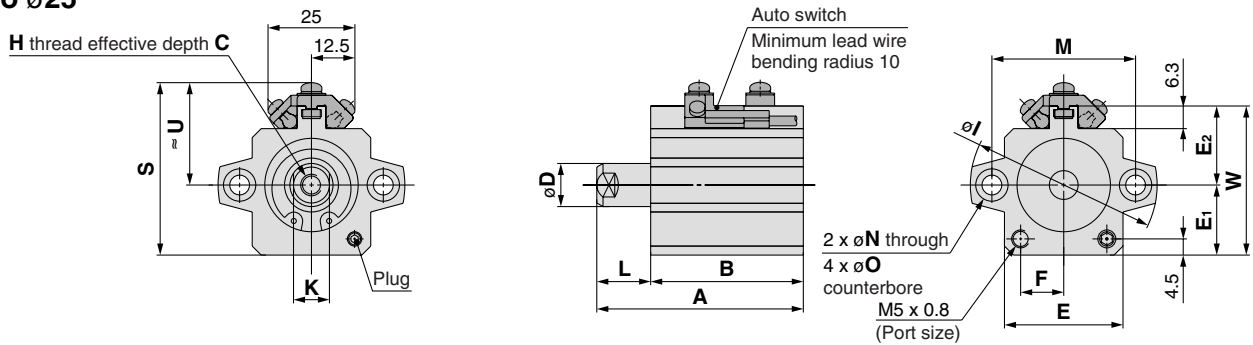
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQP2

Dimensions

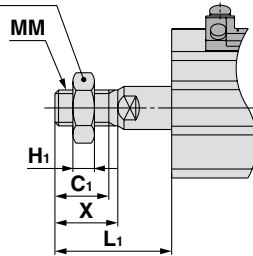
Ø12 to Ø50/Spring Extend With Auto Switch

Ø12 to Ø25



Rod end male thread

Width across flat B₁



Rod End Male Thread

(mm)

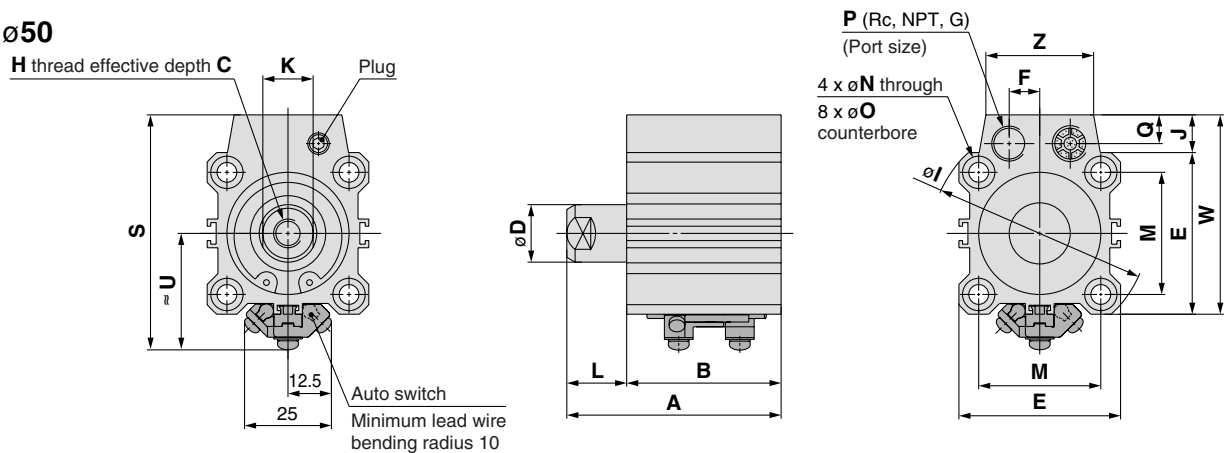
Bore size (mm)	B ₁	C ₁	H ₁	L ₁		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

Standard For auto switch proper mounting position and its mounting height, refer to pages 123 to 127.

(mm)

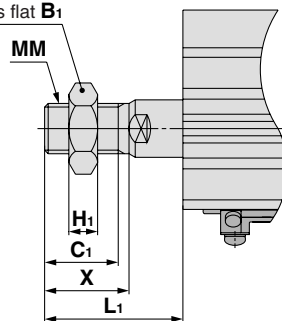
Bore size (mm)	A		B		C	D	E	E ₁	E ₂	F	H	I	K	L			M	N	O	S	U	W
	5st	10st	5st	10st										5st	10st							
12	45.9	55.9	37.4	42.4	6	6	23	13	14	7	M3 x 0.5	32	5	8.5	13.5	22	3.5	6.5 depth 3.5	33.5	20.5	27	
16	44	54	35.5	40.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	8.5	13.5	28	3.5	6.5 depth 3.5	38.5	23.5	32	
20	46	56	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	

Ø32 to Ø50



Rod end male thread

Width across flat B₁



Rod End Male Thread

(mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁			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

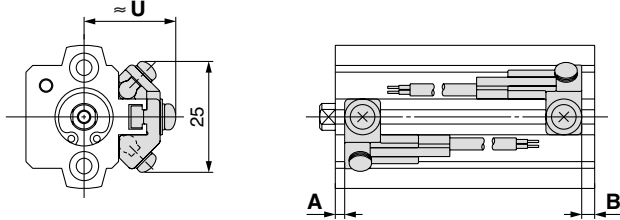
Axial Piping Series **CDQP2** With Auto Switch 1

1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

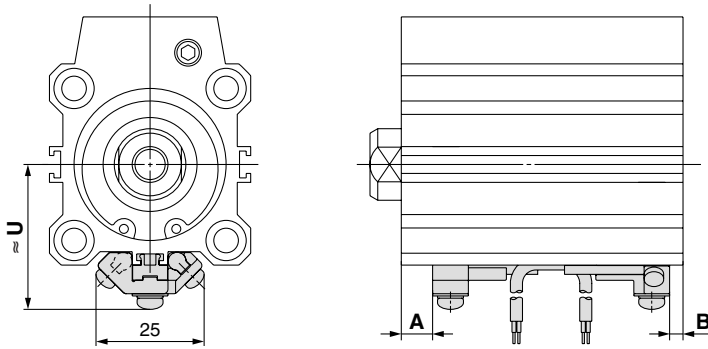
Applicable Cylinder Series: CDQP2, CDQP2□□□□□S/□T (Axial piping)

- 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



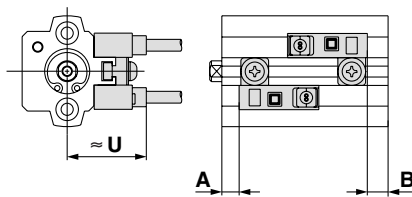
ø32 to ø100



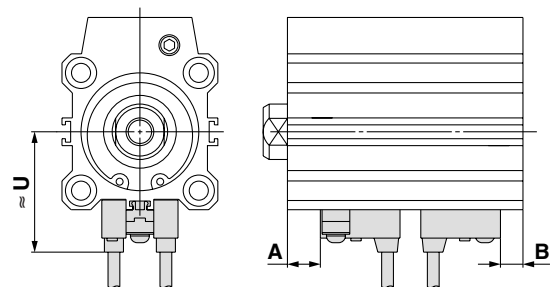
- D-A7□
- D-A80
- D-A7□H
- D-A80H
- D-F7□
- D-J79
- D-F7□W
- D-J79W
- D-F79F

- D-F7NTL
- D-F7BAL
- D-A73C
- D-A80C
- D-J79C
- D-A79W
- D-F7□WV
- D-F7□V
- D-F7BAVL

ø12 to ø25

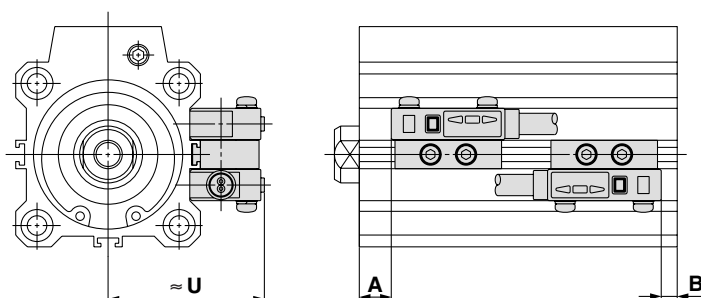


ø32 to ø100



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
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
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	
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	

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)

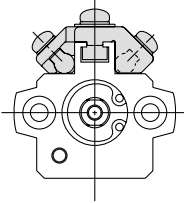
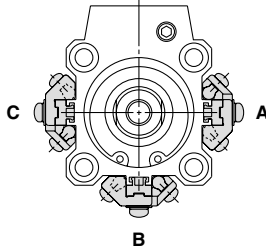
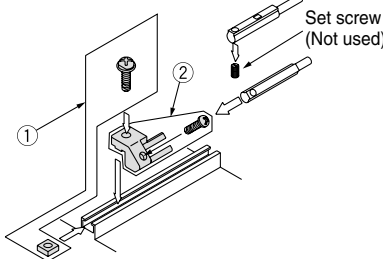
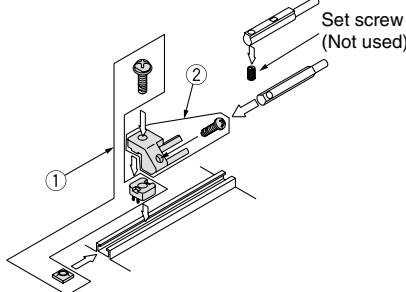
(mm)

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
D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL	①BQ-1 ②BQ2-012 Two kinds of auto switch brackets are used as a set. 	①BQ-2 ②BQ2-012 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
D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F7BAL/F7BAVL D-F79F/F7NTL	BQ-1		BQ-2
D-P4DWL	—		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
Reed	D-A73	Grommet (Perpendicular)	—	ø12 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)	—	ø12 to ø100
	D-F7NWV, F7BWV		Diagnostic indication (2-color indication)	
	D-F7BAVL		Water resistant (2-color indication)	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	
	D-F7BAL		Water resistant (2-color indication)	
	D-F7NTL		With timer	
	D-P5DWL	Grommet (In-line)	Magnetic field resistant (2-color 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 -

With auto switch
(Built-in magnet)

Mounting

B	Through-hole (Standard)
A	Both ends tapped
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)Q2BS" on pages 133 and 134.

Type

S	Anti-lateral load
---	-------------------

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

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) CDQ2LS40-30DCZ

Action

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

Body option 1

Nil	Standard
F	With boss on head end

Body option 2

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

Auto switch mounting groove

Z	4 surfaces
---	------------

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the below table for applicable auto switches.

Made to Order
Refer to the next page for details.

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.
Applicable Auto Switches/Refer to the individual catalog (ES20-201) for the D-P3DW type.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—			○	—	—
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○				
				2-wire				M9BV	M9B	●	●	●	○	—	○				
				3-wire (NPN)				M9NVV	M9NV	●	●	●	○	—	○				
	Diagnostic indication (2-color indication)			3-wire (PNP)				M9PWV	M9PW	●	●	●	○	—	○	—	—		
				2-wire				M9BWW	M9BW	●	●	●	○	—	○				
				3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○				
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○				
	Water resistant (2-color indication)			2-wire				M9BAV**	M9BA**	○	○	●	○	—	○	—	—		
				2-wire (Non-polar)				—	P3DW	●	—	●	●	—	○				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	—			
				12 V				A93V	A93	●	—	●	—	—					
				5 V, 12 V				A90V	A90	●	—	●	—	—					

** 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.

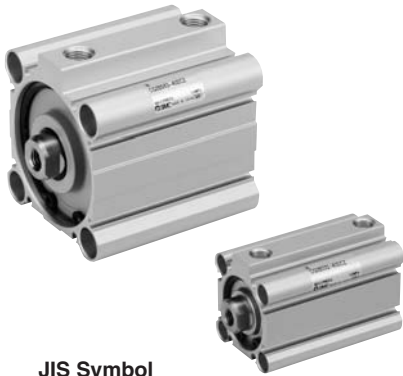
* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ

* 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.

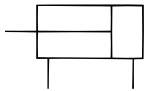
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Series CQ2



JIS 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

- 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.

Specifications

Bore size (mm)	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	0.05 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)	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 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	Bore size
	Stroke range	Stroke range
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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

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

20-CQ2BS Bore size — Stroke DC(M)Z

• Copper and fluorine-free series

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

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)	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

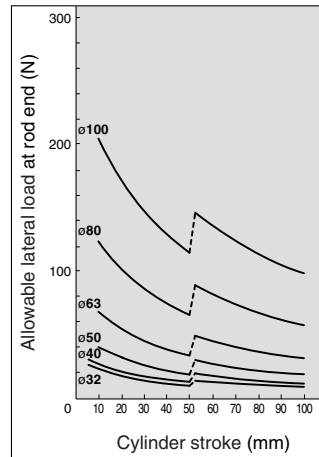
Bore size (mm)		32	40	50	63	80	100
Both ends tapped		6	6	6	19	45	45
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolts)		142	154	243	320	690	1057
Rod flange (Including mounting bolts)		180	214	373	559	1056	1365
Head flange (Including mounting bolts)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)		151	196	393	554	1109	1887

Calculation: (Example) **CQ2DS32-20DCMZ**

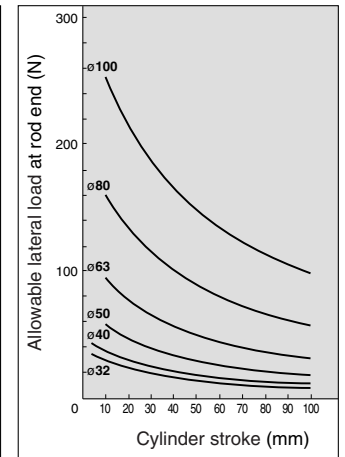
- Basic weight: CQ2BS32-20DCZ 193 g
- Additional weight: Both ends tapped 6 g
- Rod end male thread 43 g
- Double clevis 151 g
- 393 g

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

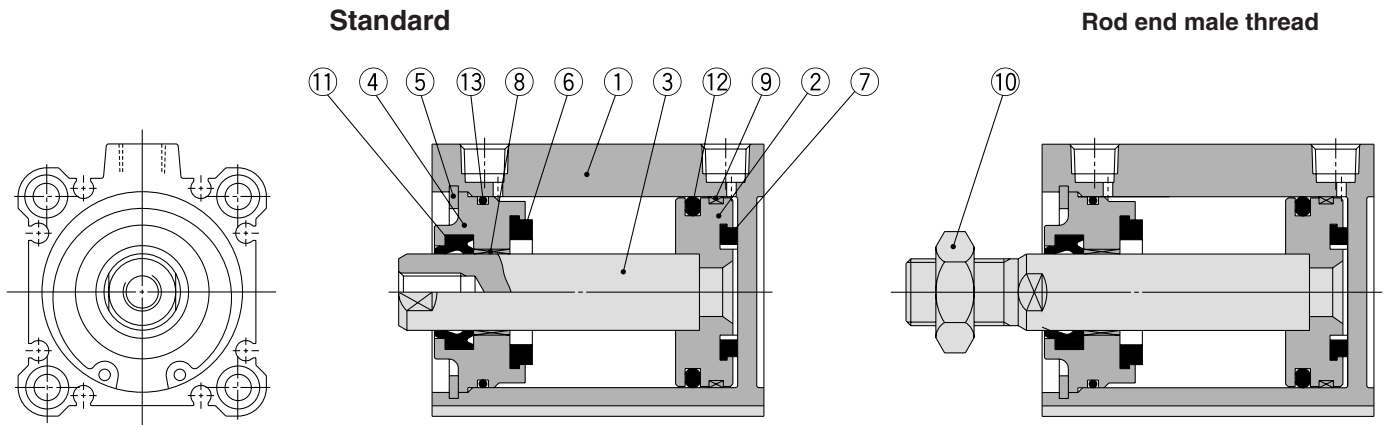
With Auto Switch

Auto Switch

Made to Order

Series CQ2

Construction



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy	Anodized
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, ⑬ from the table.
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	

* Seal kit includes ①, ②, 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)

Mounting Brackets/Part No.

Bore size (mm)	Foot <small>Note 1)</small>	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



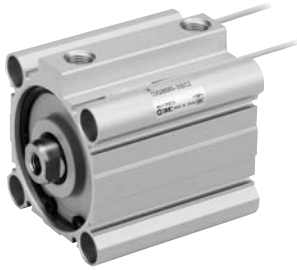
Note 1) When ordering a foot bracket, order 2 pieces per cylinder.

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

Anti-lateral Load 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
32	191	211	230	250	270	289	309	329	348	368	468	567
40	284	305	327	348	369	391	412	434	455	477	589	701
50	—	480	513	546	579	611	644	677	710	743	915	1087
63	—	710	748	787	825	863	901	939	977	1015	1211	1408
80	—	1229	1289	1350	1410	1470	1530	1591	1651	1711	2008	2305
100	—	2070	2150	2231	2311	2391	2472	2552	2633	2713	3121	3529

Additional Weight

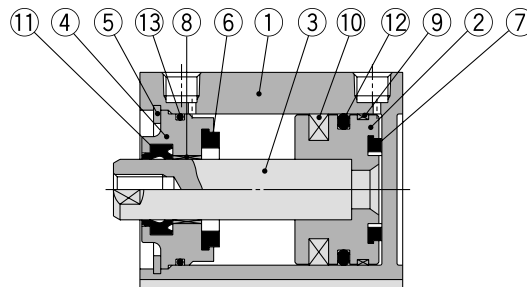
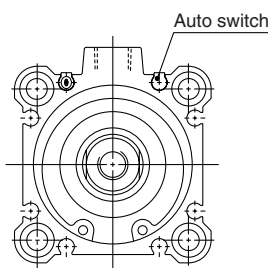
Bore size (mm)	32	40	50	63	80	100
Both ends tapped	6	6	6	19	45	45
Rod end male thread	Male thread	26	27	53	53	120
	Nut	17	17	32	32	49
Foot (Including mounting bolts)	142	154	243	320	690	1057
Rod flange (Including mounting bolts)	180	214	373	559	1056	1365
Head flange (Including mounting bolts)	165	198	348	534	1017	1309
Double clevis (Including pin, retaining rings, bolts)	151	196	393	554	1109	1887

Calculation: (Example) **CDQ2DS32-20DCMZ**

- Basic weight: CDQ2BS32-20DCZ 250 g
 - Additional weight: Both ends tapped 6 g
 - Rod end male thread 43 g
 - Double clevis 151 g
- 450 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 anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	Aluminum alloy	Anodized
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	Magnet	—	
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 ⑪, ⑫, ⑬ from the table.
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-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)

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

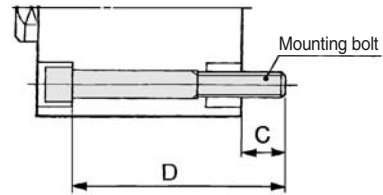
Series CQ2

Mounting Bolt for CQ2BS/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2BS is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M5x40L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CQ2BS32-5DCZ	9	40	CQ-M5 x 40L
-10DCZ		45	x 45L
-15DCZ		50	x 50L
-20DCZ		55	x 55L
-25DCZ		60	x 60L
-30DCZ		65	x 65L
-35DCZ		70	x 70L
-40DCZ		75	x 75L
-45DCZ		80	x 80L
-50DCZ		85	x 85L
-75DCZ		120	x 120L
-100DCZ		145	x 145L
CQ2BS40-5DCZ		7.5	45
-10DCZ	50		x 50L
-15DCZ	55		x 55L
-20DCZ	60		x 60L
-25DCZ	65		x 65L
-30DCZ	70		x 70L
-35DCZ	75		x 75L
-40DCZ	80		x 80L
-45DCZ	85		x 85L
-50DCZ	90		x 90L
-75DCZ	125		x 125L
-100DCZ	150		x 150L
CQ2BS50-10DCZ	12.5		55
-15DCZ		60	x 60L
-20DCZ		65	x 65L
-25DCZ		70	x 70L
-30DCZ		75	x 75L
-35DCZ		80	x 80L
-40DCZ		85	x 85L
-45DCZ		90	x 90L
-50DCZ		95	x 95L
-75DCZ		130	x 130L
-100DCZ		155	x 155L

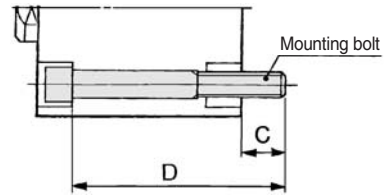
Cylinder model	C	D	Mounting bolt part no.	
CQ2BS63-10DCZ	14.5	60	CQ-M8 x 60L	
-15DCZ		65	x 65L	
-20DCZ		70	x 70L	
-25DCZ		75	x 75L	
-30DCZ		80	x 80L	
-35DCZ		85	x 85L	
-40DCZ		90	x 90L	
-45DCZ		95	x 95L	
-50DCZ		100	x 100L	
-75DCZ		135	x 135L	
-100DCZ		160	x 160L	
CQ2BS80-10DCZ		15	65	CQ-M10 x 65L
-15DCZ			70	x 70L
-20DCZ	75		x 75L	
-25DCZ	80		x 80L	
-30DCZ	85		x 85L	
-35DCZ	90		x 90L	
-40DCZ	95		x 95L	
-45DCZ	100		x 100L	
-50DCZ	105		x 105L	
-75DCZ	140		x 140L	
-100DCZ	165		x 165L	
CQ2BS100-10DCZ	15.5		75	CQ-M10 x 75L
-15DCZ			80	x 80L
-20DCZ		85	x 85L	
-25DCZ		90	x 90L	
-30DCZ		95	x 95L	
-35DCZ		100	x 100L	
-40DCZ		105	x 105L	
-45DCZ		110	x 110L	
-50DCZ		115	x 115L	
-75DCZ		150	x 150L	
-100DCZ		175	x 175L	

