

Compact Cylinder

New

Remodeled with a new body to get more flexibility!

It is possible to mount small auto switches on 4 surfaces.

Auto switches can be mounted on any of the 4 surfaces, depending on the installation conditions.
(2 surfaces for $\phi 12$ to $\phi 25$)

Improved flexibility of system design.

$\phi 32$ to $\phi 100$



$\phi 12$ to $\phi 25$

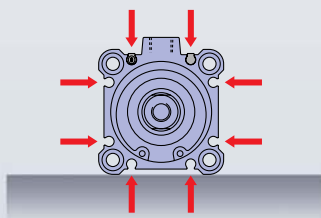


Auto switch mounting rail removed.

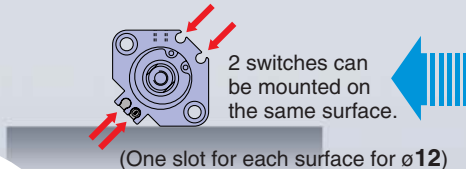
A round slot for mounting small auto switches is provided on 4 surfaces.

NEW

$\phi 32$ to $\phi 100$

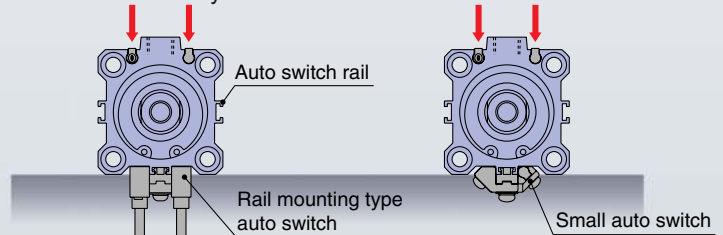


Mountable on 2 surfaces for $\phi 12$ to $\phi 25$.



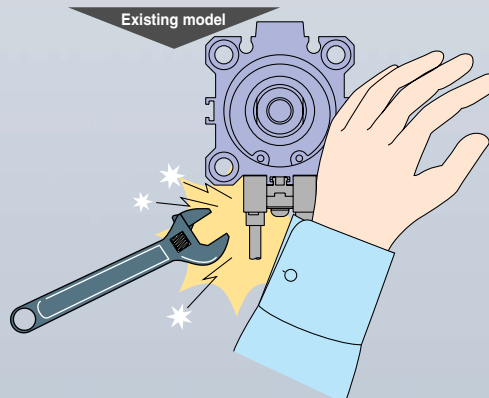
Existing model

Only one surface for $\phi 32$ to $\phi 50$.



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.

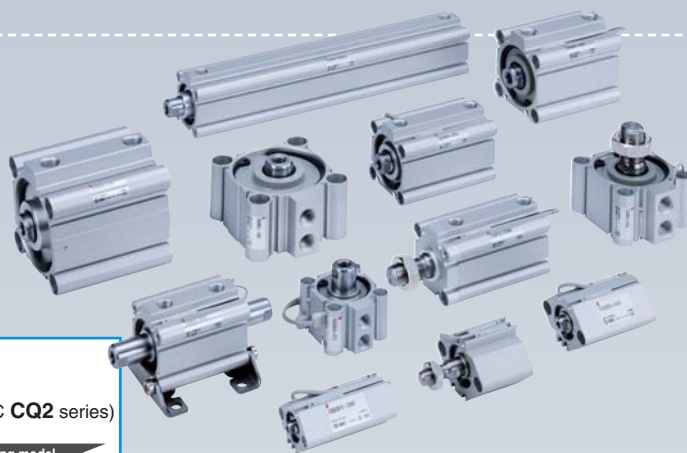


Series CQ2

SVC

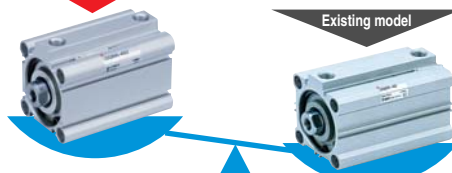
CAT.ES20-205A

Series CQ2 Compact Cylinder



Lighter weight

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



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

Contribution to environment and ecology.

Reduction of CO₂ discharge by **1300t** by less use of aluminum

Mass

(For the model with a stroke 50 mm, built-in magnet, female threads and rubber bumper) (g)

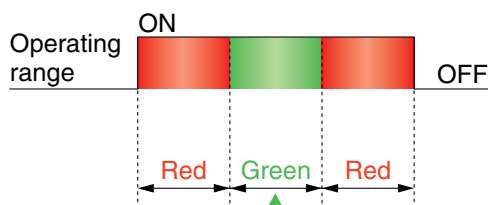
Bore size – Stroke	ø40-50st
NEW CQ2	446 (473)
Existing model CQ2	483 (527)

(): Mass when using male thread

Small auto switch

2-color indication solid state auto switch

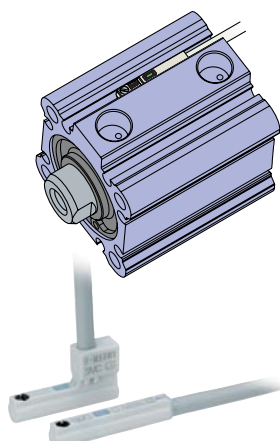
◎ Appropriate setting of the mounting position can be performed without mistakes.



A **green** light lights up at the optimum operating position.

Optimum operating position

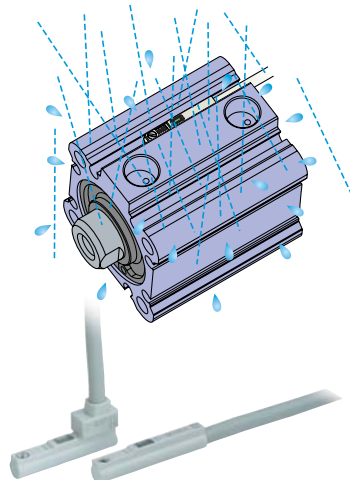
For general environments



D-M9□W(V)

Water resistant type

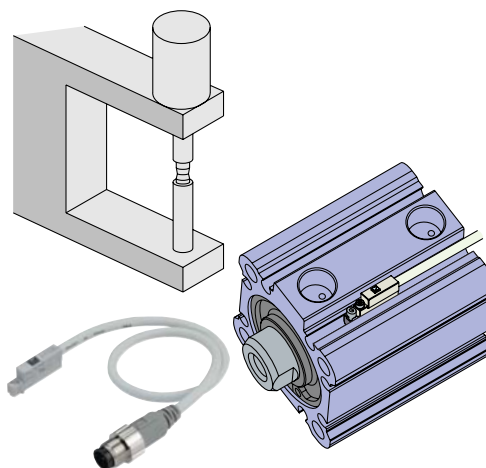
For environments exposed to water and coolant.



D-M9□A(V)

Magnetic field resistant type

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



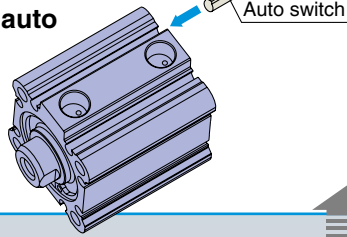
D-P3DW

Reduction of labor for work

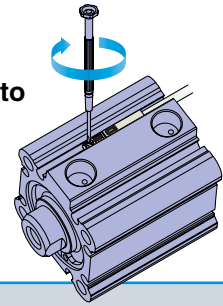
- Reduction of number of components
- No loss of components

NEW

- 1 Insert the auto switch.

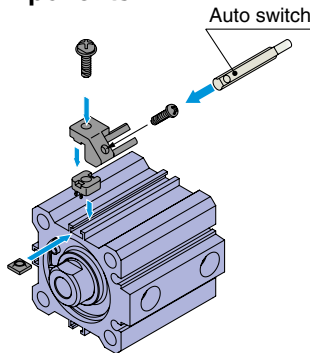
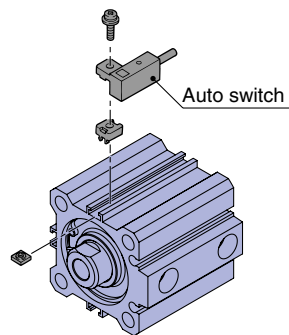


- 2 Fix the auto switch.

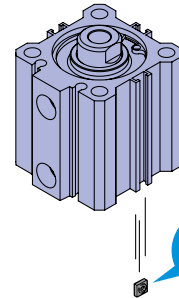


- Takes a lot of labor and time because there are many components.
- Highly likely to lose components

Existing model



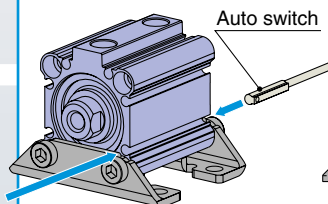
The nuts and screws may fall out when installed vertically.



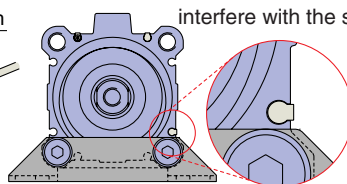
Reduction of labor for design

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

NEW

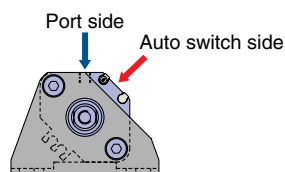
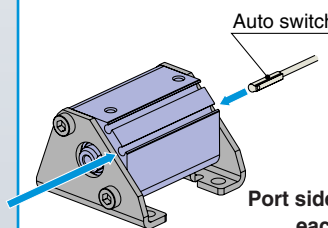
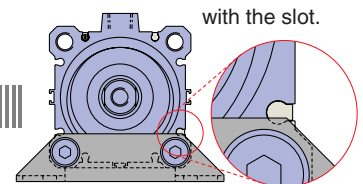


The bracket does not interfere with the slot.

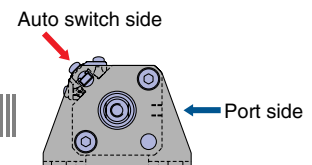


Existing model

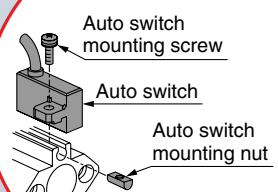
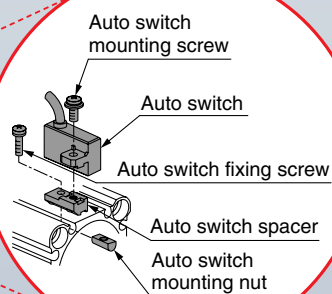
The bracket interferes with the slot.



Port side and auto switch side are near each other for easy handling.



- The rail mounting-type auto switch can be mounted.

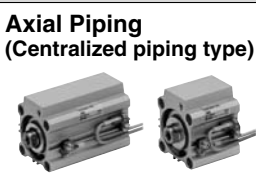


Compact Cylinder *Series CQ2*

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	Rod	Bore size (mm)	Standard stroke (mm)	Page
Standard 	Double acting	Single rod CQ2	12 16 20 25 32 40 50 63 80 100 125 140 160 180 200	ø12, ø16/5 to 30 ø20, ø25/5 to 50 ø32, ø40/5 to 100 ø50 to ø100/10 to 100	1
		Double rod CQ2W		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		ø12 to ø40/5, 10 ø50/10, 20	38
Large Bore Size 	Double acting	Single rod CQ2		10 to 300	57
		Double rod CQ2W		10 to 300	63
Long Stroke 	Double acting	Single rod CQ2		125 to 300	73
Non-rotating Rod 	Double acting	Single rod CQ2K		ø12, ø16/5 to 30 ø20, ø25/5 to 50 ø32, ø40/5 to 100 ø50, ø63/10 to 100	82
		Double rod CQ2KW		ø12, ø16/5 to 30 ø20, ø25/5 to 50 ø32, ø40/5 to 100 ø50, ø63/10 to 100	96
Axial Piping (Centralized piping type) 	Double acting	Single rod CQP2		ø12, ø16/5 to 30 ø20, ø25/5 to 50 ø32, ø40/5 to 100 ø50 to ø100/10 to 100	107
	Single acting	Spring return/ Spring extend CQP2		ø12 to ø40/5, 10 ø50/10, 20	116
Anti-lateral Load 	Double acting	Single rod CQ2□S		ø32 to ø40/5 to 100 ø50 to ø100/10 to 100	132
With End Lock 	Double acting	Single rod CBQ2		ø20 to ø63/10 to 100 ø80, ø100/25 to 100	144
Water Resistant 	Double acting	Single rod CQ2□R		ø20, ø25/5 to 50 ø32, ø40/5 to 100 ø50 to ø100/10 to 100	160
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

Series CQ2

- : Standard
- ⊙ : Made to Order
- : Special product (Contact SMC for details.)
- : Not available

Refer to pages 189 to 217 for further information on Made to Order.

Symbol	Specifications	Applicable bore size	ø12 to ø100		ø12 to ø50		ø125 to ø200		
Standard	Standard	ø12 to ø100	●	●	●	●	●	●	
D	Built-in magnet		●	●	●	●	●	●	
CQ2□A	Both ends tapped		●	●	●	●	●	●	
CQ2□-□M	Rod end male thread		●	●	●	●	●	●	
CQ2□-□C	With rubber bumper		●	●	○	○	● ^{Note 2)}	● ^{Note 2)}	
CQ2□-□F	With boss on head end	ø12 to ø100	●	—	●	●	○	—	
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		●	●	●	●	○	○	
CQ2□ ^R _V	Water resistant	ø20 to ø100	●	● ^{Note 6)}	○	○	○	○	
XB6	Heat resistant cylinder (–10 to 150°C)	ø12 to ø100	⊙	⊙	○	○	○	○	
XB7	Cold resistant cylinder	ø12 to ø40	⊙	⊙	○	○	○	○	
XB9	Low-speed cylinder (10 to 50 mm/s)	ø12 to ø100	⊙	⊙	○	○	○	○	
XB10	Intermediate stroke (Using exclusive body)	ø12 to ø100	⊙	⊙	⊙	○	⊙	⊙	
XB11	Long stroke type (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)}	○	○	○	○	
XC6	Made of stainless steel (Rod, retaining ring, rod end nut stainless steel)	ø12 to ø100	⊙	⊙	⊙	⊙	○	○	
XC8	Adjustable stroke cylinder/Adjustable extension type		⊙	—	○	○	○	—	
XC9	Adjustable stroke cylinder/Adjustable retraction type		⊙	—	○	○	○	—	
XC10	Dual stroke cylinder/Double rod		⊙	—	○	○	○	—	
XC11	Dual stroke cylinder/Single rod		⊙	—	○	○	○	—	
XC26	With a split pin for double clevis pin and double knuckle pin and a flat washer	ø12 to ø100	⊙	—	⊙	⊙	○	○	
XC27	Double clevis and double knuckle joint pins made of stainless steel 304)	ø12 to ø100	⊙	○	⊙	⊙	○	○	
XC35	With coil scraper	ø32 to ø100	⊙	⊙	○	○	○	○	
XC36	With boss on rod end	ø12 to ø100	⊙	⊙	⊙	⊙	○	○	
X144	Special port location	ø12 to ø25	⊙	⊙	⊙	⊙	—	—	
X202	Full length dimension is the same as Series CQ1.	ø12 to ø100	⊙	—	⊙	⊙	—	—	
X203	L dimension from rod cover is the same as Series CQ1.	ø12 to ø32	⊙	—	⊙	⊙	—	—	
X235	Special piston rod end for double rod cylinder	ø12 to ø100	—	⊙	—	—	—	⊙	
X271	Fluororubber seals	ø12 to ø100	⊙	⊙	⊙	⊙	⊙ ^{Note 11)}	⊙ ^{Note 11)}	
X293	Full length dimension is the same as Series CQ1W.	ø12 to ø100	—	⊙	—	—	—	—	
X525	Long stroke of adjustable extension stroke cylinder (-XC8)		⊙	—	○	○	○	—	
X526	Long stroke of adjustable retraction stroke cylinder (-XC9)		⊙	—	○	○	○	—	
X633	Intermediate stroke of double rod cylinder	ø12 to ø100	—	⊙	—	—	—	⊙ ^{Note 11)}	
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) Rubber bumper is standard for ø12 with an auto switch.

Note 2) Rubber bumper is standard.

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

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

Note 5) ø12: (—)

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

to Order Specifications

Series **CQ2**

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

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

Note 10) A type with boss on rod end is a 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

Without auto switch
ø32 to ø100

With auto switch

Ordering Example: CQ2 B 20 - 30 D Z M9BW

Mounting:

B	Through-hole (Standard)	F	Rod end flange
A	Both ends tapped	G	Head end 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 CQ2" on pages 5 and 10.

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
TN	NPT	ø32 to ø100
TF	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 an auto switch, M threads are compatible only for ø32 with 5 strokes.

Auto switch:

Nil Without auto switch
* Refer to the below table for the applicable auto switch model.

Auto switch mounting groove:

Z	ø12 to ø25	2 sides
	ø32 to ø100	4 sides

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

Number of auto switches:

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

Body option:

Nil	Standard (Rod end female thread)
F	With boss on head end
C	With rubber bumper Note 4)
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
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Made to Order
(Refer to page 2 for details.)

Cylinder stroke (mm)
For "Standard Stroke" and "Manufacture of intermediate Stroke", refer to page 2.

Built-in Magnet Cylinder Model
If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2L32-25DZ

Applicable Auto Switches/Refer to pages 180 to 188 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 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				M9NW	●	●	●	○	—	○	IC circuit				
	3-wire (PNP)								M9PVV	M9PW	●	●	●	○		—		○	
	2-wire								M9BVV	M9BW	●	●	●	○		—		○	
	Water resistant (2-color indication)			3-wire (NPN)				M9NAV	M9NA	○	○	●	○	—	○	IC circuit			
				3-wire (PNP)						M9PAV	M9PA	○	○	●	○			—	○
				2-wire						M9BAV	M9BA	○	○	●	○			—	○
				2-wire (Non-polar)						—	P3DW	●	—	●	●			—	○
Reed switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—		
	2-wire			24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	—	—	—	Relay, PLC	
					5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	—	—	—	IC circuit	

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
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.
* D-P3DW type is available from ø32 up to ø100 only.

* There are other applicable auto switches other than the listed above. For details, refer to page 179.
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
Refer to page 187 for the D-P3DW type.

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

Specifications

Pneumatic

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

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 Actuators Precautions (5).

Standard Stroke

Pneumatic

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

• When stroke exceeds the standard range, refer to page 73.

Air-hydro

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 Stroke

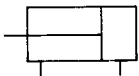
Description	Spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to "How to Order" for the standard model no. on page 1.	Suffix "-XB10" to the end of standard model no. on page 1.
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.
Stroke range	Bore size	Bore size
	Stroke range	Stroke range
	12, 16	12, 16
	1 to 29	6 to 29
	20, 25	20, 25
	1 to 49	6 to 49
	32 to 100	32, 40
		6 to 99
		50 to 100
		11 to 99
Example	Part no.: CQ2B50-57DZ CQ2B50-75DZ with 18 mm width spacer inside. B dimension is 115.5 mm.	Part no.: CQ2B50-57DZ-XB10 Makes 57 stroke tube. B dimension is 97.5 mm.

- Air-hydro type is excluded.
- In the case of spacer type, intermediate stroke with dumper for ø40 to ø100, it can be manufactured by 5 mm intervals in 5 mm and 55 to 95 mm.
- In the case of an exclusive body with ø32 to ø100 (-XB10) with the stroke length exceeding 50 mm, the reference values of the longitudinal dimension will be changed. Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.
- Regarding the long stroke which exceeds the stroke range, refer to page 73 for the long stroke type of either CQS or CQ2.



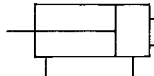
JIS Symbol

Double acting,
Single rod



Symbol

With boss on
head end



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of 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 (Using exclusive body)
—XB11	Long stroke type, 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	Retaining ring, piston rod, rod end nut made of 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 a split pin for double clevis pin and double knuckle pin and a flat washer
—XC27	Double clevis pins and double knuckle pins made of stainless steel (Stainless steel 304)
—XC35	With coil scraper, ø32 to ø100 only
—XC36	With boss on rod end
—XC59	Fluororubber seals/Built-in hard plastic magnet, ø20 to ø100 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.
—X144	Special port location, with auto switch ø12 to ø25 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

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

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

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	Screw-in type	—	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
			TN	—	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
			TF	—	—	—	—	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
		Built-in one-touch fittings Note 3)		—	—	—	—	ø6/4 Note 2)	ø6/4	ø8/6	ø8/6	—	—
	Rod end male thread			●	●	●	●	●	●	●	●	●	●
	With rubber bumper			●	●	●	●	●	●	●	●	●	●
	With boss on head end			●	●	●	●	●	●	●	●	●	●
Air-hydro	Mounting	Through-hole (Standard)		—	—	●	●	●	●	●	●	●	
		Both ends tapped		—	—	●	●	●	●	●	●	●	●
	Built-in magnet			—	—	●	●	●	●	●	●	●	
	Piping	Screw-in type	—	—	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8	
			TN	—	—	—	—	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8	
	Rod end male thread			—	—	●	●	●	●	●	●	●	●
	With boss on head end			—	—	●	●	●	●	●	●	●	●

Note 1) For a ø32 cylinder without an auto switch, M5 x 0.8 is used for 5-stroke piping dimension. Thus, do not enter a symbol for the port thread type.

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

Note 3) One-touch fittings cannot be replaced.

Mounting Bracket/Part No.

Bore size (mm)	Part no.	Note 4) Foot	Flange	Double clevis
12	Without switch	CQ2□□-□D	CQ-L012	CQ-F012
	With switch	CQ2□□-□DZ	CQ-LZ12	CQ-D012
16	Without switch	CQ2□□-□D	CQ-L016	CQ-F016
	With switch	CQ2□□-□DZ	CQ-LZ16	CQ-D016
20	Without switch	CQ2□□-□D	CQ-L020	CQ-F020
	With switch	CQ2□□-□DZ	CQ-LZ20	CQ-D020
25	Without switch	CQ2□□-□D	CQ-L025	CQ-F025
	With switch	CQ2□□-□DZ	CQ-LZ25	CQ-D025
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 4) When ordering foot bracket, please be careful of order quantity, since the required quantity will be different depending on the bore size.

ø12 to ø25:

- Without switch: Order 2 pieces per cylinder.
- With switch: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)

ø32 to ø100:

- Order 2 pieces per cylinder.

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

⚠ Precautions

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and “Handling Precautions for SMC Product” (M-E03-3) for Actuators and Auto Switches Precautions.

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

Series CQ2 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.

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 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 132).

⚠ Caution

2. Connection with workpiece

When a workpiece is mounted on the piston rod end, connect them aligning the center of piston rod and workpiece. 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

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

$$\text{Kinetic energy } E \text{ (J)} = \frac{(m_1 + m_2) V^2}{2}$$

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)	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	175
	Nut	1	2	4	8	17	17	32	32	116
With rubber bumper		0	0	-2	-3	-3	-7	-9	-18	-31

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

• Cylinder mass: CDQ2B32-20DZ 101 g

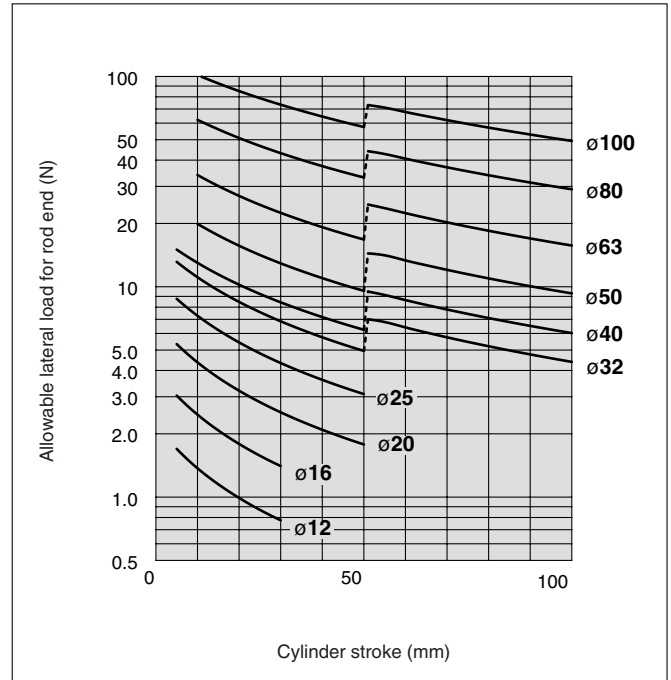
• Option mass: Rod end male thread 43 g

With rubber bumper -3 g

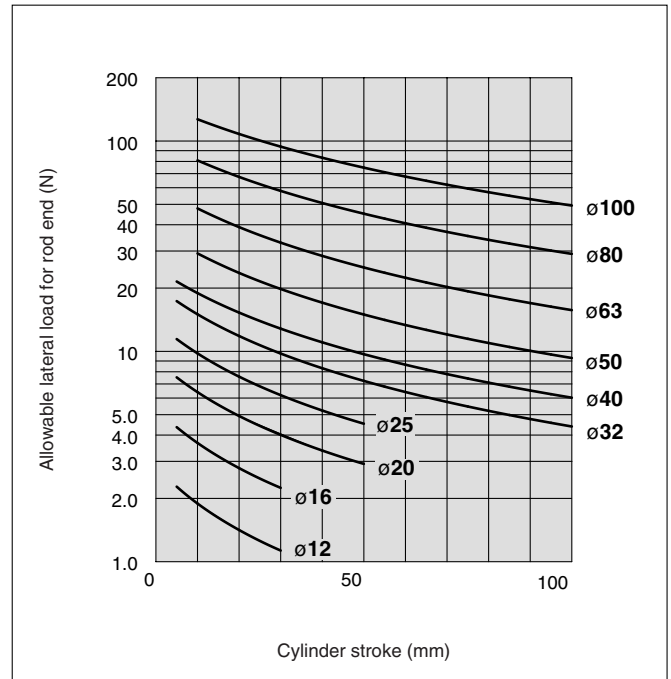
141 g

Allowable Lateral Load at Rod End

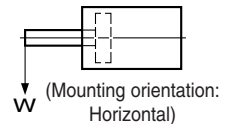
Without Auto Switch



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.



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
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

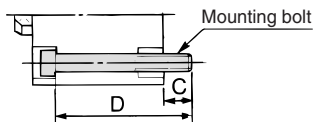
Mounting Bolt for CQ2/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CQ2B12-5D	6.5	25	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	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	M5 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D		50	x 50L
-35D	9.5	55	x 55L
-40D		60	x 60L
-45D		65	x 65L
-50D		70	x 70L
CQ2B25-5D	9.5	30	M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		45	x 45L
-25D		50	x 50L
-30D		55	x 55L
-35D	12.5	60	x 60L
-40D		65	x 65L
-45D		70	x 70L
-50D		75	x 75L

Cylinder model	C	D	Mounting bolt size
CQ2B32-5DZ	9	30	M5 x 30L
-10DZ		35	x 35L
-15DZ		40	x 40L
-20DZ		45	x 45L
-25DZ		50	x 50L
-30DZ		55	x 55L
-35DZ	7.5	60	x 60L
-40DZ		65	x 65L
-45DZ		70	x 70L
-50DZ		75	x 75L
-75DZ		110	x 110L
-100DZ		135	x 135L
CQ2B40-5DZ	7.5	35	M5 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ		60	x 60L
-35DZ	12.5	65	x 65L
-40DZ		70	x 70L
-45DZ		75	x 75L
-50DZ		80	x 80L
-75DZ		115	x 115L
-100DZ		140	x 140L
CQ2B50-10DZ	12.5	45	M6 x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ		60	x 60L
-30DZ		65	x 65L
-35DZ		70	x 70L
-40DZ	12.5	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 size
CQ2B63-10DZ	14.5	50	M8 x 50L
-15DZ		55	x 55L
-20DZ		60	x 60L
-25DZ		65	x 65L
-30DZ		70	x 70L
-35DZ		75	x 75L
-40DZ	15	80	x 80L
-45DZ		85	x 85L
-50DZ		90	x 90L
-75DZ		130	x 130L
-100DZ		155	x 155L
CQ2B80-10DZ	15	55	M10 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ	15.5	85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		140	x 140L
-100DZ		165	x 165L

Mass

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

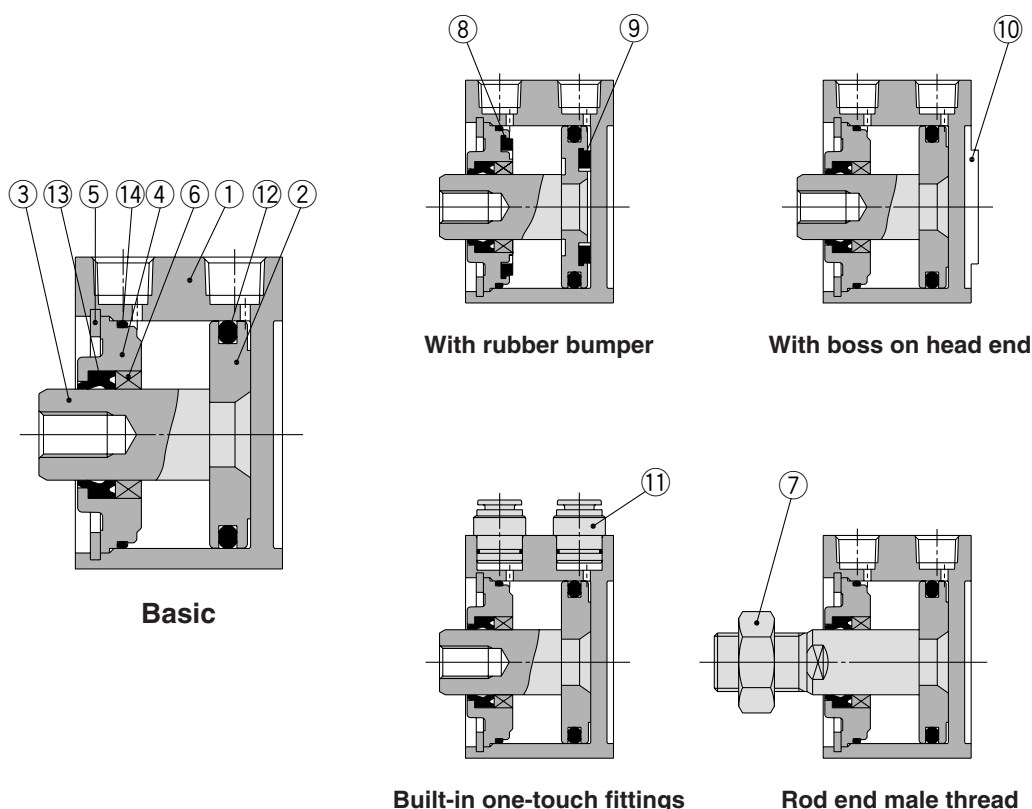
Additional Mass

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	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 bolt)	55	67	164	186	142	154	243	317	683	1052
Rod end flange (Including mounting bolt)	57	69	139	161	180	214	373	559	1056	1365
Head end flange (Including mounting bolt)	54	65	133	152	165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)	32	39	88	123	151	196	393	554	1109	1887

Calculation: (Example) **CQ2D32-20DCMZ**

- Cylinder mass: CQ2B32-20DZ 184 g
 - Option mass: 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 Carbon steel	ø12 to ø25 ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy Aluminum alloy casted	ø12 to ø40, Anodized ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Bearing alloy	For ø50 or larger 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	Hard anodized ø20 to ø100
11	One-touch fitting	—	ø32 to ø63
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Gasket	NBR	

Replacement Parts/Seal Kit (Pneumatic)

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

* 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)

Replacement Parts/Seal Kit (Air-hydro)

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

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

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

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

Series CQ2

Clean Series

10 – **C** ☐ **Q2B** **Bore size** – **Stroke** **D(M)Z**

• Clean Series

10	Relief type
11	Vacuum type

•

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

The type which is 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									

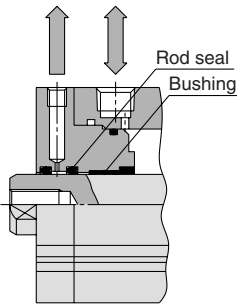
Note) ø12 with switch: With rubber bumper (Standard)

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

Construction

Series 10-CQ2
(Double seal)

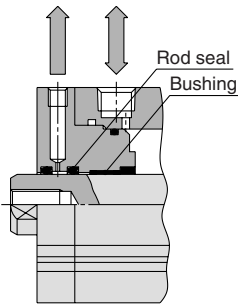
Relief port



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.

Series 11-CQ2
(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

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

To prevent 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 160 to 172 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

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.



Specifications

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

* Specifications other than above are the same as standard, basic.

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 **CDQ2** With Auto Switch



Refer to page below for further information on auto switches.