Mounting Bolt for CDQ2BS/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2BS is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M5x50L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CDQ2BS32-5DCZ	9	50	CQ-M5 x 50L
-10DCZ		55	x 55L
-15DCZ		60	x 60L
-20DCZ		65	x 65L
-25DCZ		70	x 70L
-30DCZ		75	x 75L
-35DCZ		80	x 80L
-40DCZ		85	x 85L
-45DCZ		90	x 90L
-50DCZ		95	x 95L
-75DCZ		120	x 120L
-100DCZ	145	x 145L	
CDQ2BS40-5DCZ	7.5	55	CQ-M5 x 55L
-10DCZ		60	x 60L
-15DCZ		65	x 65L
-20DCZ		70	x 70L
-25DCZ		75	x 75L
-30DCZ		80	x 80L
-35DCZ		85	x 85L
-40DCZ		90	x 90L
-45DCZ		95	x 95L
-50DCZ		100	x 100L
-75DCZ		125	x 125L
-100DCZ	150	x 150L	
CDQ2BS50-10DCZ	12.5	65	CQ-M6 x 65L
-15DCZ		70	x 70L
-20DCZ		75	x 75L
-25DCZ		80	x 80L
-30DCZ		85	x 85L
-35DCZ		90	x 90L
-40DCZ		95	x 95L
-45DCZ		100	x 100L
-50DCZ		105	x 105L
-75DCZ		130	x 130L
-100DCZ		155	x 155L

Cylinder model	C	D	Mounting bolt part no.
CDQ2BS63-10DCZ	14.5	70	CQ-M8 x 70L
-15DCZ		75	x 75L
-20DCZ		80	x 80L
-25DCZ		85	x 85L
-30DCZ		90	x 90L
-35DCZ		95	x 95L
-40DCZ		100	x 100L
-45DCZ		105	x 105L
-50DCZ		110	x 110L
-75DCZ		135	x 135L
-100DCZ		160	x 160L
CDQ2BS80-10DCZ	15	75	CQ-M10 x 75L
-15DCZ		80	x 80L
-20DCZ		85	x 85L
-25DCZ		90	x 90L
-30DCZ		95	x 95L
-35DCZ		100	x 100L
-40DCZ		105	x 105L
-45DCZ		110	x 110L
-50DCZ		115	x 115L
-75DCZ		140	x 140L
-100DCZ		165	x 165L
CDQ2BS100-10DCZ	15.5	85	CQ-M10 x 85L
-15DCZ		90	x 90L
-20DCZ		95	x 95L
-25DCZ		100	x 100L
-30DCZ		105	x 105L
-35DCZ		110	x 110L
-40DCZ		115	x 115L
-45DCZ		120	x 120L
-50DCZ		125	x 125L
-75DCZ		150	x 150L
-100DCZ		175	x 175L

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

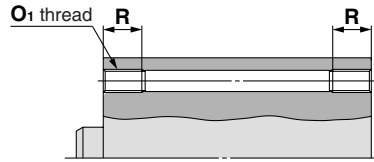
Ø32 to Ø50/With Auto Switch

(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

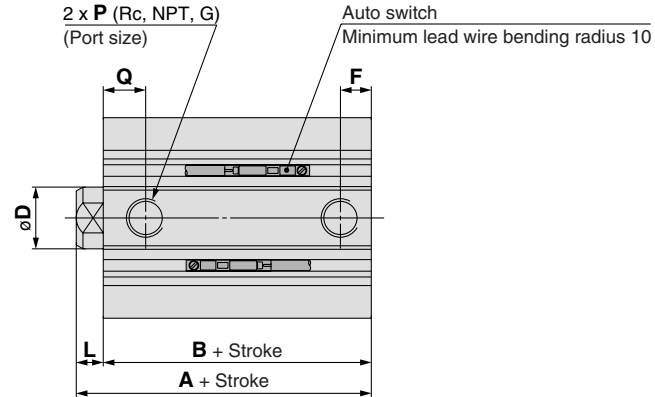
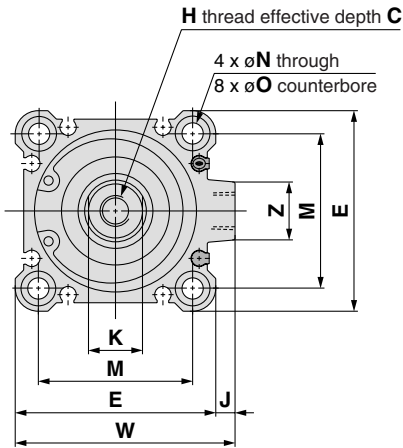
Both ends tapped: CQ2AS/CDQ2AS

CDQ2AS

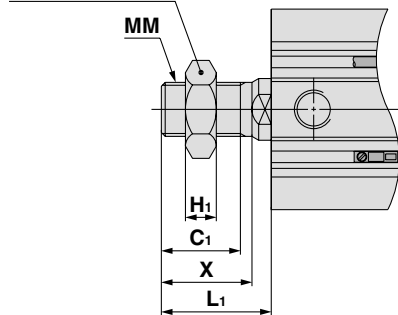


Both Ends Tapped

Bore size (mm)	O ₁	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.

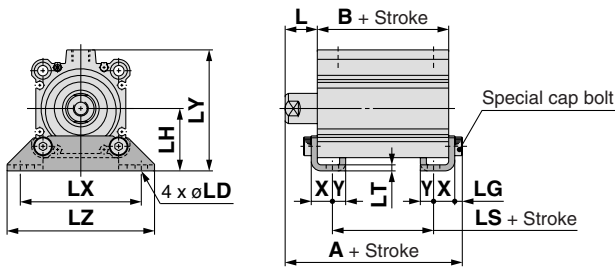
Rod End Male Thread

(mm)

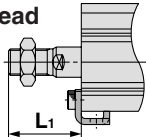
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

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																	

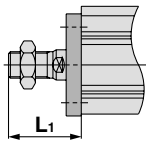
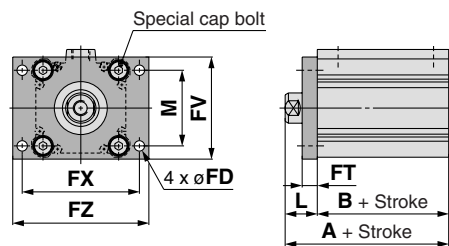
Foot: CQ2LS/CDQ2LS



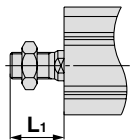
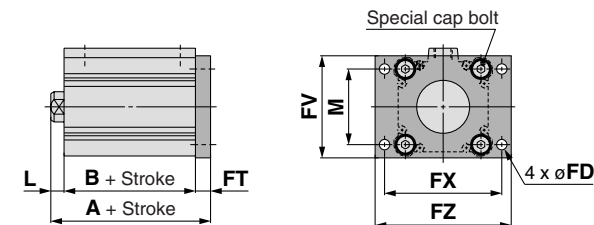
Rod end male thread



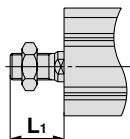
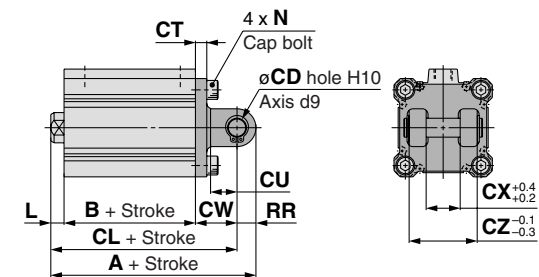
Rod flange: CQ2FS/CDQ2FS



Head flange: CQ2GS/CDQ2GS



Double clevis: CQ2DS/CDQ2DS



Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	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 ₁	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 ₁
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 L₁ 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 ₁	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.

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

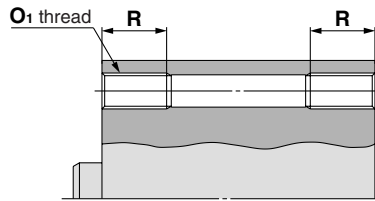
∅63 to ∅100/With Auto Switch

(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

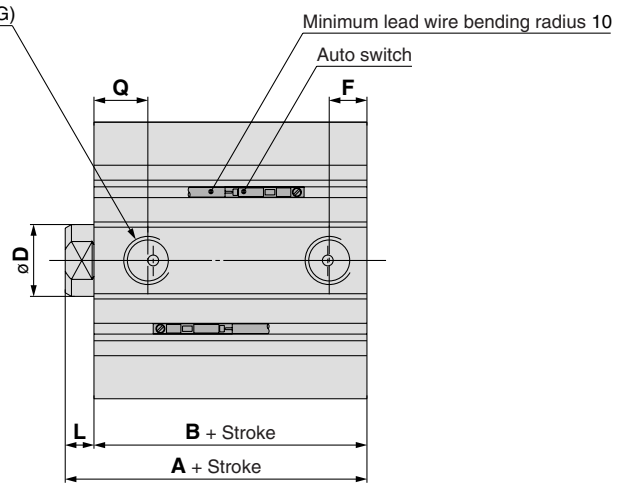
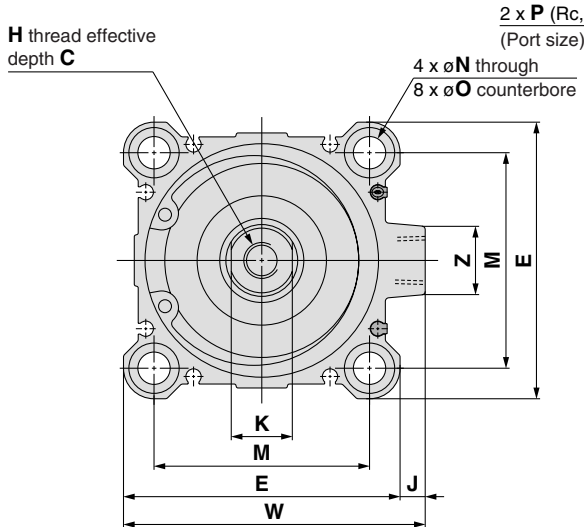
Both ends tapped: CQ2AS/CDQ2AS

The dimensions with boss on head end are equivalent to those of the CQ2 series, double acting, single rod. Refer to page 17.

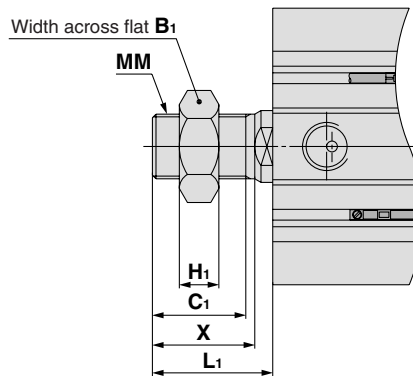


Both Ends Tapped

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



Rod end male thread

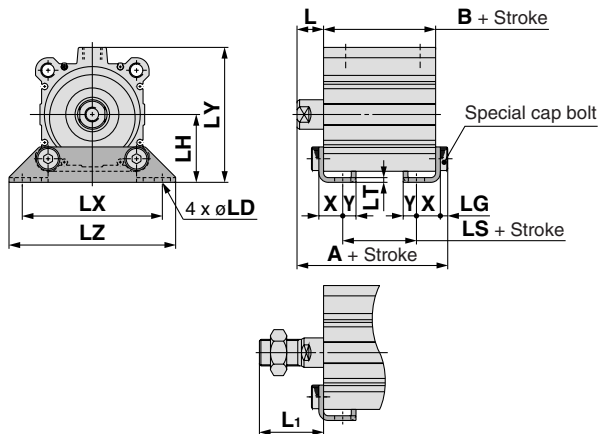


Rod End Male Thread (mm)

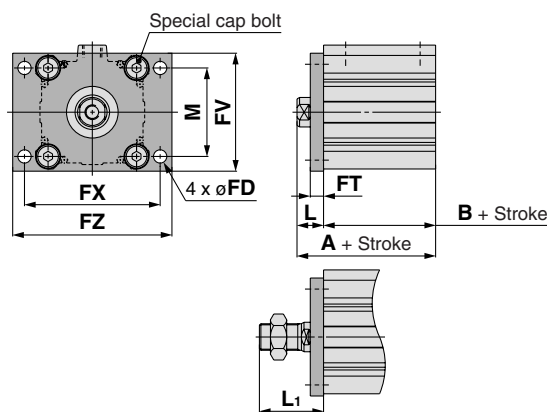
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
63	27	26	11	33.5	M18 x 1.5	28.5
80	32	32.5	13	43.5	M22 x 1.5	35.5
100	41	32.5	16	43.5	M26 x 1.5	35.5

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																	

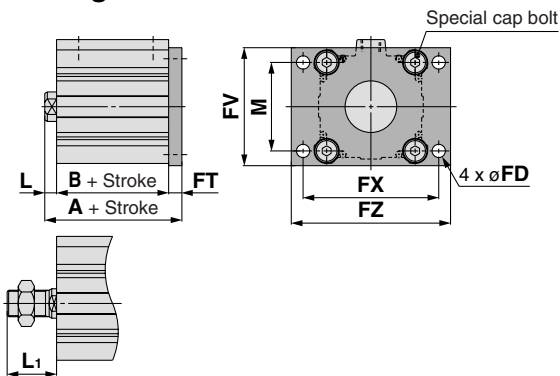
Foot: CQ2LS/CDQ2LS



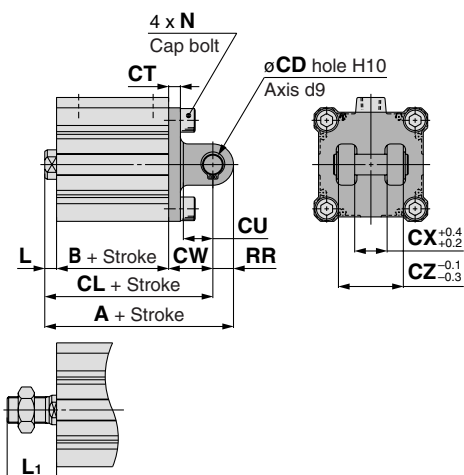
Rod flange: CQ2FS/CDQ2FS



Head flange: CQ2GS/CDQ2GS



Double clevis: CQ2DS/CDQ2DS



Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	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								
	75, 100	5	46	3.2	95	91.5	113	16.2	9
80	10 to 50								
	75, 100	7	59	4.5	118	114	140	19.5	11
100	10 to 50								
	75, 100	7	71	6	137	136	162	23	12.5

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 ₁	M
63	10 to 50			
	75, 100	18	43.5	60
80	10 to 50			
	75, 100	20	53.5	77
100	10 to 50			
	75, 100	22	53.5	94

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 ₁
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 L₁ 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 ₁	N	RR
63	10 to 50							
	75, 100	30	22	44	8	33.5	M10 x 1.5	14
80	10 to 50							
	75, 100	38	28	56	10	43.5	M12 x 1.75	18
100	10 to 50							
	75, 100	45	32	64	12	43.5	M12 x 1.75	22

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

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**

Number of auto switches

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

Auto switch

Nil	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

Nil	Rod end female thread
CM	Rod end male thread

Made to Order
Refer to the next page for details.

Cushion

C	Rubber bumper
---	---------------

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) CDBQ2L32-30DC-RL

Mounting

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

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

Port thread type

Nil	M thread	ø20, ø25
TN	NPT	ø32 to ø100
TF	G	

Cylinder stroke (mm)
Refer to the next page for standard strokes and intermediate 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 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
							ø20, ø25	ø32 to ø100	ø20, ø25	ø32	ø40 to ø100									
Solid state auto switch		Grommet	No	3-wire (NPN)	24 V	—			M9NV	M9N	●	●	●	○	—	○	IC circuit			
				3-wire (PNP)					M9PV	M9P	●	●	●	○	—	○				
		Connector	Yes	2-wire			M9BV	M9B	●	●	●	○	—	○	—	○	—			
				—			J79C	—	●	—	●	●	—	—	—					
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	—			M9NVV	M9NV	●	●	●	○	—	○	IC circuit			
				3-wire (PNP)					M9PVV	M9PV	●	●	●	○	—	○				
		Connector	No	2-wire			M9BVV	M9BV	●	●	●	○	—	○	—					
				3-wire (NPN)			M9NAV**	M9NA**	○	○	○	○	—	○		IC circuit				
		Magnetic field resistant (2-color indication)	Grommet	Yes	3-wire (PNP)					M9PAV**	M9PA**	○	○	●	○		—	○	—	
					2-wire					M9BAV**	M9BA**	○	○	●	○	—	○			
With diagnostic output (2-color indication)	Connector	No	4-wire					—	—	F79F	●	—	●	○	—	○	IC circuit			
	Connector	Yes	2-wire (Non-polar)					—	—	P4DW	—	—	●	●	—	○	—			
Reed auto switch		Grommet	Yes	3-wire (NPN equivalent)	24 V	—			A96V	A96	●	—	●	—	—	—	IC circuit			
				—					A72	—	A72H	●	—	●	—	—		—		
				12 V					100 V	A93V	A93	●	—	●	—	—		—		
		Connector	No	2-wire						A90V	A90	●	—	●	—	—	—	IC circuit		
				5 V, 12 V						100 V or less	A73C	—	●	—	●	●	●		—	—
				12 V						—	A80C	—	●	—	●	●	●		—	—
Diagnostic indication (2-color indication)	Grommet	Yes	2-wire					A80C	—	●	—	●	●	●	—	—	IC circuit			
			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 Nil (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.
* 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.

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



Specifications

Bore size (mm)	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	0.15 MPa ^{Note)}							
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)	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
Stroke length tolerance	+1.0 mm 0							
Lock position	Head end, Rod end							
Holding force (Max.) (N)	215	330	550	860	1340	2140	3450	5390
Pressure for unlocking	0.15 MPa or less							
Backlash	2 mm or less							
Manual release	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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Standard Strokes

Bore size	Standard stroke (mm)
20 to 63	10, 15, 20, 25, 50, 75, 100
80, 100	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 ^{Note 1)}	Flange	Double clevis ^{Note 2)}
20	CQS-L020	CQS-F020	CQS-D020
25	CQS-L025	CQS-F025	CQS-D025
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

Note 1) When ordering a foot bracket, order 2 pieces per cylinder.

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

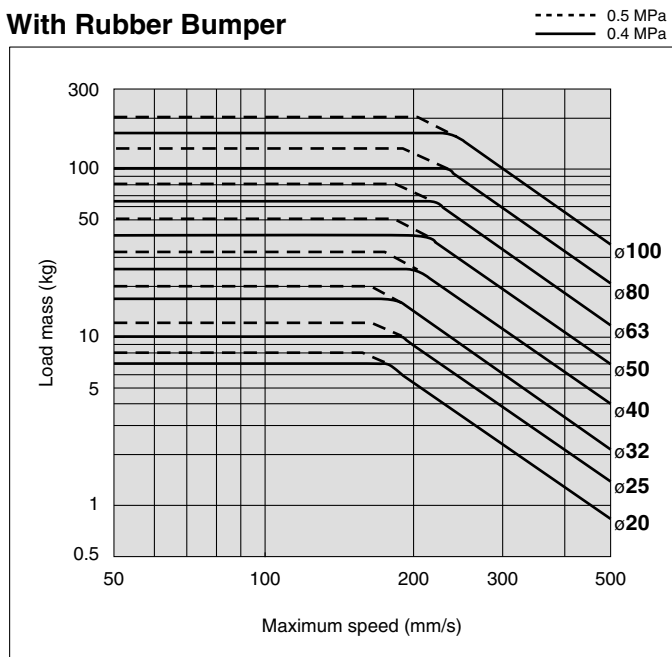
Foot or Flange: Body mounting bolts

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.

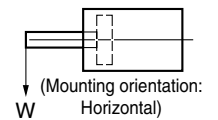
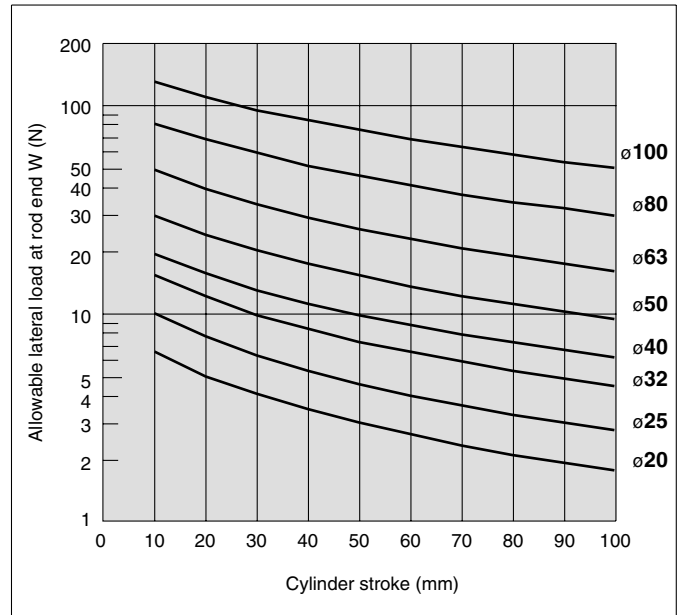
Allowable Kinetic Energy

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

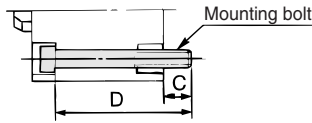
Made to Order

Series CBQ2

Mounting Bolt for CBQ2

Mounting method: Mounting bolt for through-hole mounting of the CBQ2 is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M5x75L 4 pcs.



Note) Be sure to use the attached flat washers when mounting $\phi 20$ and $\phi 25$ cylinders with through-holes.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

With Head End Lock (H□)

Cylinder model	C	D	Mounting bolt part no.
C□BQ2B20-10DC-H□	10	75	CQ-M5 x 75L
-15DC-H□		80	x 80L
-20DC-H□		85	x 85L
-25DC-H□		90	x 90L
-50DC-H□		120	x 120L
-75DC-H□		145	x 145L
-100DC-H□		170	x 170L
C□BQ2B25-10DC-H□	7	75	CQ-M5 x 75L
-15DC-H□		80	x 80L
-20DC-H□		85	x 85L
-25DC-H□		90	x 90L
-50DC-H□		120	x 120L
-75DC-H□		145	x 145L
-100DC-H□		170	x 170L
C□BQ2B32-10DC-H□	6.5	75	CQ-M5 x 75L
-15DC-H□		80	x 80L
-20DC-H□		85	x 85L
-25DC-H□		90	x 90L
-50DC-H□		115	x 115L
-75DC-H□		140	x 140L
-100DC-H□		165	x 165L
C□BQ2B40-10DC-H□	7	85	CQ-M5 x 85L
-15DC-H□		90	x 90L
-20DC-H□		95	x 95L
-25DC-H□		100	x 100L
-50DC-H□		125	x 125L
-75DC-H□		150	x 150L
-100DC-H□		175	x 175L

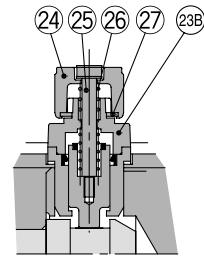
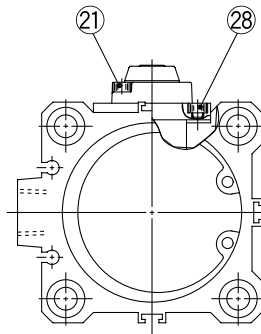
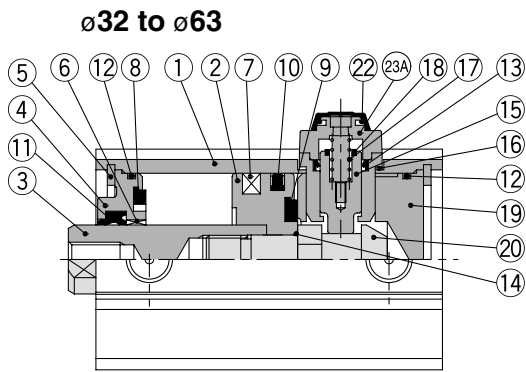
Cylinder model	C	D	Mounting bolt part no.
C□BQ2B50-10DC-H□	12.5	90	CQ-M6 x 90L
-15DC-H□		95	x 95L
-20DC-H□		100	x 100L
-25DC-H□		105	x 105L
-50DC-H□		130	x 130L
-75DC-H□		155	x 155L
-100DC-H□		180	x 180L
C□BQ2B63-10DC-H□	13.5	90	CQ-M8 x 90L
-15DC-H□		95	x 95L
-20DC-H□		100	x 100L
-25DC-H□		105	x 105L
-50DC-H□		130	x 130L
-75DC-H□		155	x 155L
-100DC-H□		180	x 180L
C□BQ2B80-25DC-H□	12.5	135	CQ-M10 x 135L
-50DC-H□		160	x 160L
C□BQ2B100-25DC-H□	13	145	CQ-M10 x 145L
-50DC-H□		170	x 170L

With Rod End Lock (R□)

Cylinder model	C	D	Mounting bolt part no.
C□BQ2B20-10DC-R□	6.5	65	CQ-M5 x 65L
-15DC-R□		70	x 70L
-20DC-R□		75	x 75L
-25DC-R□		80	x 80L
-50DC-R□		120	x 120L
-75DC-R□		145	x 145L
-100DC-R□		170	x 170L
C□BQ2B25-10DC-R□	8.5	70	CQ-M5 x 70L
-15DC-R□		75	x 75L
-20DC-R□		80	x 80L
-25DC-R□		85	x 85L
-50DC-R□		120	x 120L
-75DC-R□		145	x 145L
-100DC-R□		170	x 170L
C□BQ2B32-10DC-R□	9	70	CQ-M5 x 70L
-15DC-R□		75	x 75L
-20DC-R□		80	x 80L
-25DC-R□		85	x 85L
-50DC-R□		110	x 110L
-75DC-R□		135	x 135L
-100DC-R□		160	x 160L
C□BQ2B40-10DC-R□	7.5	75	CQ-M5 x 75L
-15DC-R□		80	x 80L
-20DC-R□		85	x 85L
-25DC-R□		90	x 90L
-50DC-R□		115	x 115L
-75DC-R□		140	x 140L
-100DC-R□		165	x 165L

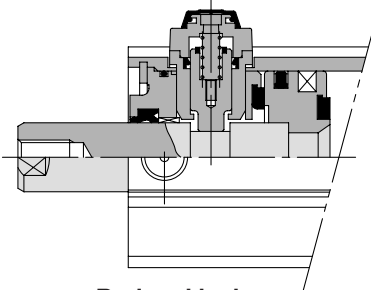
Cylinder model	C	D	Mounting bolt part no.
C□BQ2B50-10DC-R□	12.5	80	CQ-M6 x 80L
-15DC-R□		85	x 85L
-20DC-R□		90	x 90L
-25DC-R□		95	x 95L
-50DC-R□		120	x 120L
-75DC-R□		145	x 145L
-100DC-R□		170	x 170L
C□BQ2B63-10DC-R□	14.5	85	CQ-M8 x 85L
-15DC-R□		90	x 90L
-20DC-R□		95	x 95L
-25DC-R□		100	x 100L
-50DC-R□		125	x 125L
-75DC-R□		150	x 150L
-100DC-R□		175	x 175L
C□BQ2B80-25DC-R□	15	130	CQ-M10 x 130L
-50DC-R□		155	x 155L
C□BQ2B100-25DC-R□	15.5	140	CQ-M10 x 140L
-50DC-R□		165	x 165L

Construction



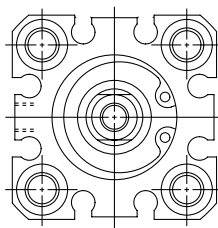
Manual release (Lock type): Suffix L

Head end lock

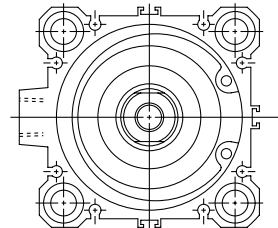


Rod end lock

Cylinder tube form
ø32 to ø63

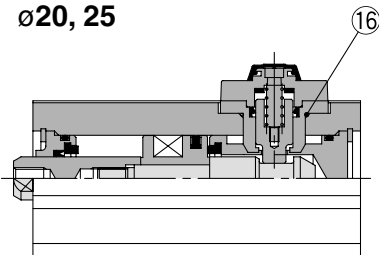


Cylinder tube form
ø25 or less

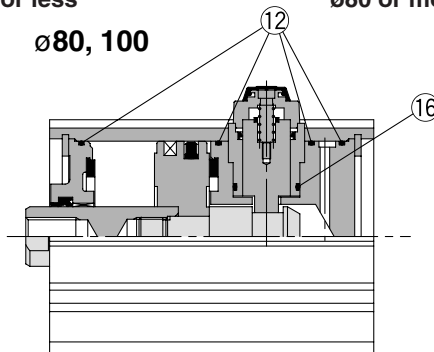


Cylinder tube form
ø80 or more

ø20, 25



ø80, 100



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Carbon steel	Hard chrome plated
4	Collar	R□ Aluminum alloy	Anodized
		H□ Aluminum alloy	ø40 or less, Anodized
		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	Anodized
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)

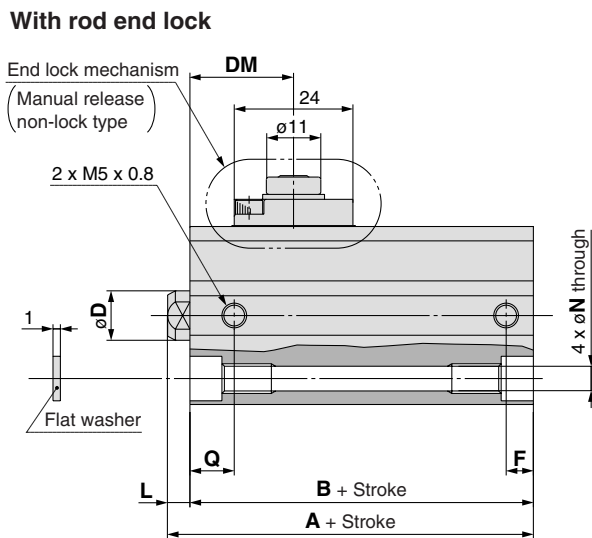
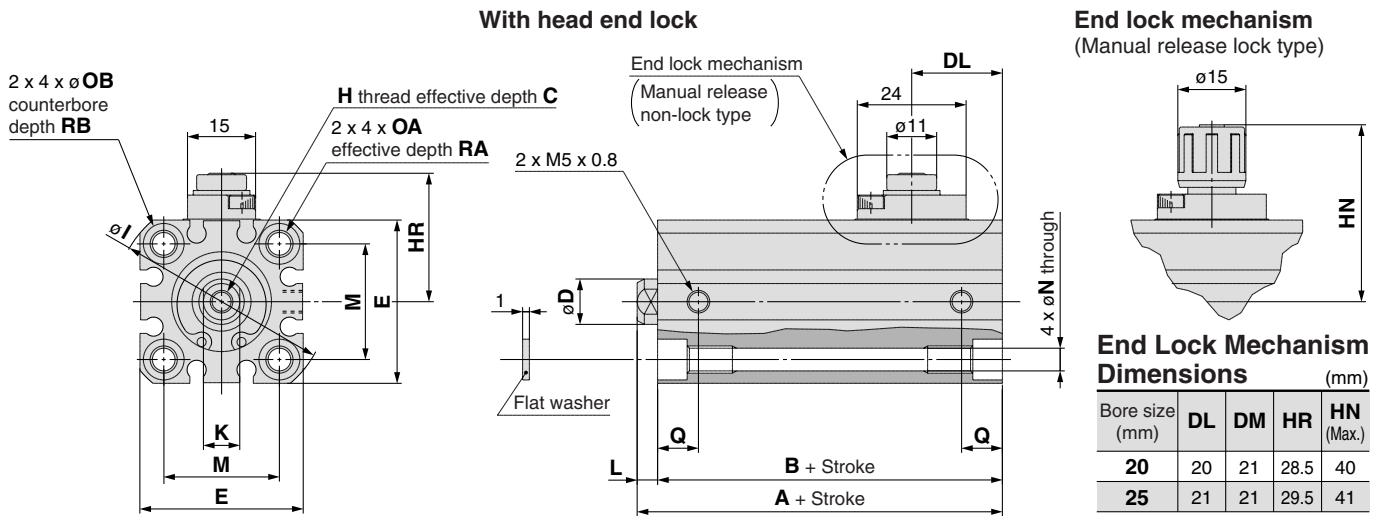
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CBQ2

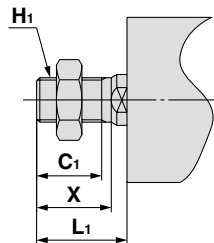
Dimensions

Ø20, Ø25

Standard (Through-hole/Both ends tapped common):
CBQ2B/CDBQ2B



Rod end male thread

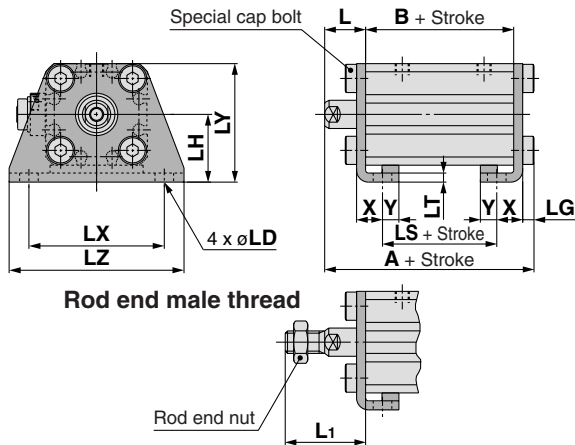


Rod End Male Thread

Bore size (mm)	Standard stroke	C ₁	X	H ₁	L ₁
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



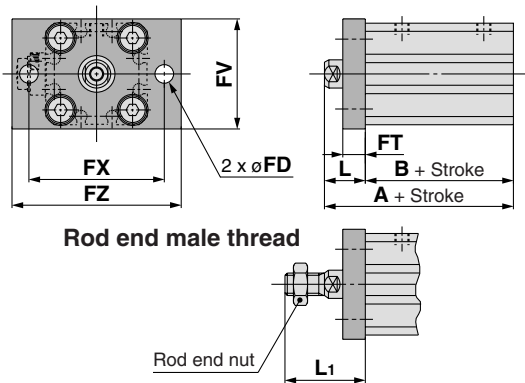
Foot

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 ₁	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: CBQ2F/CDBQ2F



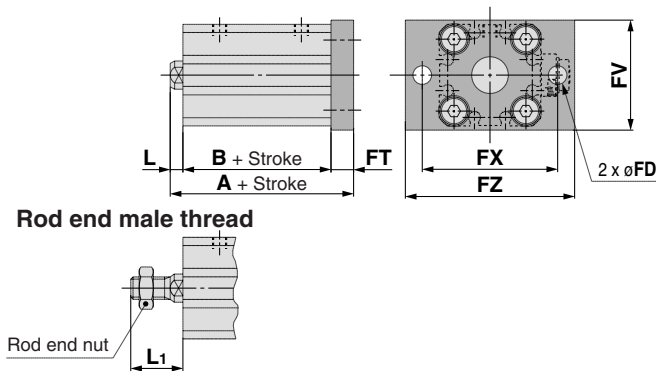
Rod Flange

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 ₁
		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: CBQ2G/CDBQ2G



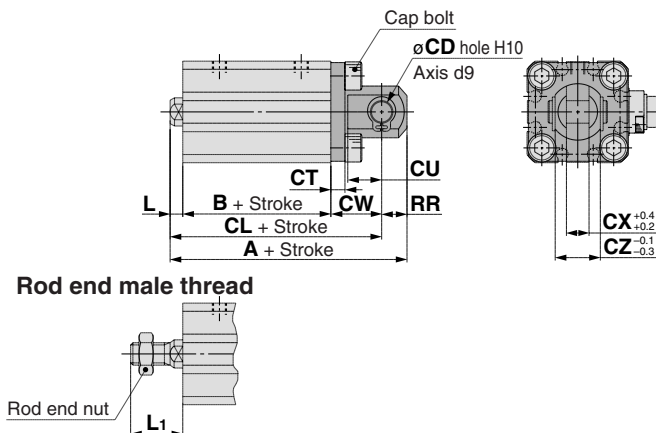
Head Flange

Bore size (mm)	Standard stroke	With head end lock				With rod end lock			
		A	B	L	L ₁	A	B	L	L ₁
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: CBQ2D/CDBQ2D



Double Clevis

Bore size (mm)	Standard stroke	With head end lock					With rod end lock				
		A	B	CL	L	L ₁	A	B	CL	L	L ₁
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

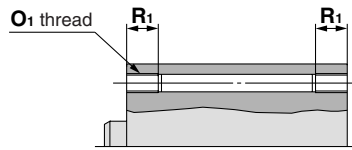
Series CBQ2

Dimensions

ø32 to ø100

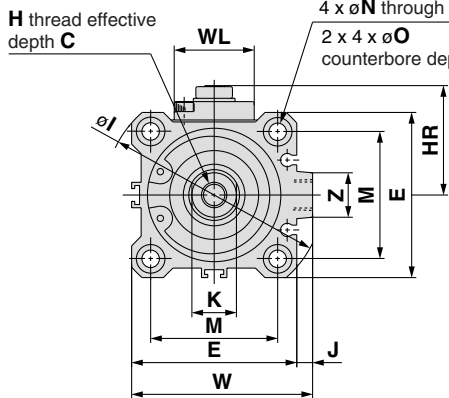
Standard (Through-hole): CBQ2B/CDBQ2B

Both ends tapped: CBQ2A/CDBQ2A

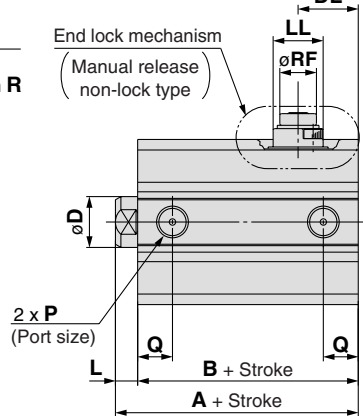


Both Ends Tapped (mm)

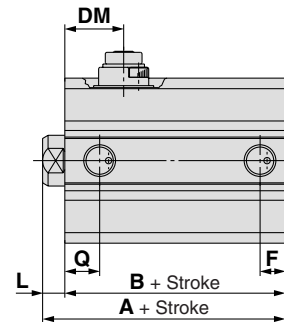
Bore size (mm)	O ₁	R ₁
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



With head end lock



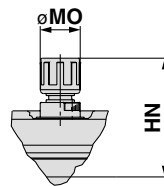
With rod end lock



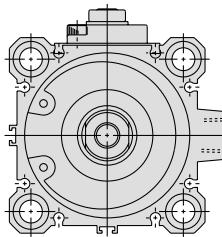
End Lock Mechanism Dimensions (mm)

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

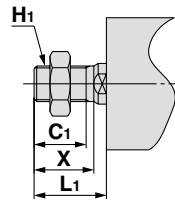
End lock mechanism (Manual release lock type)



Cylinder tube form ø63, ø80, ø100



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	Standard stroke	C ₁	X	H ₁	L ₁
32	10, 15, 20, 25 50, 75, 100	20.5	23.5	M14 x 1.5	28.5
40		20.5	23.5	M14 x 1.5	28.5
50		26	28.5	M18 x 1.5	33.5
63	25, 50 75, 100	26	28.5	M18 x 1.5	33.5
80		32.5	35.5	M22 x 1.5	43.5 53.5
100	25, 50 75, 100	32.5	35.5	M26 x 1.5	43.5 53.5

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	25, 50, 75, 100	15	20	77	M10 x 1.5	103	7	17	60	9	14	Rc1/4	10.5	84	19
80		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.

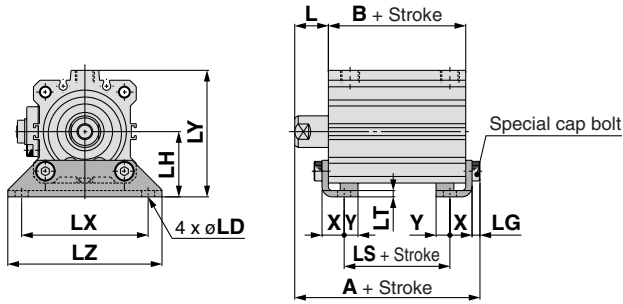
With Head End Lock (mm)

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	25, 50 75, 100	85	77	8	15.5
80		121	111	10	18
100	136	116	20	19	
100	25, 50	132.5	120.5	12	22
	75, 100	147.5	125.5	22	23

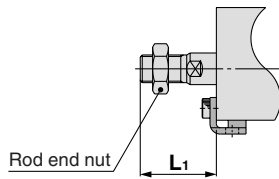
With Rod End Lock (mm)

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	25, 50 75, 100	79	71	10.5	8	15
80		113.5	103.5	12.5	10	16
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



Rod end male thread



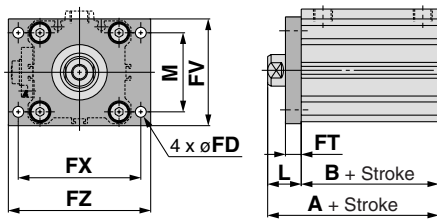
Foot

Bore size (mm)	Standard stroke	With head end lock			With rod end lock			(mm)		
		A	B	LS	A	B	LS	L	L ₁	LD
32	10, 15, 20, 25 50, 75, 100	89.7	65.5	49.5	82.2	58	42	17	38.5	6.6
40		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			

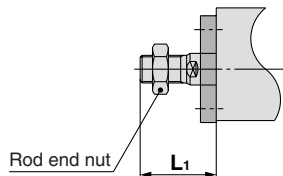
Bore size (mm)	Standard stroke	LG	LH	LT	LX	LY	LZ	X	Y
32	10, 15, 20, 25 50, 75, 100	4	30	3.2	57	57	71	11.2	5.8
40		4	33	3.2	64	64	78	11.2	7
50		5	39	3.2	79	78	95	14.7	8
63		5	46	3.2	95	91.5	113	16.2	9
80	25, 50, 75, 100	7	59	4.5	118	114	140	19.5	11
100		7	71	6	137	136	162	23	12.5

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod flange: CBQ2F/CDBQ2F



Rod end male thread



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	10, 15, 20, 25 50, 75, 100	82.5	65.5	75	58	5.5	8	48	56	65
40		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 ₁	M
32	10, 15, 20, 25 50, 75, 100	17	38.5	34
40		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

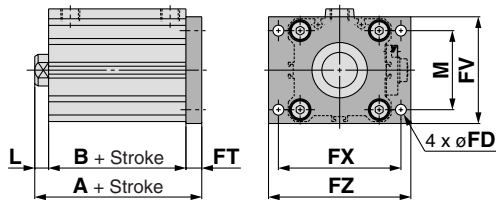
Made to Order

Series CBQ2

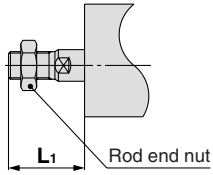
Dimensions

∅32 to ∅100

Head flange: CBQ2G/CDBQ2G



Rod end male thread



Head Flange

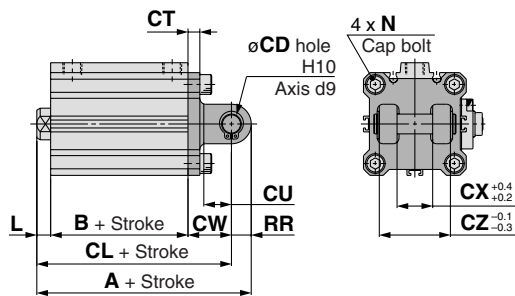
(mm)

Bore size (mm)	Standard stroke	With head end lock				With rod end lock			
		A	B	L	L ₁	A	B	L	L ₁
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

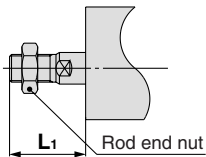
Bore size (mm)	Standard stroke	M	FD	FT	FV	FX	FZ
32	10, 15, 20, 25 50, 75, 100	34	5.5	8	48	56	65
40		40	5.5	8	54	62	72
50		50	6.6	9	67	76	89
63		60	9	9	80	92	108
80		77	11	11	99	116	134
100		94	11	11	117	136	154

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 ₁
		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

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

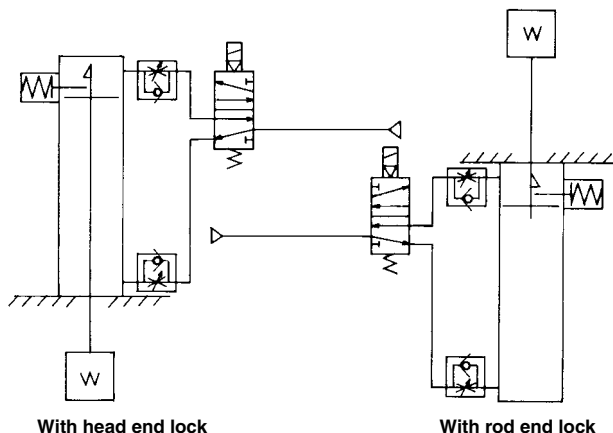
Auto Switch

Made to Order

Use the Recommended Pneumatic Circuit

⚠ Caution

• This is necessary for the correct locking and unlocking actions.