Auto switch specifications	P.180 to 188
Auto switch proper mounting position and height	P.173 to 178
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass

Mass

(g)

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 Mass

(g)

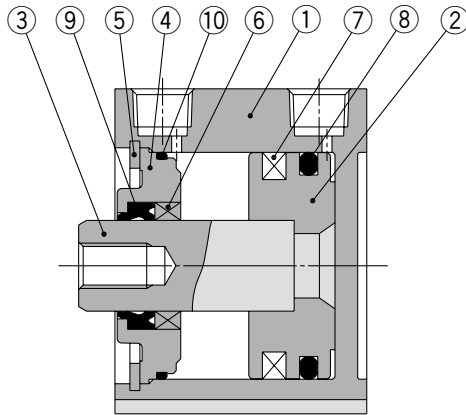
Bore size (mm)		12	16	20	25	32	40	50	63	80	100
Both ends tapped		1	1	3	3	6	6	6	19	45	45
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53	120	175
	Nut	1	2	4	8	17	17	32	32	49	116
With boss on head end		0.7	1.3	2	3	5	7	13	25	45	96
With rubber bumper		0	0	−2	−3	−3	−7	−9	−18	−31	−56
Built-in one-touch fittings		—	—	—	—	12	12	21	21	—	—
Foot (Including mounting bolt)		49	62	147	169	142	154	243	317	683	1052
Rod end flange (Including mounting bolt)		54	67	131	153	180	214	373	559	1056	1365
Head end flange (Including mounting bolt)		52	63	124	144	165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)		29	35	78	114	151	196	393	554	1109	1887

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

- Cylinder mass: CDQ2B32-20DZ:..... 241 g
- Option mass: Both ends tapped 6 g
- Rod end male thread 43 g
- With rubber bumper −3 g
- Double clevis 151 g
- 438 g

Add each mass 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 larger only
7	Magnet	—	
8	Piston seal	NBR	
9	Rod seal	NBR	
10	Gasket	NBR	

Replacement Parts/Seal Kit Pneumatic

Bore size(mm)	Kit no.	Contents
12	CQ2B12-PS	Set of nos. above (8), (9), (10).
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

Bore size(mm)	Kit no.	Contents
20	CQ2BH20-PS	Set of nos. above (8), (9), (10).
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)

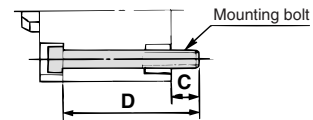
Mounting Bolt for CDQ2/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
 Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CDQ2B12-5DZ	5.5	35	M3 x 35L
-10DZ		40	x 40L
-15DZ		45	x 45L
-20DZ		50	x 50L
-25DZ		55	x 55L
-30DZ	8	65	x 60L
CDQ2B16-5DZ		40	M3 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ		55	x 55L
-25DZ	10.5	60	x 60L
-30DZ		65	x 65L
CDQ2B20-5DZ		40	M5 x 40L
-10DZ		45	x 45L
-15DZ		50	x 50L
-20DZ	9.5	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		40	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

Cylinder model	C	D	Mounting bolt size
CDQ2B32-5DZ	9	40	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	7.5	110	x 110L
-100DZ		135	x 135L
CDQ2B40-5DZ		45	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	12.5	85	x 85L
-50DZ		90	x 90L
-75DZ		115	x 115L
-100DZ		140	x 140L
CDQ2B50-10DZ		55	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		120	x 120L
-100DZ		145	x 145L

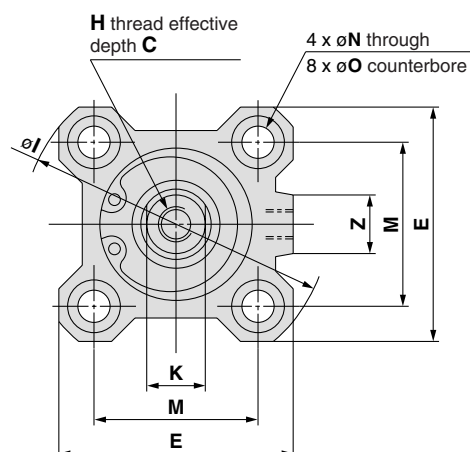
Cylinder model	C	D	Mounting bolt size
CDQ2B63-10DZ	14.5	60	M8 x 60L
-15DZ		65	x 65L
-20DZ		70	x 70L
-25DZ		75	x 75L
-30DZ		80	x 80L
-35DZ		85	x 85L
-40DZ		90	x 90L
-45DZ		95	x 95L
-50DZ		100	x 100L
-75DZ		125	x 125L
-100DZ	15	150	x 150L
CDQ2B80-10DZ		65	M10 x 65L
-15DZ		70	x 70L
-20DZ		75	x 75L
-25DZ		80	x 80L
-30DZ		85	x 85L
-35DZ		90	x 90L
-40DZ		95	x 95L
-45DZ		100	x 100L
-50DZ		105	x 105L
-75DZ	15.5	130	x 130L
-100DZ		155	x 155L
CDQ2B100-10DZ		75	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
-75DZ		140	x 140L
-100DZ		165	x 165L

Series CQ2

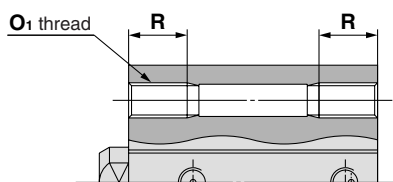
Dimensions

Ø12 to Ø25/Without Auto Switch

Basic (Through-hole): CQ2B

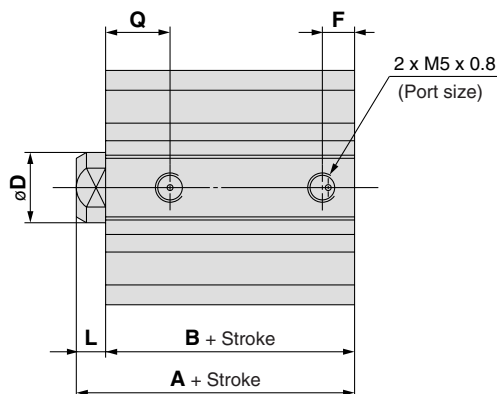


Both ends tapped: CQ2A

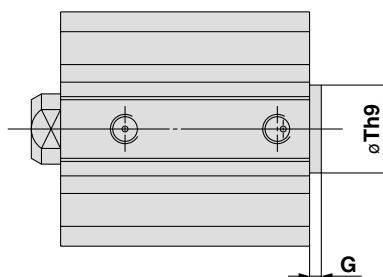


Both Ends Tapped (mm)

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

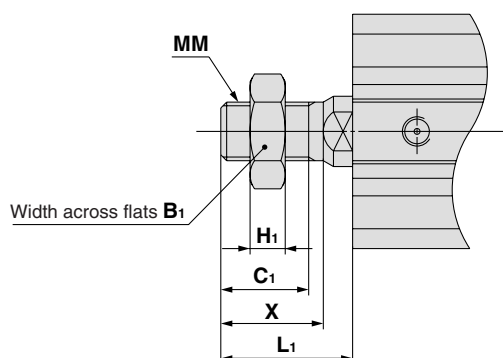


With Boss on Head End (mm)

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 part 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

Basic

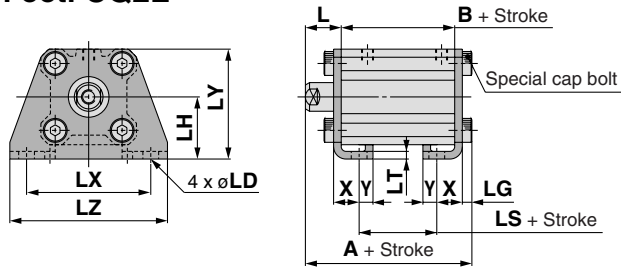
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	K	L	M	N	O	Q	Z
12	5 to 30	20.5	17	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	7.5	—
16	5 to 30	22	18.5	8	8	29	5.5	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	8	10
20	5 to 50	24	19.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	9	10
25	5 to 50	27.5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

Note 2) External dimensions with rubber bumper are same as Basic, as shown above.

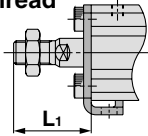
* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of the intermediate strokes, refer to page 2.

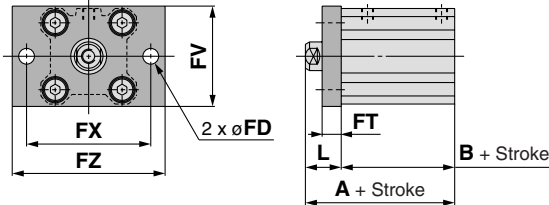
Foot: CQ2L



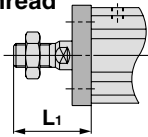
Rod end male thread



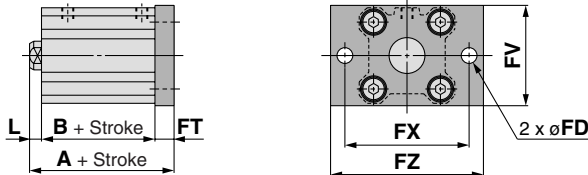
Rod end flange: CQ2F



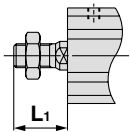
Rod end male thread



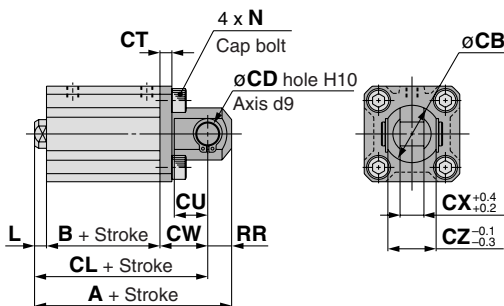
Head end flange: CQ2G



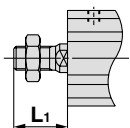
Rod end male thread



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 End 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 End 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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

(* Dimensions except A, L and L₁ are the same as rod end flange.)

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

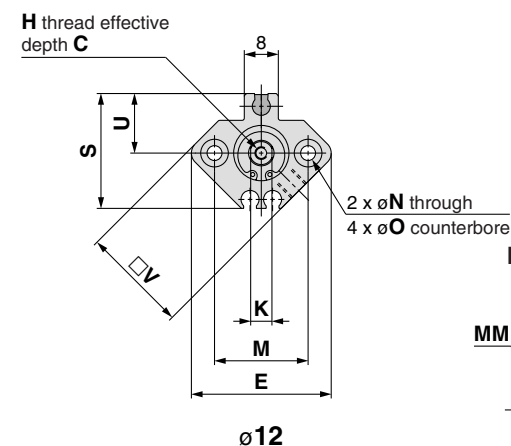
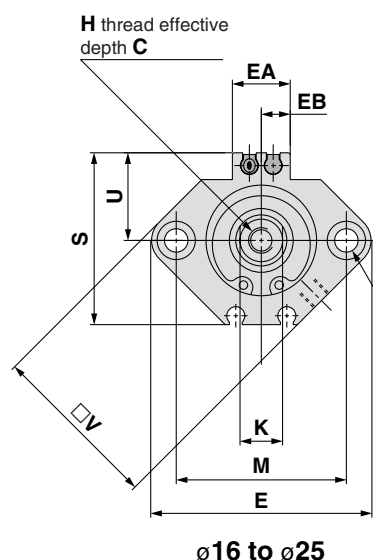
* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pins and retaining rings are included.

Series CQ2

Dimensions

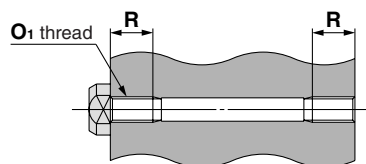
ø12 to ø25/With Auto Switch

Basic (Through-hole): CDQ2B



Width across flats B₁

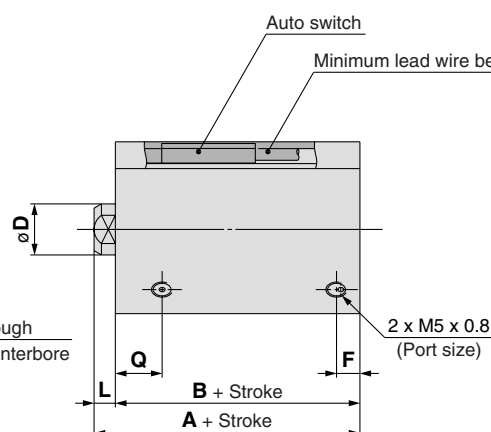
Both ends tapped: CDQ2A



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

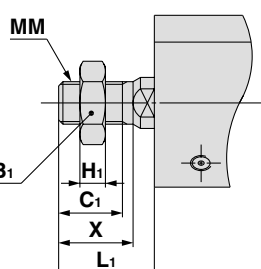


With Boss on Head End

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 1) With boss on rod end: Option (Suffix "-XC36" to the end of part 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

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

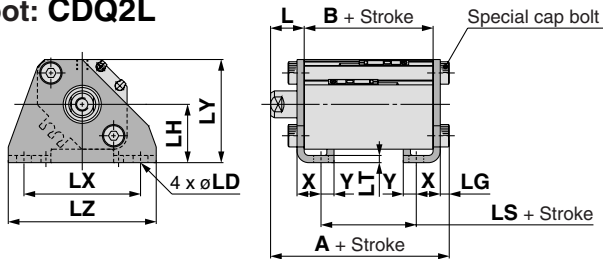
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	H	K	L	M	N	O	Q	S	U	V
12	5 to 30	31.5	28	6	6	33	—	—	6.5	M3 x 0.5	5	3.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
16	5 to 30	34	30.5	8	8	37	13.2	6.6	5.5	M4 x 0.7	6	3.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
20	5 to 50	36	31.5	7	10	47	13.6	6.8	5.5	M5 x 0.8	8	4.5	36	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	41	21	40

Note 2) External dimensions with rubber bumper are same as Basic, as shown above.

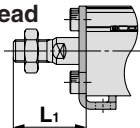
* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of the intermediate strokes, refer to page 2.

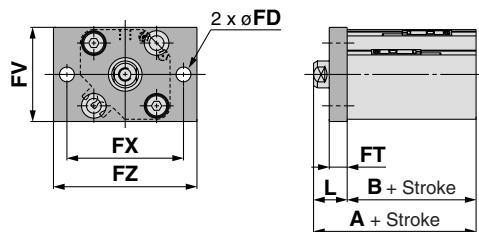
Foot: CDQ2L



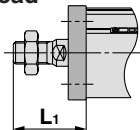
Rod end male thread



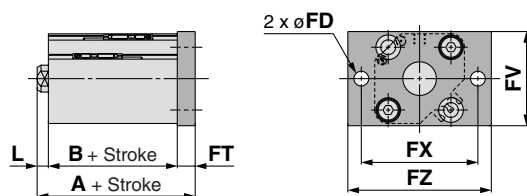
Rod end flange: CDQ2F



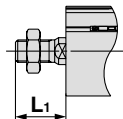
Rod end male thread



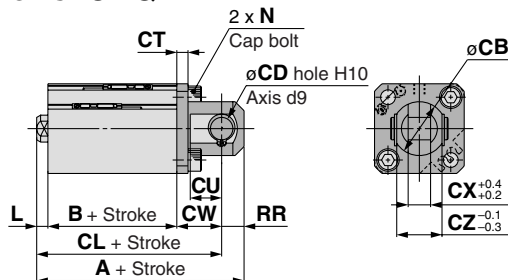
Head end flange: CDQ2G



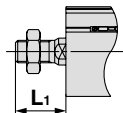
Rod end male thread



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 End 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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Head End 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

Foot 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 pins 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

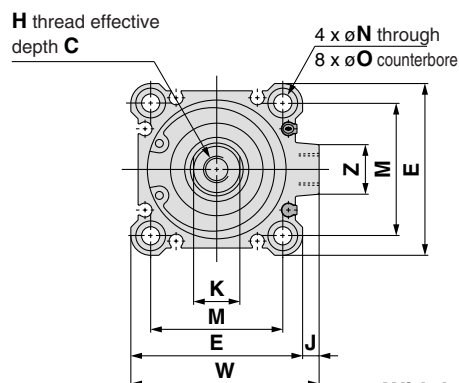
Made to Order

Series CQ2

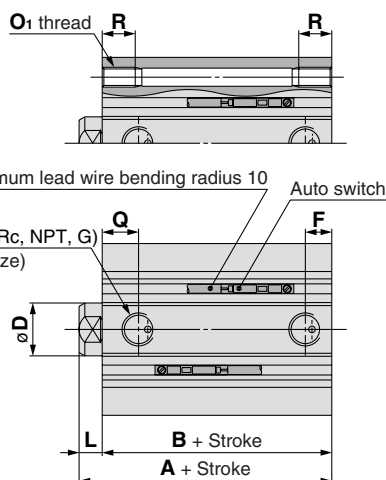
Dimensions

ø32 to ø50

Basic (Through-hole): CQ2B/CDQ2B



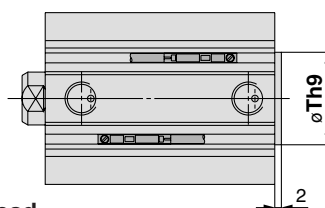
Both ends tapped: CQ2A/CDQ2A



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

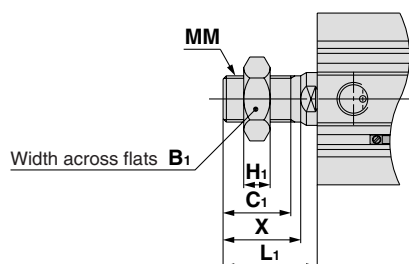


With Boss on Head End (mm)

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
part number.)

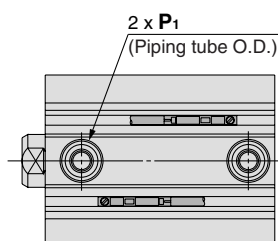
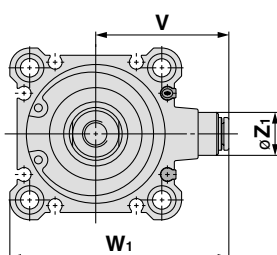
Rod end male thread



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
50	16	8	50	82

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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
	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

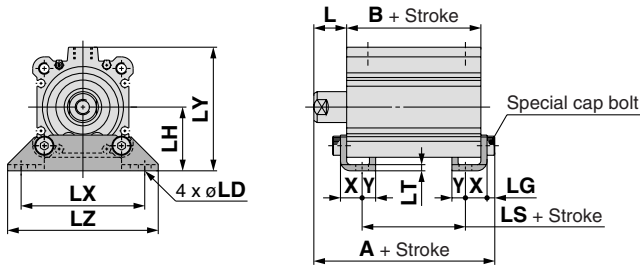
Bore size (mm)	O	W	Z
32	9 depth 7	49.5	14
40	9 depth 7	57	15
50	11 depth 8	71	19

Note 2) External dimensions with rubber bumper are same as Basic, as shown above.

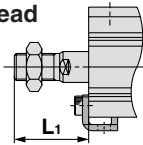
* For details about the rod end nut and accessory brackets, refer to page 19.

Note 3) For calculation on the longitudinal dimension of the intermediate strokes, refer to page 2.
Because we have the spacer-installed type and the exclusive body type (-X10).

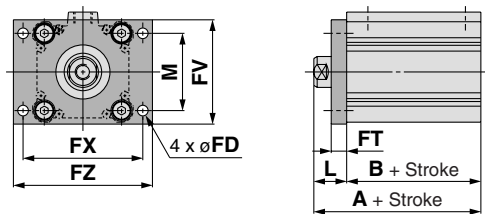
Foot: CQ2L/CDQ2L



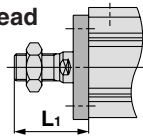
Rod end male thread



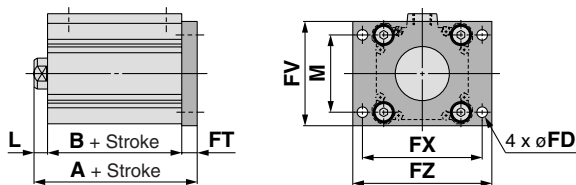
Rod end flange: CQ2F/CDQ2F



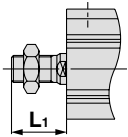
Rod end male thread



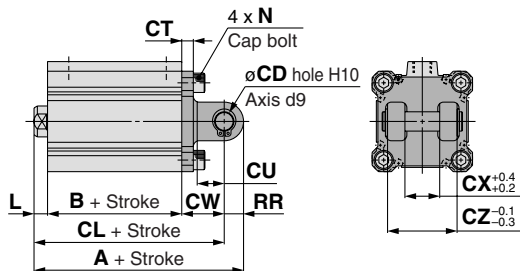
Head end flange: CQ2G/CDQ2G



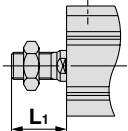
Rod end male thread



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 End 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										
40	5 to 50	46.5	29.5	56.5	39.5	5.5	8	54	62	72	17	38.5	40
	75, 100	56.5	39.5										
50	10 to 50	48.5	30.5	58.5	40.5	6.6	9	67	76	89	18	43.5	50
	75, 100	58.5	40.5										

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head End Flange

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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

(* Dimensions except A,
L and L₁ are the same
as rod end flange.)

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											
40	5 to 50	68.5	29.5	58.5	78.5	39.5	68.5	10	6	14	22	18	36	7	28.5
	75, 100	78.5	39.5	68.5											
50	10 to 50	80.5	30.5	66.5	90.5	40.5	76.5	14	7	20	28	22	44	8	33.5
	75, 100	90.5	40.5	76.5											

Double clevis bracket material: Cast iron
Surface treatment: Painted

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

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

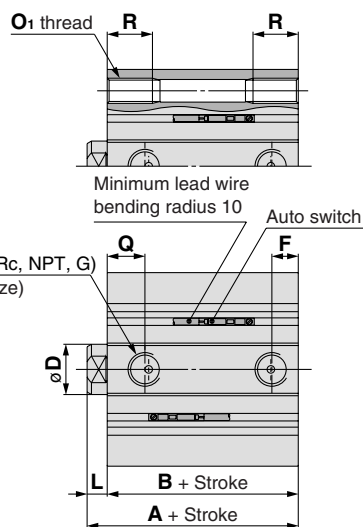
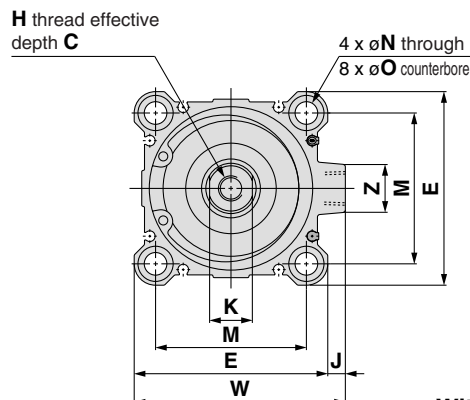
Series CQ2

Dimensions

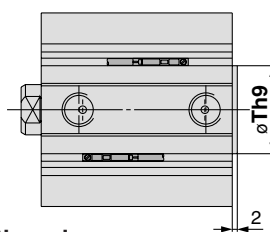
ø63 to ø100

Both ends tapped: CQ2A/CDQ2A

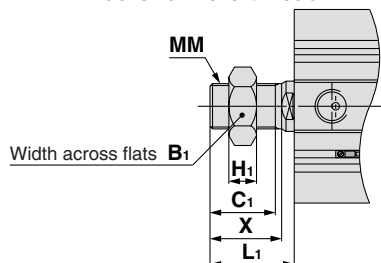
Basic (Through-hole) CQ2B/CDQ2B



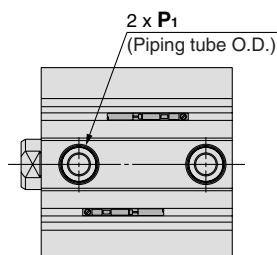
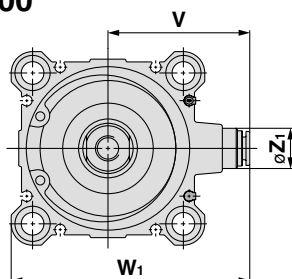
With boss on head end



Rod end male thread



Built-in one-touch fittings: ø63 to ø100



Both Ends Tapped

Bore size (mm)	Ø1	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

With Boss on Head End

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 part number.)

Rod End Male Thread

Bore size (mm)	B1	C1	H1	L1	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

Bore size (mm)	Z1	P1	V	W1
63	16	8	56.5	95

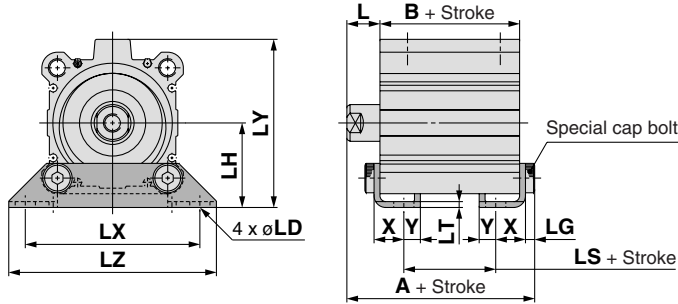
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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																	

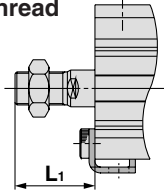
Note 2) External dimensions with rubber bumper are same as Basic, as shown above.

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

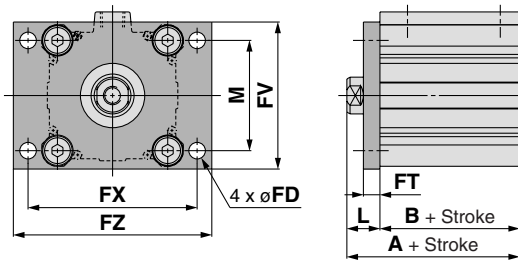
Foot: CQ2L/CDQ2L



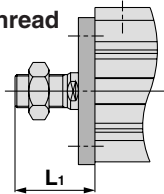
Rod end male thread



Rod end 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

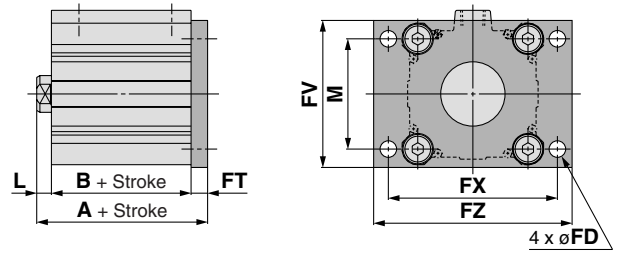
Bore size (mm)	Stroke range (mm)	LX	LY	LZ	X	Y
63	10 to 50	95	91.5	113	16.2	9
	75, 100					
80	10 to 50	118	114	140	19.5	11
	75, 100					
100	10 to 50	137	136	162	23	12.5
	75, 100					

Rod End Flange (mm)

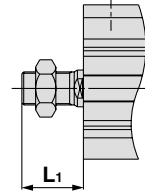
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L	L ₁	M
		A	B	A	B								
63	10 to 50	54	36	64	46	9	9	80	92	108	18	43.5	60
	75, 100	64	46										
80	10 to 50	63.5	43.5	73.5	53.5	11	11	99	116	134	20	53.5	77
	75, 100	73.5	53.5										
100	10 to 50	75	53	85	63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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

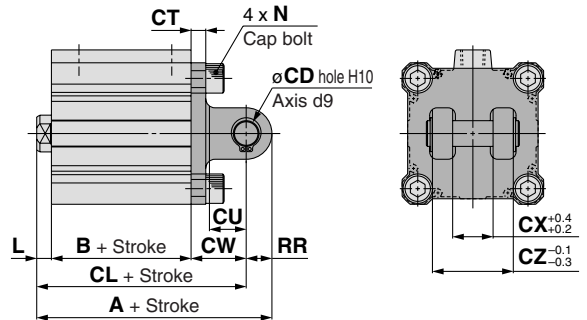
Head end flange: CQ2G/CDQ2G



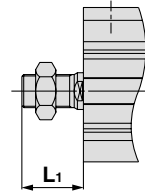
Rod end male thread



Double clevis: CQ2D/CDQ2D



Rod end male thread



Head End Flange (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch	L	L ₁
		A	A		
63	10 to 50	53	63	8	33.5
	75, 100	63			
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			

(* Dimensions except A, L and L₁ are the same as rod end 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 pins 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

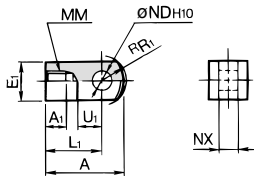
Series CQ2

Accessory Bracket

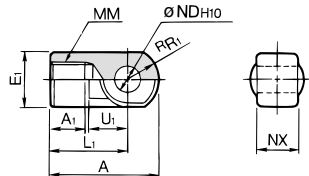
Single Knuckle Joint

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

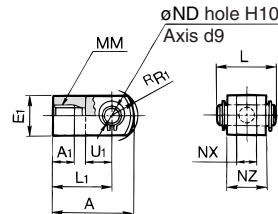
(mm)

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}

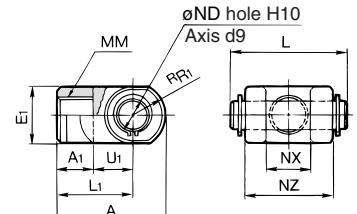
Double Knuckle Joint

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

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



Material: Carbon steel
Surface treatment: Nickel plated



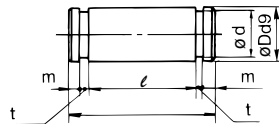
Material: Cast iron
Surface treatment: Nickel plated

(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-J012
Y-Z015A	16	28	11	□12	21	M6 x 1	8.1	10	5 ^{+0.048} ₀	6.5 ^{+0.2} _{-0.2}	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 ring are included.

Knuckle Pin (Common with double clevis pin)

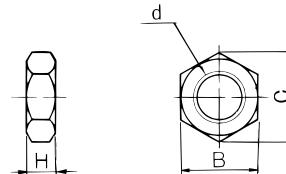


Material: Carbon steel
(mm)

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 C 5 for axis
IY-J015	16	5 ^{-0.030} _{-0.060}	16.6	4.8	12.2	1.5	0.7	Type C 5 for axis
IY-G02	20	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	Type C 8 for axis
IY-G03	25	10 ^{-0.040} _{-0.076}	25.6	9.6	20.2	1.55	1.15	Type C 10 for axis
IY-G04	32, 40	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	Type C 10 for axis
IY-G05	50, 63	14 ^{-0.050} _{-0.093}	50.6	13.4	44.2	2.05	1.15	Type C 14 for axis
IY-G08	80	18 ^{-0.050} _{-0.093}	64	17	56.2	2.55	1.35	Type C 18 for axis
IY-G10	100	22 ^{-0.065} _{-0.117}	72	21	64.2	2.55	1.35	Type C 22 for axis

* Type C retaining rings for axis are included.

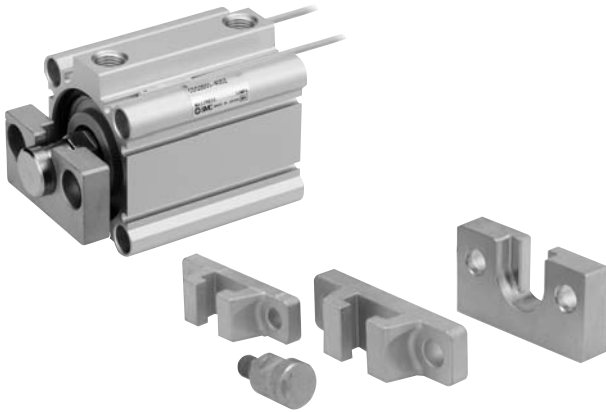
Rod End Nut



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 $\phi 100$



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

YA - 03

• Mounting bracket

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

• Applicable air cylinder bore

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

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)

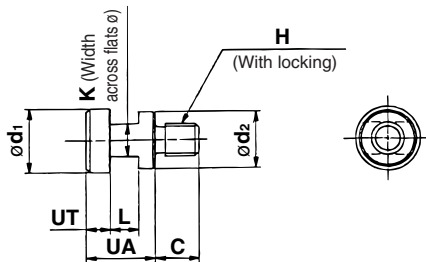
Bore size $\phi 40$ Part no.