Operating Precautions

⚠ Caution

1. 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.

2. 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.)

3. 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.

4. 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.

5. Do not operate multiple cylinders in synchronization.

Avoid applications in which two or more end lock cylinders are synchronized to move one work piece, as one of the cylinder locks may not be able to release when required.

6. Use a speed controller with meter-out control.

Lock cannot be released occasionally by meter-in control.

7. 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.

8. 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-color 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 EXH port of the solenoid valve.

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 be rushed to move.

Manual Release

⚠ Caution

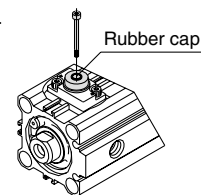
1. Manual release (Non-lock type)

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.

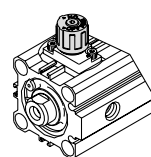
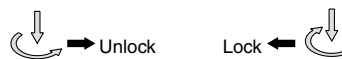
Bore size (mm)	Thread size	Pulling force (N)	Stroke (mm)
20, 25, 32	M2.5 x 0.45 x 25 ℓ or more	4.9	2
40, 50, 63	M3 x 0.5 x 30 ℓ or more	10	3
80, 100	M5 x 0.8 x 40 ℓ or more	24.5	3

Remove the bolt for normal operation. It can cause lock malfunction or faulty release.

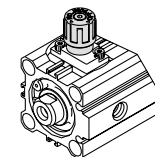


2. Manual release (Lock type)

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.



Manually locked state



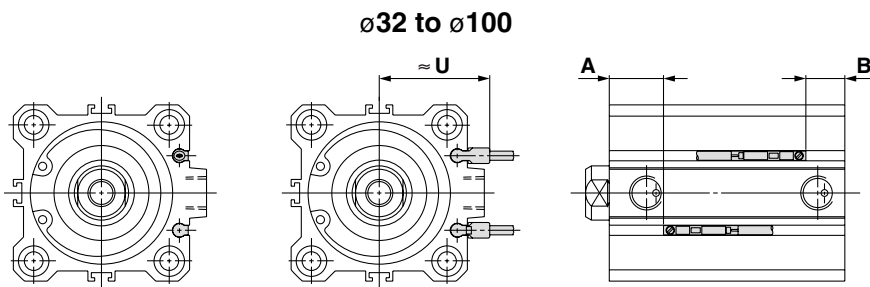
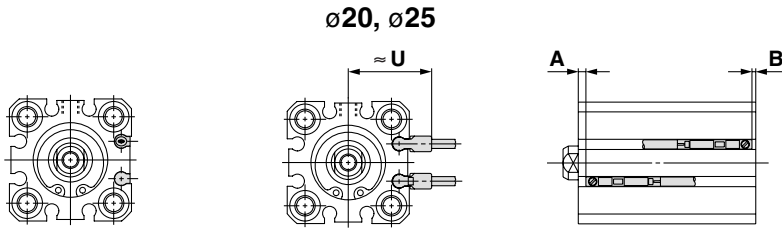
Manually unlocked state

With End Lock Series **CDBQ2** With Auto Switch 1

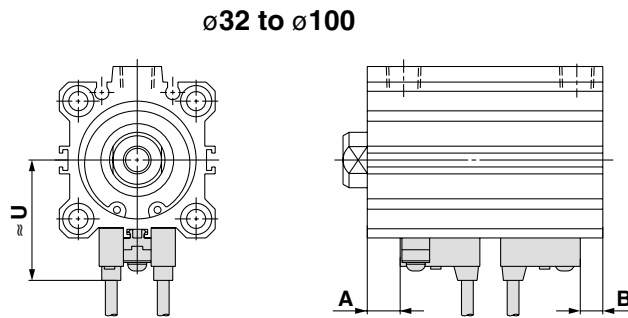
1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

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

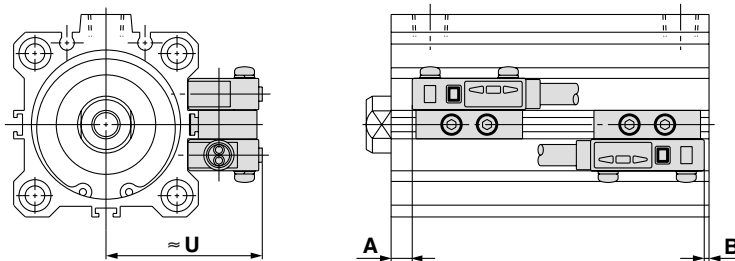


- D-A7□
- D-A80
- D-A7□H
- D-A80H
- D-F7□
- D-J79
- D-F7□W
- D-J79W
- D-F79F
- D-F7NTL
- D-F7BAL
- D-A73C
- D-A80C
- D-J79C
- D-A79W
- D-F7□WV
- D-F7□V
- D-F7BAVL



D-P4DWL

ø40 to ø100



Auto Switch Mounting Height

Applicable Cylinder Series: CDBQ2 (With end lock)

(mm)

Auto switch model Bore size	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 parentheses for ø20 and ø25 are for 50, 75 and 100 mm strokes, and the dimensions in parentheses 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)

(mm)

Auto switch model Bore size	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

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 parentheses 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	Port side Auto switch mounting brackets are not required.	A/B/C side ① BQ-2 ② BQ2-012 Two kinds of auto switch brackets are used as a set. Auto switch mounting brackets are not required.
	D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		

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
D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F7BAL/F7BAVL D-F79F/F7NTL						BQ-2
D-P4DWL	—					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-color indication)	
	D-F7BAVL		Water resistant (2-color indication)	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	
	D-F7BAL		Water resistant (2-color indication)	
	D-F7NTL		With timer	
	D-P5DWL	Grommet (In-line)	Magnetic field resistant (2-color 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

Nil	M thread
	Rc
TN	NPT
TF	G

Number of auto switches

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

Made to Order

Refer to the next page for details.

Auto switch

Nil 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

Nil	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 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	Water resistant (2-color 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 Nil (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.

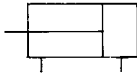
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQ2



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 auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Specifications

Bore size (mm)	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	0.08 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)	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
Stroke length tolerance	+1.0 mm 0							

Standard Strokes

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

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.	

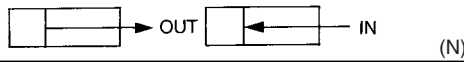
Type

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 x 0.8	M5 x 0.8	^{Note)} M5 x 0.8 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
Rod end male thread		●	●	●	●	●	●	●	●		

Note) ø32 without auto switch: M5 x 0.8 is used for 5 mm stroke piping dimension.
Thus, do not enter a symbol for the port thread type.

Compact Cylinder: Water Resistant Double Acting, Single Rod *Series CQ2*

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.

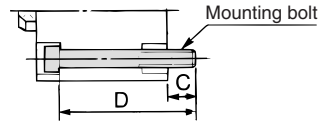
Bore size (mm)	Foot ^{Note 1)}	Flange	Double clevis
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

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

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Material: Chromium molybdenum steel
 Surface treatment: Nickel plated



Example) CQ-M5x35L 2 pcs.

Cylinder model	C	D	Mounting bolt part no.
CQ2B20^ø-5D	7.5	35	CQ-M5 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
-35D		65	x 65L
-40D		70	x 70L
-45D		75	x 75L
-50D		80	x 80L
CQ2B25^ø-5D	9.5	40	CQ-M5 x 40L
-10D		45	x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D		65	x 65L
-35D		70	x 70L
-40D		75	x 75L
-45D		80	x 80L
-50D		85	x 85L
CQ2B32^ø-5DZ	9	40	CQ-M5 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
-75DZ	120	x 120L	
-100DZ	145	x 145L	

Cylinder model	C	D	Mounting bolt part no.
CQ2B40^ø-5DZ	7.5	35	CQ-M5 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ		60	x 60L
-35DZ		65	x 65L
-40DZ		70	x 70L
-45DZ		75	x 75L
-50DZ		80	x 80L
CQ2B50^ø-10DZ	12.5	45	CQ-M6 x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ		75	x 75L
-45DZ		80	x 80L
-50DZ		85	x 85L
-75DZ		120	x 120L
-100DZ	145	x 145L	
CQ2B63^ø-10DZ	14.5	50	CQ-M8 x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ		80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
-75DZ		125	x 125L
-100DZ	150	x 150L	

Cylinder model	C	D	Mounting bolt part no.
CQ2B80^ø-10DZ	15	55	CQ-M10 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
-100DZ	155	x 155L	
CQ2B100^ø-10DZ	15.5	65	CQ-M10 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-75DZ		140	x 140L
-100DZ	165	x 165L	

Weight

Weight Without Auto Switch

Stroke	Bore size											
	5	10	15	20	25	30	35	40	45	50	75	100
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

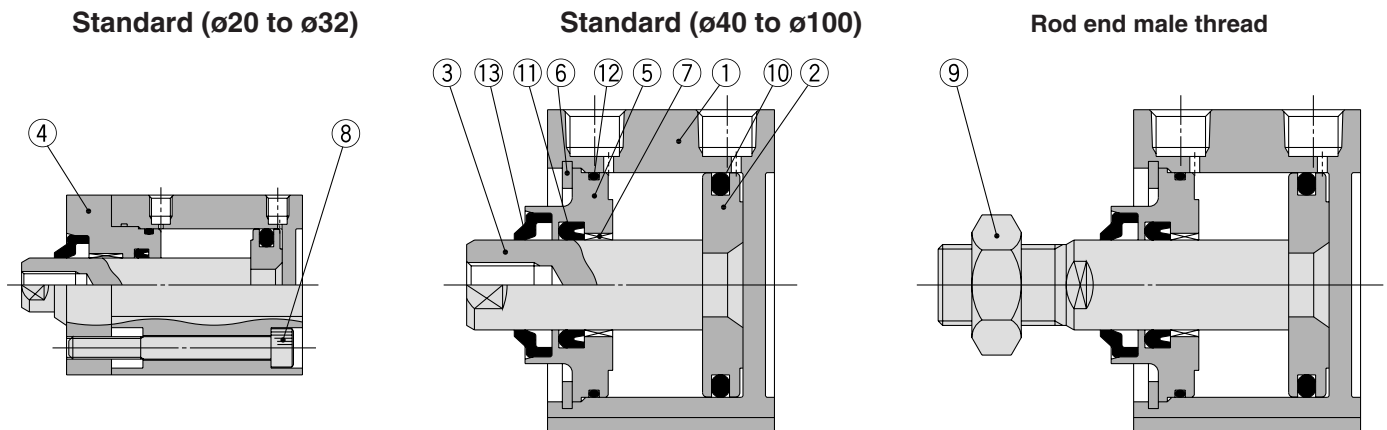
Bore size (mm)		20	25	32	40	50	63	80	100
Both ends tapped		—	—	—	6	6	19	45	45
Rod end male thread	Male thread	6	12	26	27	53	53	120	175
	Nut	4	8	17	17	32	32	49	116
Foot (Including mounting bolts)		—	—	—	154	243	320	690	1057
Rod flange (Including mounting bolts)		—	—	—	214	373	559	1066	1365
Head flange (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 anodized
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, Anodized
5	Collar	Aluminum alloy	ø40 to ø100, Anodized
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

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

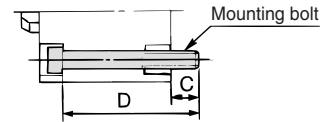
Add each weight of auto switches when auto switches are mounted.

Mounting Bolt for CDQ2B/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M5x50L 2 pcs.

Material: Chromium molybdenum steel
 Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt part no.
CDQ2B20 ^ø -5DZ	10.5	50	CQ-M5 x 50L
		55	x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
CDQ2B25 ^ø -5DZ	9.5	50	CQ-M5 x 50L
		55	x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
CDQ2B32 ^ø -5DZ	9	50	CQ-M5 x 50L
		55	x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
CDQ2B40 ^ø -5DZ	7.5	50	CQ-M5 x 50L
		55	x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
CDQ2B50 ^ø -10DZ	12.5	55	CQ-M6 x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		120	x 120L
CDQ2B63 ^ø -10DZ	14.5	60	CQ-M8 x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		100	x 100L
		125	x 125L

Cylinder model	C	D	Mounting bolt part no.
CDQ2B40 ^ø -5DZ	7.5	45	CQ-M5 x 45L
		50	x 50L
		55	x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
CDQ2B50 ^ø -10DZ	12.5	115	x 115L
		140	x 140L
		55	CQ-M6 x 55L
		60	x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
CDQ2B63 ^ø -10DZ	14.5	95	x 95L
		120	x 120L
		145	x 145L
		60	CQ-M8 x 60L
		65	x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
CDQ2B80 ^ø -10DZ	15	150	x 150L
		65	CQ-M10 x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		100	x 100L
		105	x 105L
CDQ2B100 ^ø -10DZ	15.5	130	x 130L
		155	x 155L
		75	CQ-M10 x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		100	x 100L
		105	x 105L
		110	x 110L

Cylinder model	C	D	Mounting bolt part no.
CDQ2B80 ^ø -10DZ	15	65	CQ-M10 x 65L
		70	x 70L
		75	x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		100	x 100L
		105	x 105L
		130	x 130L
CDQ2B100 ^ø -10DZ	15.5	155	x 155L
		75	CQ-M10 x 75L
		80	x 80L
		85	x 85L
		90	x 90L
		95	x 95L
		100	x 100L
		105	x 105L
		110	x 110L
		115	x 115L

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

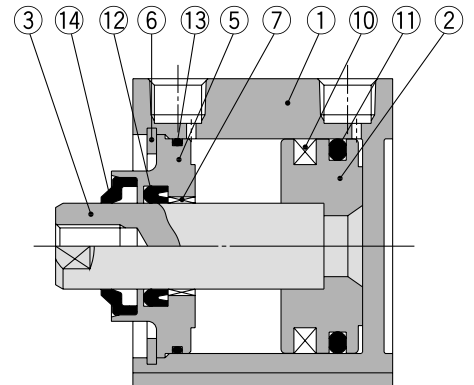
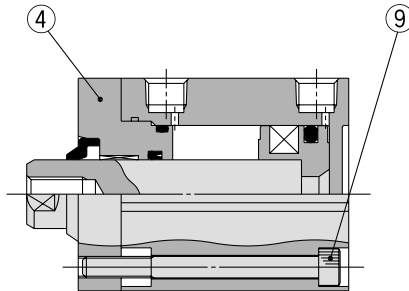
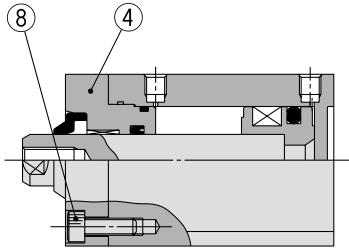
Series CQ2

Construction

ø20, ø25

ø32

ø40 to ø100



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
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, Anodized
5	Collar	Aluminum alloy	ø40 to ø100, Anodized
6	Retaining ring	Carbon tool steel	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 ø25, Nickel plated
9	Hexagon socket head cap screw	Chromium molybdenum steel	ø32, Nickel plated
10	Magnet	—	
11	Piston seal	R: NBR	
		V: FKM	
12	Rod seal	R: NBR	
		V: FKM	
13	Tube gasket	R: NBR	
		V: FKM	
14	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 ①, ②, ③ 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 ①, ②, ③. 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.

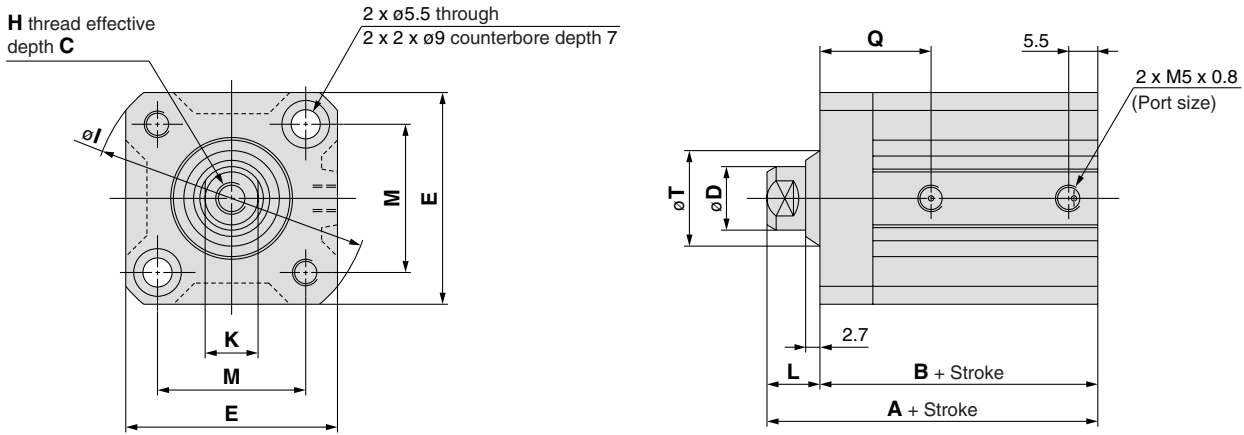
* Since the seal kit does not include a grease pack, order it separately.

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

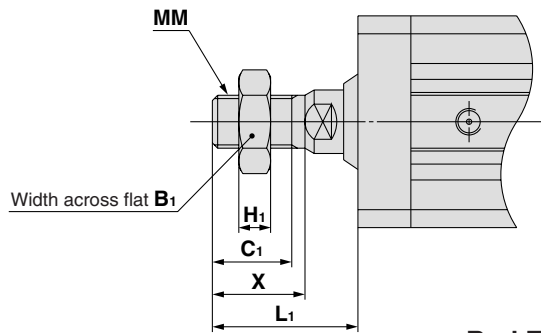
Dimensions

Ø20, Ø25/Without Auto Switch

Standard (Through-hole): CQ2B



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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.

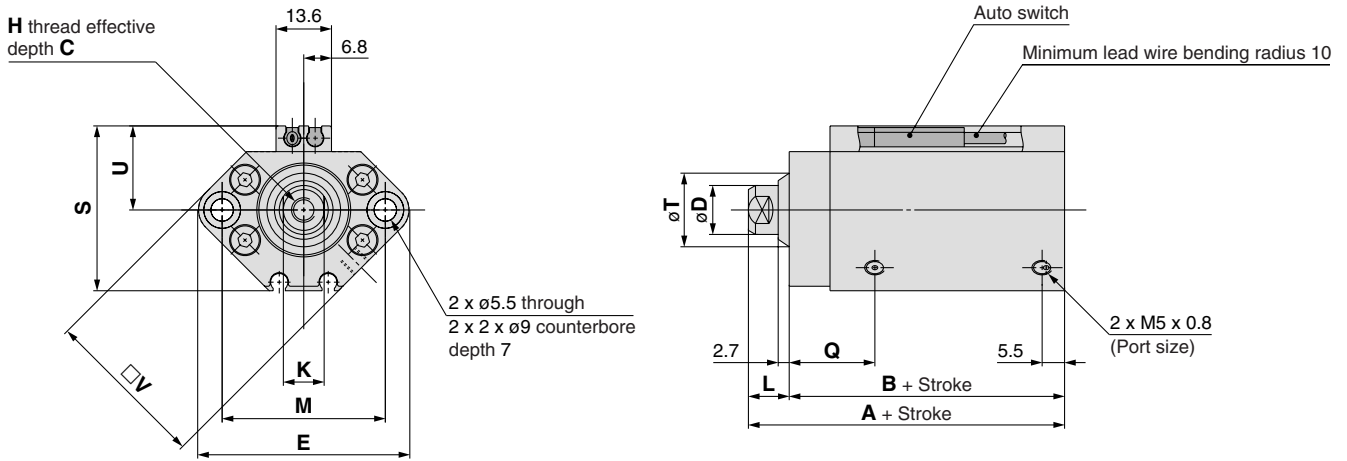
Standard
Large Bore Size
Long Stroke
Non-rotating Rod
Axial Piping
Anti-lateral Load
With End Lock
Water Resistant
With Auto Switch
Auto Switch
Made to Order

Series CQ2

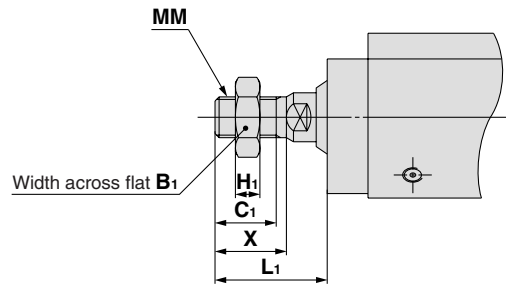
Dimensions

Ø20, Ø25/With Auto Switch

Standard (Through-hole): CDQ2B



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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.

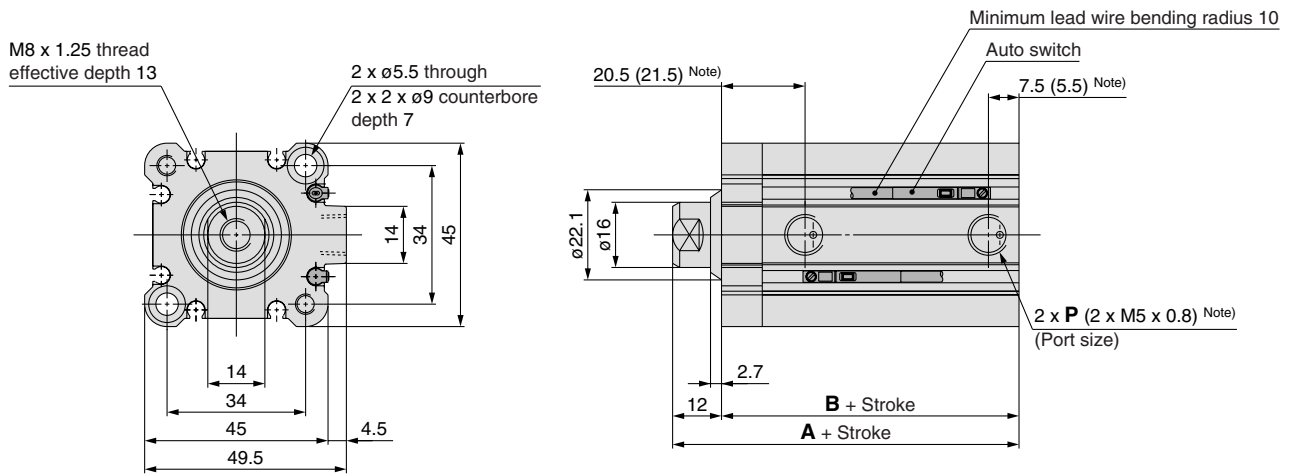
* Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

Compact Cylinder: Water Resistant Double Acting, Single Rod *Series CQ2*

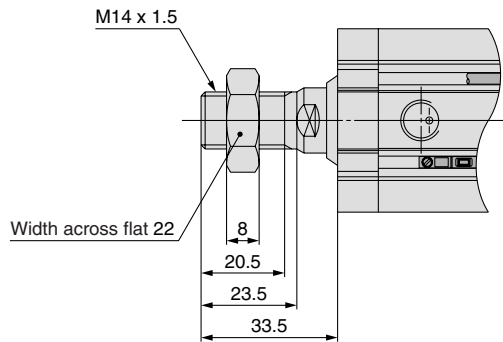
Dimensions

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

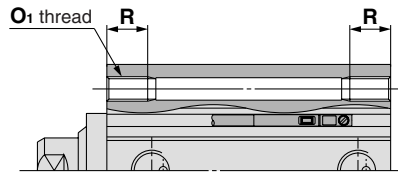
Dimensions

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.)

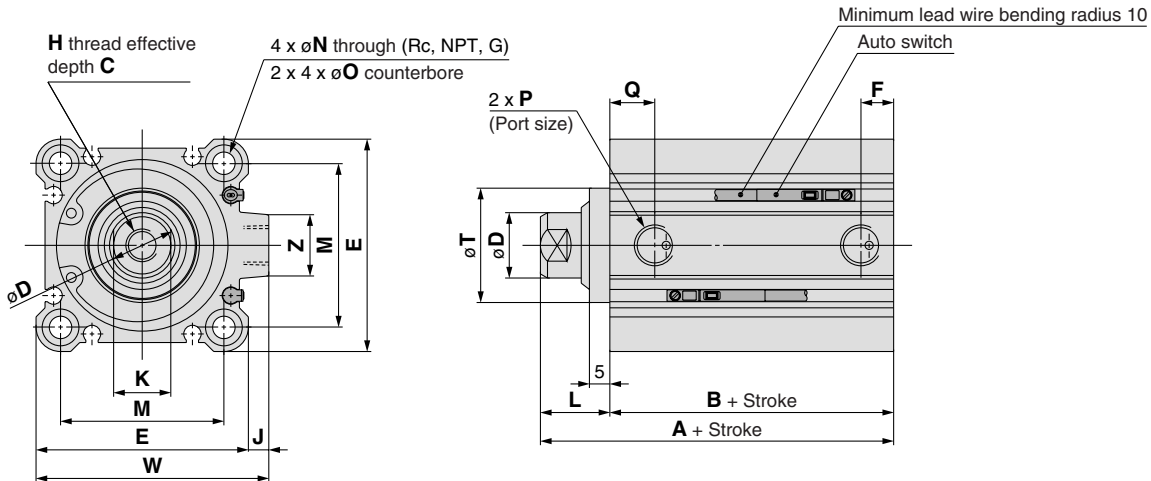
Both ends tapped: CQ2A/CDQ2A

Standard (Through-hole): CQ2B/CDQ2B

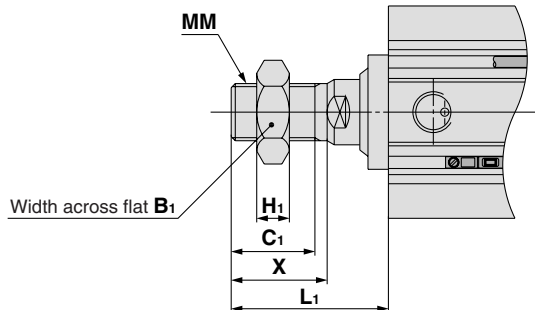


Both Ends Tapped (mm)

Bore size (mm)	O ₁	R
40	M6 x 1.0	10
50	M8 x 1.25	14



Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	B ₁	C ₁	H ₁	L ₁	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. (mm)

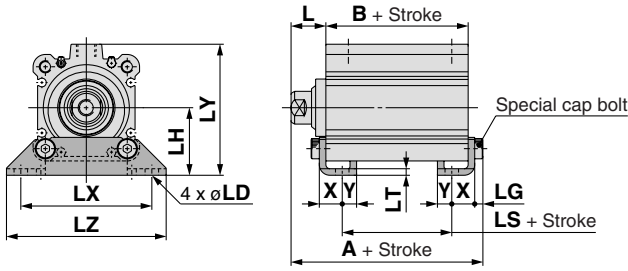
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	T	W	Z
		A	B	A	B																
40	5 to 50	46.5	29.5	56.5	39.5	13	16	52	8	M8 x 1.25	5	14	17	40	5.5	9 depth 7	1/8	11	28	57	15
	75, 100	56.5	39.5																		
50	10 to 50	48.5	30.5	58.5	40.5	15	20	64	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.

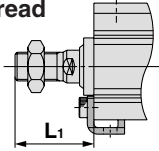
Note 2) Refer to page 157 for the calculation on the longitudinal dimension of intermediate strokes.

Compact Cylinder: Water Resistant Double Acting, Single Rod *Series CQ2*

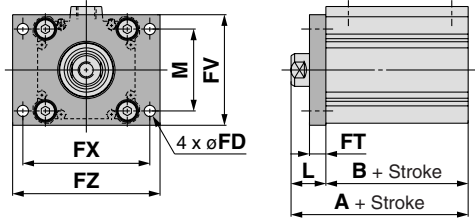
Foot: CQ2L/CDQ2L



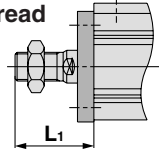
Rod end male thread



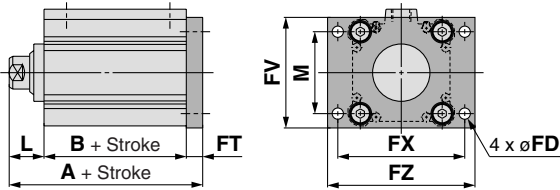
Rod flange: CQ2F/CDQ2F



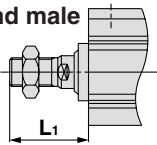
Rod end male thread



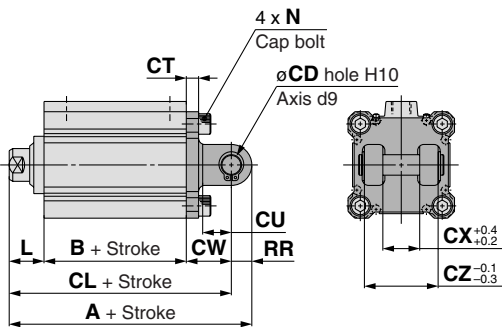
Head flange: CQ2G/CDQ2G



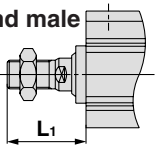
Rod end male thread



Double clevis: CQ2D/CDQ2D



Rod end male thread



Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			(mm)		
		A	B	LS	A	B	LS	L	L ₁	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						

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 ₁	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)	(mm)	
		Without auto switch	With auto switch
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 ₁	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.

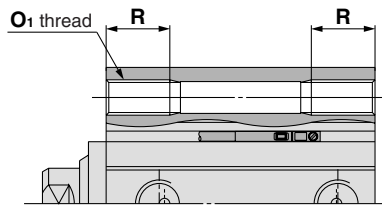
Series CQ2

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.)

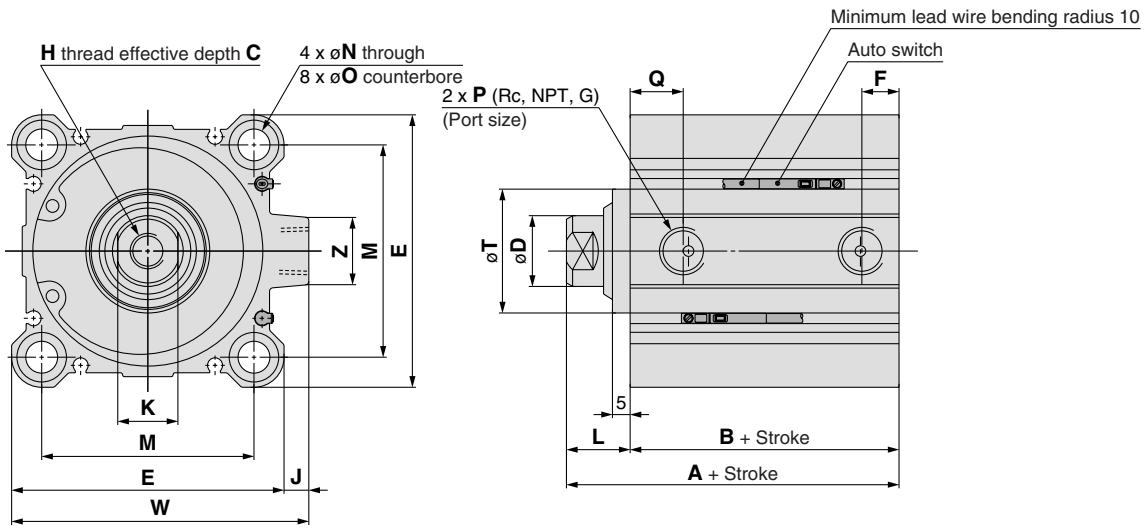
Both ends tapped: CQ2A/CDQ2A



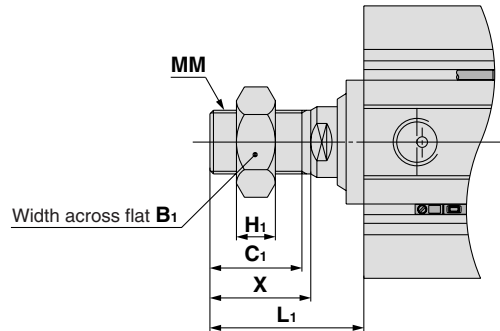
Both Ends Tapped

Bore size (mm)	O ₁	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 ₁	C ₁	H ₁	L ₁	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.

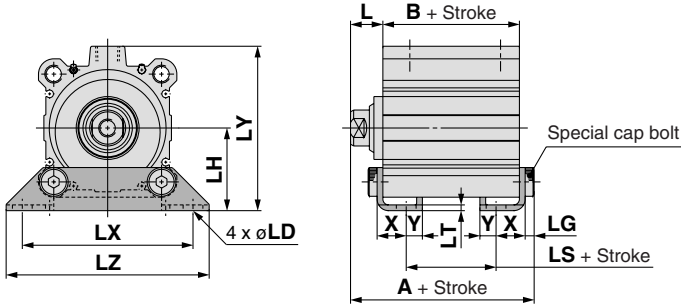
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		C	D	E	F	H	J	K	L	M	N	O	P	Q	T
		A	B	A	B														
63	10 to 50	54	36	64	46	15	20	77	10.5	M10 x 1.5	7	17	18	60	9	14 depth 10.5	1/4	15	35
	75, 100	64	46																
80	10 to 50	63.5	43.5	73.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	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																

(mm)

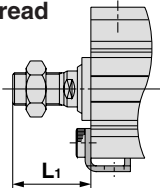
Bore size (mm)	W	Z
63	84	19
80	104	25
100	123.5	25

* 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.

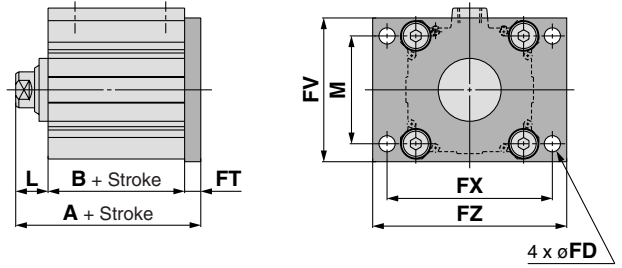
Foot: CQ2L/CDQ2L



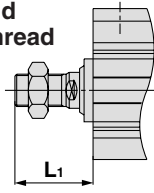
Rod end male thread



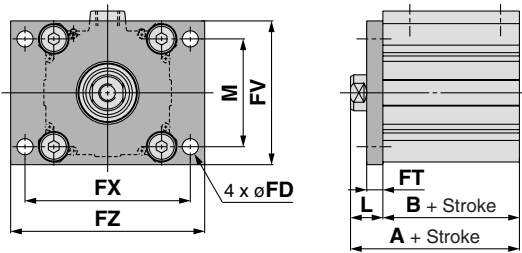
Head flange: CQ2G/CDQ2G



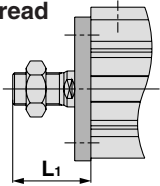
Rod end male thread



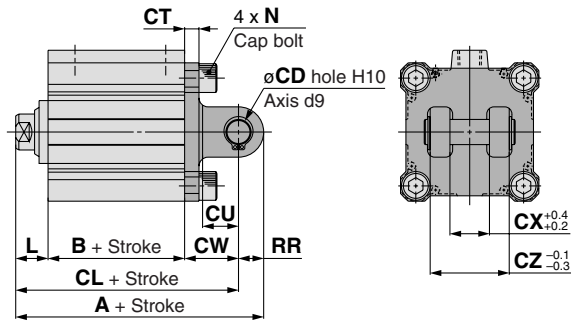
Rod flange: CQ2F/CDQ2F



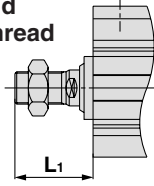
Rod end male thread



Double clevis: CQ2D/CDQ2D



Rod end male thread



Foot (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	L ₁	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 ₁	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 (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 ₁	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

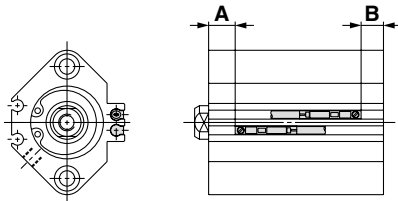
Compact Cylinder Series **CDQ2** With Auto Switch 1

1 Auto Switch Proper Mounting Position (Detection at Stroke End) and its Mounting Height

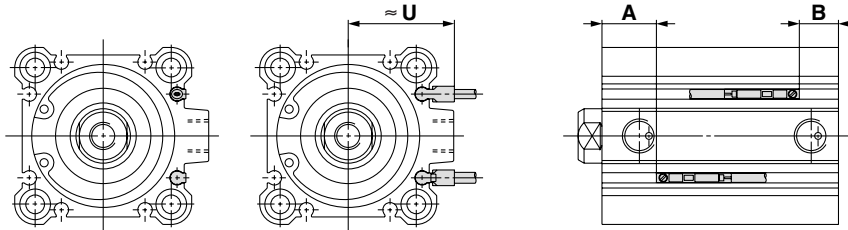
Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/□T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant)

D-A9□
D-M9□
D-M9□W
D-M9□AL
D-A9□V
D-M9□V
D-M9□WV
D-M9□AVL

ø12 to ø25



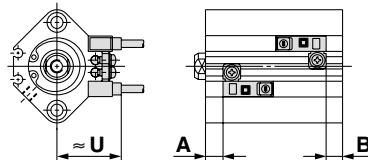
ø32 to ø200



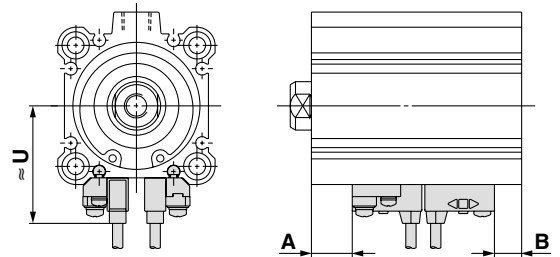
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F

D-F7NTL
D-F7BAL
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V
D-F7BAVL

ø12 to ø25

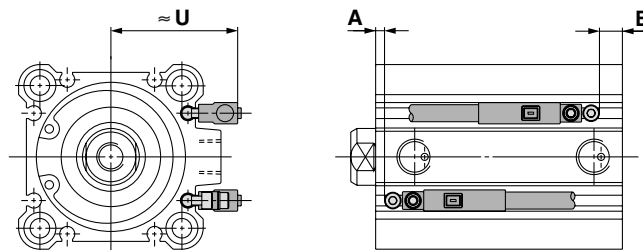


ø32 to ø160



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
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
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
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)

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□	(mm)
									With 1 pc.
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 2 pcs.	5	10	15	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)

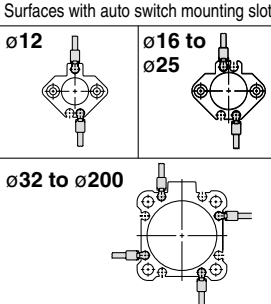
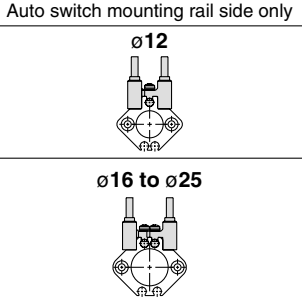
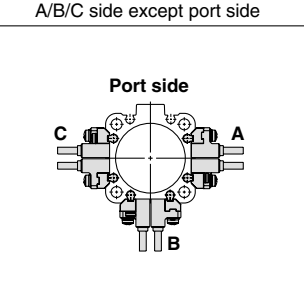
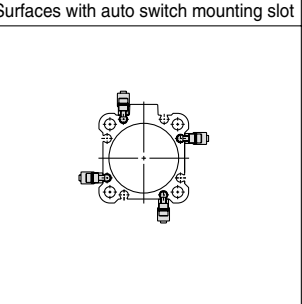
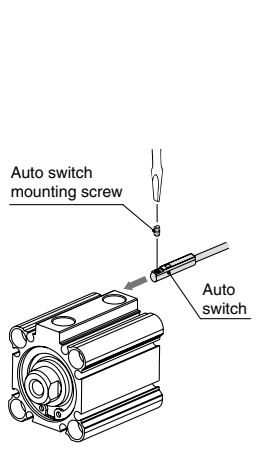
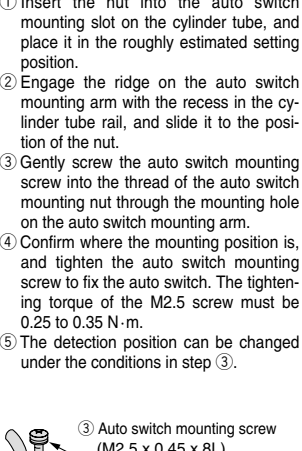
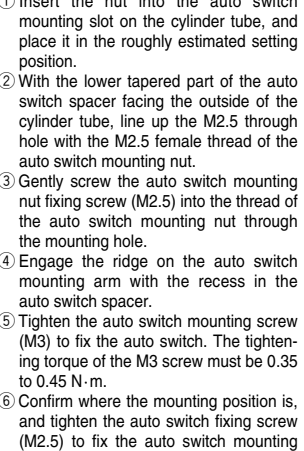
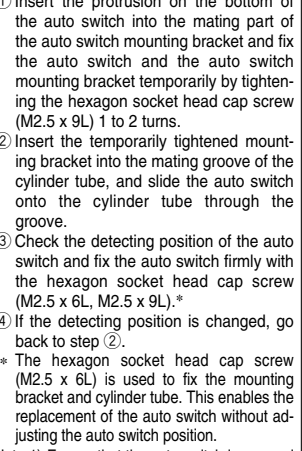
Auto switch model	Bore size														
	12	16	20	25	32	40	50	63	80	100	125	140	160	180	200
D-A9□(V)	7.5	9.5	10	9	9	9.5	9.5	11	10.5	10.5	13.5	12.5	12	13	12.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L*	3	5	5.5	5.5	5	5	6	6.5	7	7.5	7.5	8	7.5	7.5	8.5
D-A7□(H)(C) D-A80□(H)(C)	9.5	12	12	11	10.5	11.5	11	13	11.5	11.5	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 ø160	ø32 to ø100								
Auto switch mounting bracket part no.	—	BQ4-012	BQ5-032	BQ3-032S								
Auto switch mounting bracket fitting parts lineup/Weight	—	<ol style="list-style-type: none"> Auto switch mounting screw (M2.5 x 8L) Auto switch mounting nut Weight: 1.5 g	<ol style="list-style-type: none"> Auto switch fixing screw (M2.5 x 10L) Auto switch mounting screw (M3 x 8L) Auto switch spacer Auto switch mounting nut Weight: 3.5 g	<ol style="list-style-type: none"> Hexagon socket head cap screw (M2.5 x 6L) Hexagon socket head cap screw (M2.5 x 9L) Auto switch mounting bracket (nut) Weight: 2.5 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 	Surfaces with auto switch mounting slot 								
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>Tightening torque for auto switch mounting screw (N·m)</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="3">0.05 to 0.15</td> </tr> <tr> <td>D-M9□W(V)</td> </tr> <tr> <td>D-M9□A(V)L</td> </tr> <tr> <td>D-A9□(V)</td> <td>0.10 to 0.20</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	D-A9□(V)	0.10 to 0.20	<ol style="list-style-type: none"> Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. 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. 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. 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. The detection position can be changed under the conditions in step ③.  <p>③ Auto switch mounting screw (M2.5 x 0.45 x 8L)</p> <p>② Auto switch</p> <p>① Auto switch mounting bracket (nut)</p>	<ol style="list-style-type: none"> Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. 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. Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. 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. 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. The detection position can be changed under the conditions in step ⑤.  <p>⑤ Auto switch mounting screw (M3 x 0.5 x 8L)</p> <p>④ Auto switch</p> <p>③ Auto switch fixing screw (M2.5 x 0.45 x 10L)</p> <p>② Auto switch spacer</p> <p>① Auto switch mounting bracket (nut)</p>	<ol style="list-style-type: none"> 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. 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. 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)*. If the detecting position is changed, go back to step ②. <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>  <p>Hexagon socket head cap screw (M2.5 x 9L)</p> <p>Hexagon socket head cap screw (M2.5 x 6L)</p> <p>Protrusion</p> <p>Auto switch mounting bracket</p>
Auto switch model	Tightening torque											
D-M9□(V)	0.05 to 0.15											
D-M9□W(V)												
D-M9□A(V)L												
D-A9□(V)	0.10 to 0.20											

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.