- Type A mounting bracket part no. YA-03

- Joint YU-03

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

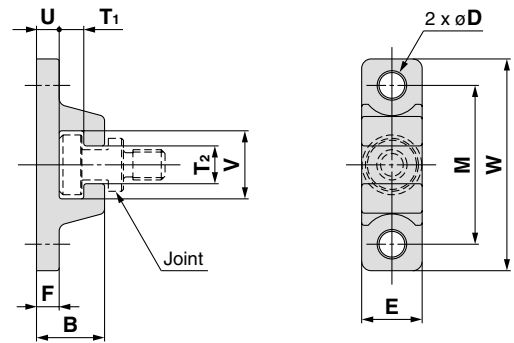
Bore size (mm)	Joint part no.	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



Material: Chromium molybdenum steel (Nickel plated)

Part no.	Applicable bore size (mm)	UA	C	d1	d2	H	K	L	UT	Mass (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 A Mounting Bracket

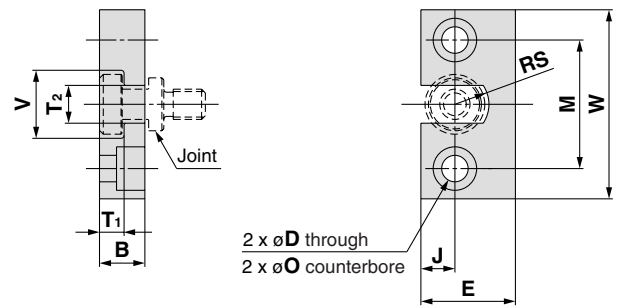


Material: Chromium molybdenum steel (Nickel plated) (mm)

Part no.	Bore size (mm)	B	D	E	F	M	T1	T2
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	Mass (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

Type B Mounting Bracket



Material: Stainless steel (mm)

Part no.	Bore size (mm)	B	D	E	J	M	øO
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)	T1	T2	V	W	RS	Mass (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

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

Without auto switch
ø32 to ø100

With auto switch

CQ2W B 20 - 30 D —
CQ2W B 32 - 30 D Z —
CDQ2W B 32 - 30 D Z - M9BW —

With auto switch
(Built-in magnet)

Mounting

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 CQ2" on pages 25 and 28.

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
TN	Rc	ø32 to ø100
TF	NPT	
F	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 an auto switch, M threads are compatible only for ø32 with 5 strokes.

Auto switch

Nil Without auto switch
* Refer to the below table for the applicable auto switch model.

Auto switch mounting groove

Z	ø12 to ø25	2 sides
	ø32 to ø100	4 sides

Number of auto switches

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

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
---	---------------

Made to Order

Refer to page 23 for details.

Cylinder stroke (mm)

For "Standard Stroke", refer to page 23.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2WL32-25DZ

Applicable Auto Switches/Refer to pages 180 to 188 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 switch	————	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
	3-wire (PNP)			M9PV				M9P	●	●	●	○	—	○				
	2-wire			M9BV				M9B	●	●	●	○	—	○				
	Diagnostic indication (2-color indication)			3-wire (NPN)				M9NVW	M9NW	●	●	●	○	—	○	IC circuit		
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	—	○			
	Water resistant (2-color indication)			2-wire				M9BWV	M9BW	●	●	●	○	—	○	—		
				3-wire (NPN)				M9NAV	M9NA	○	○	●	○	—	○			
				Magnetic field resistant (2-color indication)				3-wire (PNP)	M9PAV	M9PA	○	○	●	○	—	○		IC circuit
								2-wire	M9BAV	M9BA	○	○	●	○	—	○		
	Reed switch			————				Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●		—
No	2-wire	24 V	12 V, 100 V	100 V or less	A93V	A93	●			—	●	—	—	—	—	—	—	IC circuit
					A90V	A90	●	—	●	—	—	—	—	—	—	—	—	—

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9NMW
3 m L (Example) M9NLW
5 m Z (Example) M9NZW

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

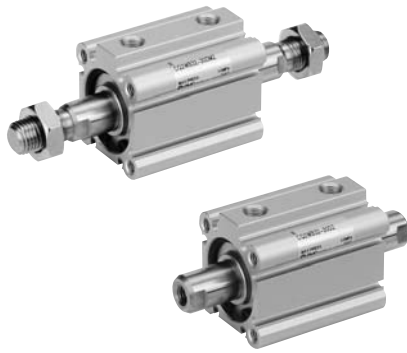
* D-P3DW□ type is available from ø32 up to ø100 only.

* There are other applicable auto switches other than the listed above. For details, refer to page 179.

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

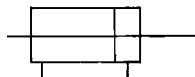
* Refer to page 187 for the D-P3DW□ type.

Series CQ2W



JIS Symbol

Double acting, Double rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of 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 (Using exclusive body)
—XB13	Low-speed cylinder (5 to 50 mm/s)
—XC4	With heavy duty scraper, ø40 to ø100 only
—XC6	Retaining ring, piston rod, rod end nut made of stainless steel
—XC35	With coil scraper, ø32 to ø100 only
—XC36	With boss on rod end
—X293	Full length dimension is the same as Series CQ1W.
—X144	Special port location, with auto switch ø12 to ø25 only
—X235	Change of piston rod end of double rod cylinder
—X271	Fluororubber seals
—X633	Intermediate stroke of double rod cylinder

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

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

Specifications

Pneumatic

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)	Without cushion	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
	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 dose not include the amount of bumper change.

Air-hydro

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 Actuators Precautions (5).

Standard Stroke

Pneumatic (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 (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 Stroke

Description	Spacer is installed in the standard stroke body (5 mm).	Spacer is installed in the standard stroke (1 mm).	Exclusive body (-XB10)
Part no.	"How to Order" for the standard model no. on page 22.	Suffix "-X633 (P. 215)" to the end of standard model no. on page 22.	Suffix "-XB10" to the end of standard model no. on page 22.
Description	Dealing with the stroke by the 5 mm interval is available by installing spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval is available by installing spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.
Stroke range	Bore size	Bore size	Bore size
	Stroke range	Stroke range	Stroke range
	12, 16	6 to 29	12, 16
	20, 25	6 to 49	20, 25
32 to 100	32, 40	6 to 99	32, 40
	50 to 100	11 to 99	50 to 100
Example	Part no.: CQ2WB50-65DZ CQ2WB50-75DZ with 10 mm width spacer inside. B dimension is 125.5 mm.	Part no.: CQ2WB50-72DZ-X633 CQ2WB50-75DZ with 3 mm width spacer inside. B dimension is 125.5 mm.	Part no.: CQ2WB50-65DZ-XB10 Makes 65 stroke tube. B dimension is 115.5 mm.

- Air-hydro type is excluded.
 - In the case of spacer type, intermediate stroke with bumper for bore 40 to 100, "-X633" is not available.
 - In the case of an exclusive body 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	Screw-in type	—	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
			TN	—	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
			TF	—	—	—	—	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
		Built-in one-touch fittings Note 3)		—	—	—	—	ø6/4 Note 2)	ø6/4	ø8/6	ø8/6	—	—
	Rod end male thread		●	●	●	●	●	●	●	●	●	●	
	With rubber bumper		●	●	●	●	●	●	●	●	●	●	
Air-hydro	Mounting	Through-hole (Standard)	—	—	●	●	●	●	●	●	●	●	
		Both ends tapped	—	—	●	●	●	●	●	●	●	●	
	Built-in magnet		—	—	●	●	●	●	●	●	●		
	Piping	Screw-in type	—	—	—	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
			TN	—	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
Rod end male thread		—	—	—	●	●	●	●	●	●	●	●	

Note 1) For a ø32 cylinder without an auto switch, M5 x 0.8 is used for 5-stroke piping dimension. Thus, do not enter a symbol for the port thread type.

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

Note 3) One-touch fittings cannot be replaced.

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for Safety Instructions and "Handling Precautions for SMC Products" (M-E03-3) for Actuators and Auto Switches Precautions.

Retaining Ring Installation/Removal

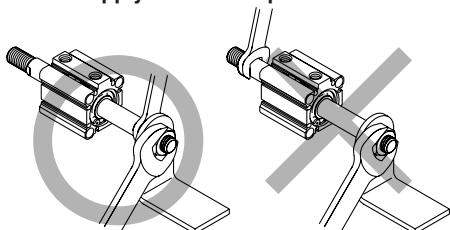
⚠ Caution

- 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 installation.

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 flats is secured. Do not fix the other side of the piston rod width across flats and apply reverse torque.



Mounting Bracket/Part No.

Bore size (mm)		Part no.	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 foot bracket, please be careful of order quantity, since 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)

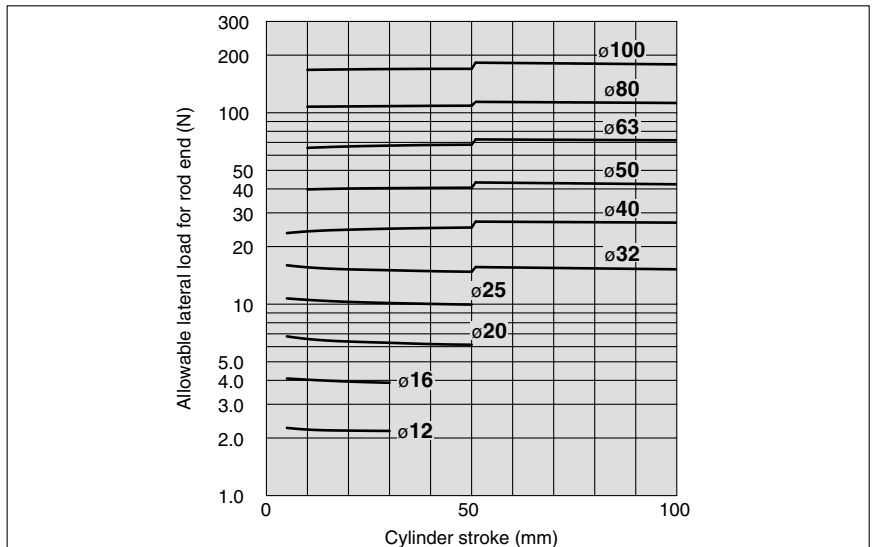
ø32 to ø100:

- Order pieces per cylinder.

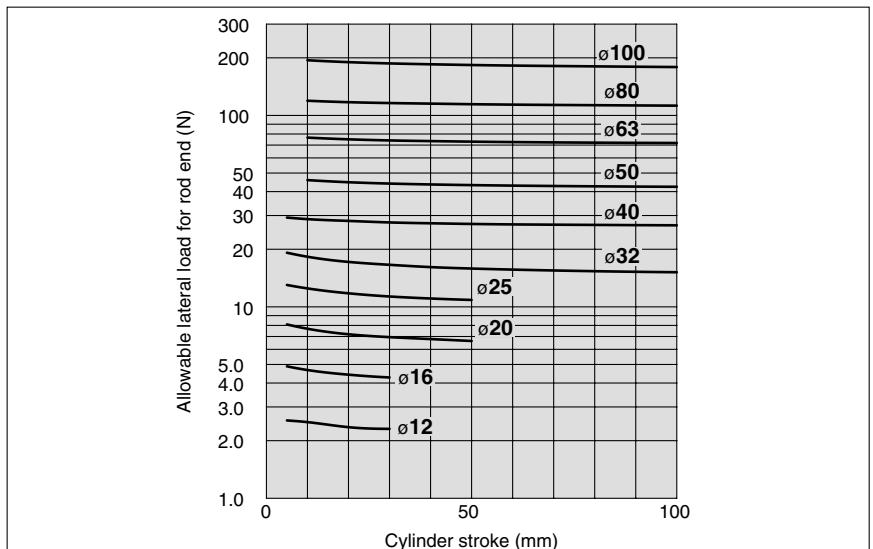
Note 5) Parts belonging to each bracket are as follows.
Foot or Flange: Body mounting bolt

Allowable Lateral Load at Rod End

Without Auto Switch



With Auto Switch



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

Mass

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 Mass

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 bolt)	57	71	170	195	158	170	267	342	722	1107	
Flange (Including mounting bolt)	57	69	139	161	180	214	373	559	1056	1365	

Calculation: (Example) CQ2WF32-20DCMZ

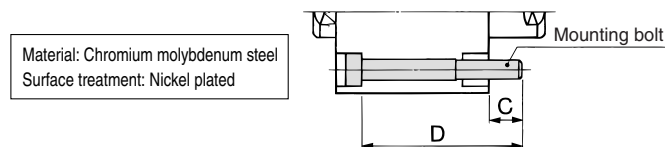
- Cylinder mass: CQ2WB32-20DZ 257 g
 - Option mass: Both ends tapped 6 g
 - Rod end male thread 86 g
 - With rubber bumper -3 g
 - Flange 180 g
- 526 g

Mounting Bolt for CQ2WB/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2WB is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35L 4 pcs.



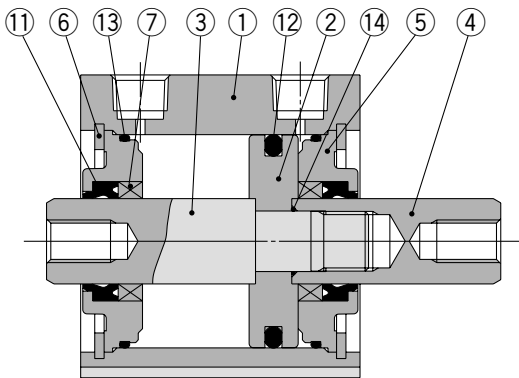
Cylinder model	C	D	Mounting bolt size
CQ2WB12-5D	8.3	35	M3 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
CQ2WB16-5D	7.5	35	M3 x 35L
-10D		40	x 40L
-15D		45	x 45L
-20D		50	x 50L
-25D		55	x 55L
-30D		60	x 60L
CQ2WB20-5D	6	30	M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		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	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 size
CQ2WB32-5DZ	6.5	35	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
-75DZ		115	x 115L
-100DZ		140	x 140L
CQ2WB40-5DZ	7	45	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
CQ2WB50-10DZ	12.5	55	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

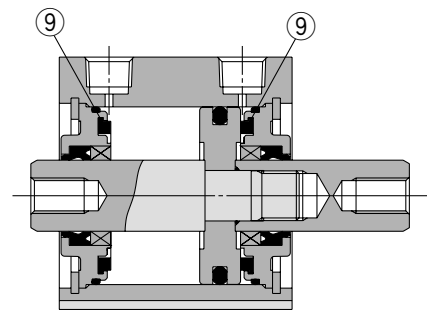
Cylinder model	C	D	Mounting bolt size
CQ2WB63-10DZ	13.5	55	M8 x 55L
-15DZ		60	x 60L
-20DZ		65	x 65L
-25DZ		70	x 70L
-30DZ		75	x 75L
-35DZ		80	x 80L
-40DZ		85	x 85L
-45DZ		90	x 90L
-50DZ		95	x 95L
-75DZ		130	x 130L
-100DZ		155	x 155L
CQ2WB80-10DZ	12.5	60	M10 x 60L
-15DZ		65	x 65L
-20DZ		70	x 70L
-25DZ		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
-100DZ		160	x 160L
CQ2WB100-10DZ	13	70	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

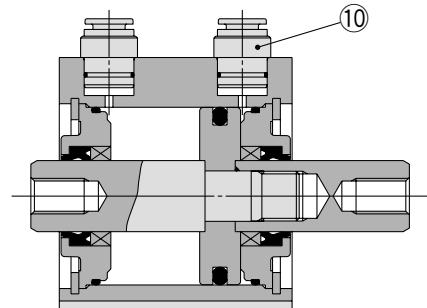
Basic



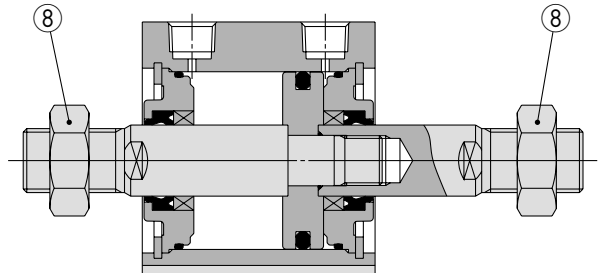
With rubber bumper



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 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 larger only
8	Rod end nut	Carbon steel	Nickel plated
9	Bumper	Urethane	
10	One-touch fittings	—	ø32 to ø63
11*	Rod seal	NBR	
12*	Piston seal	NBR	
13*	Tube gasket	NBR	
14	Piston gasket	NBR	

Replacement Parts/Seal Kit (Pneumatic)

Bore size (mm)	Kit no.	Contents
12	CQ2WB12-PS	Set of nos. above ⑪, ⑫, ⑬
16	CQ2WB16-PS	
20	CQ2WB20-PS	
25	CQ2WB25-PS	
32	CQ2WB32-PS	
40	CQ2WB40-PS	
50	CQ2WB50-PS	
63	CQ2WB63-PS	
80	CQ2WB80-PS	
100	CQ2WB100-PS	

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

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

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

Replacement Parts/Seal Kit (Air-hydro)

Bore size (mm)	Kit no.	Contents
20	CQ2WBH20-PS	Set of nos. above ⑪, ⑫, ⑬
25	CQ2WBH25-PS	
32	CQ2WBH32-PS	
40	CQ2WBH40-PS	
50	CQ2WBH50-PS	
63	CQ2WBH63-PS	
80	CQ2WBH80-PS	
100	CQ2WBH100-PS	

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

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

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

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

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

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

To prevent 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									
Maximum operating pressure	1.0 MPa									
Rubber bumper	None									
Piping	Screw-in piping									
Piston speed	50 to 500 mm/s									
Mounting	Through-hole									
Auto switch	Mountable									

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



Refer to page below for further information on auto switches.

Auto switch specifications	P.180 to 188
Auto switch proper mounting position and height	P.173 to 178
Minimum stroke for auto switch mounting	
Operating range	
Switch mounting bracket/Part no.	

Mass

Mass (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 Mass (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	3	6	12	24	52	54	106	106	240
		2	4	8	16	34	34	64	64	98
male thread	Nut	2	4	8	16	34	34	64	64	98
		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 bolt)	52	65	153	177	158	170	267	342	722	1107
Flange (Including mounting bolt)	54	67	131	153	180	214	373	559	1056	1365

Calculation:

(Example) **CDQ2WF32-20DCMZ**

• Cylinder mass: CDQ2WB32-20DZ..... 306 g

• Option mass: Both ends tapped 6 g

Rod end male thread..... 86 g

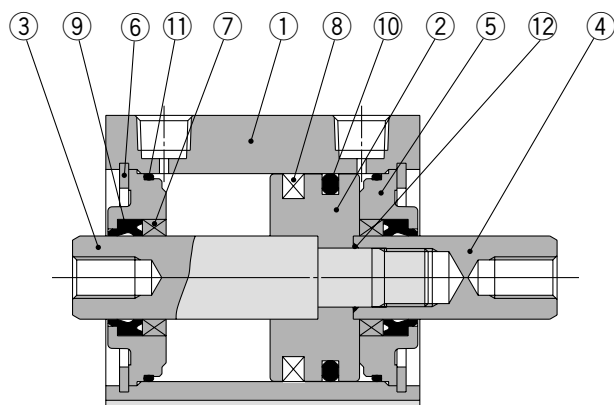
With rubber bumper -3 g

Rod end flange 180 g

575 g

Add each mass 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 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 larger only
8	Magnet	—	—
9*	Rod seal	NBR	
10*	Piston seal	NBR	
11*	Tube gasket	NBR	
12	Piston gasket	NBR	

Replacement Parts/Seal Kit (Pneumatic)

Bore size (mm)	Kit no.	Contents
12	CQ2WB12-PS	Set of nos. above ⑨, ⑩, ⑪
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)

Bore size (mm)	Kit no.	Contents
20	CQ2WBH20-PS	Set of nos. above ⑨, ⑩, ⑪
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)

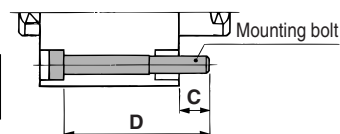
Mounting Bolt for CDQ2/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2WB is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 40L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CDQ2WB12-5DCZ	6.1	40	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	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	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	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 size
CDQ2WB32-5DZ	6.5	45	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		115	x 115L
-100DZ		140	x 140L
CDQ2WB40-5DZ	7	55	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
CDQ2WB50-10DZ	12.5	65	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 size
CDQ2WB63-10DZ	13.5	65	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	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	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

Large Bore
Size

Long Stroke

Non-rotating
Rod

Axial Piping

Anti-lateral
Load

With End Lock

Water
Resistant

With Auto
Switch

Auto Switch

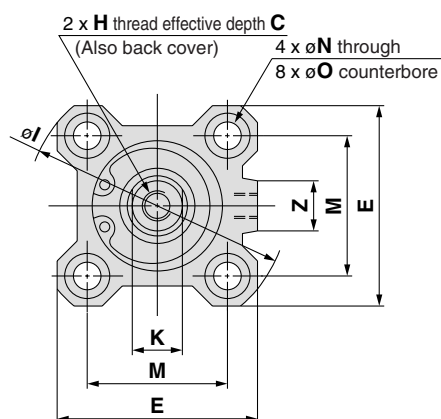
Made to Order

Series CQ2W

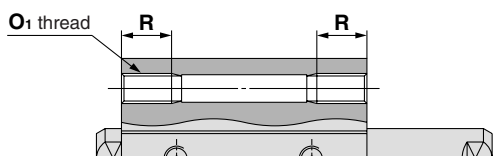
Dimensions

Ø12 to Ø25/Without Auto Switch

Basic (Through-hole): CQ2WB

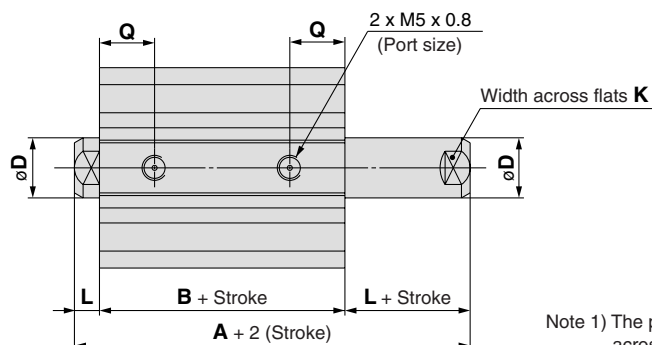


Both ends tapped: CQ2WA



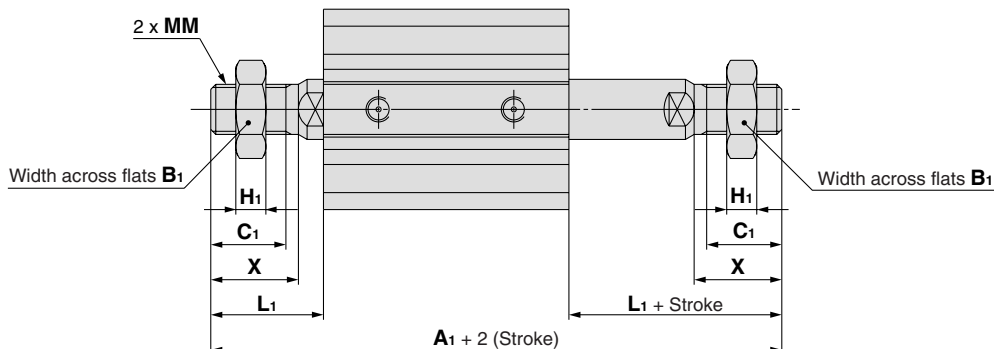
Both Ends Tapped

Bore size (mm)	Ø1	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



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

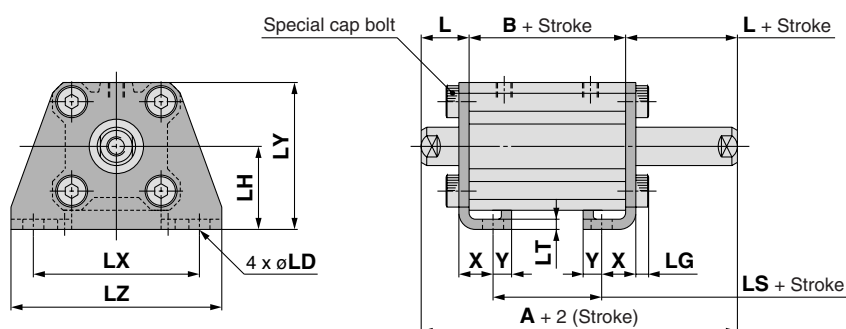
Basic

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) External dimensions with rubber bumper are same as Basic, as shown above.

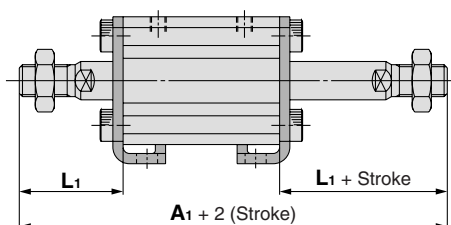
* For details about the rod end nut and accessory brackets, refer to page 19.

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

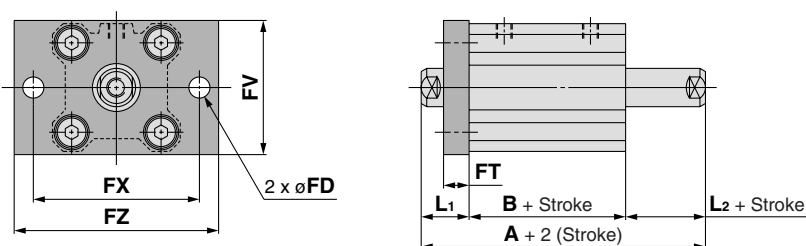
Foot

(mm)

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

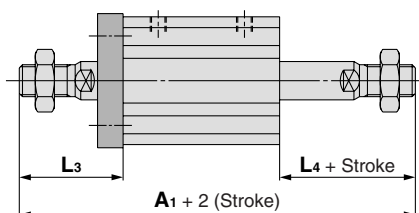
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Flange: CQ2WF



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

Rod end male thread



Rod End Male Thread (mm)

Bore size (mm)	A 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

(mm)

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.

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

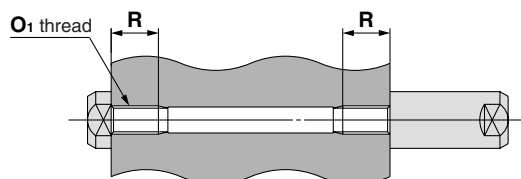
Series CQ2W

Dimensions

ø12 to ø25/With Auto Switch

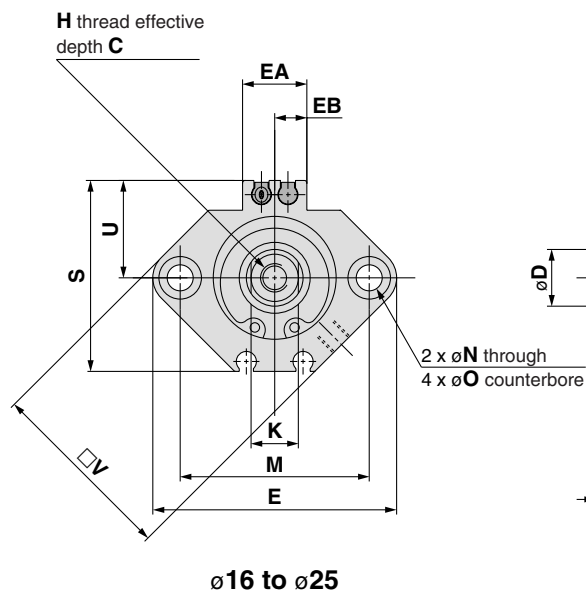
Basic (Through-hole): CDQ2WB

Both ends tapped: CDQ2WA

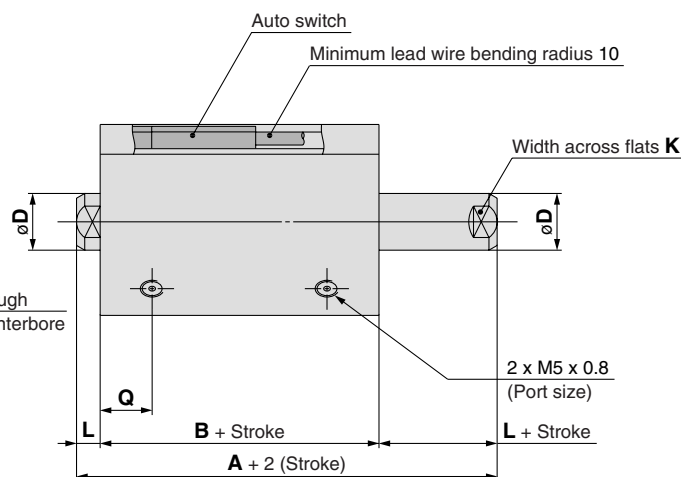


Both Ends Tapped

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

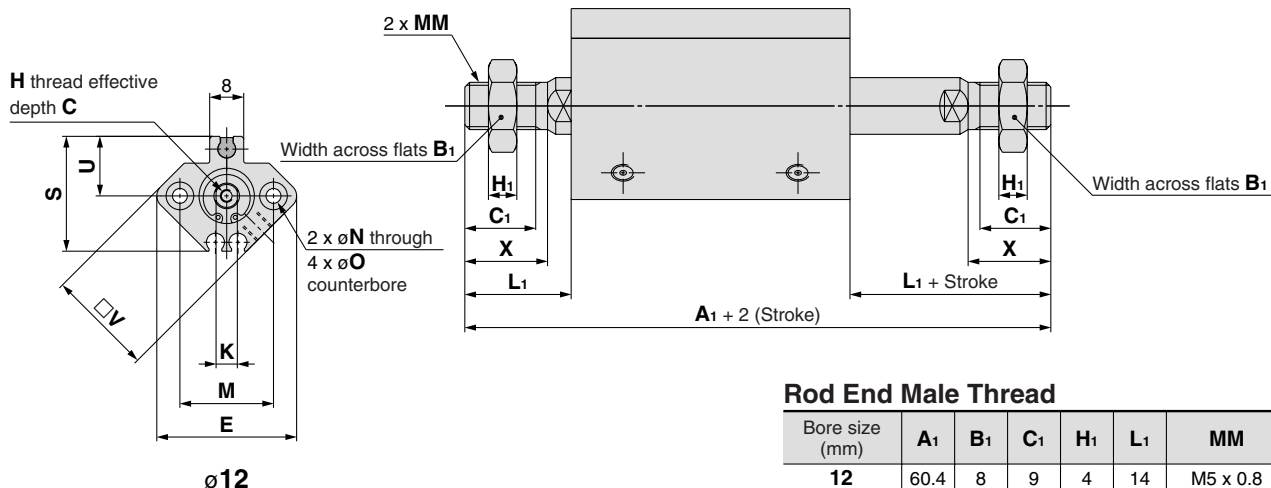


Note 1) The positions of left and right width across flats are not constant.



ø16 to ø25

Rod end male thread



ø12

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

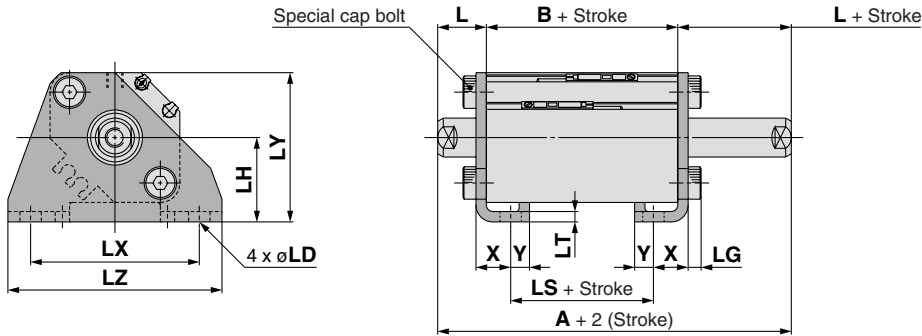
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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) External dimensions with rubber bumper are same as Basic, as shown above.

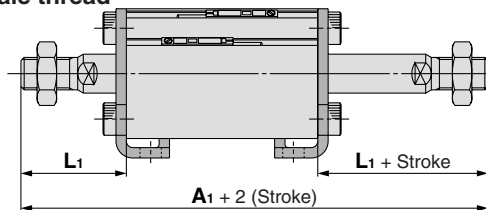
* For details about the rod end nut and accessory brackets, refer to page 19.

Foot: CDQ2WL



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

Rod end male thread



Rod End Male Thread (mm)

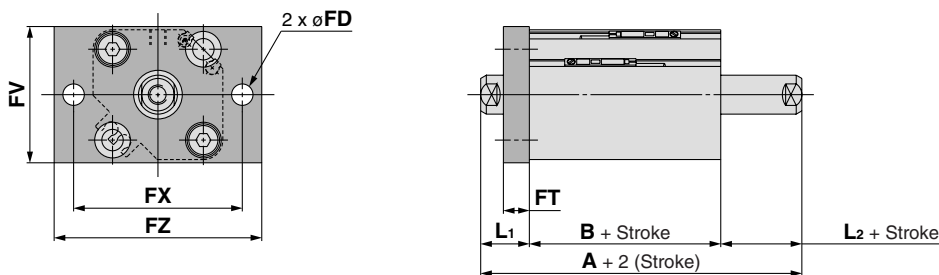
Bore size (mm)	A ₁	L ₁
12	80.4	24
16	87	25.5
20	95	28.5
25	104	32.5

Foot

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

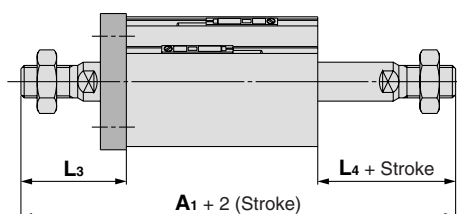
Foot bracket material: Carbon steel
Surface treatment: Nickel plated

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

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

Series CQ2W

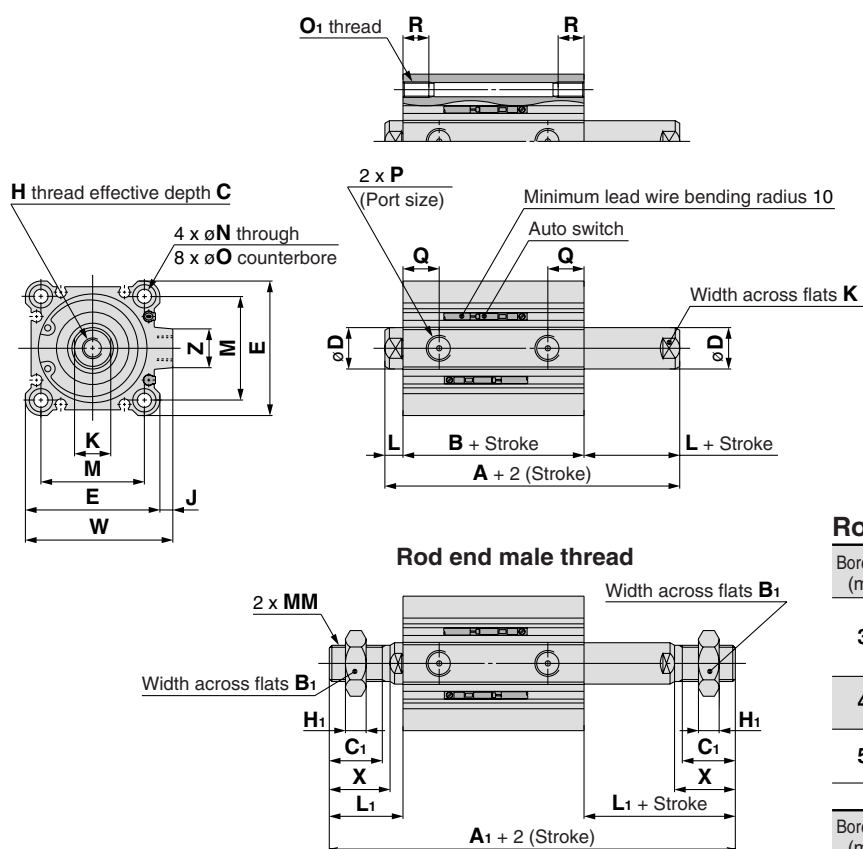
Dimensions

ø32 to ø50/With Auto Switch

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

Basic (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

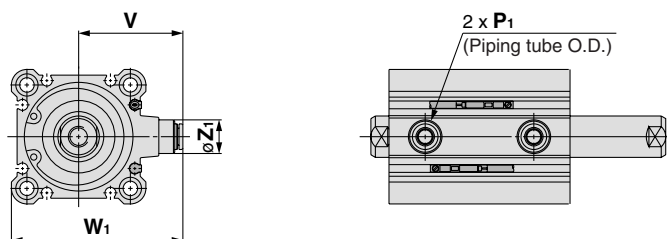
Note 1) The positions of left and right width across flats are not constant.

Rod End Male Thread

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch
32	5	87.5	97.5
	10 to 50		
	75, 100		
40	5 to 50	97	107
	75, 100	107	
	10 to 50	107.5	
50	75, 100	117.5	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
32	V	W ₁	V	W ₁
40	38	60.5	36.5	59
50	42	68	40.5	66.5
	50	82	50	82
			16	8

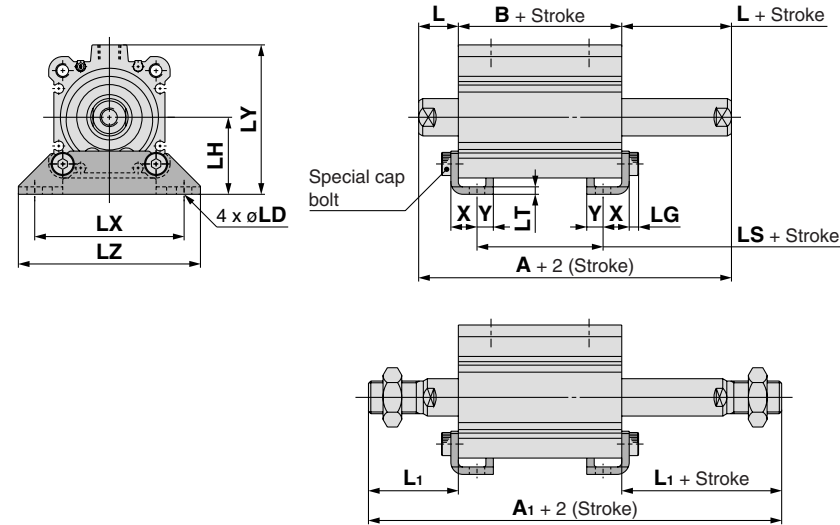
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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			1/8			
	75, 100			1/8			
40	5 to 50	54	40	1/8	64	50	1/8
	75, 100	64	50				
	10 to 50	56.5	40.5				
50	75, 100	66.5	50.5	1/4	66.5	50.5	1/4

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) External dimensions with rubber bumper are same as Basic, 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 (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A₁	With auto switch A₁	L₁
32	5 to 50	107.5	117.5	38.5
	75, 100	117.5		
40	5 to 50	117	127	38.5
	75, 100	127		
50	10 to 50	127.5	137.5	43.5
	75, 100	137.5		

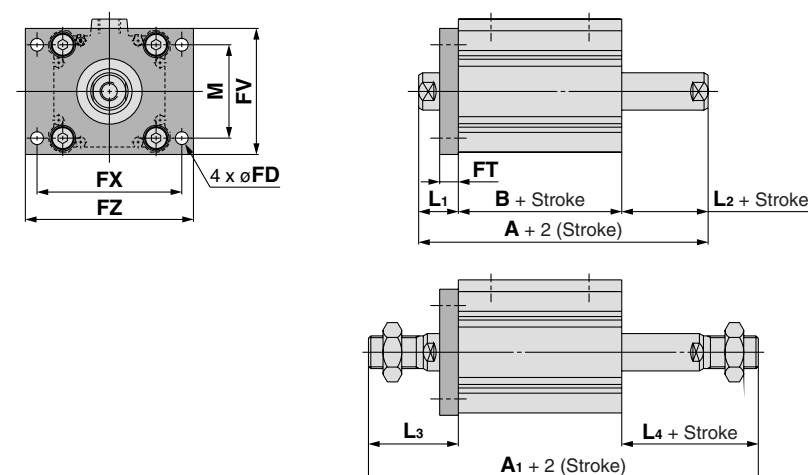
Foot (mm)

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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

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

Flange: CQ2WF/CDQ2WF



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

Rod End Male Thread (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch A₁	With auto switch A₁	L₃	L₄
32	5 to 50	97.5	107.5	38.5	28.5
	75, 100	107.5			
40	5 to 50	107	117	38.5	28.5
	75, 100	117			
50	10 to 50	117.5	127.5	43.5	33.5
	75, 100	127.5			

Flange (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		FD	FT	FV	FX	FZ	L₁	L₂	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										

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Series CQ2W

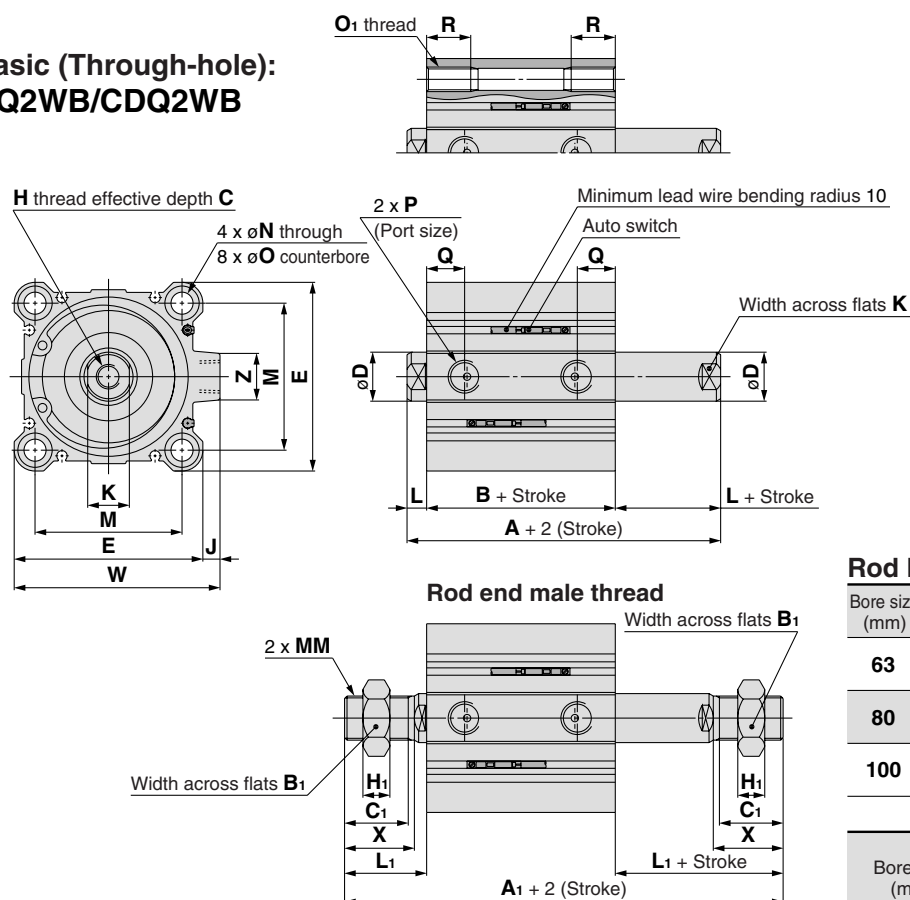
Dimensions

ø63 to ø100/With Auto Switch

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

Both ends tapped: CQ2WA/CDQ2WA

Basic (Through-hole): CQ2WB/CDQ2WB



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

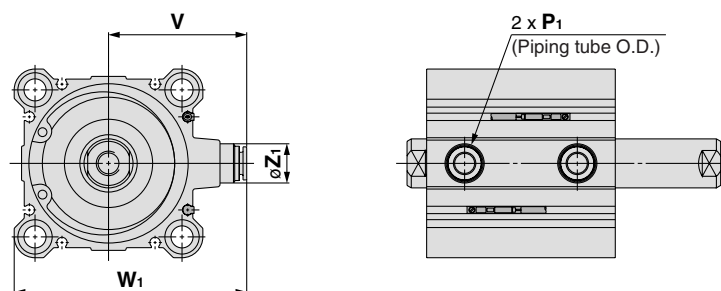
Note 1) The positions of left and right width across flats are not constant.

Rod End Male Thread

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

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



Built-in One-touch Fittings

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

* In the case of built-in one-touch fittings, the 5 mm stroke with ø32 is the same external dimensions as 10 mm stroke.

For auto switch mounting position and its mounting height, refer to pages 173 to 176.

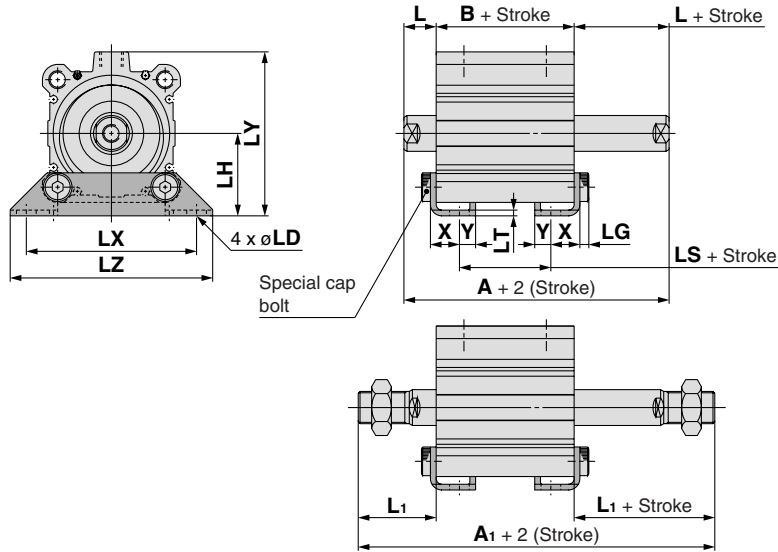
Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch	
		A	B	A	B
63	10 to 50	58	42	68	52
	75, 100	68	52		
80	10 to 50	71	51	81	61
	75, 100	81	61		
100	10 to 50	84.5	60.5	94.5	70.5
	75, 100	94.5	70.5		

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) External dimensions with rubber bumper are same as Basic, 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 (mm)

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

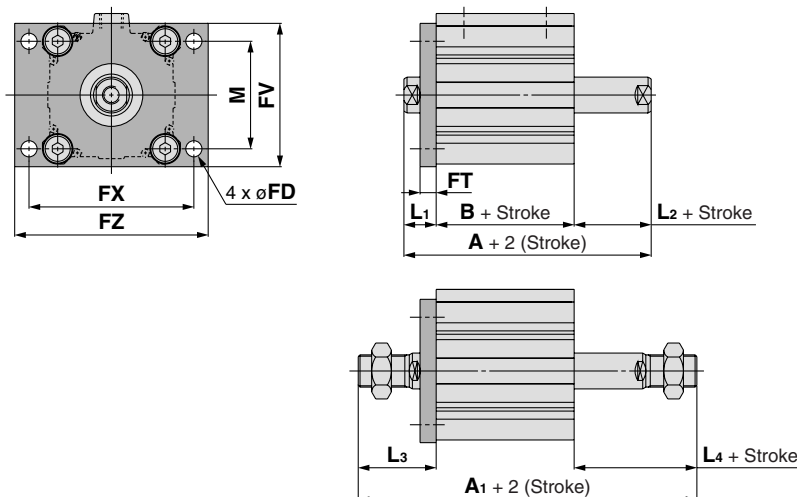
Foot

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 (mm)

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch	L ₃	L ₄
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										

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact Cylinder: Standard Single Acting, Single Rod Series CQ2

ø12, ø16, ø20, ø25, ø32, ø40, ø50

How to Order

Without auto switch ø12 to ø25
CQ2 B 20 - 10 S

Without auto switch ø32 to ø50
CQ2 B 32 - 10 S Z

With auto switch
CDQ2 B 32 - 10 S Z - M9BW

With auto switch
(Built-in magnet)

Mounting

B	Through-hole (Standard)	F	Rod end flange
A	Both ends tapped	G	Head end 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 CQ2" 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
TN	Rc	ø32 to ø50
TF	NPT	
F	G	
Built-in one-touch fittings (Note)		

Note) Bore sizes available with one-touch fittings are ø32 to ø50.
* For cylinders without an auto switch, M threads are compatible only for ø32 with 5 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 the applicable auto switch model.

Auto switch mounting groove

Z	ø12 to ø25	2 sides
	ø32 to ø50	4 sides

Made to Order
Refer to page 39 for details.

Body option

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

* Combination of body option ("FM") is available.

Action

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

Cylinder stroke (mm)
For "Standard Stroke", refer to page 39.

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

Applicable Auto Switches/Refer to pages 180 to 188 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 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)			24 V				5 V, 12 V	—	M9NVW	M9NW	●	●	●	○	—		○	IC circuit
	3-wire (PNP)									M9PVW	M9PW	●	●	●	○	—		○	
	2-wire									M9BWV	M9BW	●	●	●	○	—		○	IC circuit
	3-wire (NPN)									M9NAV	M9NA	○	○	●	○	—		○	
	3-wire (PNP)			M9PAV				M9PA	○	○	●	○	—	○					
2-wire	M9BAV	M9BA	○	○	●	○	—	○	——										
Reed switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—		
				No	2-wire	24 V	12 V, 100 V	100 V or less	A93V	A93	●	—	●	—	—	—	—	Relay, PLC	
			A90V						A90	●	—	●	—	—	—	—			

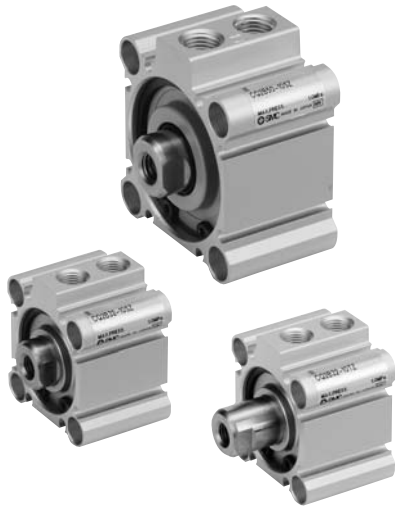
* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

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

* There are other applicable auto switches other than the listed above. For details, refer to page 179.

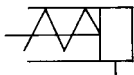
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Series CQ2

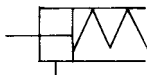


JIS Symbol

Single acting,
Spring return



Single acting,
Spring extend



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of rod end shape, Spring return type only
—XB10	Intermediate stroke (Using exclusive body), Spring return type only
—XC6	Retaining ring, piston rod, rod end nut made of stainless steel
—XC26	With a split pin for double clevis pin and double knuckle pin and a flat washer
—XC27	Double clevis pins and double knuckle pins made of stainless steel (Stainless steel 304)
—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 ø12, ø16, ø25.
—X203	L dimension from rod cover is the same as Series CQ1, ø20, ø32 only.
—X271	Fluororubber seals
—X1876	Cylinder tube: With concave boss on head end

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

- Minimum stroke for auto switch mounting
- Auto switch proper mounting position (detection at stroke end) and height
- Operating range
- Auto switch mounting bracket/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 Stroke

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

Manufacture of Intermediate Stroke

(Single acting, Spring return type is excluded.)

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 38.	
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with 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. 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	Screw-in type	—	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4
			TN	—	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4
			TF	—	—	—	—	G 1/8	G 1/8	G 1/4
		Built-in one-touch fittings		Note 2)	—	—	—	—	ø6/4	ø6/4
	Rod end male thread			●	●	●	●	●	●	●
	With boss on head end			●	●	●	●	●	●	●

Note 1) For a ø32 cylinder without an auto switch, M5 x 0.8 is used for 5-stroke piping dimension. Thus, do not enter a symbol for the port thread type.

Note 2) One-touch fittings cannot be replaced.

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and "Handling
Precautions for SMC Products" (M-
E03-3) for Actuators and Auto
Switches Precautions.

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)

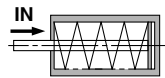
Bore size (mm)	Stroke (mm)	Spring reaction force (N)	
		Second	First
12	5	13	8.6
	10	13	3.9
16	5	15	10.3
	10	15	5.9
20	5	15	10
	10	15	5.9
25	5	20	16
	10	20	11
32	5	30	23
	10	30	16
40	5	30	13
	10	39	21
50	10	50	30
	20	54	24

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

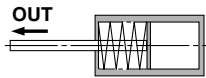
Single acting, Spring return

Spring state with first mounting load



When spring is set in cylinder

Spring state with second mounting load



When spring is compressed with air

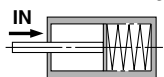
Single acting, Spring extend

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 Bracket/Part No.

Bore size (mm)	Part no.	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 foot bracket, please be careful of order quantity, since 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 bolt, Double clevis:
Clevis pin, Type C retaining ring for axis, Body mounting bolt

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	50	535	928	1316
	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

Mass

Mass

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	50	—	357	—	426
	12	29	35	—	—
	16	43	50	—	—
	20	67	78	—	—
	25	92	104	—	—
	32	135	151	—	—
	40	206	223	—	—
	50	—	374	—	429

Additional Mass

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 bolt)		55	67	164	186	142	154	243
Rod end flange (Including mounting bolt)		57	69	139	161	180	214	373
Head end flange (Including mounting bolt)		54	65	133	152	165	198	348
Double clevis (Including pin, retaining ring, bolt)		32	39	88	123	151	196	393

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

- Cylinder mass: CQ2B32-10SZ 145 g
- Option mass: Both ends tapped 6 g
- Rod end male thread 43 g
- Double clevis 151 g
- 345 g**

Series CQ2

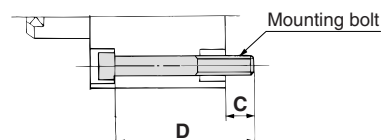
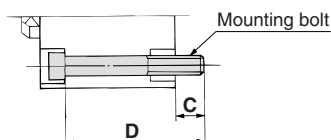
Mounting Bolt for CQ2/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



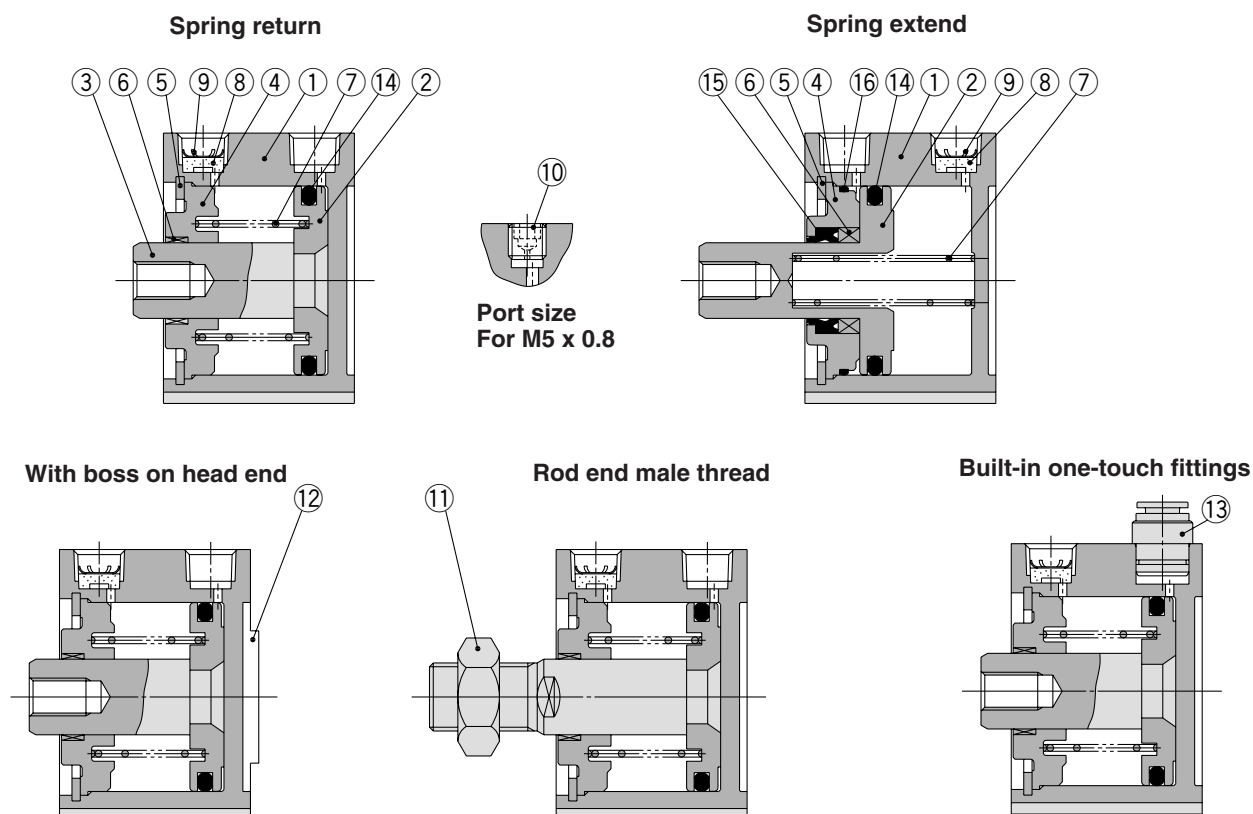
Spring Return

Cylinder model	C	D	Mounting bolt size
CQ2B12-5S	6.5	25	M3 x 25L
-10S		30	x 30L
CQ2B16-5S	5	25	M3 x 25L
-10S		30	x 30L
CQ2B20-5S	7.5	25	M5 x 25L
-10S		30	x 30L
CQ2B25-5S	9.5	30	M5 x 30L
-10S		35	x 35L
CQ2B32-5SZ	9	30	M5 x 30L
-10SZ		35	x 35L
CQ2B40-5SZ	7.5	35	M5 x 35L
-10SZ		40	x 40L
CQ2B50-10SZ	12.5	45	M6 x 45L
-20SZ		55	x 55L

Spring Extend

Cylinder model	C	D	Mounting bolt size
CQ2B12-5T	6.5	25	M3 x 25L
-10T		30	x 30L
CQ2B16-5T	5	25	M3 x 25L
-10T		30	x 30L
CQ2B20-5T	7.5	25	M5 x 25L
-10T		30	x 30L
CQ2B25-5T	9.5	30	M5 x 30L
-10T		35	x 35L
CQ2B32-5TZ	9	30	M5 x 30L
-10TZ		35	x 35L
CQ2B40-5TZ	7.5	35	M5 x 35L
-10TZ		40	x 40L
CQ2B50-10TZ	12.5	45	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, Chromate, 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 Rc 1/8, 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).
(Excluding ø12 and 16 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
Note	A set includes ⑭.	Kits include items ⑭, ⑮, ⑯ from the table above.
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 $S_T(M)Z$

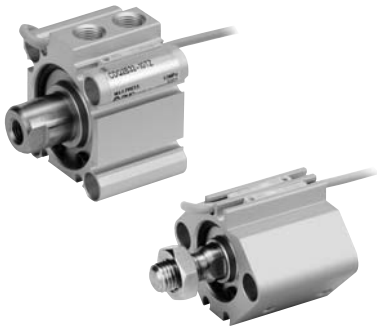
• Copper and fluorine-free series • $\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50$

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

Specifications

[illegible]

Compact Cylinder: Standard Single Acting, Single Rod Series **CDQ2** With Auto Switch



Refer to page below for further information on auto switches.

Auto switch specifications	P.180 to 188
Auto switch proper mounting position and height	P.173 to 178
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass

Mass

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

Additional Mass

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

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

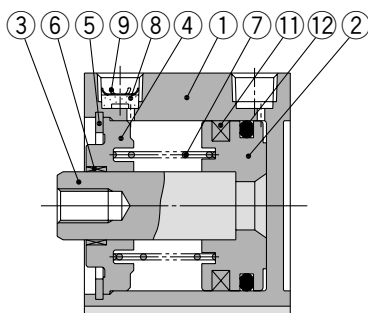
- Cylinder mass: CDQ2B32-10SZ 202 g
- Option mass: Both ends tapped 6 g
- Rod end male thread 43 g
- Double clevis 151 g

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

402 g

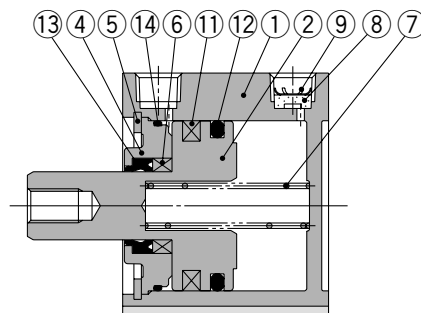
Construction

Spring return



Port size
For M5 x 0.8

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, Chromate, 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 Rc 1/8, 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 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 CDQ2/With Auto Switch

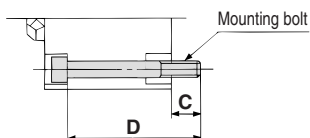
Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

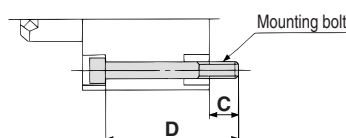
Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Spring return



Spring extend



Spring Return

Cylinder model	C	D	Mounting bolt size
CDQ2B12-5SZ	5.5	35	M3 x 35L
-10SZ		40	x 40L
CDQ2B16-5SZ	8	40	M3 x 40L
-10SZ		45	x 45L
CDQ2B20-5SZ	10.5	40	M5 x 40L
-10SZ		45	x 45L
CDQ2B25-5SZ	9.5	40	M5 x 40L
-10SZ		45	x 45L
CDQ2B32-5SZ	9	40	M5 x 40L
-10SZ		45	x 45L
CDQ2B40-5SZ	7.5	45	M5 x 45L
-10SZ		50	x 50L
CDQ2B50-10SZ	12.5	55	M6 x 55L
-20SZ		65	x 65L

Spring Extend

Cylinder model	C	D	Mounting bolt size
CDQ2B12-5TZ	6.1	40	M3 x 40L
-10TZ		45	x 45L
CDQ2B16-5TZ	8	40	M3 x 40L
-10TZ		45	x 45L
CDQ2B20-5TZ	10.5	40	M5 x 40L
-10TZ		45	x 45L
CDQ2B25-5TZ	9.5	40	M5 x 40L
-10TZ		45	x 45L
CDQ2B32-5TZ	9	40	M5 x 40L
-10TZ		45	x 45L
CDQ2B40-5TZ	7.5	45	M5 x 45L
-10TZ		50	x 50L
CDQ2B50-10TZ	12.5	55	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

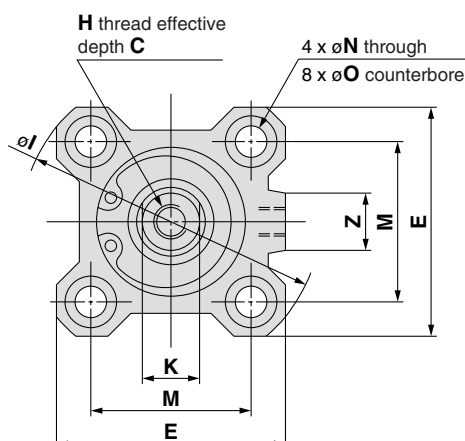
Made to Order

Series CQ2

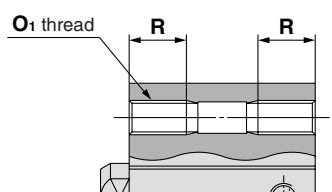
Dimensions

Ø12 to Ø25/Spring Return Without Auto Switch

Basic (Through-hole): CQ2B

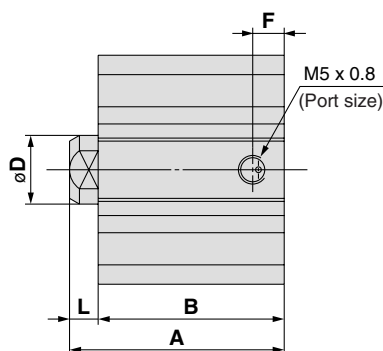


Both ends tapped: CQ2A

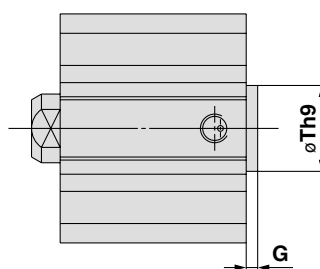


Both Ends Tapped

Bore size (mm)	Ø1	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

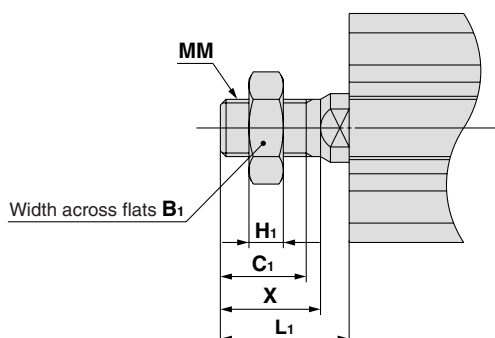


With Boss on Head End

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 in rod sid: Option (Suffix "-XC36" to the end of part number.)