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-color indication)	
	D-A73C	Connector (Perpendicular)	—	
	D-A80C		Without indicator light	
	D-A72H		—	
	D-A73H, A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	
	D-F7NWV, F7BWV		Diagnostic indication (2-color indication)	
	D-F7BAVL		Water resistant (2-color indication)	
	D-J79C	Connector (Perpendicular)	—	
	D-F79, F7P, J79	Grommet (In-line)	—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	
	D-F7BAL		Water resistant (2-color indication)	
	D-F79F		Diagnostic indication (2-color 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.

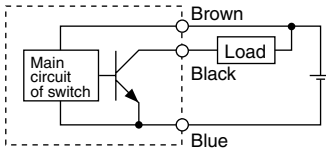
* Trimmer auto switch (D-F7K) and heat resistant solid state auto switch (D-F7NJL) are not available.

Prior to Use

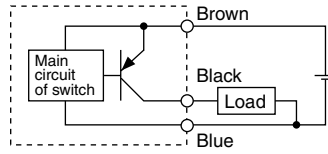
Auto Switch Connection and Example

Basic Wiring

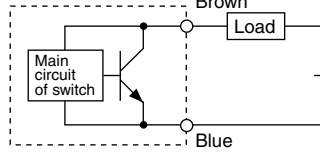
Solid state 3-wire, NPN



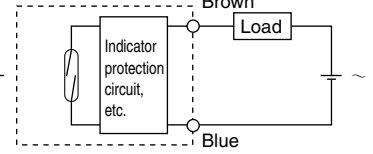
Solid state 3-wire, PNP



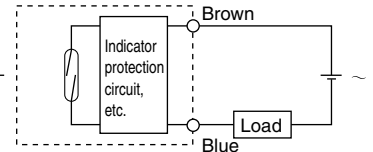
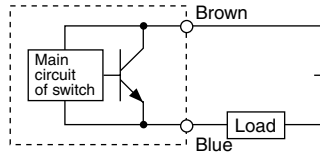
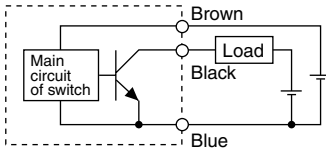
2-wire (Solid state)



2-wire (Reed)

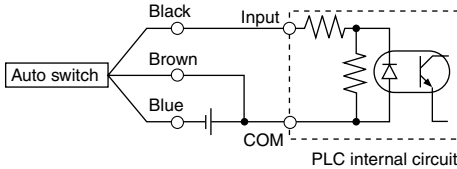


(Power supply for switch and load are separate.)

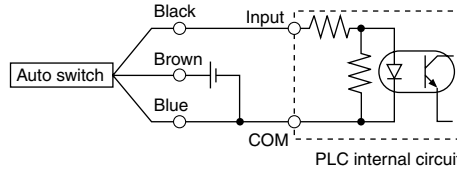


Example of Connection with PLC (Programmable Logic Controller)

• Sink input specifications 3-wire, NPN

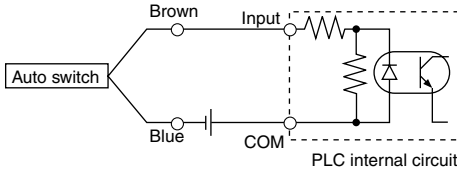


• Source input specifications 3-wire, PNP

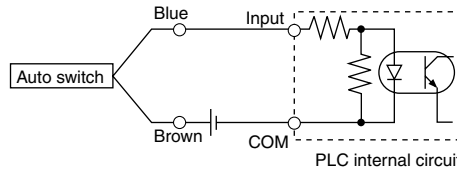


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

2-wire



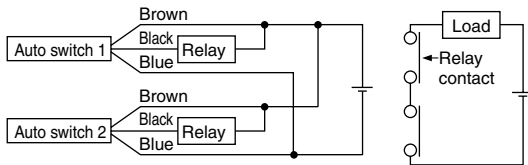
2-wire



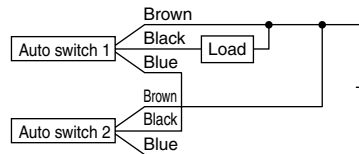
Example of AND (Series) and OR (Parallel) Connection

• 3-wire

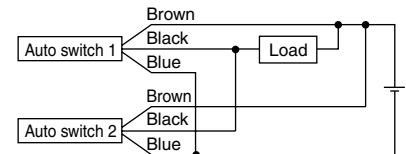
AND connection for NPN output (Using relays)



AND connection for NPN output (Performed with auto switches only)



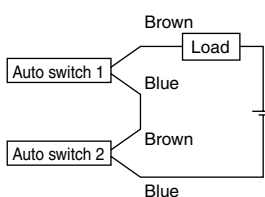
OR connection for NPN output



The indicator lights will light up when both of the auto switches are in the ON state.

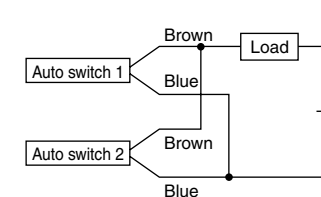
• 2-wire

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.

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.

(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.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply voltage 24 VDC
Auto switch internal voltage drop 4 V

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance 3 kΩ
Auto switch leakage current 1 mA

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)		CQ2 (Long Stroke)			CQ2K (Non-rotating Rod)			CQP2 (Axial Piping) ^{Note 2)}			CQ2□S (Anti-lateral Load)	CBQ2 (With End Lock) ^{Note 2)}	Page
		Double acting		Single acting		Double acting		Double acting			Single acting			Double acting	Double acting				
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod	Single rod	Double rod	Single rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Single rod					
-XA1 to 30	Special rod end shape	●	●	●				●	●	●	●	●	●	●	●			P.179	

Made to Order

Symbol	Specifications	CQ2 (Standard)				CQ2 (Large Bore Size)		CQ2 (Long Stroke)			CQ2K (Non-rotating Rod)			CQP2 (Axial Piping)			CQ2□S (Anti-lateral Load)	CBQ2 (With End Lock)	Page
		Double acting		Single acting		Double acting		Double acting			Single acting			Double acting	Double acting				
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod	Single rod	Double rod	Single rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Single rod					
-XB6	Heat resistant cylinder (-10 to 150°C)	●	●															P.183	
-XB7	Cold resistant cylinder (-40 to 70°C)	●	●															P.183	
-XB9	Low-speed cylinder (10 to 50 mm/s)	●	●															P.184	
-XB10	Intermediate stroke (Exclusive body type)	●	●	●		●	●	●	●	●	●				●			P.185	
-XB10A	Intermediate stroke (Spacer-installed type) ^{Note 3)}	●	●															P.186	
-XB11	Long stroke (Air-hydro type only)	●	●															P.187	
-XB13	Low-speed cylinder (5 to 50 mm/s)	●	●															P.187	
-XB14	Cylinder with heat resistant auto switch ^{Note 2)}	●	●															P.188	
-XC4	With heavy-duty scraper	●	●					●	●	●								P.189	
-XC6	Piston rod/Retaining ring/Rod end nut material: Stainless steel	●	●	●	●			●	●	●	●	●	●	●				P.190	
-XC8	Adjustable stroke cylinder/Adjustable extension type	●	●						●	●								P.191	
-XC9	Adjustable stroke cylinder/Adjustable retraction type	●	●						●	●								P.192	
-XC10	Dual stroke cylinder/Double rod	●	●						●	●								P.193	
-XC11	Dual stroke cylinder/Single rod	●	●						●	●								P.194	
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers	●	●	●	●			●	●	●	●	●	●	●	●	●	●	P.195	
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304	●	●	●	●			●	●	●	●	●	●	●	●	●	●	P.196	
-XC35	With coil scraper	●	●						●	●								P.197	
-XC36	With boss on rod end	●	●	●	●				●	●	●	●	●	●				P.197	
-X144	Special port location	●	●	●	●													P.198	
-X202	Full length dimension is the same as Series CQ1.	●	●	●	●													P.199	
-X203	L dimension from rod cover is the same as Series CQ1.	●	●	●	●													P.201	
-X235	Special rod end for double rod cylinder	●	●					●	●									P.202	
-X271	Fluororubber seals	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	P.202	
-X293	Full length dimension is the same as Series CQ1W.	●	●															P.203	
-X525	Long stroke of adjustable extension stroke cylinder (-XC8)	●	●															P.204	
-X526	Long stroke of adjustable retraction stroke cylinder (-XC9)	●	●															P.205	
-X633	Intermediate stroke of double rod cylinder	●	●					●	●									P.205	
-X636	Long stroke of dual stroke single rod cylinder	●	●															P.206	
-X1876	Cylinder tube: With concave boss on head end	●	●	●	●													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

Symbol
-XA1/2/6/7/11/17/18

Applicable Series

Series	Model	Action	Special rod end shape/Symbol
CQ2 (ø12 to ø25)	Standard	CQ2	Double acting, Single rod ^{Note)} XA1 XA2
		CQ2W	Single acting (Spring return) XA6
	Non-rotating rod	CQ2K	Double acting, Double rod XA7
		CQ2KW	Double acting, Single rod XA11 XA17
	Axial piping (Centralized piping type)	CQP2	Double acting, Double rod XA18
			Double acting, Single rod ^{Note)} Single acting (Spring return/extend)

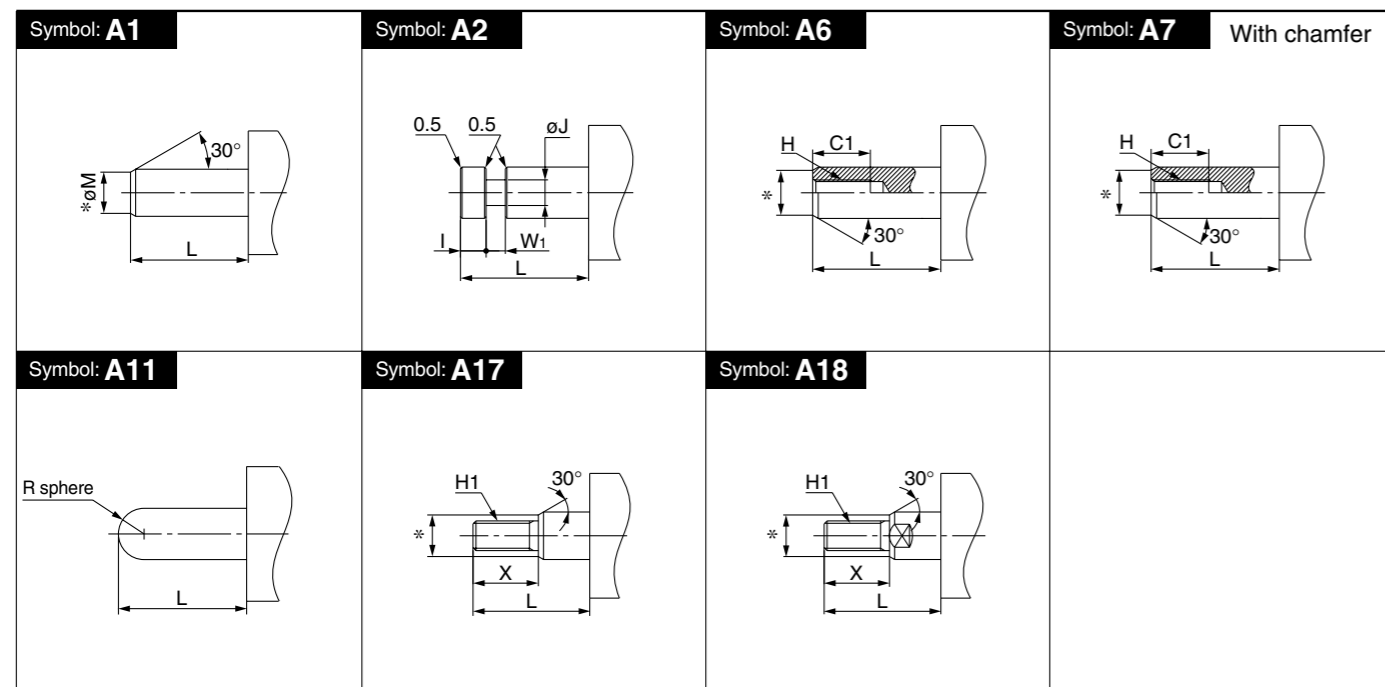
Note) Except ø12, with rubber bumper (CQ2□12-DC, CQ2P□12-DC)

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).
ø12, ø16 → D - 1 mm ø20, ø25 → D - 2 mm
Enter any special dimension you desire.
- 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.

Conditions of Manufacture

Special rod end shape/Symbol	Single rod		Double rod	
	For ø12	For ø16, ø20, ø25	For ø12	For ø16, ø20, ø25
XA1	ø12	øM: 3 mm or more 5 mm or less	øM: ø5 mm or less	øM: ø7 mm or less
	ø16	øM: 3 mm or more 7 mm or less	øM: ø7 mm or less	øM: ø8 mm or less
	ø20	øM: 4 mm or more 8 mm or less	øM: ø8 mm or less	øM: ø10 mm or less
	ø25	øM: 4 mm or more 10 mm or less	øM: ø10 mm or less	
XA2	For ø12	øJ: 4 mm or more, W1: 6 mm or less	øJ: 3 mm or more, W1: 6 mm or less	øJ: 4 mm or more, W1: 6 mm or less
	ø16	øJ: 4 mm or more, W1: 6 mm or less	øJ: 4 mm or more, W1: 6 mm or less	øJ: 5 mm or more, W1: 11 mm or less
	ø20	øJ: 5 mm or more, W1: 11 mm or less	øJ: 5 mm or more, W1: 11 mm or less	øJ: 6 mm or more, W1: 13 mm or less
	ø25	øJ: 6 mm or more, W1: 13 mm or less	øJ: 6 mm or more, W1: 13 mm or less	
XA6	For ø12	H: M4 or less	H: M4 or less	H: M4 or less
	ø16	H: M6 or less	H: M6 or less	H: M6 or less
	ø20	H: M6 or less	H: M6 or less	H: M6 or less
	ø25	H: M8 or less	H: M8 or less	H: M8 or less
XA7	For ø12	H: M4 or less	H: M4 or less	H: M4 or less
	ø16	H: M5 or less	H: M5 or less	H: M5 or less
	ø20	H: M6 or less	H: M6 or less	H: M6 or less
	ø25	H: M8 or less	H: M8 or less	H: M8 or less
XA11	For ø12	SR3 mm only	SR3 mm or more	SR3 mm or more
	ø16	SR4 mm only	SR4 mm or more	SR4 mm or more
	ø20	SR5 mm only	SR5 mm or more	SR5 mm or more
	ø25	SR6 mm only	SR6 mm or more	SR6 mm or more
XA17	For ø12	H: M5 or more, X: 20 mm or less	H: M5 or less	H: M5 or less
	ø16	H: M6 or more, X: 22.5 mm or less	H: M6 or less	H: M6 or less
	ø20	H: M8 or more, X: 26.5 mm or less	H: M8 or less	H: M8 or less
	ø25	H: M10 or more, X: 33 mm or less	H: M10 or less	H: M10 or less
XA18	For ø12	H: M5 or more, X: 20 mm or less	H: M5 or less	H: M5 or less
	ø16	H: M6 or more, X: 22.5 mm or less	H: M6 or less	H: M6 or less
	ø20	H: M8 or more, X: 26.5 mm or less	H: M8 or less	H: M8 or less
	ø25	H: M10 or more, X: 33 mm or less	H: M10 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

Symbol
-XA1 to XA23/-XA26 to XA30

Applicable Series

Series	Model	Action	Special rod end shape/Symbol
CQ2	Standard	CQ2	Double acting, Single rod ^{Note}
		CQ2W	Single acting (Spring return)
	Non-rotating rod	CQ2K	Double acting, Double rod ^{Note}
		CQ2KW	Double acting, Double rod
	Axial piping (Centralized piping type)	CQP2	Double acting, Single rod
	Anti-lateral load	CQ2S	Single acting (Spring return/extend)
		Double acting, Single rod	XA1 to 23 XA26 to 30

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: A1 	Symbol: A2 	Symbol: A3 	Symbol: A4
Symbol: A5 	Symbol: A6 	Symbol: A7 	Symbol: A8
Symbol: A9 	Symbol: A10 	Symbol: A11 	Symbol: A12

Symbol: A13 	Symbol: A14 	Symbol: A15 	Symbol: A16
Symbol: A17 	Symbol: A18 	Symbol: A19 	Symbol: A20
Symbol: A21 	Symbol: A22 	Symbol: A23 	Symbol: A26
Symbol: A27 	Symbol: A28 	Symbol: A29 	Symbol: A30

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



- 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.

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

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

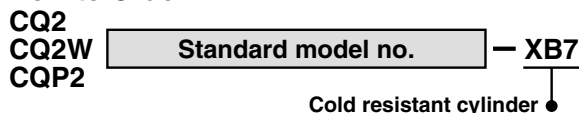
-XB7 Cold Resistant Cylinder (-40 to 70°C)

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



- 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.

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

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

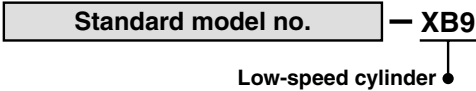
Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod
		CQ2W	Double acting, Double rod
	Axial piping	CQP2	Double acting, Single rod

How to Order

C□Q2

C□Q2W

C□QP2



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.



Made to Order **Series CQ2**

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 Single acting (Spring return)	
		CQ2W	Double acting, Double rod	
	Large bore size	CQ2	Double acting, Single rod	Except ø12 to ø32
		CQ2W	Double acting, Double rod	
	Long stroke	CQ2	Double acting, Single rod	
	Non-rotating rod	CQ2K	Double acting, Single rod	
CQ2KW		Double acting, Double rod		
Anti-lateral load	CQ2□S	Double acting, Single rod		

How to Order

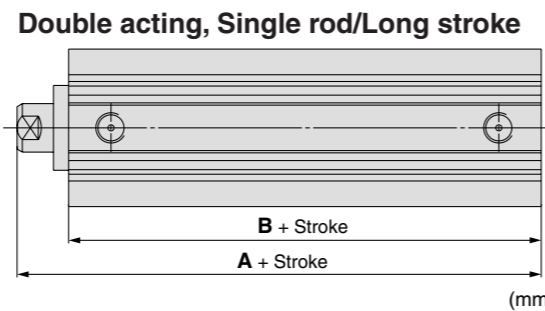
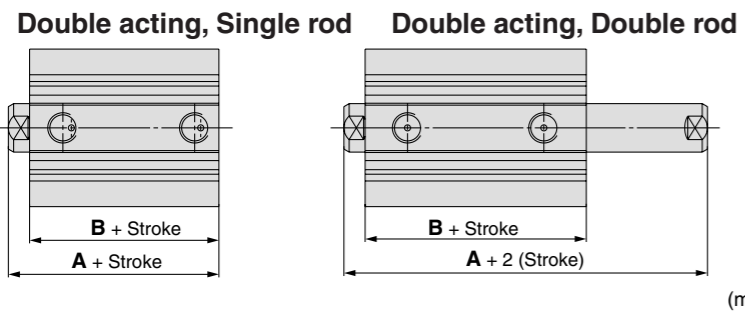
- C□Q2
- C□Q2W
- C□Q2K
- C□Q2KW
- C□Q2□S

Standard model no. — **XB10**

Intermediate stroke ●

Specifications: Same as standard

Dimensions: Series CQ2



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)	

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	

* 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)	

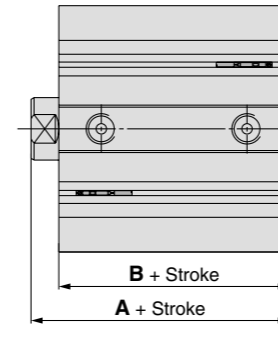
Bore size (mm)	Single rod (Single acting/Spring return)		Applicable stroke range
	A	B	
12	20.5 (31.5)	17 (28)	6 to 9
16	22 (34)	18.5 (30.5)	
20	24 (36)	19.5 (31.5)	6 to 9
25	27.5 (37.5)	22.5 (32.5)	
32	30 (40)	23 (33)	6 to 9
40	36.5 (46.5)	29.5 (39.5)	
50	38.5 (48.5)	30.5 (40.5)	11 to 19



Symbol
-XB10

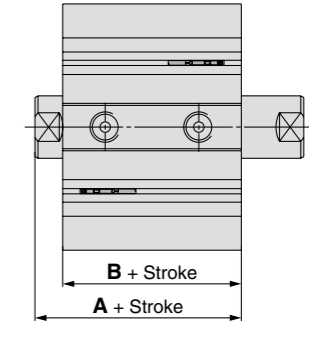
Dimensions: Series CQ2

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	

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

* 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		⊙	●	⊙	●	⊙	●	—	◆	⊙	●	⊙	●	⊙	●	⊙	●	—	◆

Note) Specify a spacer-installed type 1 with standard model number on page 3 for ordering intermediate stroke with a * mark.