Rod end male thread



Rod End Male Thread

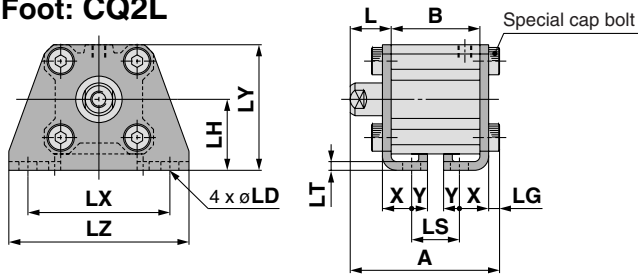
Bore size (mm)	B1	C1	H1	L1	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Basic

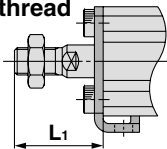
Bore size (mm)	Stroke (mm)	A	B	C	D	E	F	H	I	K	L	M	N	O	Z
12	5	25.5	22	6	6	25	5	M3 x 0.5	32	5	3.5	15.5	3.5	6.5 depth 3.5	—
	10	30.5	27												
16	5	27	23.5	8	8	29	5.5	M4 x 0.7	38	6	3.5	20	3.5	6.5 depth 3.5	10
	10	32	28.5												
20	5	29	24.5	7	10	36	5.5	M5 x 0.8	47	8	4.5	25.5	5.5	9 depth 7	10
	10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

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

Foot: CQ2L



Rod end male thread



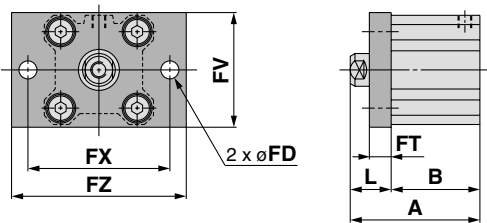
Foot

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

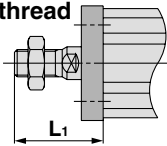
Bore size (mm)	LT	LX	LY	LZ	X	Y
12	2	34	29.5	44	8	4.5
16	2	38	33.5	48	8	5
20	3.2	48	42	62	9.2	5.8
25	3.2	52	46	66	10.7	5.8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end flange: CQ2F



Rod end male thread

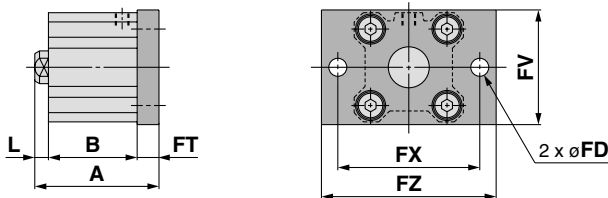


Rod End Flange

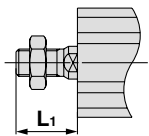
Bore size (mm)	A		B		FD	FT	FV	FX	FZ	L	L ₁
	5st	10st	5st	10st							
12	35.5	40.5	22	27	4.5	5.5	25	45	55	13.5	24
16	37	42	23.5	28.5	4.5	5.5	30	45	55	13.5	25.5
20	39	44	24.5	29.5	6.6	8	39	48	60	14.5	28.5
25	42.5	47.5	27.5	32.5	6.6	8	42	52	64	15	32.5

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head end flange: CQ2G



Rod end male thread



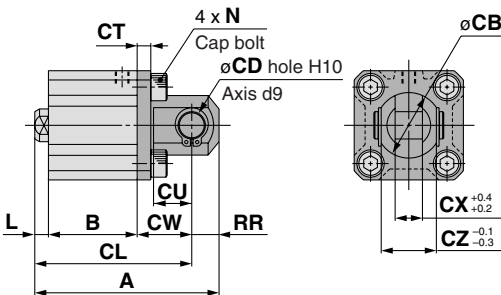
Head End Flange

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

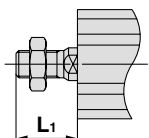
(* Dimensions except A, L and L₁ are the same as rod end flange.)

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

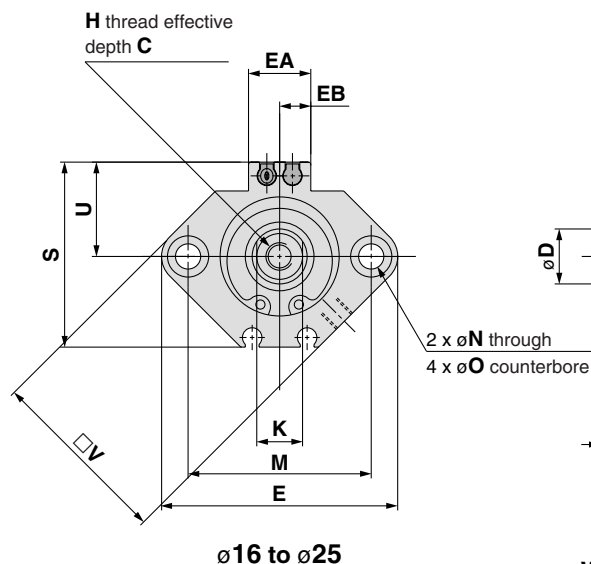
* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pins and retaining rings are included.

Series CQ2

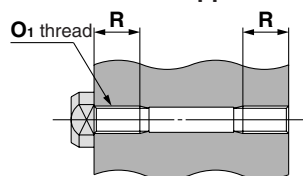
Dimensions

Ø12 to Ø25/Spring Return With Auto Switch

Basic (Through-hole): CDQ2B

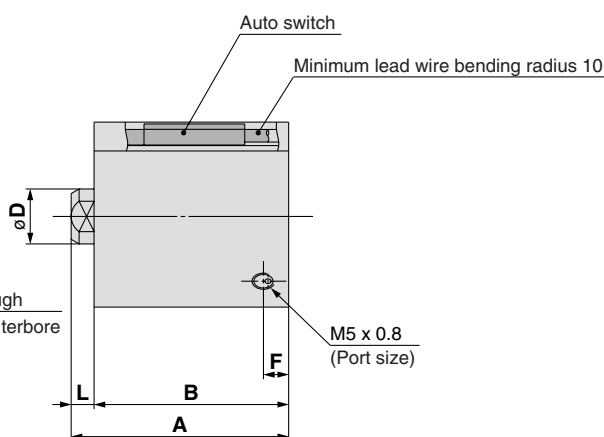


Both ends tapped: CDQ2A



Both Ends Tapped

Bore size (mm)	Ø1	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

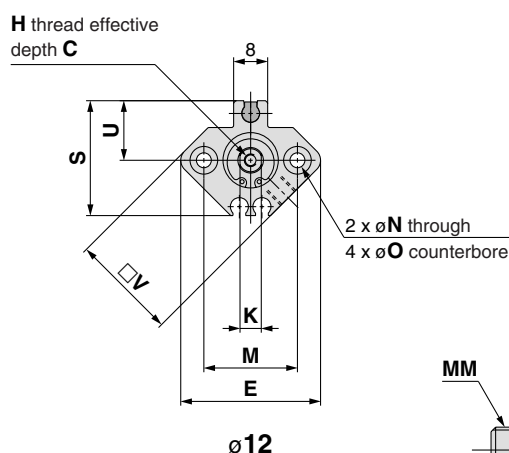


With boss on head end

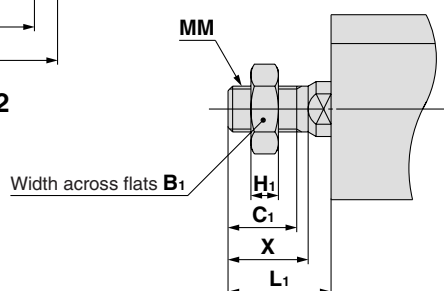
With Boss on Head End

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 part number.)



Rod end male thread



Rod End Male Thread

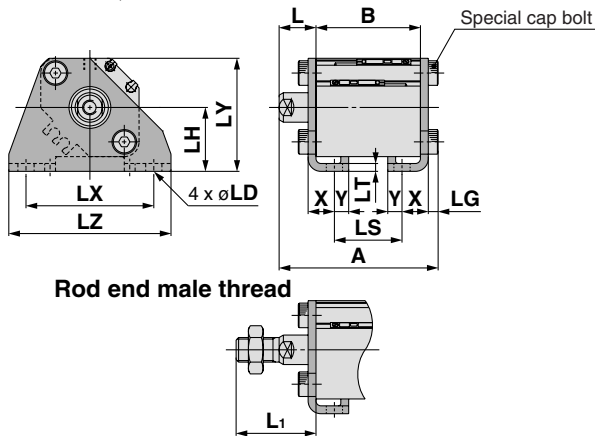
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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



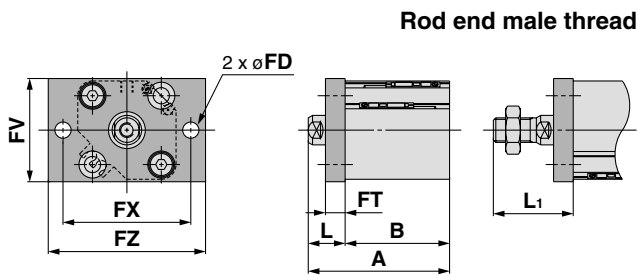
Foot

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 end flange : CDQ2F

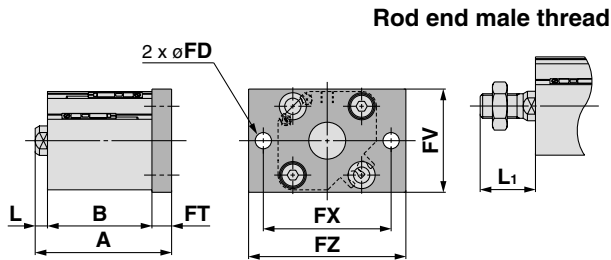


Rod End Flange

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 end flange: CDQ2G



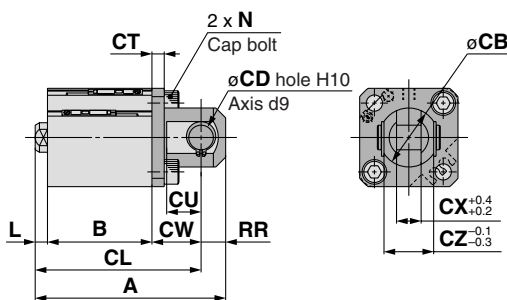
Head End Flange

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

(* Dimensions except A, L and L₁ are the same as rod end flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double clevis: CDQ2D



Double Clevis

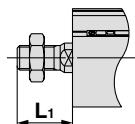
Bore size (mm)	A		B		CB	CD	CL		CT	CU	CW
	5st	10st	5st	10st			5st	10st			
12	56.5	61.5	33	38	12	5	50.5	55.5	4	7	14
16	60	65	35.5	40.5	14	5	54	59	4	10	15
20	68	73	36.5	41.5	20	8	59	64	5	12	18
25	72.5	77.5	37.5	42.5	24	10	62.5	67.5	5	14	20

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 pins and retaining rings are included.

Rod end male thread



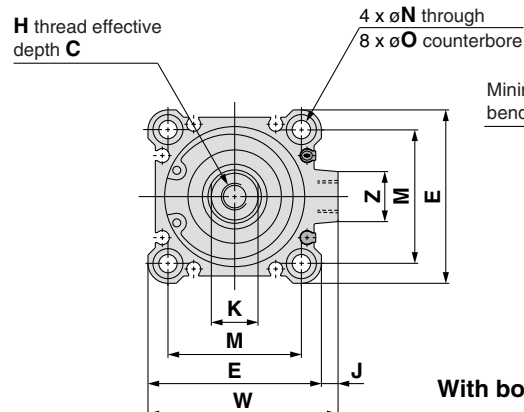
Series CQ2

Dimensions

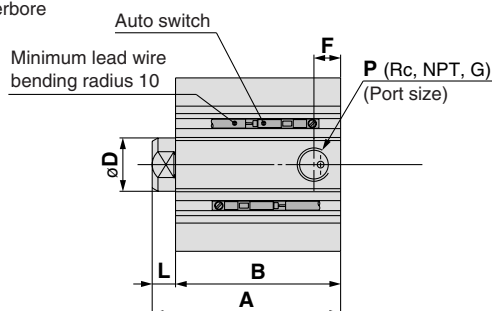
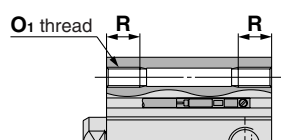
ø32 to ø50/Spring Return With Auto Switch

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

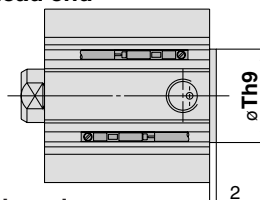
Basic (Through-hole): CQ2B/CDQ2B



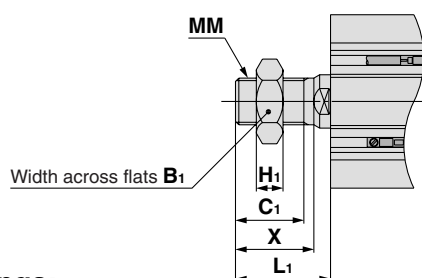
Both ends tapped: CQ2A/CDQ2A



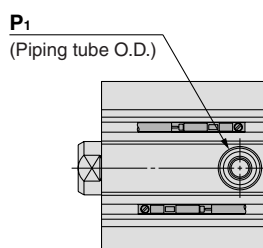
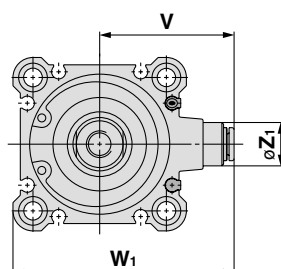
With boss on head end



Rod end male thread



Built-in one-touch fittings: ø32 to ø50



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

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 part number.)

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

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

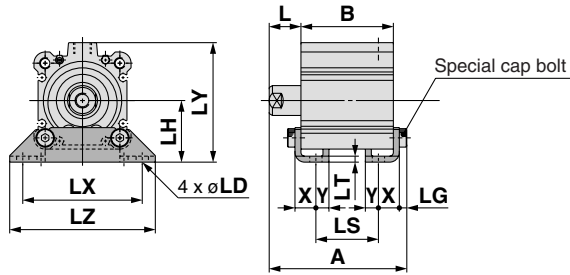
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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														

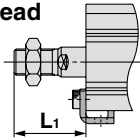
Note 2) A, B dimensions of ø32-5 stroke with built-in one-touch fitting without auto switch are the same dimensions as the stroke ø32-10 without auto switch.

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

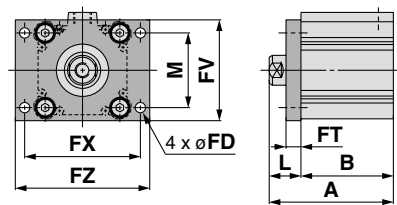
Foot: CQ2L/CDQ2L



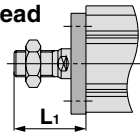
Rod end male thread



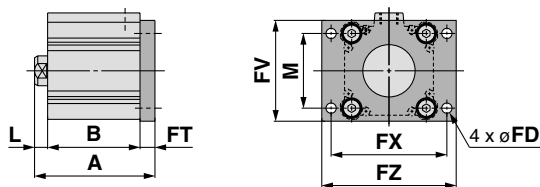
Rod end flange: CQ2F/CDQ2F



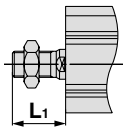
Rod end male thread



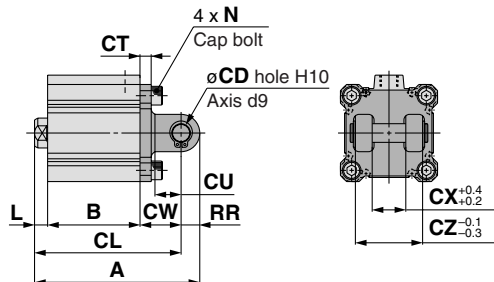
Head end flange: CQ2G/CDQ2G



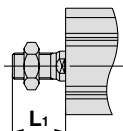
Rod end male thread



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	52.5	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	LY	LZ	X	Y
32	17	38.5	6.6	4	30	57	57	71	11.2	5.8
40	17	38.5	6.6	4	33	64	64	78	11.2	7
50	18	43.5	9	5	39	79	78	95	14.7	8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod End 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 End Flange

(mm)

Bore size (mm)	Without auto switch			With auto switch			L	L
	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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

(* Dimensions except A, L and L₁ are the same as rod end flange.)

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	—	39.5	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	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 pins and retaining rings are included.

Standard

Large Bore
Size

Long Stroke

Non-rotating
Rod

Axial Piping

Anti-lateral
Load

With End Lock

Water
Resistant

With Auto
Switch

Auto Switch

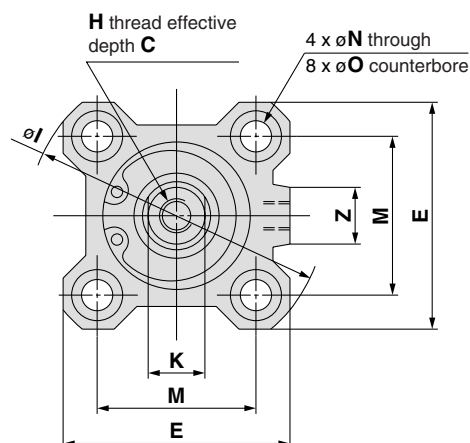
Made to Order

Series CQ2

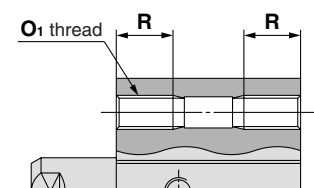
Dimensions

Ø12 to Ø25/Spring Extend Without Auto Switch

Basic (Through-hole): CQ2B

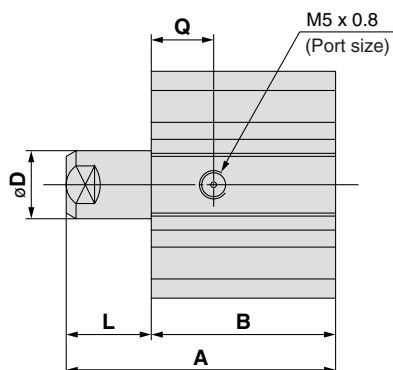


Both ends tapped: CQ2A

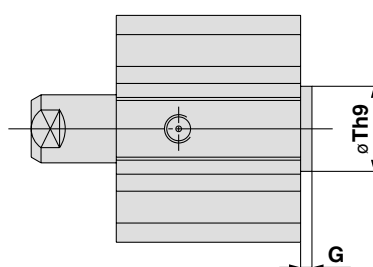


Both Ends Tapped

Bore size (mm)	Ø1	R (mm)
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

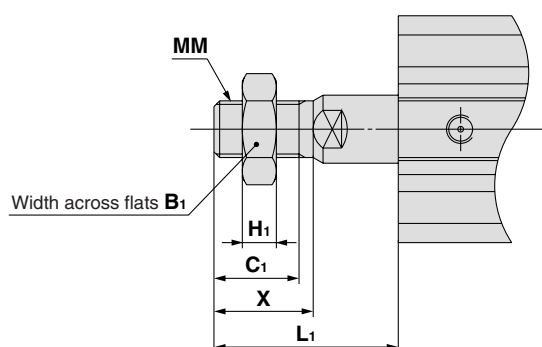


With Boss on Head End

Bore size (mm)	G	Th9 (mm)
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 part number.)

Rod end male thread



Rod End Male Thread

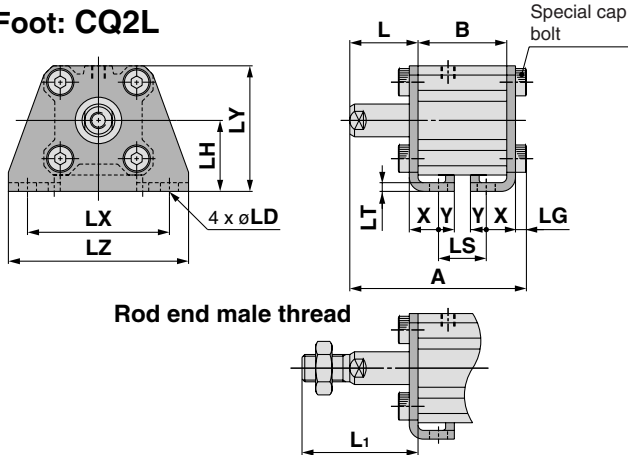
Bore size (mm)	B1	C1	H1	L1 (mm)		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

Basic

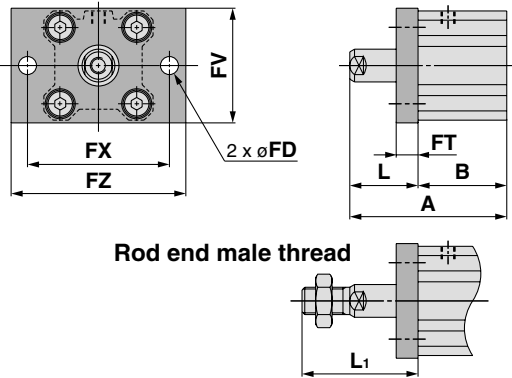
Bore size (mm)	Stroke (mm)	A	B	C	D	E	H	I	K	L	M	N	O	Q	Z
12	5	30.5	22	6	6	25	M3 x 0.5	32	5	8.5	15.5	3.5	6.5 depth 3.5	7.5	—
	10	40.5	27							13.5					
16	5	32	23.5	8	8	29	M4 x 0.7	38	6	8.5	20	3.5	6.5 depth 3.5	8	10
	10	42	28.5							13.5					
20	5	34	24.5	7	10	36	M5 x 0.8	47	8	9.5	25.5	5.5	9 depth 7	9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

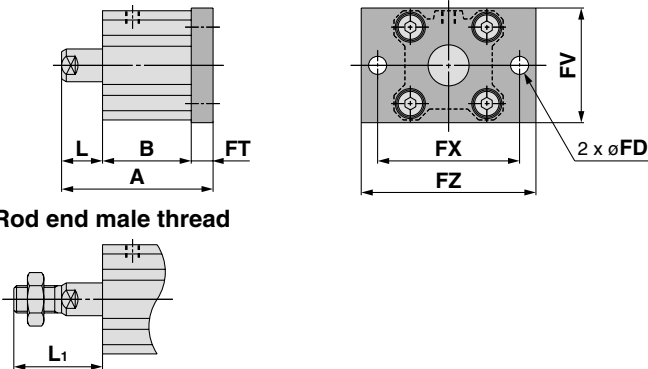
Foot: CQ2L



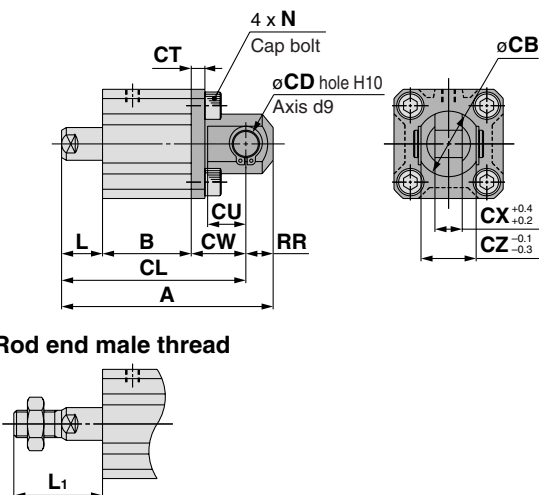
Rod end flange: CQ2F



Head end flange: CQ2G



Double clevis: CQ2D



Foot

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 End Flange

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 End Flange

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

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	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

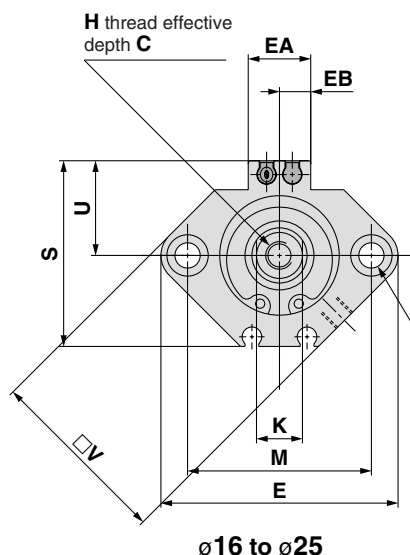
* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pins and retaining rings are included.

Series CQ2

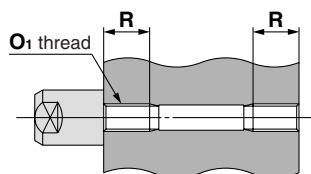
Dimensions

Ø12 to Ø25/Spring Extend With Auto Switch

Basic (Through-hole): CDQ2B

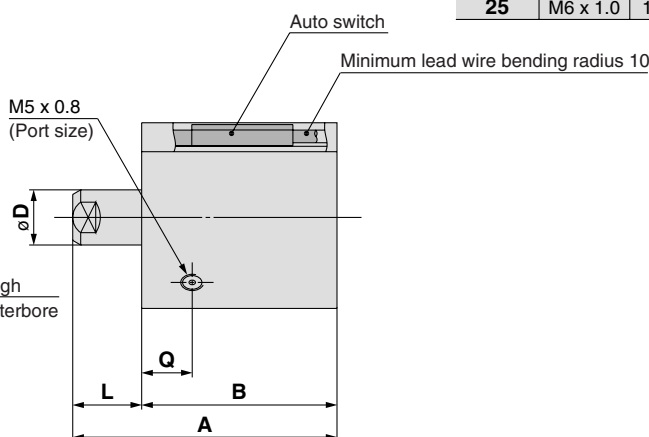


Both ends tapped: CDQ2A



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

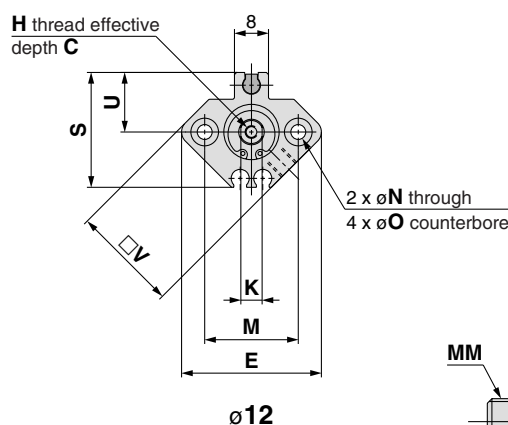


With boss on head end

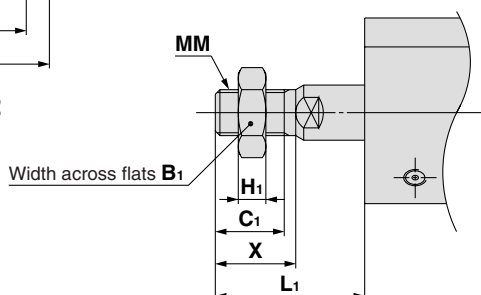
With Boss on Head End

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 part number.)



Rod end male thread



Rod End Male Thread

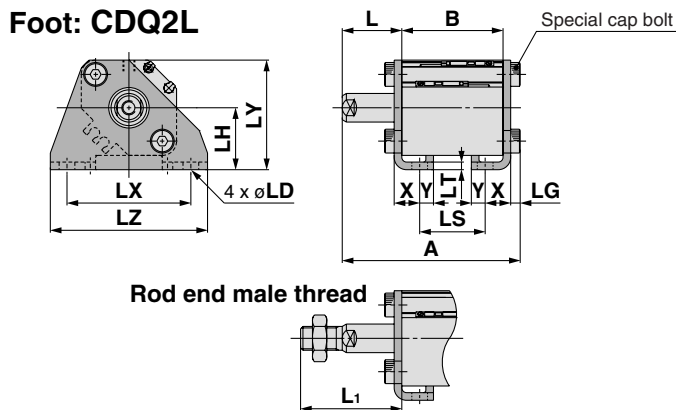
Bore size (mm)	B ₁	C ₁	H ₁	L ₁		MM	X
				5st	10st		
12	8	9	4	19	24	M5 x 0.8	10.5
16	10	10	5	20.5	25.5	M6 x 1.0	12
20	13	12	5	23.5	28.5	M8 x 1.25	14
25	17	15	6	27.5	32.5	M10 x 1.25	17.5

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

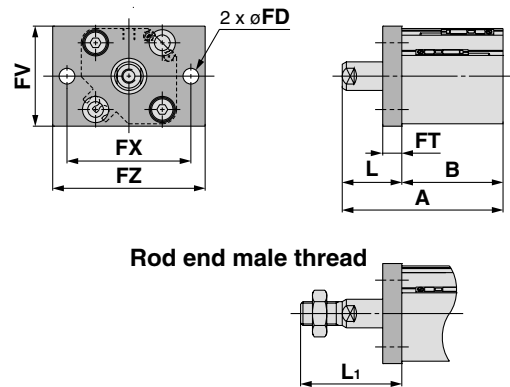
Bore size (mm)	Stroke (mm)	A	B	C	D	E	EA	EB	H	K	L	M	N	O	Q	S	U	V
12	5	45.9	37.4	6	6	33	—	—	M3 x 0.5	5	8.5	22	3.5	6.5 depth 3.5	11	27.5	14	25
	10	55.9	42.4								13.5							
16	5	44	35.5	8	8	37	13.2	6.6	M4 x 0.7	6	8.5	28	3.5	6.5 depth 3.5	10	29.5	15	29
	10	54	40.5								13.5							
20	5	46	36.5	7	10	47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

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

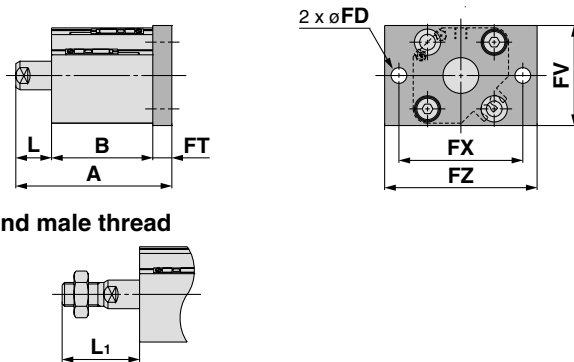
Foot: CDQ2L



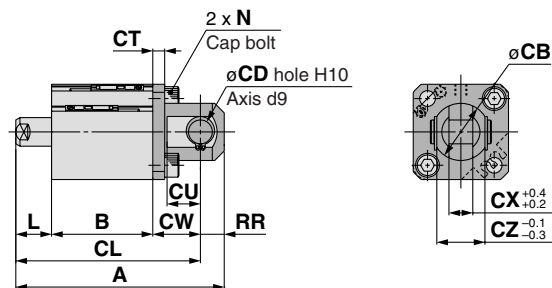
Rod end flange: CDQ2F



Head end flange: CDQ2G



Double clevis: CDQ2D



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 End 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 End 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

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

(* Dimensions except A, L and L₁ are the same as rod end flange.)

Double Clevis

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

Bore size (mm)	L		L 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

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 pins and retaining rings are included.

Series CQ2

Dimensions

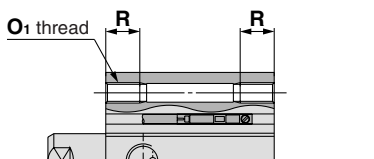
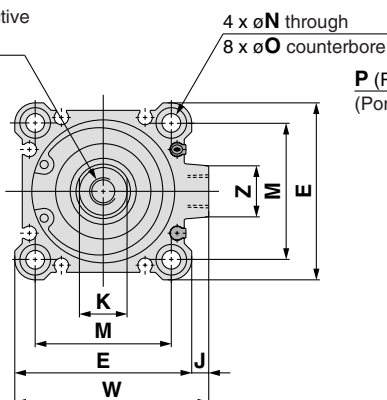
ø32 to ø50/Spring Extend With Auto Switch

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

Both ends tapped: CQ2A/CDQ2A

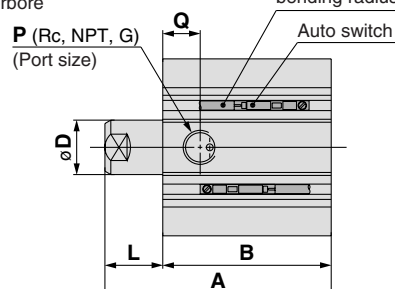
Basic (Through-hole): CQ2B/CDQ2B

H thread effective depth C

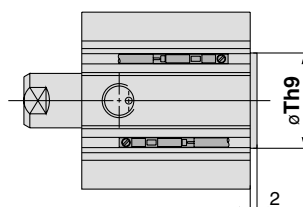


Both Ends Tapped (mm)

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

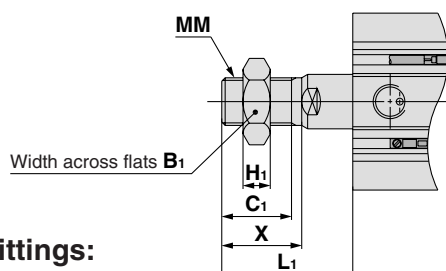


With Boss on Head End (mm)

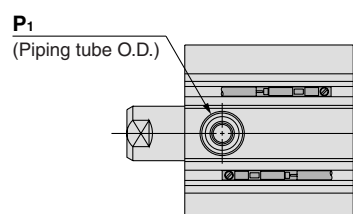
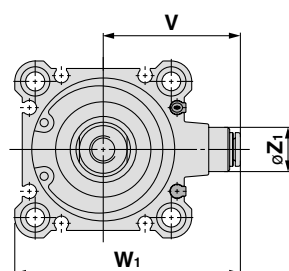
Bore size (mm)	Th9
32	21 ⁰ _{-0.052}
40	28 ⁰ _{-0.052}
50	35 ⁰ _{-0.062}

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

Rod end male thread



Built-in one-touch fittings: ø32 to ø50



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 (mm)

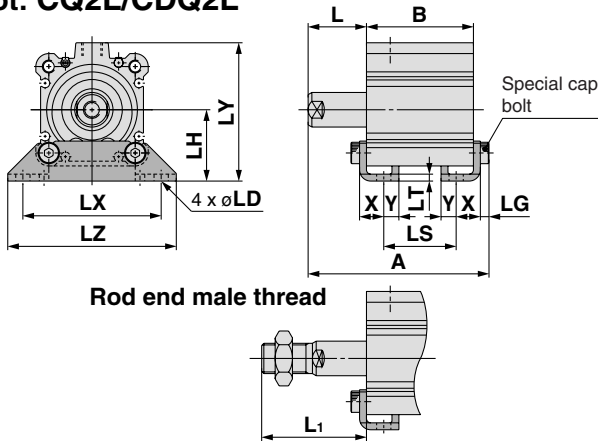
Bore size (mm)	Z ₁	P ₁	V	W ₁
32	13	6	36.5	59
40	13	6	40.5	66.5
50	16	8	50	82

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

Bore size																						For auto switch mounting position and its mounting height, refer to pages 176 to 178.		(mm)	
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									17									
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									

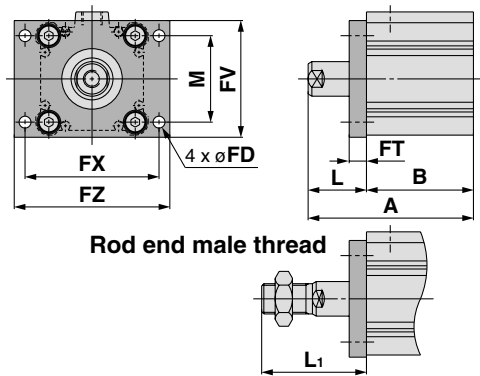
* For details about the rod end nut and accessory brackets, refer to page 19.

Foot: CQ2L/CDQ2L



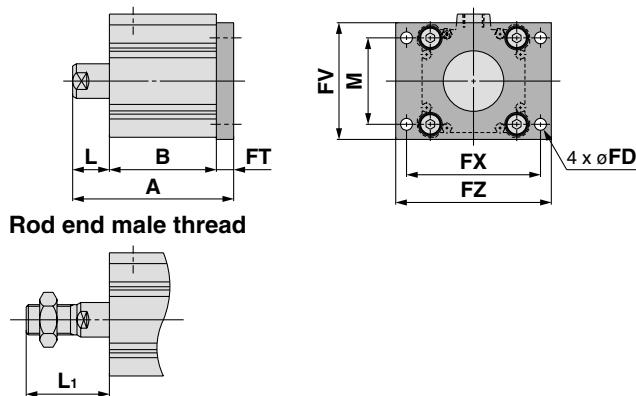
Rod end male thread

Rod end flange: CQ2F/CDQ2F



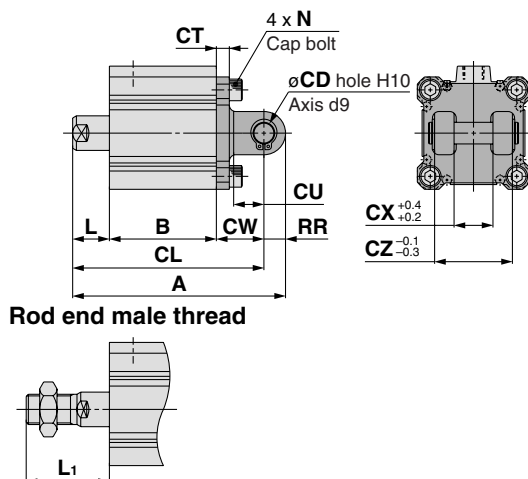
Rod end male thread

Head end 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	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	LG	LH	LX	LY	LZ	X	Y
	5st	10st	20st	5st	10st	20st								
	5st	10st	20st	5st	10st	20st								
32	22	27	—	43.5	48.5	—	6.6	4	30	57	57	71	11.2	5.8
40	22	27	—	43.5	48.5	—	6.6	4	33	64	64	78	11.2	7
50	—	28	38	—	53.5	63.5	9	5	39	79	78	95	14.7	8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod End Flange

(mm)

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	
	5st	10st	20st	5st	10st	20st	
32	22	27	—	43.5	48.5	—	34
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 End Flange

(mm)

Bore size (mm)	Without auto switch			With auto switch			L			L ₁			(* Dimensions except A, L and L ₁ are the same as rod end flange.
	A			A									
	5st	10st	20st	5st	10st	20st	5st	10st	20st	5st	10st	20st	
32	48	58	—	58	68	—	12	17	—	33.5	38.5	—	
40	45.5	64.5	—	64.5	74.5	—	12	17	—	33.5	38.5	—	
50	—	67.5	87.5	—	77.5	97.5	—	18	28	—	43.5	53.5	

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

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	70	80	—	28	33	—	80	90	—	80	90	—	38	43	—	70	80	—
40	78.5	88.5	—	34.5	39.5	—	88.5	98.5	—	88.5	98.5	—	44.5	49.5	—	78.5	88.5	—
50	—	100.5	120.5	—	40.5	50.5	—	110.5	130.5	—	110.5	130.5	—	50.5	60.5	—	96.5	116.5

Bore size (mm)	CD	CT	CU	CW	CX	CZ	L			L ₁		
							5st	10st	20st	5st	10st	20st
							5st	10st	20st	5st	10st	20st
32	10	5	14	20	18	36	12	17	—	33.5	38.5	—
40	10	6	14	22	18	36	12	17	—	33.5	38.5	—
50	14	7	20	28	22	44	—	18	28	—	43.5	53.5

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 pins and retaining rings are included.

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

ø125, ø140, ø160, ø180, ø200

How to Order

CQ2B 125 - 30 DC -

With auto switch **CDQ2B 125 - 30 DC - 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 CQ2" 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

Auto switch

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

* Refer to the below table for the applicable auto switch model.

Number of auto switches

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

Body option

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

Cushion

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

Action

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

Cylinder stroke (mm)
For "Standard Stroke", refer to page 58.

Made to Order
Refer to page 58 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2B140-30DC

Applicable Auto Switches/Refer to pages 180 to 188 of this series and 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)											
							ø125 to ø160	ø180, ø200	ø125 to ø160	ø180, ø200																
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	—	M9NV		M9N		●	●	●	○	—	○	IC circuit	Relay, PLC								
		3-wire (PNP)		M9PV			M9P		●	●	●	○	—	○												
	Connector	2-wire		M9BV			M9B		●	●	●	○	—	○	—											
		J79C		—			●	—	●	●	●	—	—													
	Diagnostic indication (2-color indication)	Grommet	3-wire (NPN)	24 V			—	M9NVV		M9NW		●	●	●	○	—	○		IC circuit							
			3-wire (PNP)					M9PWV		M9PW		●	●	●	○	—	○									
	2-wire		M9BWV					M9BW		●	●	●	○	—	○	—										
	3-wire (NPN)		M9NAV					M9NA		○	○	●	○	—	○											
	Water resistant (2-color indication)	Grommet	3-wire (PNP)					24 V	—	M9PAV		M9PA		○	○	●	○		—	○	IC circuit					
			2-wire							M9BAV		M9BA		○	○	●	○		—	○						
	2-wire		—							F79F		—		●	—	●	○		—	○	IC circuit					
	4-wire		5 V, 12 V							—		—		●	—	●	○		—	○						
Reed switch	—	Grommet	Yes		3-wire (NPN equivalent)	—				—	A96V		A96		●	—	●	—	—	—	IC circuit	Relay, PLC				
											—		200 V		A72	—		A72H	—				●	—	●	—
		Connector									2-wire	24 V	12 V	100 V	A93V		A93		●	—	●		—	—	—	—
											5 V, 12 V		100 V or less	A90V		A90		●	—	●	—		—	—	IC circuit	
	Diagnostic indication (2-color indication)	Grommet	2-wire	24 V	—		A73C				—		●	—	●	●	●	—	—	—						
			5 V, 12 V				24 V or less				A80C		—		●	—	●	●	●		—		IC circuit			
			—				—				A79W		—		●	—	●	—	—	—	—					
			—				—				—		—		●	—	●	—	—	—			—			

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX
None N (Example) J79CN

* Solid state auto switches marked with "○" are produced upon receipt of order.
* ø125 to ø200 D-A9/M9 types can be mounted only with an installation groove. (Using BMG2-012)

* There are other applicable auto switches other than the listed above. For details, refer to page 71.

* 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

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 Stroke

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 Stroke

Description	Spacer is installed in the standard stroke body.		Exclusive body (-XB10)	
Part no.	Refer to “How to Order” for the standard model no. on page 57.		Suffix “-XB10” to the end of standard model no. on page 57.	
Description	Dealing with the stroke by the 5 mm interval is available by installing spacer with standard stroke cylinder.		Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	125 to 200	5 to 295	125 to 160	11 to 299
Example	Part no.: CQ2B160-165DC CQ2B160-175DC with 10 mm width spacer inside. B dimension is 266 mm.		Part no.: CQ2B160-165DC-XB10 Makes 165 stroke tube. B dimension is 256 mm.	

Type

Bore size (mm)				125	140	160	180	200
Pneumatic	Mounting	Through-hole/Both ends tapped (Common)		●	●	●	●	●
	Built-in magnet			●	●	●	●	●
	Piping	Screw-in type	—	Rc 3/8	Rc 3/8	Rc 3/8	Rc 1/2	Rc 1/2
			TN	NPT 3/8	NPT 3/8	NPT 3/8	NPT 1/2	NPT 1/2
			TF	G 3/8	G 3/8	G 3/8	G 1/2	G 1/2
	Rod end male thread			●	●	●	●	●
Rubber bumper (Standard)			●	●	●	●	●	

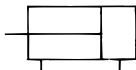
Refer to pages 69 to 71 for the specifications of cylinders with auto switches.

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



JIS Symbol

Double acting,
Single rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XB10	Intermediate stroke (Using exclusive body)
—X271	Fluororubber seals ø125 to ø160 only

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and "Handling
Precautions for SMC Products" (M-
E03-3) for Actuators and Auto
Switches Precautions.

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.

Standard

Large Bore
Size

Long Stroke

Non-rotating
Rod

Axial Piping

Anti-lateral
Load

With End Lock

Water
Resistant

With Auto
Switch

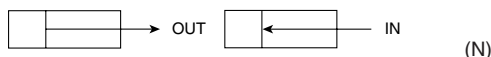
Auto Switch

Made to Order

Series CQ2

Theoretical Output

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

Mass

Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.48	5.74	6.00	6.26	6.52	7.17	7.81	8.46	9.11	9.76	10.41	11.71	13.01
140	6.49	6.78	7.08	7.38	7.68	8.42	9.17	9.91	10.66	11.40	12.15	13.64	15.13
160	8.96	9.31	9.67	10.03	10.39	11.29	12.19	13.09	13.99	14.89	15.79	17.59	19.38
180	11.97	12.39	12.81	13.24	13.67	14.73	15.80	16.87	17.93	18.99	20.05	22.18	24.31
200	15.30	15.87	16.35	16.84	17.33	18.55	19.77	20.99	22.21	23.43	24.74	27.08	29.52

With Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.54	5.80	6.06	6.32	6.58	7.23	7.87	8.52	9.17	9.82	10.47	11.77	13.07
140	6.56	6.85	7.15	7.45	7.75	8.49	9.24	9.98	10.73	11.47	12.22	13.71	15.20
160	9.04	9.39	9.75	10.11	10.47	11.37	12.27	13.17	14.07	14.97	15.87	17.67	19.46
180	12.05	12.47	12.89	13.32	13.75	14.81	15.88	16.95	18.01	19.07	20.13	22.26	24.39
200	15.38	15.95	16.43	16.92	17.41	18.63	19.85	21.07	22.29	23.51	24.82	27.16	29.60

Additional Mass

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) **CDQ2B125-30DCM**

- Cylinder mass: CDQ2B125-30DC 6.06 kg
- Option mass: Rod end male thread 0.47 kg

6.53 kg

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

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable bore size	Mass (g)
BMG2-012	ø125 to ø200	3

Mounting Bolt for CQ2

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option.

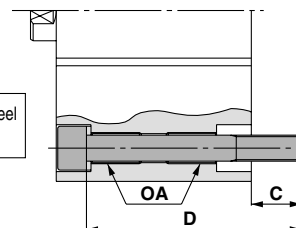
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M12 x 100L 4 pcs.

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

Note 2) Please consult with SMC regarding mounting bolts for strokes that exceed 100 mm. Use the OA screw provided on the cylinder tube to secure the cylinder.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

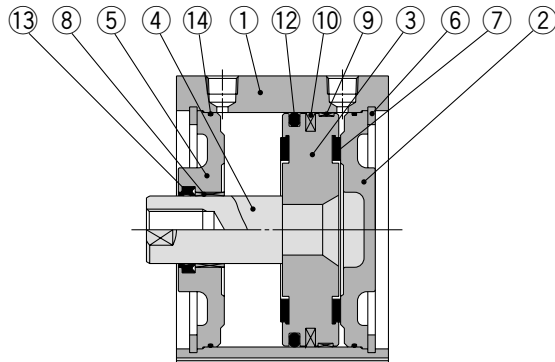


Cylinder model	C	D	Mounting bolt size
C□Q2B125-140-10DC	22.9	100	M12 x 100L
-20DC		110	x 110L
-30DC		120	x 120L
-40DC		130	x 130L
-50DC		140	x 140L
-75DC		165	x 165L
-100DC		190	x 190L
C□Q2B160-10DC	27.7	110	M14 x 110L
-20DC		120	x 120L
-30DC		130	x 130L
-40DC		140	x 140L
-50DC		150	x 150L
-75DC		175	x 175L
-100DC		200	x 200L

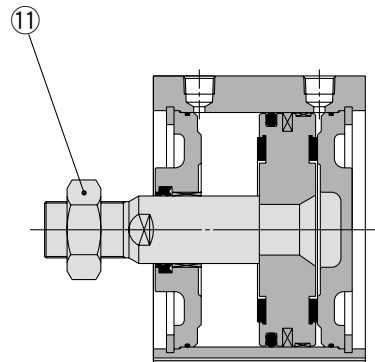
Cylinder model	C	D	Mounting bolt size
C□Q2B180-10DC	36	125	M18 x 125L
-20DC		135	x 135L
-30DC		145	x 145L
-40DC		155	x 155L
-50DC		165	x 165L
-75DC		190	x 190L
-100DC		215	x 215L
C□Q2B200-10DC	39	135	M18 x 135L
-20DC		145	x 145L
-30DC		155	x 155L
-40DC		165	x 165L
-50DC		175	x 175L
-75DC		200	x 200L
-100DC		225	x 225L

Construction

Double acting, Single rod



Rod end male thread



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 only CDQ2B□
11	Rod end nut	Carbon steel	Nickel plated
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Tube gasket	NBR	

Replacement Parts/Seal Kit

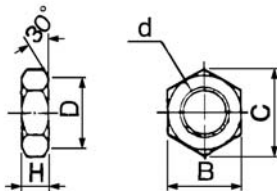
Bore size (mm)	Kit no.	Contents
125	CQ2B125-PS	Set of nos. at left ⑫, ⑬, ⑭
140	CQ2B140-PS	
160	CQ2B160-PS	
180	CQ2B180-PS	
200	CQ2B200-PS	

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

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

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

Rod End Nut



Material: Carbon steel
Surface treatment: Nickel plated

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

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

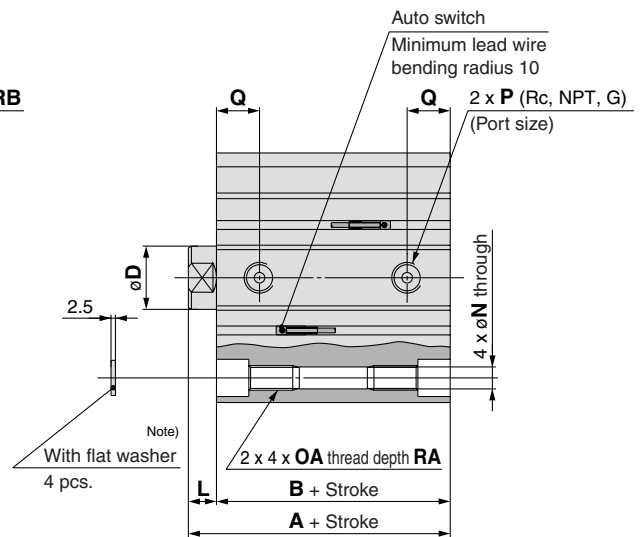
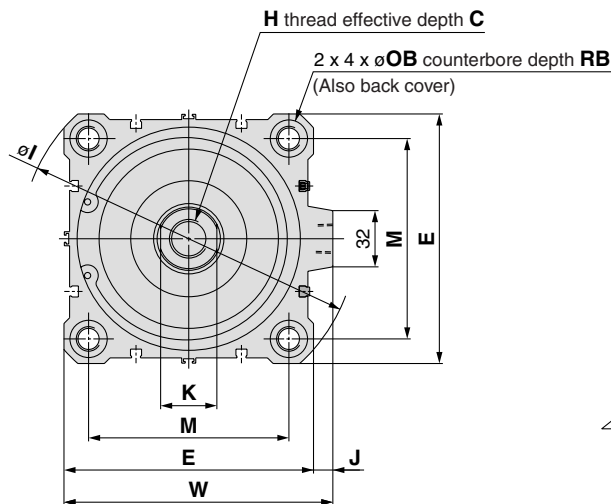
Series CQ2

Dimensions

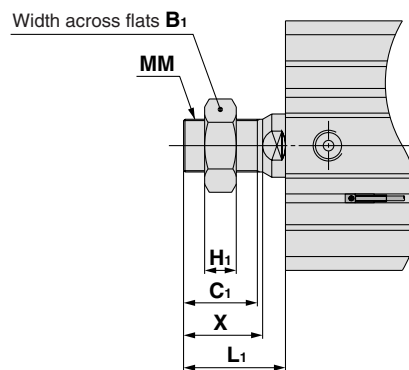
ø125, ø140, ø160

Basic (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

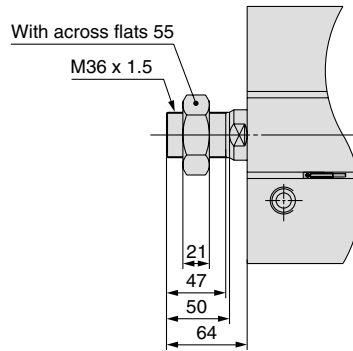
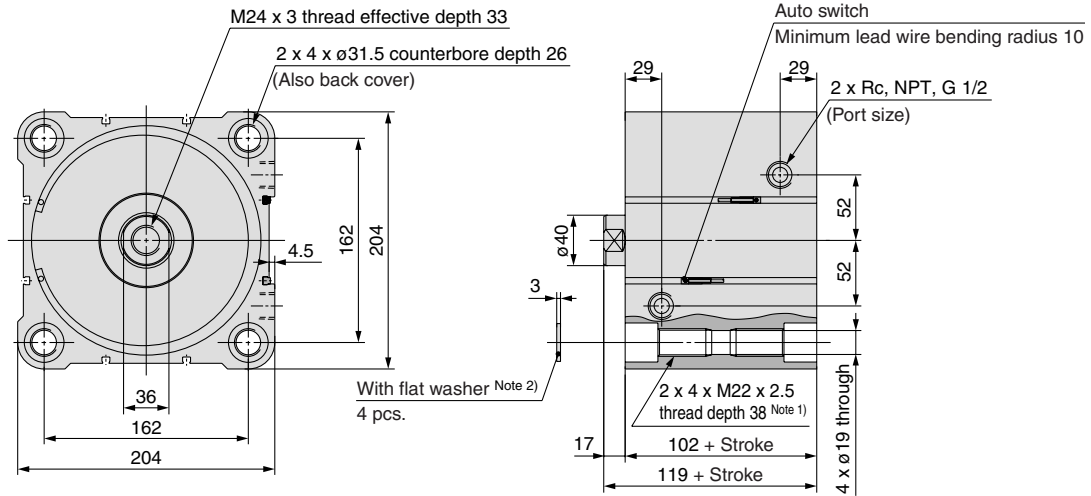
		(mm)																		
Bore size (mm)	Standard stroke	A	B	C	D	E	H	I	J	K	L	M	N	OA	OB	P	Q	RA	RB	W
125	10, 20, 30, 40, 50	99	83	30	36	142	M22 x 2.5	190	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
140	75, 100, 125, 150	99	83	30	36	158	M22 x 2.5	210	10	32	16	128	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	168
160	175, 200, 250, 300	108	91	33	40	178	M24 x 3	238	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.

ø180, ø200

ø180

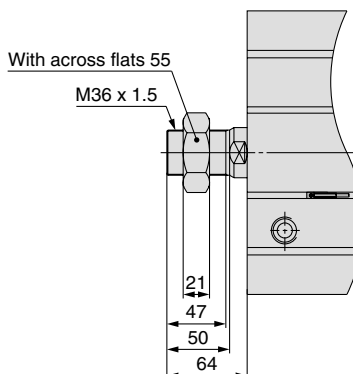
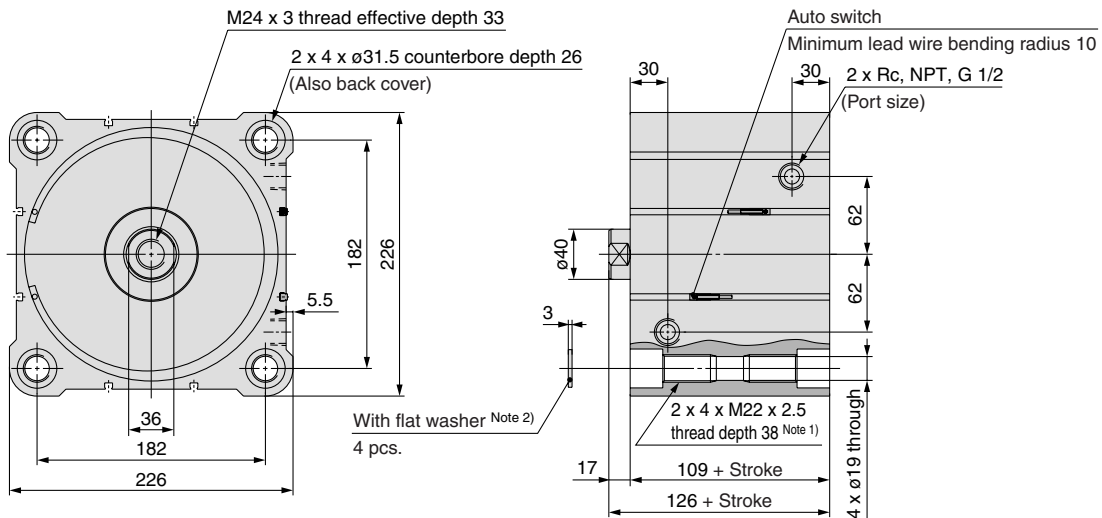
The dimensions are the same with or without an auto switch.



Note 1) In the case of 20 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.

ø200



Note 1) In the case of 20 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.

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

ø125, ø140, ø160, ø180, ø200

How to Order

CQ2WB125 **30DC**

With auto switch **CDQ2WB125** **30DC** **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 CQ2" 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

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 the applicable auto switch model.

Body option

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

Cushion
C Rubber bumper

Action
D Double acting

Cylinder stroke (mm)
For "Standard Stroke", refer to page 64.

Made to Order
Refer to page 64 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2WB140-30DC

Applicable Auto Switches/Refer to pages 180 to 188 of this series and 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)				
							ø125 to ø160	ø180, ø200	ø125 to ø160	ø180, ø200									
Solid state switch	_____	Grommet		3-wire (NPN)	24V	5 V,	—	M9NV		M9N		●	●	●	○	—	○	IC circuit	Relay, PLC
		3-wire (PNP)		12 V		M9PV		M9P		●	●	●	○	—	○				
	Connector	2-wire	12 V	M9BV		M9B		●	●	●	○	—	○	—					
			J79C	—		●		—	●	●	●	—	—						
	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)		5 V,		M9NVV		M9NW		●	●	●	○	—	○	IC circuit	
				3-wire (PNP)		12 V		M9PVV		M9PW		●	●	●	○	—	○		
				2-wire	12 V	M9BVV		M9BW		●	●	●	○	—	○	—			
				3-wire (NPN)	5 V,	M9NAV		M9NA		○	○	●	○	—	○				
	Water resistant (2-color indication)	Grommet		3-wire (PNP)	12 V	M9PAV		M9PA		○	○	●	○	—	○	IC circuit			
				2-wire	12 V	M9BAV		M9BA		○	○	●	○	—	○				
With diagnostic output (2-color indication)	Grommet		4-wire	5 V, 12 V	—		F79F	—		●	—	●	○	—	○	IC circuit			
Reed switch	_____	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V		A96		●	—	●	—	—	—	IC circuit	Relay, PLC
						—		200 V	A72	—		A72H	—		●	—	●		
		Connector	No	2-wire	24 V	12 V	100 V	A93V		A93		●	—	●	—	—	—		
						5 V, 12 V	100 V or less	A90V		A90		●	—	●	—	—	—	IC circuit	
		Grommet	Yes	12 V	—	A73C		—		—	—	●	—	●	●	●	—	—	
				5 V, 12 V	24 V or less	A80C		—		—	—	●	—	●	●	●	—	—	
	Diagnostic indication (2-color indication)	Grommet	Yes	—	—	A79W		—		—	—	●	—	●	—	—	—		

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9PV
3 m L (Example) M9BV
5 m Z (Example) M9BVV
None N (Example) J79C

* Solid state auto switches marked with "○" are produced upon receipt of order.
* ø125 to ø200 D-A9/M9 types can be mounted only with an installation groove. (Using BMG2-012)

* There are other applicable auto switches other than the listed above. For details, refer to page 71.

* 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

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 dose not include the amount of bumper change.

Standard Stroke

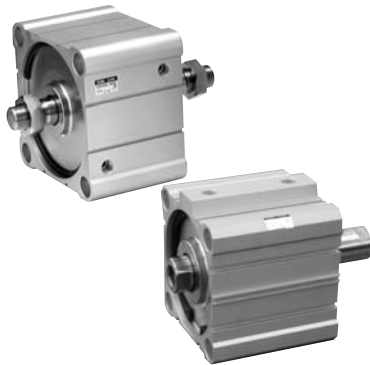
Bore size (mm)	Standard stroke (mm)
125, 140, 160 180, 200	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300

Manufacture of Intermediate Stroke

Description	Spacer is installed in the standard stroke body.		Exclusive body (-XB10)	
Part no.	Suffix “-X633” to the end of standard model no. on page 63.		Suffix “-XB10” to the end of standard model no. on page 63.	
Description	Dealing with the stroke by the 5 mm interval is available by installing spacer with standard stroke cylinder.		Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.	
Stroke range	Bore size	Stroke range	Bore size	Stroke range
	125 to 160	5 to 295	125 to 160	11 to 299
Example	Part no.: CQ2WB160-165DC-X633 CQ2WB160-175DC with 10 mm width spacer inside. B dimension is 266 mm.		Part no.: CQ2WB160-165DC-XB10 Makes 165 stroke tube. B dimension is 256 mm.	

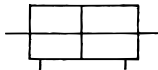
Type

Bore size (mm)				125	140	160	180	200
Pneumatic	Mounting	Through-hole/Both ends tapped (Common)		●	●	●	●	●
	Built-in magnet			●	●	●	●	●
	Piping	Screw-in type	—	Rc 3/8	Rc 3/8	Rc 3/8	Rc 1/2	Rc 1/2
			TN	NPT 3/8	NPT 3/8	NPT 3/8	NPT 1/2	NPT 1/2
			TF	G 3/8	G 3/8	G 3/8	G 1/2	G 1/2
	Rod end male thread			●	●	●	●	●
	Rubber bumper (Standard)			●	●	●	●	●



JIS Symbol

Double acting,
Double rod



Made to Order
(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XB10	Intermediate stroke (Using exclusive body)
—X235	Change of piston rod end for double rod cylinder
—X271	Fluororubber seals ø125 to ø160 only
—X633	Intermediate stroke of double rod cylinder ø125 to ø160 only

* -X633 intermediate stroke with 5 mm intervals only

Refer to pages 69 to 71 for the specifications of cylinders with auto switches.

- Minimum stroke for auto switch mounting
- Auto switch proper mounting position (detection at stroke end) and height
- Operating range
- Auto switch mounting bracket/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

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuators and Auto Switches Precautions.

Retaining Ring Installation/Removal

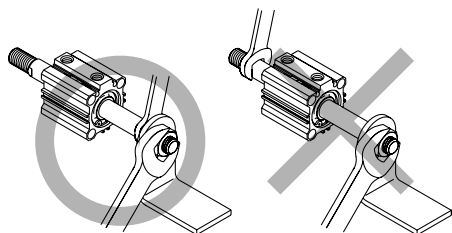
⚠ Caution

- 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 flats is secured. Do not fix the other side of the piston rod width across flats 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

(N)

Mass

Without Auto Switch

(kg)

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.71	6.02	6.34	6.68	7.02	7.87	8.71	9.56	10.41	11.26	12.11	13.81	15.50
140	6.73	7.07	7.43	7.80	8.18	9.13	10.07	11.01	11.96	12.90	13.84	15.73	17.62
160	9.26	9.69	10.12	10.58	11.04	12.18	13.33	14.47	15.62	16.76	17.91	20.20	22.49
180	12.18	12.70	13.23	13.75	14.28	15.59	16.90	18.21	19.52	20.83	22.14	24.76	27.39
200	15.63	16.22	16.80	17.39	17.97	19.44	20.91	22.37	22.84	25.30	26.77	29.70	32.63

With Auto Switch

(kg)

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.77	6.08	6.40	6.74	7.08	7.93	8.77	9.62	10.47	11.32	12.17	13.87	15.56
140	6.80	7.14	7.50	7.87	8.25	9.20	10.14	11.08	12.03	12.97	13.91	15.80	17.69
160	9.34	9.77	10.20	10.66	11.12	12.26	13.41	14.55	15.70	16.84	17.99	20.28	22.57
180	12.26	12.78	13.31	13.83	14.36	15.67	16.98	18.29	19.60	20.91	22.22	24.84	27.47
200	15.71	16.30	16.88	17.47	18.05	19.52	20.99	22.45	22.92	25.38	26.85	29.78	32.71

Additional Mass

(kg)

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) CDQ2WB125-30DCM

- Cylinder mass: CDQ2WB125-30DC 6.40 kg
 - Option mass: Rod end male thread 0.94 kg
- 7.34 kg

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

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable bore size	Mass (g)
BMG2-012	ø125 to ø200	3

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

Mounting Bolt for CQ2

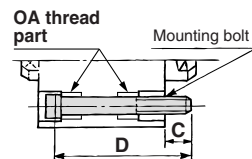
Mounting method: Mounting bolt for through-hole mounting of the CQ2WB is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M12 x 100L 4 pcs.