Specifications: Same as standard

How to Order

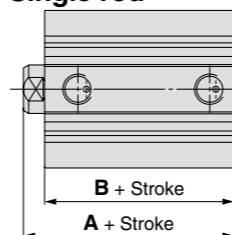
C□Q2 Standard model no. — **XB10 A**

Intermediate stroke ● Spacer-installed type

Order no. **CQ2B32-57DZ-XB10A** (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	51 to 54	56 to 59	61 to 64	66 to 69	76 to 79	81 to 84	86 to 89	91 to 94
32	95	100	105	110	120	125	130	135	88	93	98	103	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	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	120.5	125.5	130.5	135.5
63	109	114	119	124	134	139	144	149	101	106	111	116	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	133.5	138.5	143.5	148.5
100	130	135	140	145	155	160	165	170	118	123	128	133	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_Z, 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

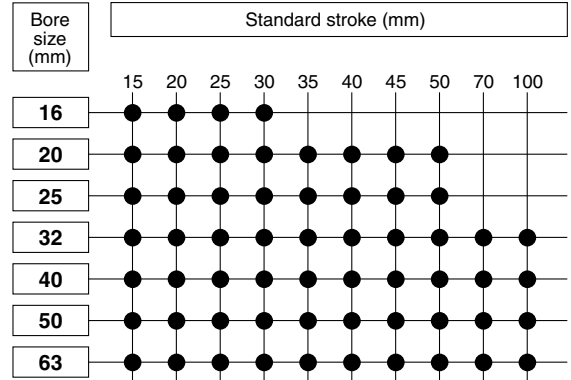
CDQ2 **Standard model no.** — F7NJL — XB14

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

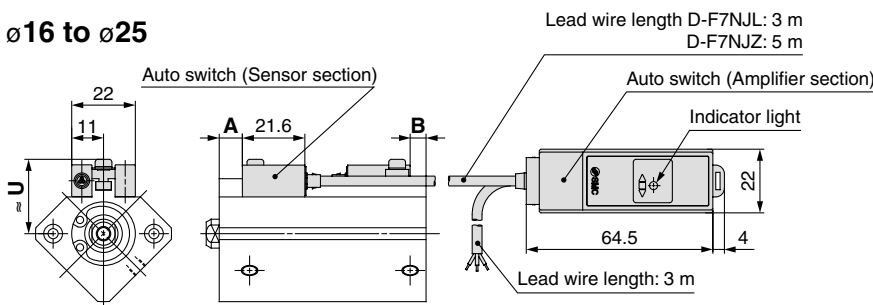


• Manufacture of intermediate strokes
Intermediate strokes in 1 mm intervals are available by installing a spacer in the standard stroke cylinder.

Note) Refer to page 1319 in Best Pneumatics No. 2 for further information on auto switches.

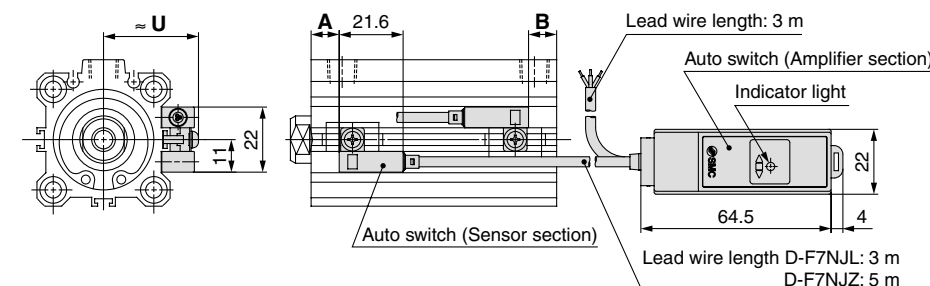
Auto Switch Proper Mounting Position (Detection at Stroke End)

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

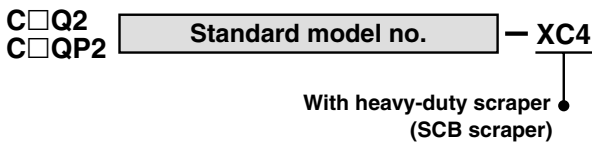
-XC4 With Heavy-Duty Scraper

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
		CQ2W	Double acting, Double rod
	Long stroke	CQ2	Double acting, Single rod
	Axial piping	CQP2	Double acting, Single rod

How to Order



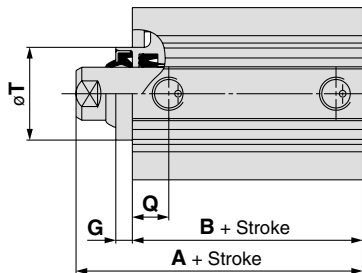
Specifications: Same as standard

⚠ Caution

Do not replace heavy-duty scrapers.

- Since heavy-duty scrapers are press-fit, replace the entire rod cover assembly.

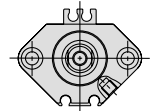
Series CQ2



- (): Dimensions with auto switch
 - The other dimensions are the same as those of the standard, CQ2 series.
 - $\phi 32$, without switch, 5 mm stroke: Q-dimension is 21.5
 - Relation between $\phi 12$ to $\phi 32$ 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: $\phi 20$ to $\phi 32$
With switch: $\phi 32$



With switch: $\phi 20$, $\phi 25$

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	
		CQ2	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^R

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□ ^R ∇	Double acting, Single rod
	Water resistant, axial piping	C□QP2□ ^R ∇	Double acting, Single rod

How to Order

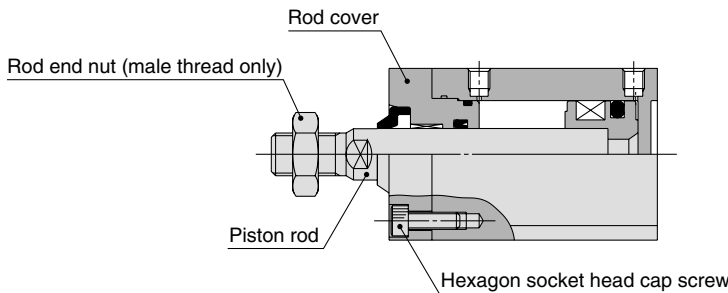
- C□Q2□^R∇
- C□QP2□^R∇

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

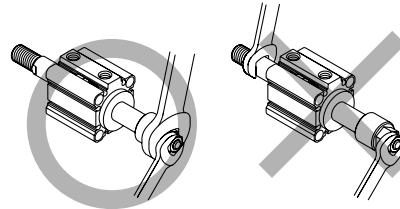
Series	Stroke adjustment range (mm)
CQ2	0 to 10

Note) The specifications other than above are the same as those of the standard.

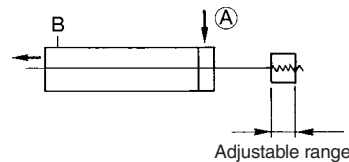
Precautions

Warning

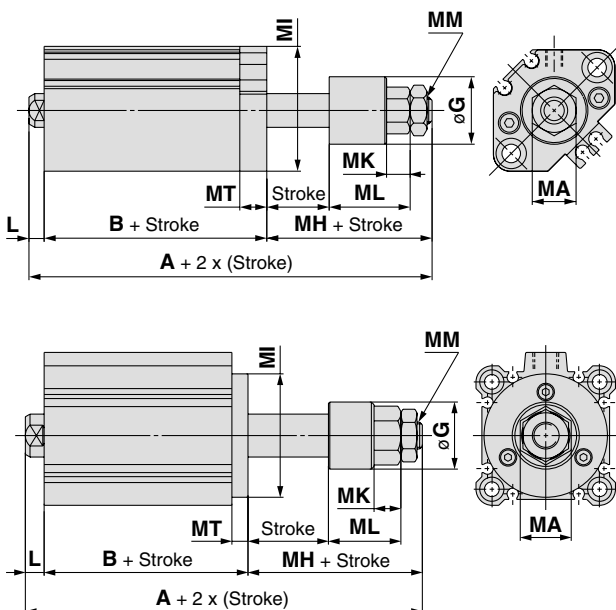
- When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
- To adjust 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	(mm)												
	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

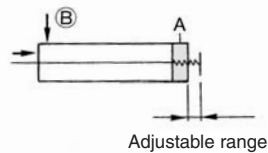
Note) The specifications other than above are the same as those of the standard.

Precautions

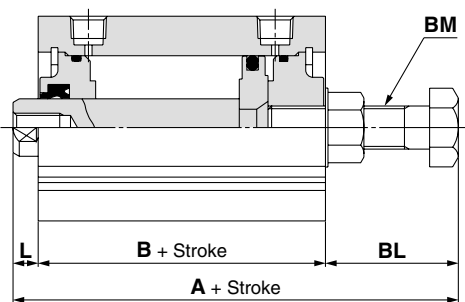
Warning

- 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	
50	84.5 (94.5)	40.5 (50.5)	8	36	M12 x 1.5	10 to 50
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	
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

Q2B Q2K **Bore size** - **Stroke S₁** + **Stroke S₂** **D(C)(M)(Z) - XC10**
 Dual stroke cylinder

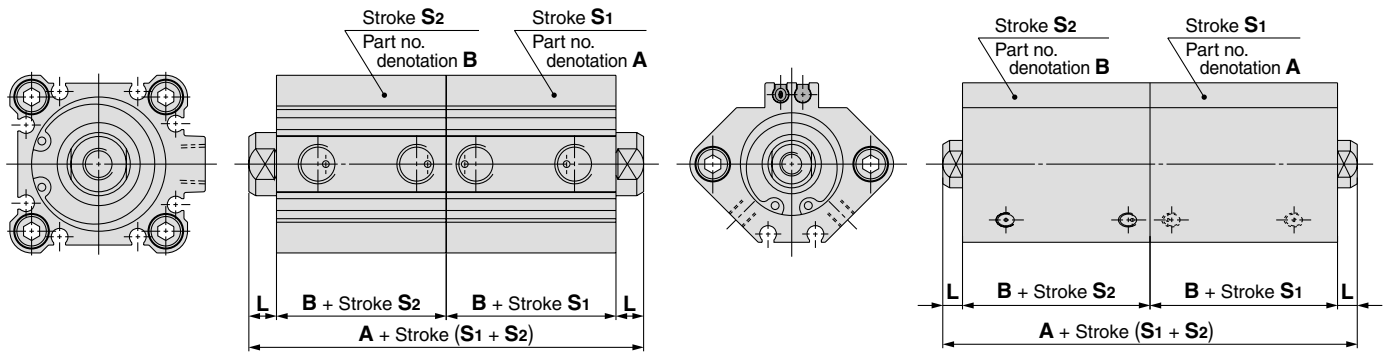
Specifications

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 ₁ , S ₂
	50 st or less	75, 100 st	50 st or less	75, 100 st		
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	
25	55 (75)	—	22.5 (32.5)	—	5	5 to 50
32	60 (80)	80 (80)	23 (33)	33 (33)	7	
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	CQ2	Double acting, Single rod	Except with bracket
	Air-hydro type	CQ2H		

How to Order

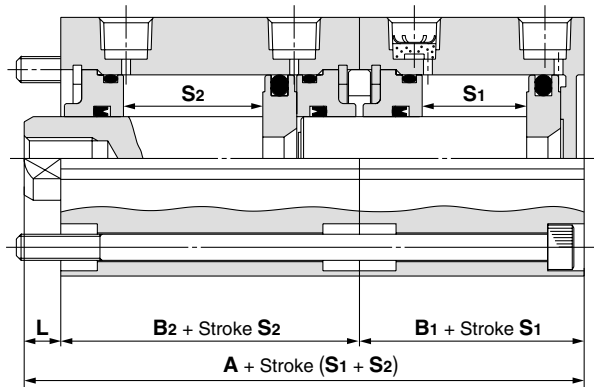
C□Q2B **Bore size** - **Stroke S₁** + **Stroke S₂ - S₁** D(C)(M)(Z) - **XC11**
 Dual stroke cylinder/Single rod

Specifications: Same as standard

(For manufacturable strokes, please contact SMC.)

Construction/Dimensions

Series CQ2



Bore size (mm)	A	B ₁	B ₂	L	Stroke Both of S ₁ , S ₂
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	5 to 50
25	56.5 (76.5)	22.5 (32.5)	29 (39)	5	
32	60.5 (80.5)	23 (33)	30.5 (40.5)	7	10 to 50
40	76.5 (96.5)	29.5 (39.5)	40 (50)	7	
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	10 to 50
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

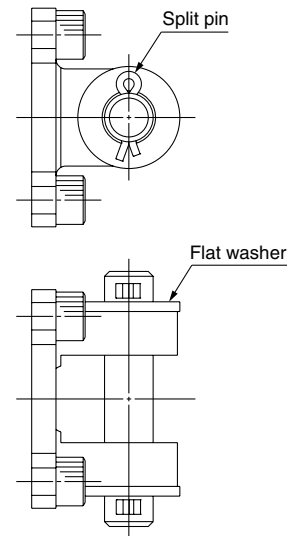
Series	Model	Action	
CQ2	Standard	Double acting, Single rod	
		Single acting (Spring return/extend)	
	Long stroke	CQ2□	Double acting, Single rod
	Non-rotating rod	CQ2K	Double acting, Single rod
	Anti-lateral load	CQ2□S	Double acting, Single rod
	With end lock	CBQ2	Double acting, Single rod
	Magnetic 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

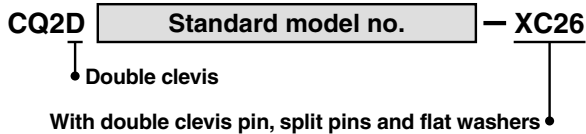
Dimensions: Same as Standard

Double clevis

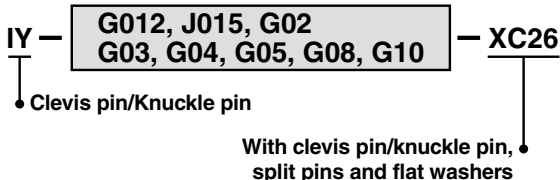
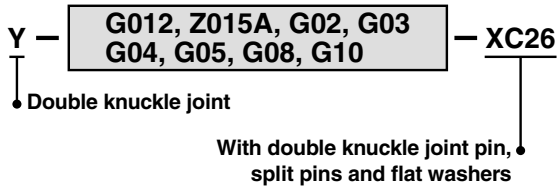
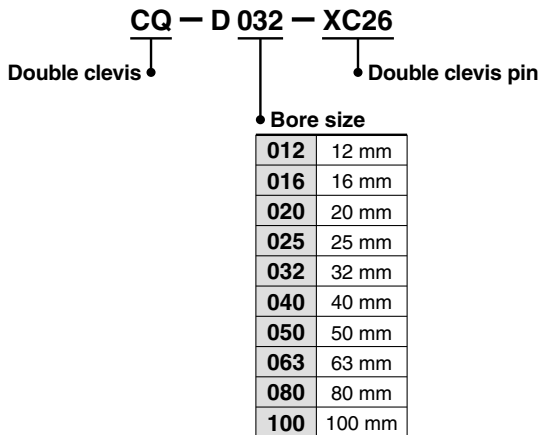


How to Order

● Product

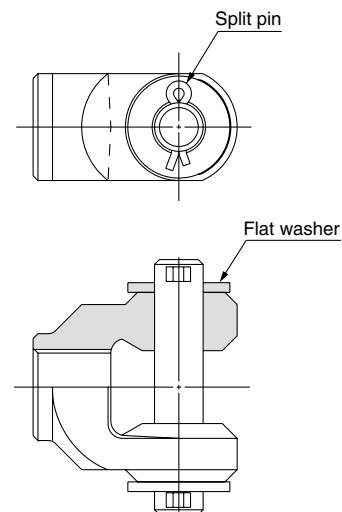


● Parts assembly



* 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.

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 (split pin) 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

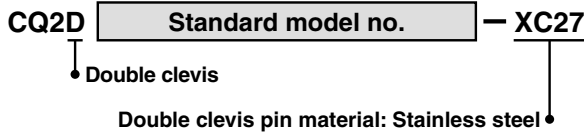
Mounting	Double clevis (D) only
Pin material	Stainless steel 304
Specifications other than above	Same as standard

Dimensions: Same as Standard

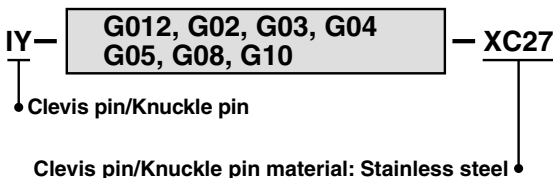
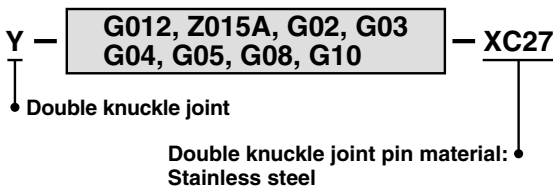
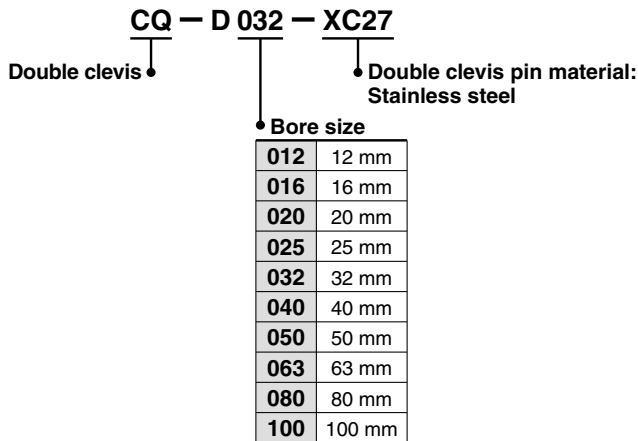
* For mounting bracket, clevis pin/knuckle pin and retaining rings are shipped together, (but not assembled).
 * Mounting method is the same as standard.

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	Applicable to $\phi 32$ to $\phi 100$, Except with bracket
		CQ2W	
	Axial piping	CQP2	

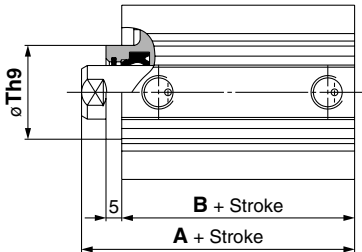
How to Order

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 ⁰ _{-0.052}
40	41.5 (51.5)	51.5 (51.5)	29.5 (39.5)	39.5 (39.5)	28 ⁰ _{-0.052}
50	43.5 (53.5)	53.5 (53.5)	30.5 (40.5)	40.5 (40.5)	35 ⁰ _{-0.062}
63	49 (59)	59 (59)	36 (46)	46 (46)	35 ⁰ _{-0.062}
80	58.5 (68.5)	68.5 (68.5)	43.5 (53.5)	53.5 (53.5)	43 ⁰ _{-0.062}
100	70 (80)	80 (80)	53 (63)	63 (63)	59 ⁰ _{-0.074}

Note 1) (): Dimensions with auto switch

Note 2) Applicable stroke: Available in 5 mm intervals

Symbol

-XC36 With Boss on Rod End

Cylinder with boss on rod end

Applicable Series

Series	Model	Action	
CQ2	Standard	CQ2	
		CQ2W	
	Axial piping	CQP2	CQ2
			CQ2W

Note 1) For double rod type, it comes with boss on both ends.

Note 2) Except with bracket

Note 3) Except $\phi 125$ or more

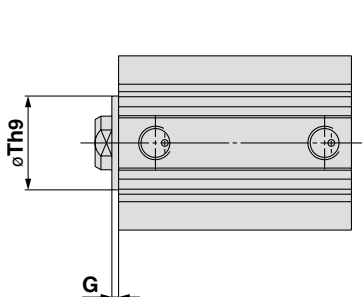
How to Order

Standard model no. — XC36

With boss on rod end ●

Specifications: Same as standard

Dimensions



* The dimensions except mentioned above are the same as those of the standard.