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

Note 2) Please consult with SMC regarding mounting bolts for strokes that exceed 100 mm. Use the OA screw provided on the cylinder tube to secure the cylinder.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

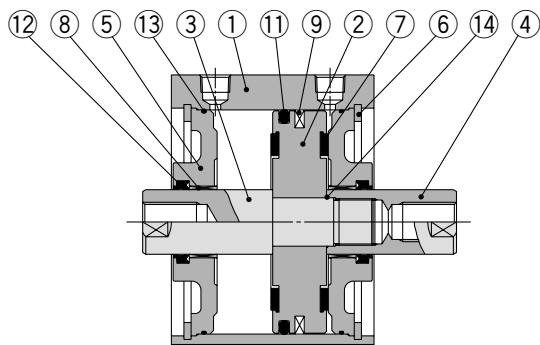


Cylinder model	C	D	Mounting bolt size
C□Q2WB125-140-10DC	22.9	100	M12 x 100L
-20DC		110	x 110L
-30DC		120	x 120L
-40DC		130	x 130L
-50DC		140	x 140L
-75DC		165	x 165L
-100DC		190	x 190L
C□Q2WB160-10DC	27.7	110	M14 x 110L
-20DC		120	x 120L
-30DC		130	x 130L
-40DC		140	x 140L
-50DC		150	x 150L
-75DC		175	x 175L
-100DC		200	x 200L

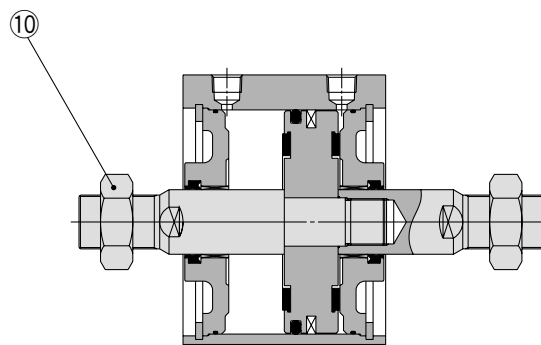
Cylinder model	C	D	Mounting bolt size
C□Q2WB180-10DC	36	125	M18 x 125L
-20DC		135	x 135L
-30DC		145	x 145L
-40DC		155	x 155L
-50DC		165	x 165L
-75DC		190	x 190L
-100DC		215	x 215L
C□Q2WB200-10DC	39	135	M18 x 135L
-20DC		145	x 145L
-30DC		155	x 155L
-40DC		165	x 165L
-50DC		175	x 175L
-75DC		200	x 200L
-100DC		225	x 225L

Construction

Double acting, Double rod



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	For only CDQ2WB□
9	Magnet	—	Nickel plated
10	Rod end nut	Carbon steel	
11	Piston seal	NBR	
12	Rod seal	NBR	
13	Tube gasket	NBR	
14	Piston gasket	NBR	

Replacement Parts/Seal Kit

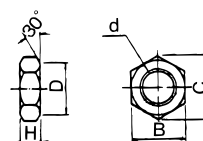
Bore size (mm)	Kit no.	Contents
125	CQ2WB125-PS	Set of nos. at left ⑪, ⑫, ⑬
140	CQ2WB140-PS	
160	CQ2WB160-PS	
180	CQ2WB180-PS	
200	CQ2WB200-PS	

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

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

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

Rod End Nut



Material: Carbon steel
Surface treatment: Nickel plated

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

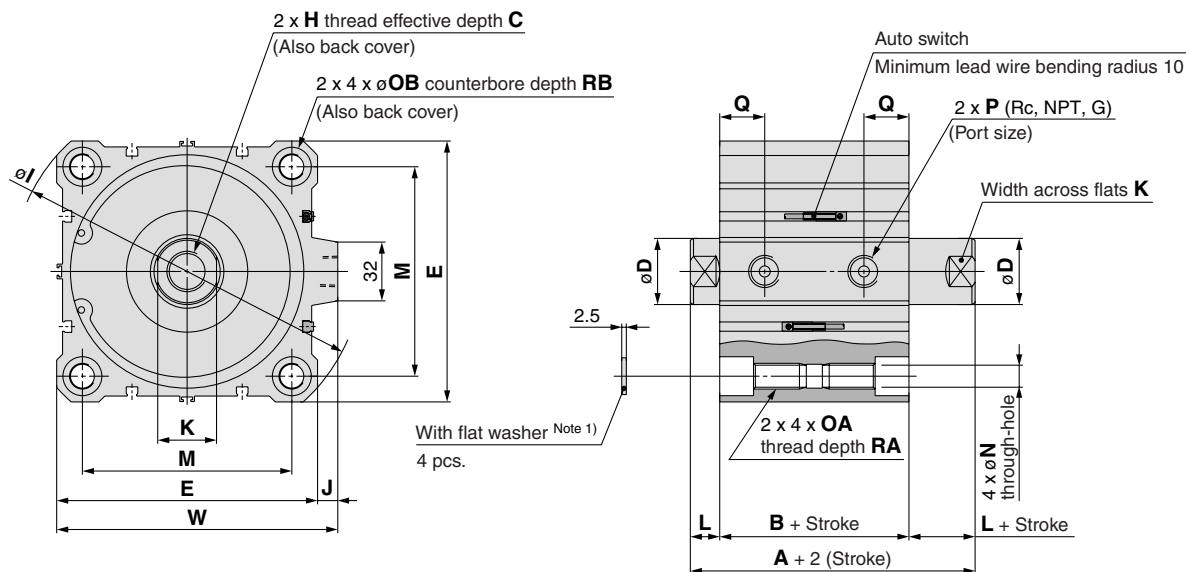
Series CQ2W

Dimensions

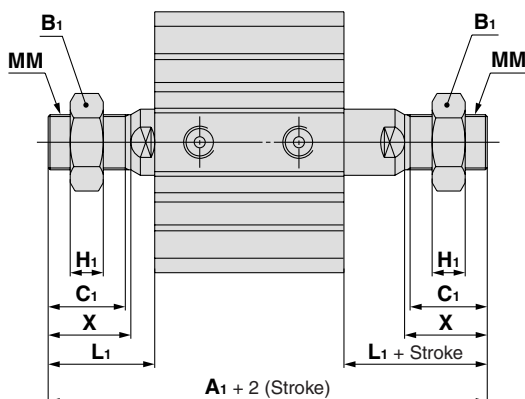
ø125, ø140, ø160

Basic (Through-hole): C□Q2WB

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



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

Bore size (mm)	Standard stroke	A	B	C (Note 2)	D	E	H	I	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	190	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
140	75, 100, 125, 150	115	83	30 (22.5)	36	158	M22 x 2.5	210	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	238	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.

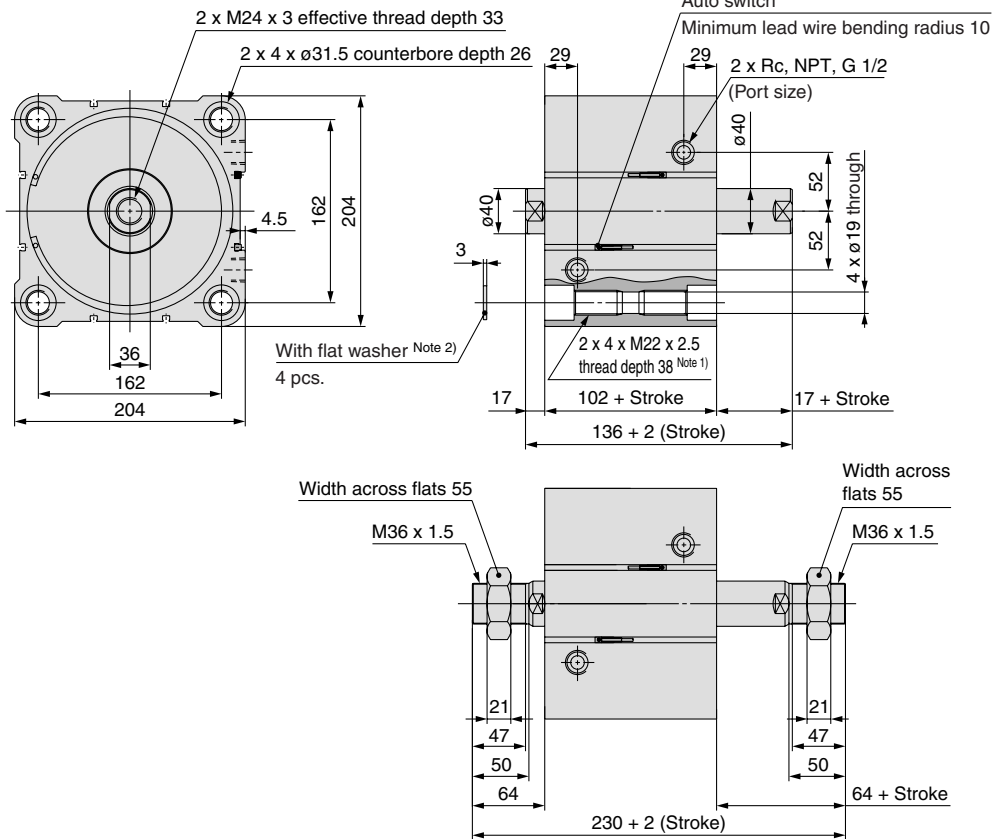
Note 2) (): Values of effective length in one side, only for the 10 stroke type

* The position of double rod width across flats is not the same.

ø180, ø200

ø180

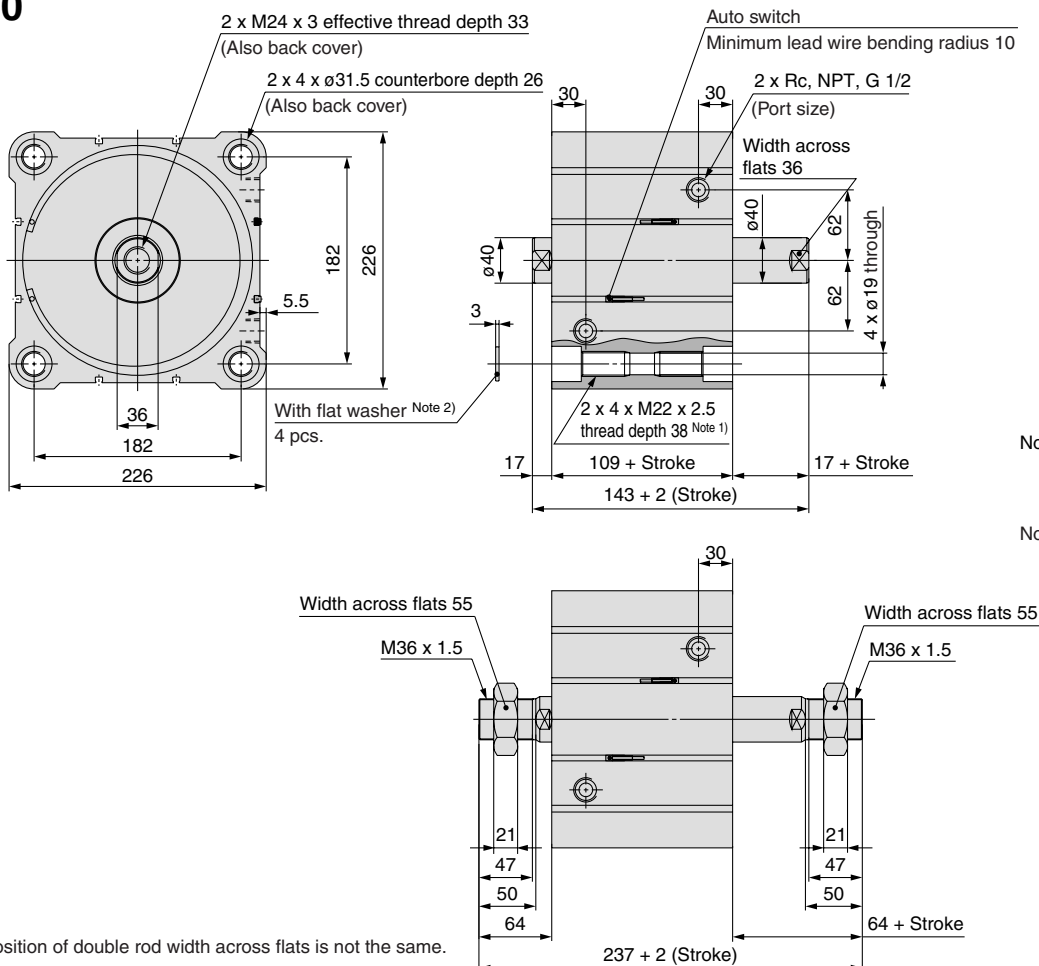
The dimensions are the same with or without an auto switch.



Note 1) In the case of 20 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.

ø200



Note 1) In the case of 20 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 position of double rod width across flats is not the same.

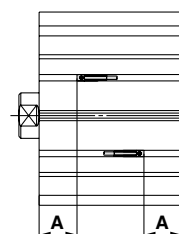
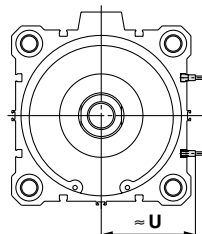
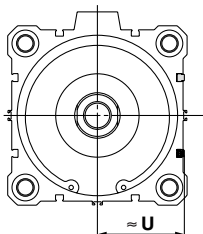
Compact Cylinder/*series* CQ2 With Auto Switch 1

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

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

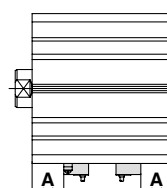
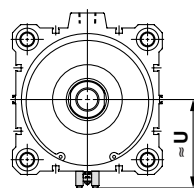
D-A9□
D-M9□
D-M9□W
D-M9□AL

D-A9□V
D-M9□V
D-M9□WV
D-M9□AVL



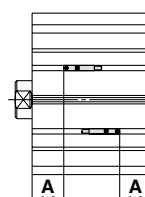
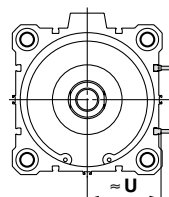
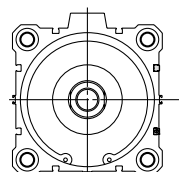
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F

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



D-Z7□
D-Z80
D-Y59□
D-Y7P
D-Y7□W
D-Y7BAL

D-Y69□
D-Y7PV
D-Y7□WV



Auto Switch Proper Mounting Position

Auto switch model Bore size	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-A72/7□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	D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL
	A	A	A	A	A	A	A
125	30	34	32.5	33	30	38	29
140	30	34	32.5	33	30	38	29
160	34	38	36.5	37	34	42	33
180	40.5	44.5	—	—	—	—	38.5
200	43.5	47.5	—	—	—	—	42

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

Auto switch model Bore size	D-A9□ D-M9□ D-M9□W D-M9□AL	D-M9□V D-M9□WV D-M9□AVL	D-A9□V D-Y69□ D-Y7PV D-Y7□WV	D-A7□ D-A80	D-A7□H D-A80H D-F7□/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
	U	U	U	U	U	U	U	U	U
125	69.5	74	72	80	81	87	83.5	85.5	82.5
140	77.5	82	80	88	89	95	91.5	93.5	90.5
160	87.5	92	90	98	99	105	101.5	103.5	100.5
180	99.5	104	102	—	—	—	—	—	—
200	109.5	114	112	—	—	—	—	—	—

2 Minimum Stroke for Auto Switch Mounting

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

(mm)

Number of auto switch mounted	D-M9□ D-M9□V D-F7□/F7□V	D-J79/J79C D-Y59□/Y69□ D-Y7P/Y7PV	D-A9□ D-A9□V D-A7□/A80	D-A73C/A80C D-A7□H/Z7□ D-Z80/A80H	D-M9□W D-M9□WV D-M9□AL D-M9□AVL D-F7□W/F7□WV	D-J79W D-F7BAL/F7BAVL D-F7NTL/F79F D-F7□W/Y7□WV D-Y7BAL	D-A79W
1 pc.	5	5	5	5	10	15	15
2 pcs.	5	5	10	10	15	20	20

3 Operating Range

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

(mm)

Auto switch model	Bore size				
	125	140	160	180	200
D-A9□(V)	12	12.5	12	10.5	9.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L	8.5	8.5	9	10	10
D-A7□(H)(C) D-A80□(H)(C)	13	13	13	—	—
D-A79W	17	17	17	—	—
D-Z7□ D-Z80	14	14	14	15	15.5
D-F7□(V) D-J79(C) D-F7□W(V) D-F7BA(V)L D-F7NTL D-F79F	9	9	8.5	—	—
D-Y59□ D-Y69□ D-Y7P(V) D-Y7□W(V) D-Y7BAL	11.5	11.5	11.5	12	12

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion).
It may vary substantially depending on an ambient environment.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

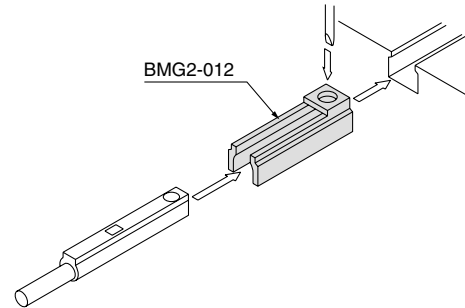
Made to Order

Compact Cylinder/series CQ2 With Auto Switch 2

4 Auto Switch Mounting Bracket/Part No.

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

Auto switch model	Bore size (mm)				
	ø125	ø140	ø160	ø180	ø200
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	BMG2-012				
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		—		



- The above figure shows how to mount D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types on CDQ2 or CDQ2W (large bore size).
- Note 1) Refer to page 1368 in Best Pneumatics No. 2 for further information on auto switches.

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable cylinder size	Mass (g)
BQ-2	ø125 to ø160	1.5
BMG2-012	ø125 to ø200	3

[Mounting screw set made of stainless steel]

(Applicable bore size: ø125 to ø160)

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order BQ-2 separately, since auto switch spacers (for BQ-2) are not included.)

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

The above stainless steel screws are used when a cylinder is shipped with D-F7BAL, F7BAVL-type auto switches.

When only an auto switch is shipped independently, BBA2 is attached.

Note 2) Refer to page 1361 in Best Pneumatics No. 2 for details of BBA2.

Besides the models listed in How to Order, the following auto switches are applicable.

Refer to Best Pneumatics No. 2 for details.

Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

Auto switch type	Part no.	Electrical entry	Features	Applicable bore size
Reed	D-A73	Grommet (Perpendicular)	—	ø125 to ø160
	D-A80		Without indicator light	
	D-A73H, A76H	Grommet (In-line)	—	
	D-A80H		Without indicator light	ø125 to ø200
	D-Z73, Z76		—	
	D-Z80		Without indicator light	
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—	ø125 to ø160
	D-F7NWV, F7BWV		Diagnostic indication (2-color indication)	
	D-F7BAVL	Grommet (In-line)	Water resistant (2-color indication)	
	D-F79, F7P, J79		—	
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication)	ø125 to ø200
	D-F7BAL		Water resistant (2-color indication)	
	D-F7NTL		With timer	
	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)	—	
	D-Y7NWV, Y7PWV, Y7BWV		Diagnostic indication (2-color indication)	ø125 to ø200
	D-Y59A, Y69B, Y7P	Grommet (In-line)	—	
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color indication)	
	D-Y7BAL		Water resistant (2-color indication)	

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to Best Pneumatics No. 2 for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H types) are also available. Refer to Best Pneumatics No. 2 for details.

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
---------------	-------------	------------------	-----------------	---------------	-------------------	--------------	------------------	-------------	-----------------	----------

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

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

With auto switch CQ2 A 32 - 200 DC Z - M9BW -

With auto switch
(Built-in magnet)

Mounting

A	Both ends tapped
L	Foot
F	Rod end flange
G	Head end 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)
For "Standard Stroke", refer to page 74.

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 page 74 for details.

Auto switch

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

* Refer to the below table for the applicable auto switch model.

Auto switch mounting groove

Z	4 sides
---	---------

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

Applicable Auto Switches/Refer to pages 180 to 188 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 switch	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)					●	●	●	○	—	○		
				2-wire					●	●	●	○	—	○		
				3-wire (NPN)					●	●	●	○	—	○		
				3-wire (PNP)					●	●	●	○	—	○		
				2-wire					●	●	●	○	—	○		
				3-wire (NPN)					○	○	●	○	—	○		
				3-wire (PNP)					○	○	●	○	—	○		
				2-wire					○	○	●	○	—	○		
				2-wire (Non-polar)					●	—	●	●	—	○		
Reed switch		Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	A96V	A96	●	—	●	—	—	—	IC circuit	Relay, PLC
				2-wire					●	—	●	—	—	—	—	
				—					●	—	●	—	—	—	IC circuit	

* 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 179.

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

* Refer to page 187 for the D-P3DW□ type.

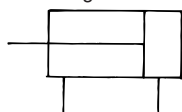
Compact Cylinder: Long Stroke

Double Acting, Single Rod *Series CQ2*



JIS Symbol

Double acting,
Single rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XB10	Intermediate stroke (Using exclusive body)
—XC4	With heavy duty scraper
—XC6	Piston rod and rod end nut made of stainless steel
—XC26	With a split pin for double clevis pin and double knuckle pin and a flat washer
—X271	Fluororubber seals

⚠ Precautions

- Be sure to read before handling.
- Refer to back pages 1 and 2 for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Actuators and Auto Switches Precautions.

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	+1.4 mm Note) 0					

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

Standard Stroke

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

Manufacture of Intermediate Stroke

Description	Spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to “How to Order” for the standard model no. on page 73.	Suffix “-XB10” to the end of standard model no. on page 73.
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.
Stroke range	Bore size 32 to 200	Stroke range 101 to 299
Example	Part no.: CQ2A50-166DCZ CQ2B50-175DCZ with 9 mm width spacer inside. B dimension is 230.5 mm.	Part no.: CQ2B50-166DCZ-XB10 Makes 166 stroke tube. B dimension is 221.5 mm.

Type

Bore size (mm)	32	40	50	63	80	100
Pneumatic	●	●	●	●	●	●
Piping	●	●	●	●	●	●
Built-in magnet	●	●	●	●	●	●
Screw-in type	—	Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8
TF	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
TF	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
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 173 to 178 for the specifications of cylinders with auto switches.

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

Series CQ2

Copper and Fluorine-free Series (For CRT manufacturing process)

20 - C□Q2A Bore size - Stroke DC(M)Z

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

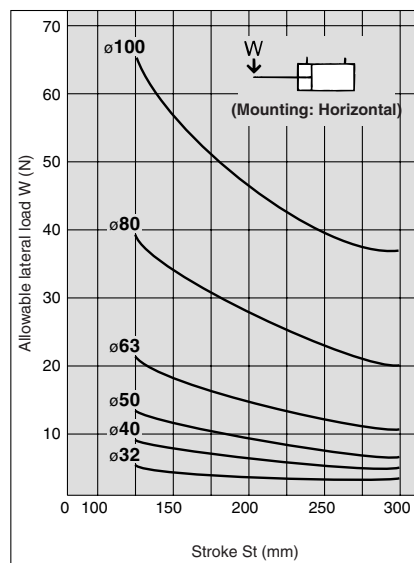
• Copper and fluorine-free series

To prevent 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 equipment)					
Piping	Screw-in piping, Built-in one-touch fitting					
Piston speed	50 to 500 mm/S					
Mounting	Both ends tapped					
Auto switch	Mountable					

Allowable Lateral Load at Rod End



Mounting Bracket/ Part No.

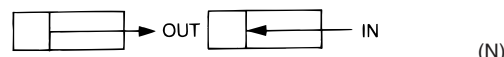
Bore size (mm)	Foot Note 1)	Flange	Double clevis
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

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

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

Foot or Flange: Body mounting bolt, Double clevis: Clevis pin, Body mounting bolt, Type C retaining ring 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

Mass

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

Additional Mass

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 bolt)		146	158	253	349	672	1113
Rod end flange (Including mounting bolt)		165	198	348	534	1017	1309
Head end flange (Including mounting bolt)		165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)		151	196	393	554	1109	1887

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

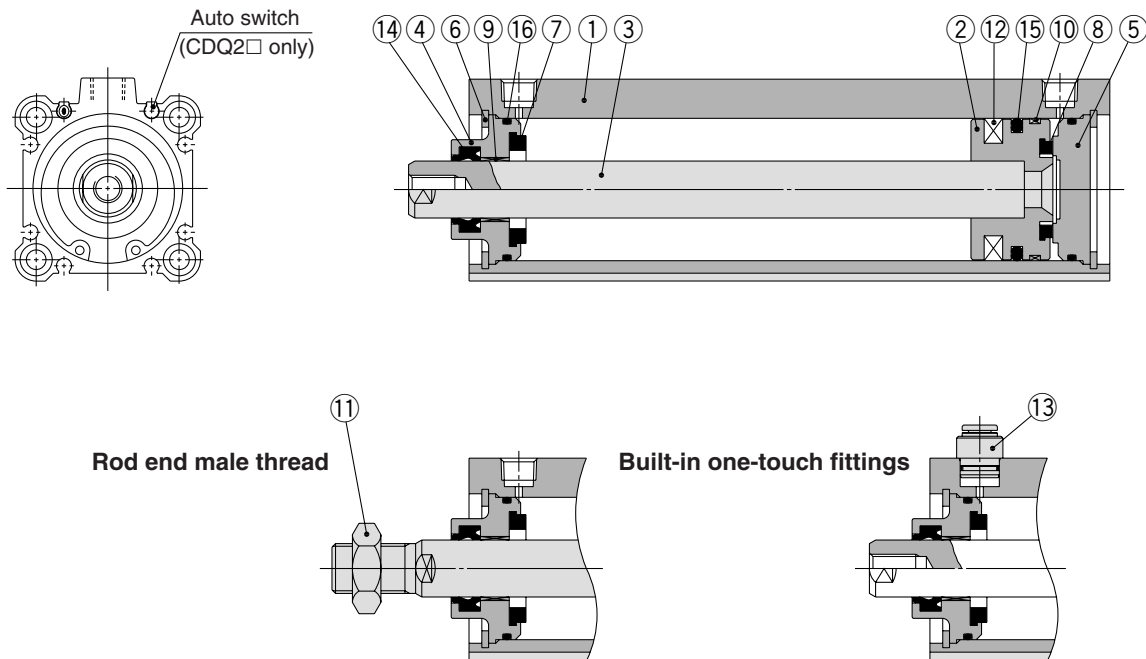
Calculation: (Example) CQ2D32-200DCMZ

- Cylinder mass: CQ2A32-200DCZ 1017 g
- Option mass: Rod end male thread 43 g
- Double clevis 151 g

1211 g

Add each mass 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 only CDQ2A□
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	Set of nos. at left (14, 15, 16)
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)

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

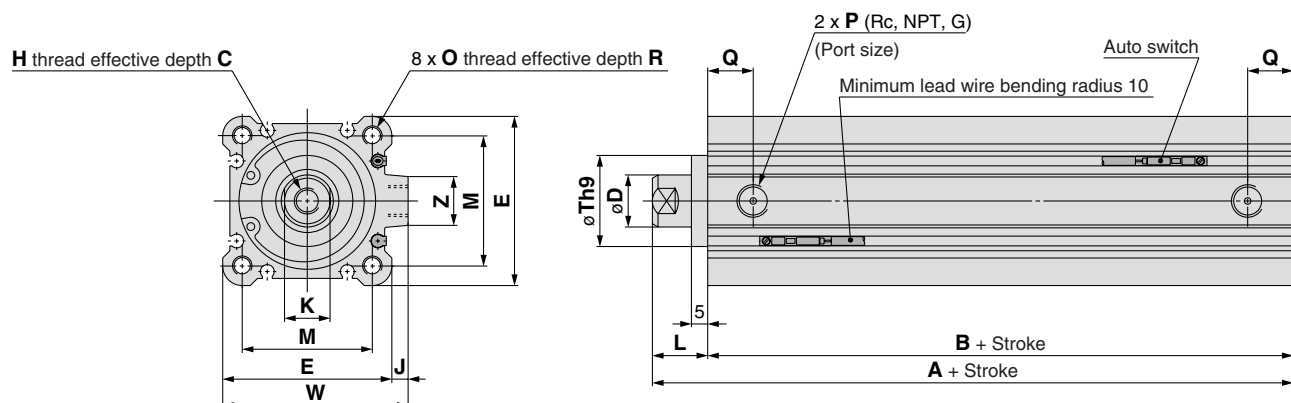
Series CQ2

Dimensions

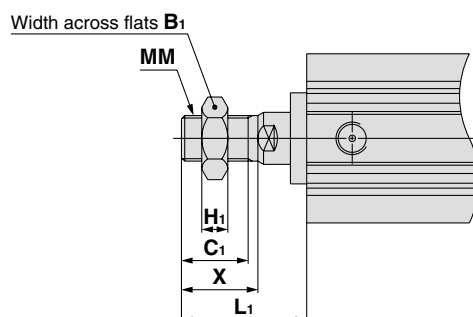
ø32 to ø50

Both ends tapped: C□Q2A

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
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

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

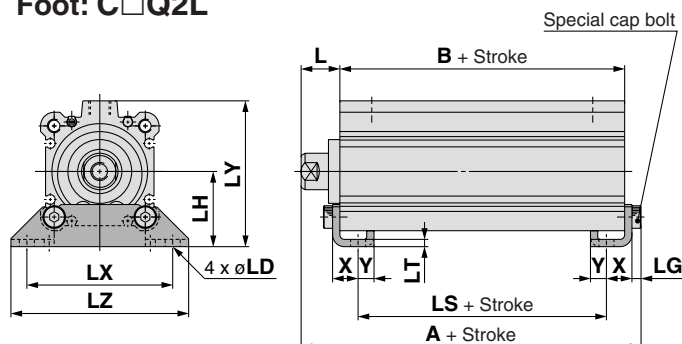
Both Ends Tapped For auto switch mounting position and its mounting height, refer to pages 173 to 176. (mm)

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 stroke, strokes are by the 25 mm interval.

Note 2) For calculation on the longitudinal dimension of the intermediate strokes, refer to page 74.

Foot: C□Q2L



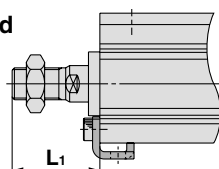
Foot (mm)

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

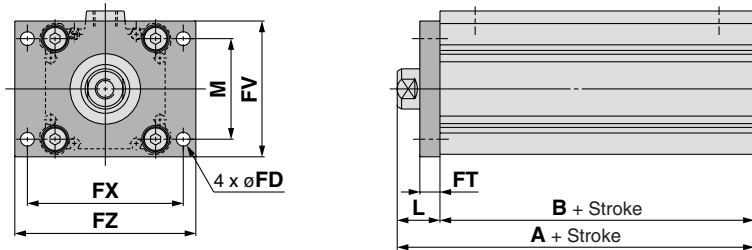
* For details about the rod end nut and accessory brackets, refer to page 19.

Rod end male thread



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

Rod end flange: C□Q2F

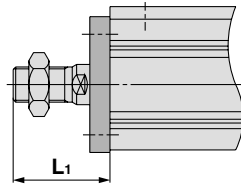


Rod End Flange

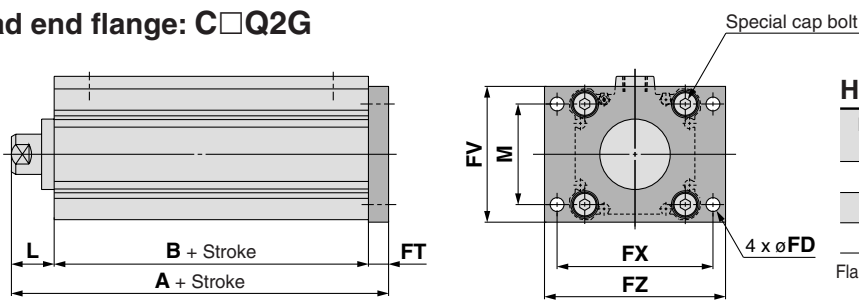
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L ₁	M
32	62.5	45.5	5.5	8	48	56	65	17	38.5	34
40	72	55	5.5	8	54	62	72	17	38.5	40
50	73.5	55.5	6.6	9	67	76	89	18	43.5	50

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head end flange: C□Q2G



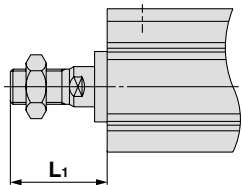
Head End Flange (mm)

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

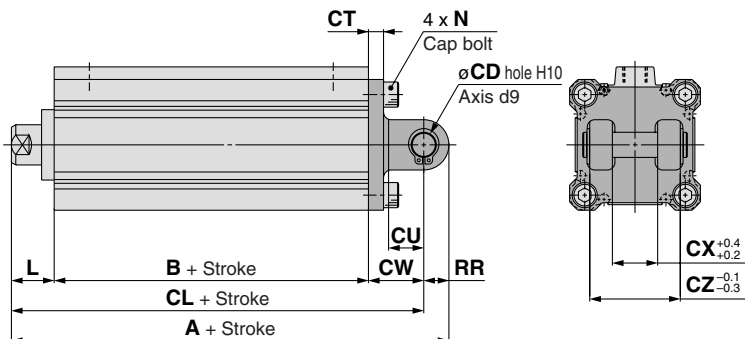
(* Dimensions except A are the same as rod end flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Double clevis: C□Q2D



Double Clevis

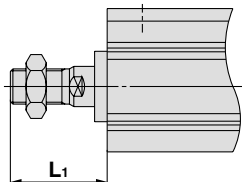
Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
32	92.5	45.5	10	82.5	5	14	20	18	36
40	104	55	10	94	6	14	22	18	36
50	115.5	55.5	14	101.5	7	20	28	22	44

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 ring are shipped together.