Series	CQ2	
	Th9 (mm)	G (mm)
12	15 ⁰ _{-0.043}	1.5
16	20 ⁰ _{-0.052}	1.5
20	13 ⁰ _{-0.043}	2
25	15 ⁰ _{-0.043}	2
32	21 ⁰ _{-0.052}	2
40	28 ⁰ _{-0.052}	2
50	35 ⁰ _{-0.062}	2
63	35 ⁰ _{-0.062}	2
80	43 ⁰ _{-0.062}	2
100	59 ⁰ _{-0.074}	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

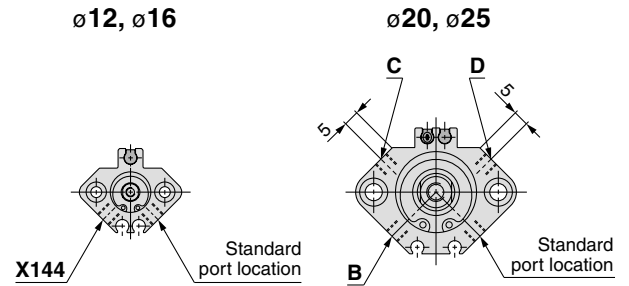
Special port location

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



Symbol

-X202 Full Length Dimension is the Same as the CQ1 Series.

Symbol

-X202

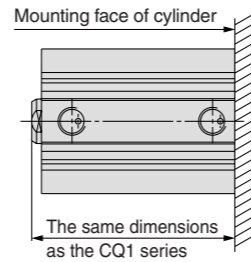
C□Q2 **Mounting** **Bore size** — **Stroke** **Action** **Option** (Z) — X202

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.

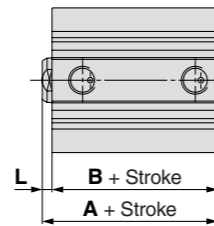
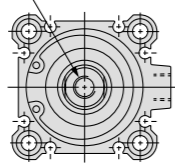


The specifications are the same as those of the standard, CQ2 series.

Dimensions (Without auto switch)

Double acting, Single rod: Female thread

H thread effective depth C



Symbol	$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)
A	25.5	23(25)	28	28	26.5 (28.5)	31.5	33	38	34	39	39.5	44.5	47	52	56.5	61.5
B	22	19.5	24.5	23	28	29.5	34.5	30.5	35.5	36	41	43.5	48.5	53	58	63
L	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	3.5	3.5	3.5
H	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		
C	6	7		9*		11*		13*		15		21		27		

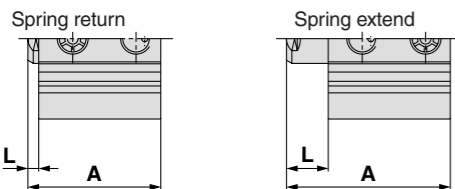
Note) (): Stroke 10 mm * The H/C dimensions of $\phi 32$, $\phi 40$ and $\phi 50$ are different from those of the new CQ2 series model.

75 st, 100 st

Symbol	$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke
A	75	100	75	100	75	100	75	100	75	100	75	100
B	36.5	43	44	49.5	57	66.5						
L	33	39.5	40.5	46	53.5	63						
L	3.5	3.5	3.5	3.5	3.5	3.5						

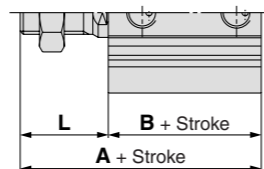
Note) The H/C dimensions are the same as above.

Single acting



Action	Bore size	$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$	
		Stroke	Symbol	Stroke	Symbol	Stroke	Symbol	Stroke	Symbol
Single acting, Spring return	A	5	28	10	31.5	5	38	10	44
		10	35	10	38.5	10	43	10	54
Single acting, Spring extend	A	5	33	10	36.5	5	43	10	54
		10	45	10	48.5	10	53	10	74
Single acting, Spring return	L	5	3.5	5	3.5	5	3.5	5	3.5
		10	5.5	10	5.5	10	3.5	10	3.5
Single acting, Spring extend	L	5	8.5	5	8.5	5	8.5	5	8.5
		10	15.5	10	15.5	10	13.5	10	23.5

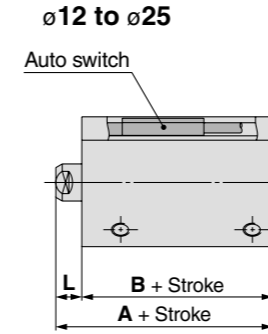
Double acting: Rod end male thread



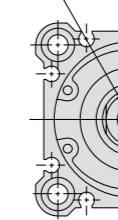
Symbol	$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke	Bore size	Stroke
A	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25
B	36	40	43	53.5	56.5	63	69	74.5	92	101.5						
L	14	20.5	18.5	30.5	28.5	28.5	33.5	33.5	43.5	43.5						

Dimensions (With auto switch)

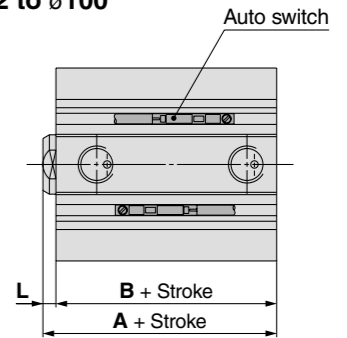
Double acting, Single rod: Female thread



H thread effective depth C



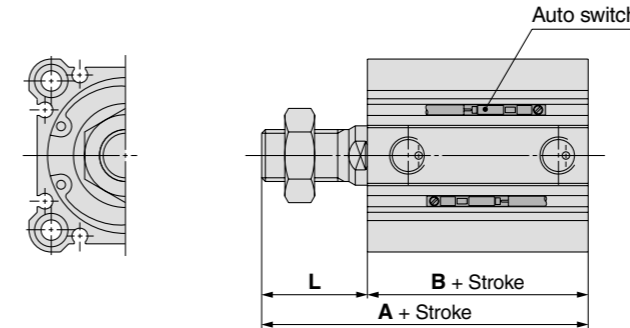
$\phi 32$ to $\phi 100$



Symbol	$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)
A	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	33	31.5	36.5	33	38	39.5	44.5	40.5	45.5	46	51	53.5	58.5	63	68	
L	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	
H	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		
C	6	7		9*		11*		13*		15		21		27		

* The H/C dimensions of $\phi 32$, $\phi 40$ and $\phi 50$ are different from those of the new CQ2 series model.

Double acting: Rod end male thread



Symbol	$\phi 12$		$\phi 20$		$\phi 32$		$\phi 40$		$\phi 50$		$\phi 63$		$\phi 80$		$\phi 100$	
	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)	Bore size	Stroke (mm)
A	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25
B	47	53.5	58.5	66.5	73	79	84.5	102	111.5							
L	33	31.5	36.5	38	44.5	45.5	51	58.5	68							
L	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.

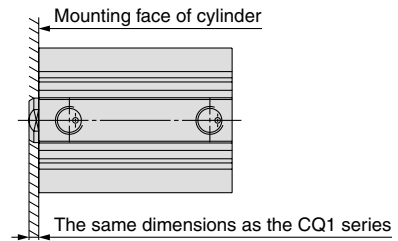
C□Q2 **Mounting** **Bore size** — 10 **Action** **Option** Z — X203

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
		Single acting (Spring return, Spring extend)
	Male thread	Available as the standard, CQ2 series

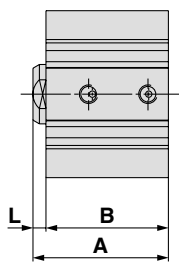
Note 1) $\phi 16$ and $\phi 25$ are the new models so that they are not applicable.
Note 2) (): Same dimensions as for those of -X202



The specifications are the same as those of the standard, CQ2 series.

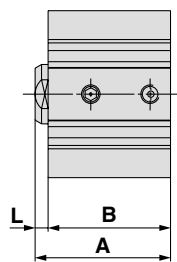
Dimensions: Applicable to CQ2B²⁰/₃₂-10D(C)Z Only

Double acting, Single rod



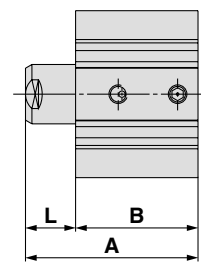
Symbol	Bore size	
	$\phi 20$	$\phi 32$
A	33	36.5
B	29.5	33
L	3.5	3.5

Single acting, Spring return



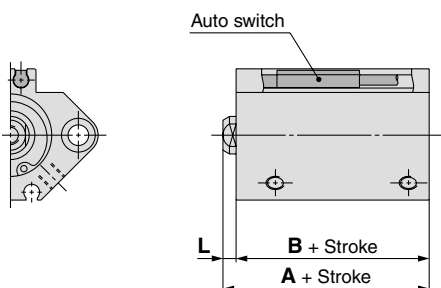
Symbol	Bore size	
	$\phi 20$	$\phi 32$
A	33	36.5
B	29.5	33
L	3.5	3.5

Single acting, Spring extend



Symbol	Bore size	
	$\phi 20$	$\phi 32$
A	43	46.5
B	29.5	33
L	13.5	13.5

With Auto Switch: Applicable to CDQ2B-□D(C)(Z) Only

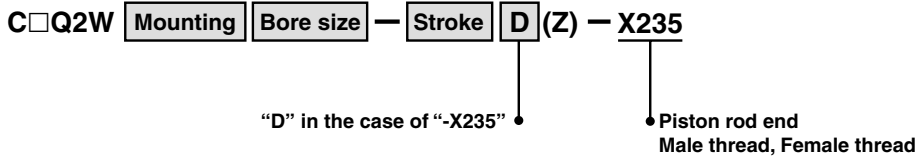


Symbol	Bore size $\phi 20$	
	Stroke	Stroke
A	5, 10 20, 30 40, 50	15, 25 35, 45
B	35	40
L	31.5	36.5
	3.5	3.5

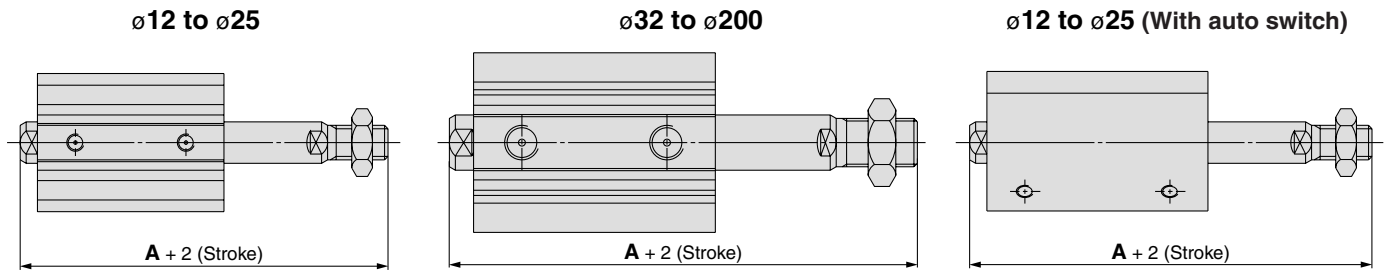
Symbol

-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.



* Specifications: Same as standard
Note) For mounting a bracket, please contact SMC.



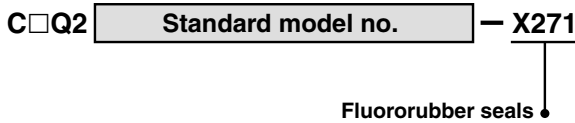
Bore size	12	16	20	25	32	40	50	63	80	100	125	140	160	180	200
Symbol															
A	42.7 (49.9)	45 (55)	49 (61)	56.5 (66.5)	66 (76)	75.5 (85.5)	82 (92)	83.5 (93.5)	104.5 (114.5)	116 (126)	157	157	172	183	190
Applicable stroke	5 to 30		5 to 50		5 to 100			10 to 100			10 to 300				

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.



* 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.

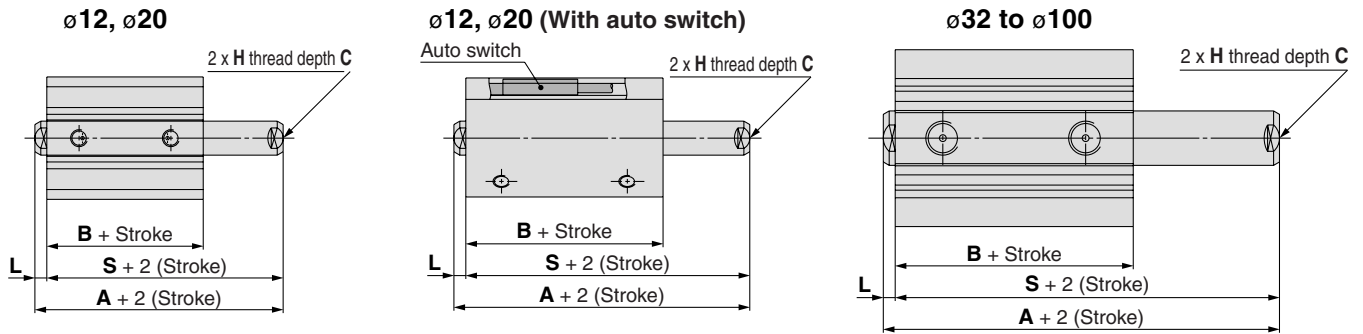


Symbol

-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	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15			
Symbol	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
A	33	33	38	37	38	43	46.5	51.5	57	47.5	52.5	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	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
Symbol	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	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)

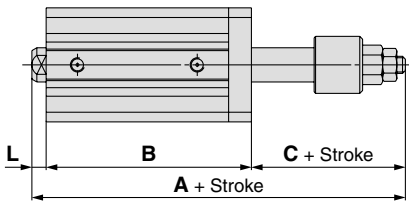
C□Q2 **Mounting** **Bore size** — **Stroke** D(M)(Z) — **X525**

• Long stroke of -XC8

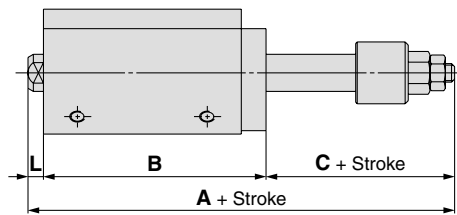
The specifications are the same as those of -XC8 of the CQ2 series. Refer to "Made to Order."

Note) For tap mounting (ø12 to ø25—without switch) and bracket mounting, please contact SMC.

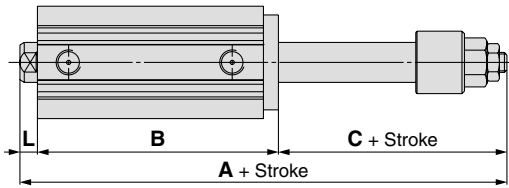
ø12 to ø25 (Without auto switch)



ø12 to ø25 (With auto switch)



ø32 to ø100



ø12, ø16

Symbol Bore size 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

Symbol Bore size 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)

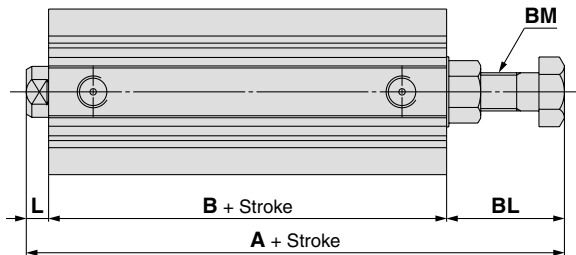
C□Q2 **Mounting** **Bore size** — **Stroke** D(M)(Z) — X526

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, 125 150, 175, 200
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	
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

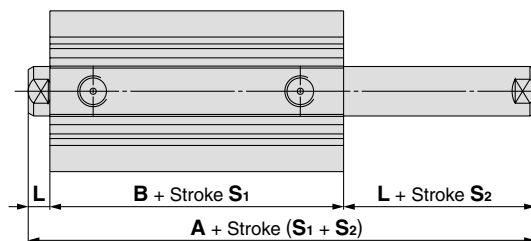
-X633 Intermediate Stroke of Double Rod Cylinder

C□Q2W
C□Q2KW **Standard model no.** — X633

* Specifications: Same as standard

Note) For models with a bracket, please contact SMC.

Dimensions



Bore size	Symbol	A	B	L	Stroke S ₁	Stroke S ₂
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 50 to 100 stroke, 25 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		
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 50 to 200 stroke, 25 mm intervals In the case of 200 to 300 stroke, 50 mm intervals	In the case of 10 to 300 stroke, 1 mm intervals
140		115	83	16		
160		125	91	17		
180		136	102	17		
200		143	109	17		

Note 1) (): Dimensions with auto switch
Note 2) Installing a spacer inside the standard cylinder tube, stroke S₁ has 5 mm intervals for controlling intermediate strokes in 1 mm intervals.

Example) In the case of CDQ2WB40-18DZ, stroke S₁ is 20 mm and stroke S₂ 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 S₁ + Stroke S₂-S₁ (C)(M)(Z) - X636

Long stroke of -XC11

Applicable Stroke

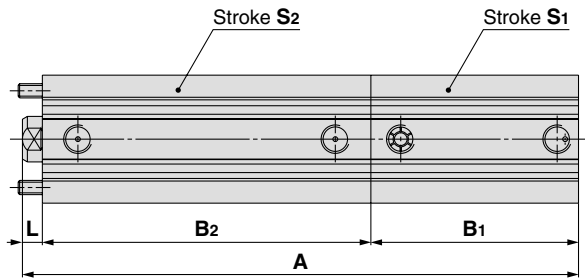
(mm)

Bore size	Stroke
ø12, ø16	Stroke S ₂ : Up to 50 mm
ø20 to ø100	Stroke S ₂ : 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 ₁	B ₂	L	Stroke range	
					S ₁	S ₂
ø12	52.9 (63.9) + Stroke (S ₁ + S ₂)	17 (28) + Stroke S ₁	32.4 + Stroke S ₂	3.5	5 to 30	35 to 50
ø16	58 (70) + Stroke (S ₁ + S ₂)	18.5 (30.5) + Stroke S ₁	36 + Stroke S ₂	3.5	5 to 30	35 to 50

Bore Size: ø20, ø25

(mm)

Symbol Bore size Stroke	A		B ₁	B ₂		L	Stroke range	
	Stroke S ₂			Stroke S ₂			S ₁	S ₂
	55 to 75	80 to 100		55 to 75	80 to 100			
ø20	137 (149) + Stroke S ₁	162 (174) + Stroke S ₁	19.5 (31.5) + Stroke S ₁	113	138	4.5	5 to 50	55 to 100
ø25	141.5 (151.5) + Stroke S ₁	166.5 (176.5) + Stroke S ₁	22.5 (32.5) + Stroke S ₁	114	139	5	5 to 50	55 to 100

Bore Size: ø32 to ø100

(mm)

Symbol Bore size Stroke	A					B ₁			B ₂		L	Stroke range	
	Stroke S ₂ 55 to 75		Stroke S ₂ 80 to 100			Stroke S ₁			Stroke S ₂			S ₁	S ₂
	Stroke S ₁		Stroke S ₁			Stroke S ₁			Stroke S ₂				
	≤ 55	55 to 75	≤ 50	55 to 75	80 to 100	≤ 50	55 to 75	80 to 100	55 to 75	80 to 100			
ø32	145.4 (155.5) + Stroke S ₁	230.5	170.5 (180.5) + Stroke S ₁	255.5	280.5	23 (33) + Stroke S ₁	108	133	115.5	140.5	7	5 to 100	55 to 100
ø40	161.5 (171.5) + Stroke S ₁	246.5	186.5 (196.5) + Stroke S ₁	271.5	296.5	29.5 (39.5) + Stroke S ₁	114.5	139.5	125	150	7	5 to 100	55 to 100
ø50	164 (174) + Stroke S ₁	249	189 (199) + Stroke S ₁	274	299	30.5 (40.5) + Stroke S ₁	115.5	140.5	125.5	150.5	8	10 to 100	55 to 100
ø63	171 (181) + Stroke S ₁	256	196 (206) + Stroke S ₁	281	306	36 (46) + Stroke S ₁	121	146	127	152	8	10 to 100	55 to 100
ø80	189.5 (199.5) + Stroke S ₁	274.5	214.5 (224.5) + Stroke S ₁	299.5	324.5	43.5 (53.5) + Stroke S ₁	128.5	153.5	136	161	10	10 to 100	55 to 100
ø100	210.5 (220.5) + Stroke S ₁	295.5	235.5 (245.5) + Stroke S ₁	320.5	345.5	53 (63) + Stroke S ₁	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 End

C□Q2
C□Q2K
C□Q2□S

Mounting

Bore size

Stroke

D(C)(M)(Z)

S(M)(Z)

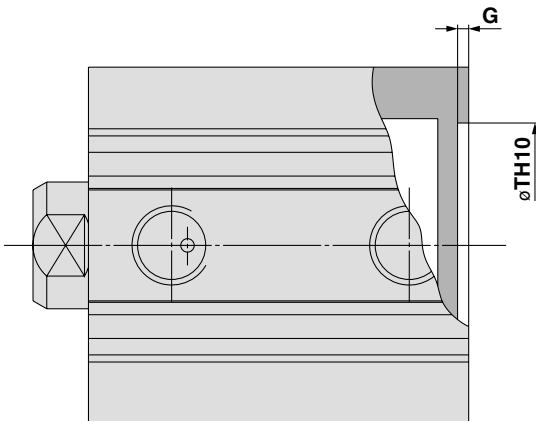
T(M)(Z)

- X1876

• With concave boss on head end

The specifications are the same as those of the CQ2 series.

Note) Except ø12, ø16 and ø125 to ø200



Bore size (mm)	TH10	G
20	19.3 ^{+0.084} ₀	1.4
25	23.8 ^{+0.084} ₀	1.4
32	30.9 ^{+0.100} ₀	1.4
40	39.3 ^{+0.100} ₀	1.3
50	48.7 ^{+0.100} ₀	2.1
63	61.5 ^{+0.120} ₀	2.4
80	78.3 ^{+0.120} ₀	3.3
100	98.9 ^{+0.140} ₀	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 catalog 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 catalog.
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 catalog 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.

Revision history

Edition B * Large bore size: Change to the new body shape
* Standard: -XB10A addition to double acting, single rod type
* Number of pages from 228 to 216

OS



Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-DN

1st printing NU printing OS 12450SZ Printed in Japan.