Rod end male thread



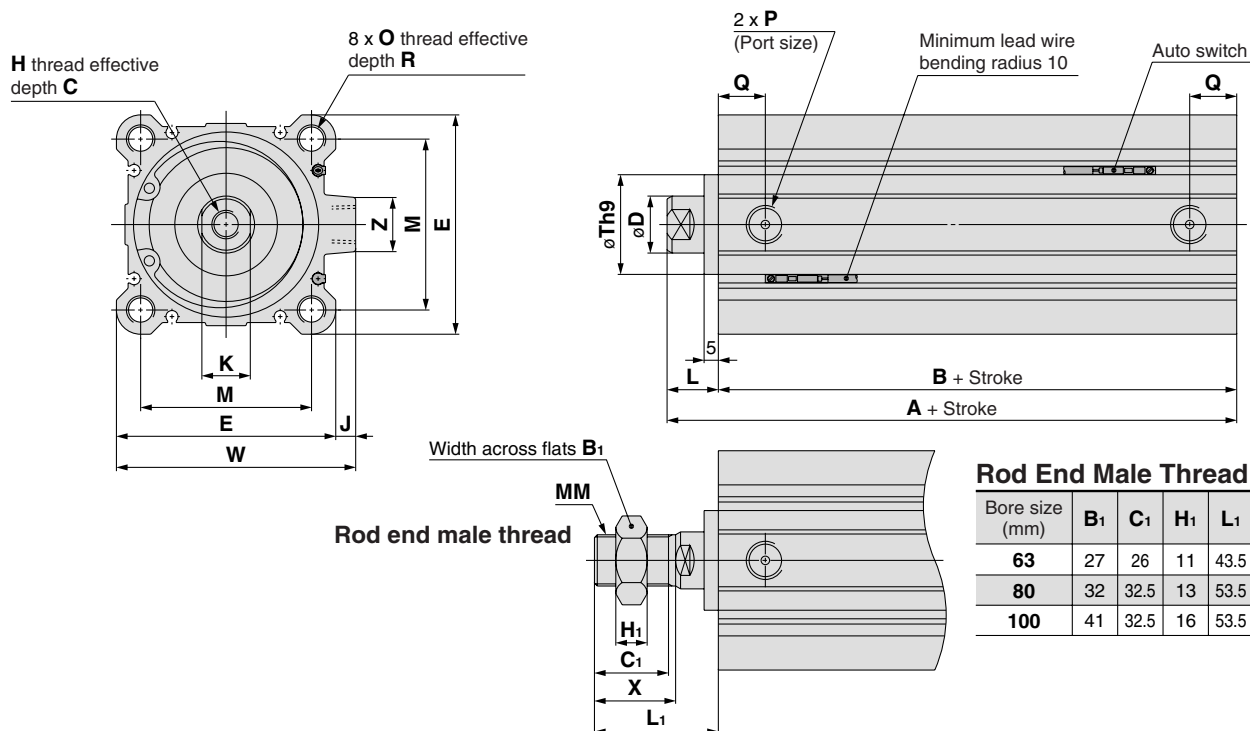
Series CQ2

Dimensions

ø63 to ø100

Both ends tapped: C□Q2A

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



Rod End Male Thread (mm)						
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

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

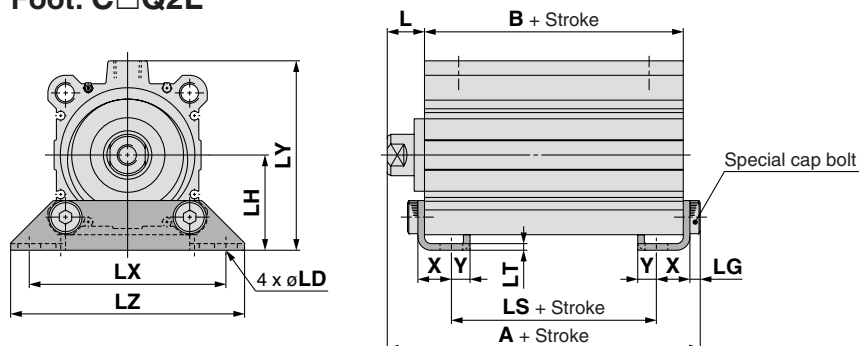
Both Ends Tapped For auto switch mounting position and its mounting height, refer to pages 173 to 176. (mm)

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)	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	250, 300	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

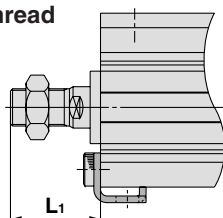
Note 1) For 125 to 200 stroke, strokes are by the 25 mm interval.

Note 2) For calculation on the longitudinal dimension of the intermediate strokes, refer to page 74.

Foot: C□Q2L



Rod end male thread



Foot (mm)

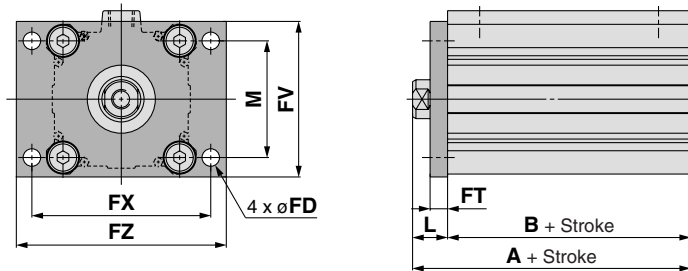
Bore size (mm)	A	B	L	L ₁	LD	LG	LH	LS	LT	LX	LY	LZ	X	Y
63	83.2	57	18	43.5	11	5	46	31	3.2	95	91.5	113	16.2	9
80	97.5	66	20	53.5	13	7	59	36	4.5	118	114	140	19.5	11
100	110.5	75.5	22	53.5	13	7	71	41.5	6	137	136	162	23	12.5

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

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

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

Rod end flange: C□Q2F

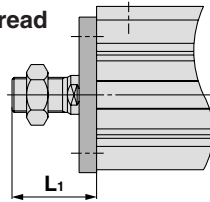


Rod End Flange

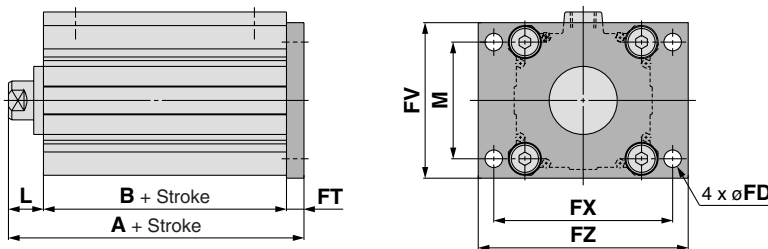
Bore size (mm)	A	B	FD	FT	FV	FX	FZ	L	L ₁	M
63	75	57	9	9	80	92	108	18	43.5	60
80	86	66	11	11	99	116	134	20	53.5	77
100	97.5	75.5	11	11	117	136	154	22	53.5	94

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head end flange: C□Q2G



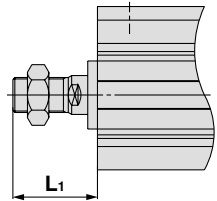
Head End Flange

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

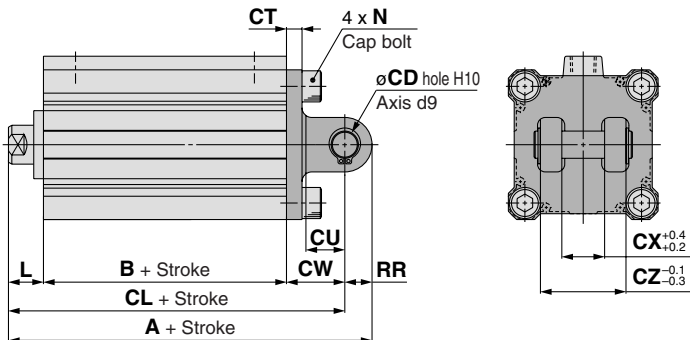
(* Dimensions except A are the same as rod side flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Double clevis: C□Q2D



Double Clevis

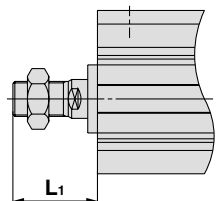
Bore size (mm)	A	B	CD	CL	CT	CU	CW	CX	CZ
63	119	57	14	105	8	20	30	22	44
80	142	66	18	124	10	27	38	28	56
100	164.5	75.5	22	142.5	13	31	45	32	64

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 ring are shipped together.

Rod end male thread



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
CQ2K B 20 - 30 D

Without auto switch ø32 to ø63
CQ2K B 32 - 30 D Z

With auto switch
CDQ2K B 32 - 30 D 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 end flange	ø40, ø50, ø63
G	Head end 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 CQ2KB" on pages 86 and 88.

Bore size

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

Note 1) When ø12 with switch is required, the body option should be with rubber bumper (C).
Example) CDQ2KB12-30DCZ

Port thread type

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

Note 2) Bore sizes available with one-touch fittings are ø32 to ø63.
* For cylinders without an auto switch, M threads are compatible only for ø32 with 5 strokes.

Cylinder stroke (mm)
For "Standard Stroke", refer to page 83.

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 the applicable auto switch model.

Auto switch mounting groove

Z	ø12 to ø25	2 sides
	ø32 to ø63	4 sides

Made to Order
Refer to page 83 for details.

Body option

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

* Combination of body option (FM) is available.

Action
D Double acting

Built-in Magnet Cylinder Model
If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2KL32-30DZ

Applicable Auto Switches/Refer to pages 180 to 188 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 switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
	3-wire (PNP)			M9PV				M9P	●	●	●	○	—	○				
	2-wire			M9BV				M9B	●	●	●	○	—	○				
	Diagnostic indication (2-color indication)			3-wire (NPN)				5 V, 12 V	M9NVW	M9NW	●	●	●	○	—	○		IC circuit
	3-wire (PNP)			12 V				M9PVW	M9PW	●	●	●	○	—	○			
	Water resistant (2-color indication)			2-wire				12 V	M9BVW	M9BW	●	●	●	○	—	○		—
				3-wire (NPN)				5 V, 12 V	M9NAV	M9NA	○	○	●	○	—	○		IC circuit
				3-wire (PNP)				12 V	M9PAV	M9PA	○	○	●	○	—	○		
				2-wire				12 V	M9BAV	M9BA	○	○	●	○	—	○		—
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)				—	—	P3DW	●	—	●	●	—	○		—
Reed switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	
				No	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	—	IC circuit
			5 V, 12 V				100 V or less	A90V	A90	●	—	●	—	—	—	—		

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
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.
* D-P3DW□ type is available from ø32 up to ø63 only.

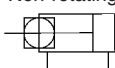
* There are other applicable auto switches other than the listed above. For details, refer to page 179.
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
* Refer to page 187 for the D-P3DW□ type.

Series CQ2K



Symbol

Non-rotating rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of rod end shape
—XB10	Intermediate stroke (Using exclusive body): 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 a split pin for double clevis pin and double knuckle pin and a flat washer
—X1876	Cylinder tube: With concave boss on head end

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

- Minimum stroke for auto switch mounting
- Auto switch proper mounting position (detection at stroke end) and height
- Operating range
- Auto switch mounting bracket/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	0.038	0.055	0.09	0.15	0.26	0.46	0.77
	0.043 Note 1)							
Stroke length tolerance	+1.0 mm Note 2) 0							
Rod non-rotating accuracy	±2°	±1°			±0.8°			

* Bore size ø12 cylinder with a switch comes with a rubber bumper as standard.

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

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

Standard Stroke

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 Stroke

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 82.	
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with 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. B dimension is 115.5 mm.	

Type

Bore size (mm)	12	12	12	12	32	40	50	63
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●
		Both ends tapped	—	—	—	●	●	●
	Built-in magnet		●	●	●	●	●	●
	Piping	Screw-in type	—	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8
			—	—	—	—	—	—
		TN	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4
		TF	—	—	—	G 1/8	G 1/8	G 1/4
	Built-in one-touch fittings		—	—	—	—	—	—
Rod end male thread	—		—	—	—	—	—	—
	With boss on head end		●	●	●	●	●	●

Note 1) For a ø32 cylinder without an auto switch, M5 x 8 is used for 5-stroke piping dimension. Thus, do not enter a symbol for the port thread type.

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

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and "Handling
Precautions for SMC Products" (M-
E03-3) for Actuators and Auto
Switches Precautions.

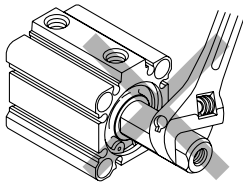
Retaining Ring Installation/Removal

⚠ 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 flats 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 chart below 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 workpiece 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 Bracket/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 foot bracket, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows.
Foot or Flange: Body mounting bolt,
Double clevis: Clevis pin, Body mounting bolt, Type C retaining ring 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

Mass

Mass

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 Mass

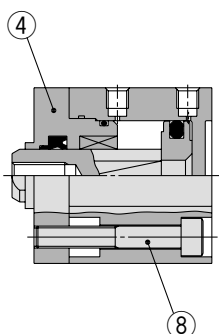
Bore size (mm)		12	16	20	25	32	40	50	63
Both ends tapped		—	—	—	—	—	6	6	19
Rod end male thread	Male thread	1.5	3	6	12	26	27	53	53
	Nut	1	2	4	8	17	17	32	32
With boss on head end		0.7	1.3	2	3	5	7	13	25
Built-in one-touch fittings		—	—	—	—	12	12	21	21
Foot (Including mounting bolt)		—	—	—	—	—	153	242	316
Rod end flange (Including mounting bolt)		—	—	—	—	—	213	372	558
Head end flange (Including mounting bolt)		—	—	—	—	—	198	348	534
Double clevis (Including pin, retaining ring, bolt)		—	—	—	—	—	196	393	554

Calculation: (Example) **CQ2KD40-20DMZ**

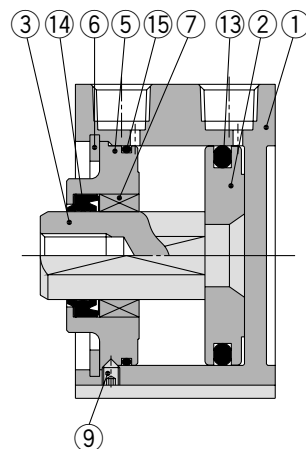
- Cylinder mass: CQ2KB40-20DZ 269 g
- Option mass: Both ends tapped 6 g
- Rod end male thread 44 g
- Double clevis 196 g
- 515 g

Construction

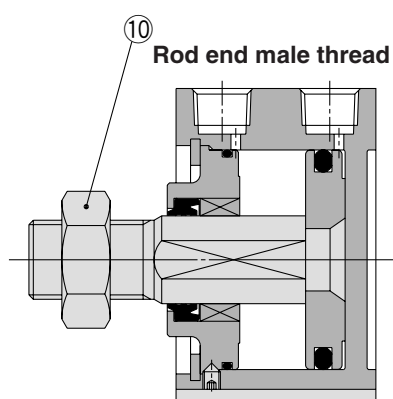
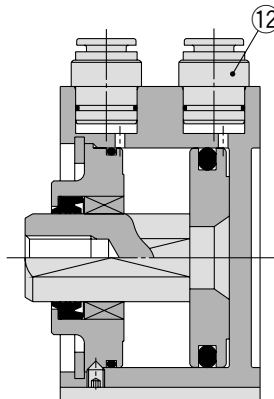
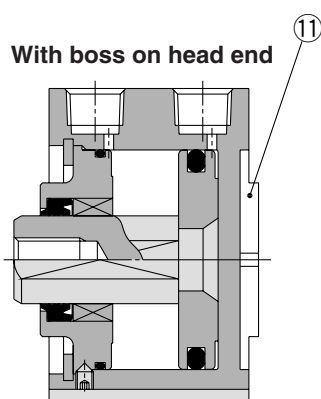
Basic (Bore size ø12 to ø32)



Basic (Bore size 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	Set of nos. above 13, 14, 15
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)

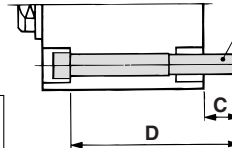
Mounting Bolt for CQ2KB/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2KB is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

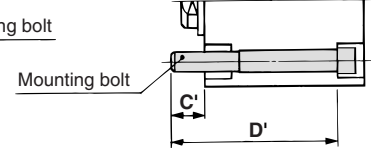
Example) Bolt M3 x 30L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Head end mounting



Rod end mounting



Cylinder model	C	D	Mounting bolt size	C'	D'	Mounting bolt size
CQ2KB12-5D	6.5	30	M3 x 30L	6.5	30	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	M3 x 30L	5	30	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	M5 x 35L	9.5	35	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	M5 x 40L	6.5	35	M5 x 35L
-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	M5 x 40L	10	40	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 size	C'	D'	Mounting bolt size
CQ2KB40-5DZ	7.5	35	M5 x 35L	7.5	35	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	12.5	115	x 115L	12.5	115	x 115L
-100DZ		140	x 140L		140	x 140L
CQ2KB50-10DZ		45	M6 x 45L		45	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	14.5	85	x 85L	14.5	85	x 85L
-75DZ		120	x 120L		120	x 120L
-100DZ		145	x 145L		145	x 145L
CQ2KB63-10DZ		50	M8 x 50L		50	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 • $\phi 16, \phi 20, \phi 25, \phi 32$
 $\phi 40, \phi 50, \phi 63$

To prevent 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						
Maximum operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Screw-in piping						
Piston speed	50 to 500 mm/s						
Mounting	Through-hole						
Auto switch	Mountable						



Auto switch specifications	P.180 to 188
Auto switch proper mounting position and height	P.173 to 178
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass (g)

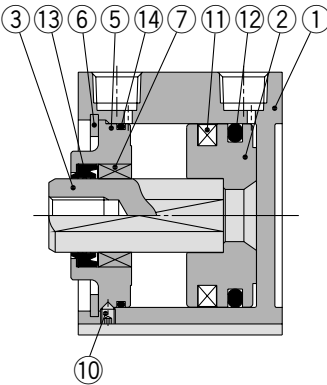
Bore size (mm)	Cylinder stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
12	71	77	83	89	96	102	—	—	—	—	—	—
16	74	82	89	97	105	113	—	—	—	—	—	—
20	119	132	144	156	168	180	192	204	217	229	—	—
25	162	177	192	208	223	238	254	269	284	300	—	—
32	227	247	266	286	306	326	345	365	385	404	504	604
40	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 Mass (g)

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 bolt)		—	—	—	—	—	153	242	316
Rod end flange (Including mounting bolt)		—	—	—	—	—	213	372	558
Head end flange (Including mounting bolt)		—	—	—	—	—	198	348	534
Double clevis (Including pin, retaining ring and bolt)		—	—	—	—	—	196	393	554

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

Ø40 to Ø63



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	Nickel plated, ø40 to ø63
11	Magnet	—	
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Tube gasket	NBR	

Bore size (mm)	Kit no.	Contents
12	CQ2KB12-PS	Set of nos. at left (12, 13, 14)
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)

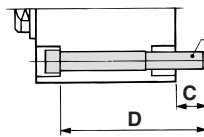
Mounting Bolt for CDQ2KB/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting
of the CDQ2KB is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

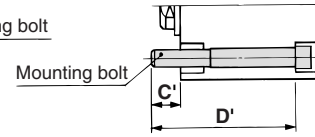
Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Head end mounting



Rod end mounting



Cylinder model	C	D	Mounting bolt size	C'	D'	Mounting bolt size
CDQ2KB12-5DCZ	5.5	35	M3 x 35L	5.5	40	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	M3 x 40L	8	45	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	M5 x 40L	7.5	45	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	M5 x 40L	6.5	45	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	M5 x 50L	10	50	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

Cylinder model	C	D	Mounting bolt size	C'	D'	Mounting bolt size
CDQ2KB32-40DZ	8.5	85	M5 x 85L	10	85	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	M5 x 45L	7.5	45	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	12.5	115	x 115L	12.5	115	x 115L
-100DZ		140	x 140L		140	x 140L
CDQ2KB50-10DZ	12.5	55	M6 x 55L	12.5	55	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	14.5	145	x 145L	14.5	145	x 145L
CDQ2KB63-10DZ		60	M8 x 60L		60	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	150	125	x 125L	150	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

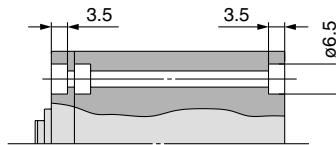
Series CQ2K

Dimensions

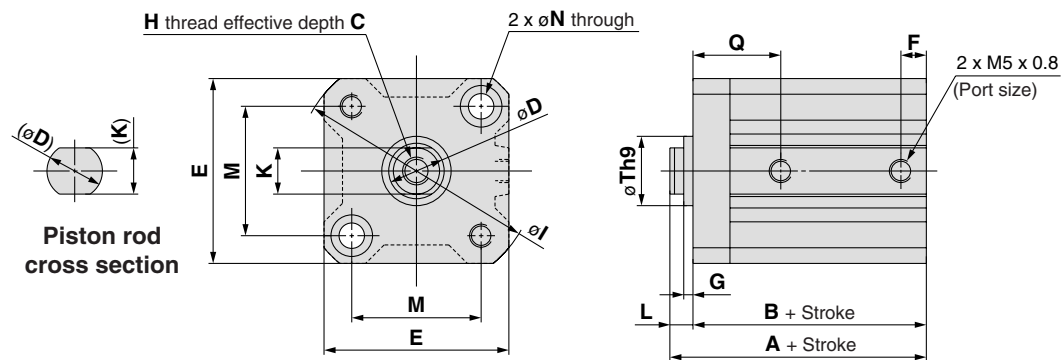
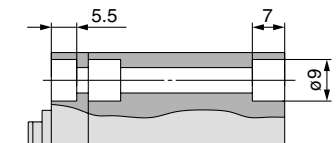
Ø12 to Ø25/Without Auto Switch

Basic (Through-hole): CQ2KB

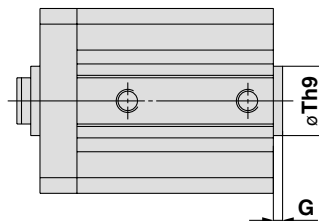
Ø12, Ø16



Ø20, Ø25



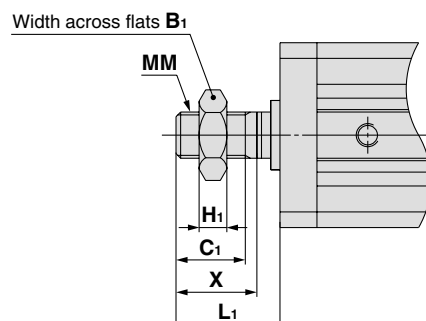
With boss on head end



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)	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

Basic

(mm)

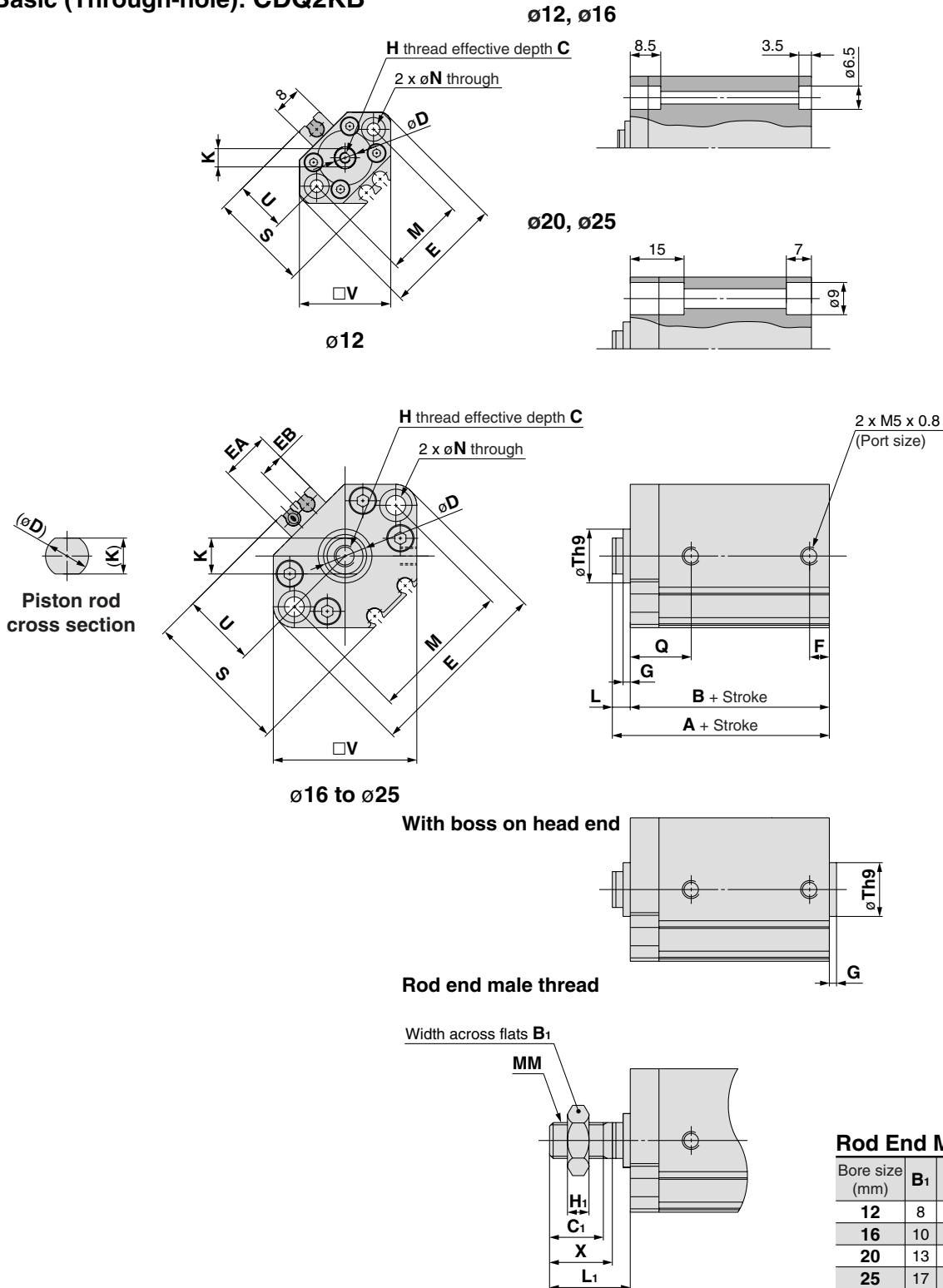
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	G	H	I	K	L	M	N	Q	Th9
12	5 to 30	25.5	22	6	6	25	5	1.5	M3 x 0.5	32	5.2	3.5	15.5	3.5	12.5	15 ⁰ _{-0.043}
16	5 to 30	27	23.5	8	8	29	5.5	1.5	M4 x 0.7	38	6	3.5	20	3.5	13	20 ⁰ _{-0.052}
20	5 to 50	32	27.5	7	10	36	5.5	2	M5 x 0.8	47	8	4.5	25.5	5.5	17	13 ⁰ _{-0.043}
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

ø12 to ø25/With Auto Switch

Basic (Through-hole): CDQ2KB



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

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176. (mm)

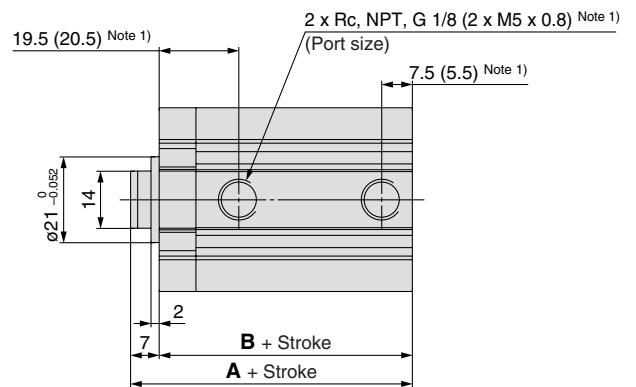
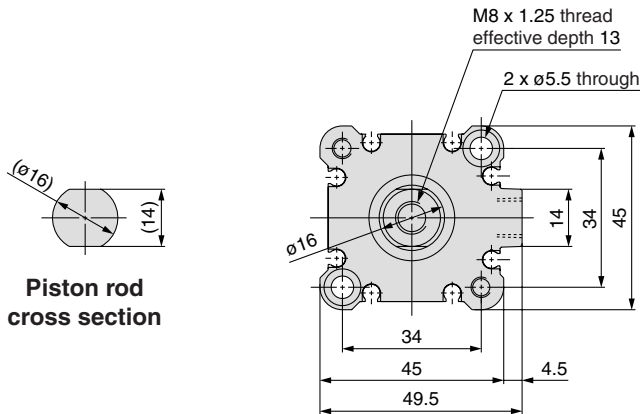
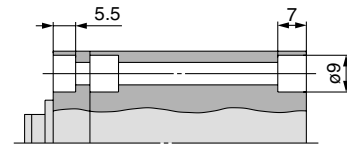
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	EA	EB	F	G	H	K	L	M	N	Q	S	Th9	U	V
12	5 to 30	36.5	33	6	6	33	—	—	6.5	1.5	M3 x 0.5	5.2	3.5	22	3.5	16	27.5	15 ⁰ _{-0.043}	14	25
16	5 to 30	39	35.5	8	8	37	13.2	6.6	5.5	1.5	M4 x 0.7	6	3.5	28	3.5	15	29.5	20 ⁰ _{-0.052}	15	29
20	5 to 50	44	39.5	7	10	47	13.6	6.8	5.5	2	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.

Series CQ2K

Dimensions

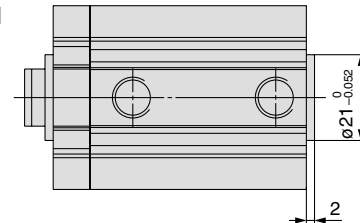
Ø32/Without Auto Switch



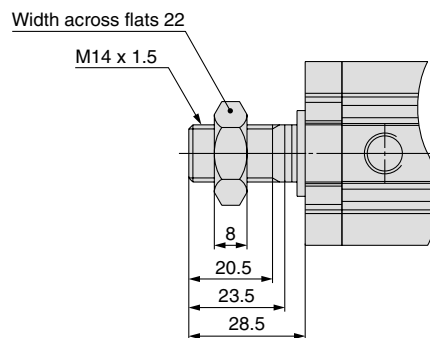
Note 1) (): Stroke 5 mm

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

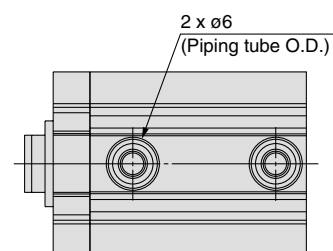
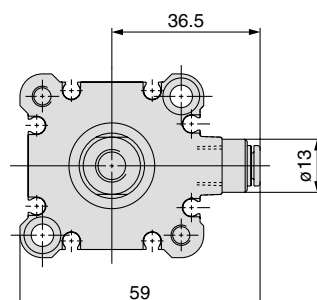
With boss on head end



Rod end male thread



Built-in one-touch fittings: Ø32

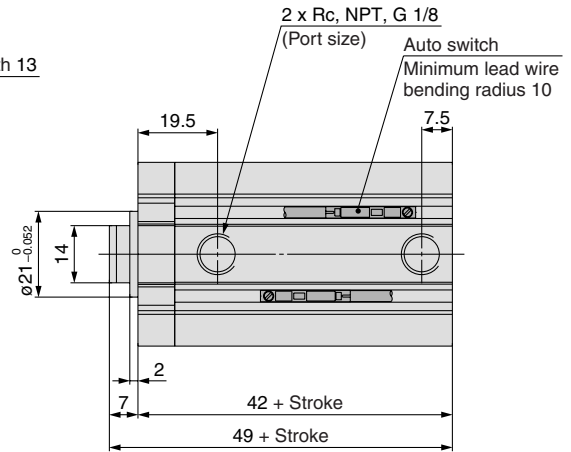
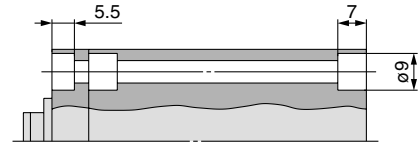
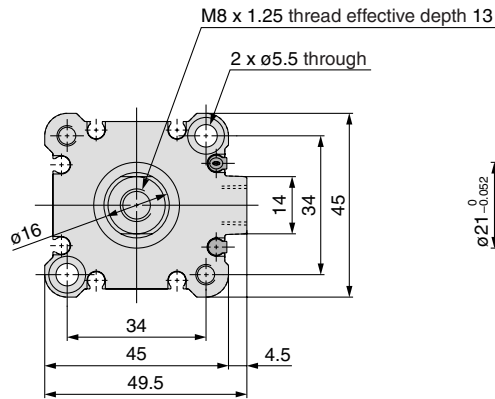
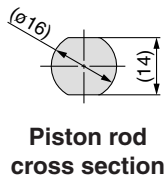


Note 2) In the case of built-in one-touch fitting, the 5 mm stroke is the same external dimensions as 10 mm stroke.

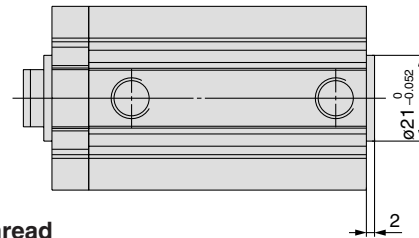
* For details about the rod end nut and accessory brackets, refer to page 19.

Dimensions

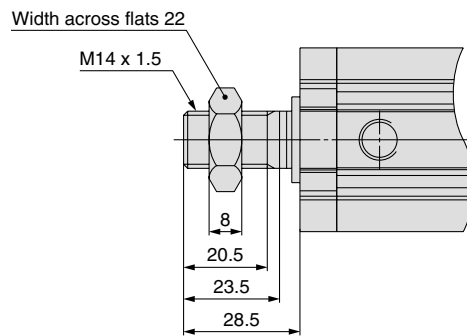
Ø32/With Auto Switch



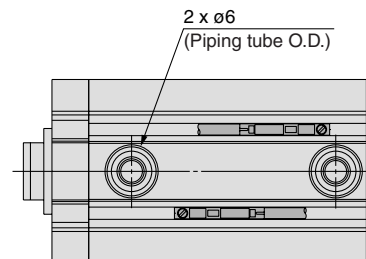
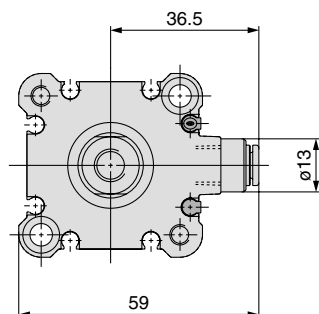
With boss on head end



Rod end male thread



Built-in one-touch fittings: Ø32



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

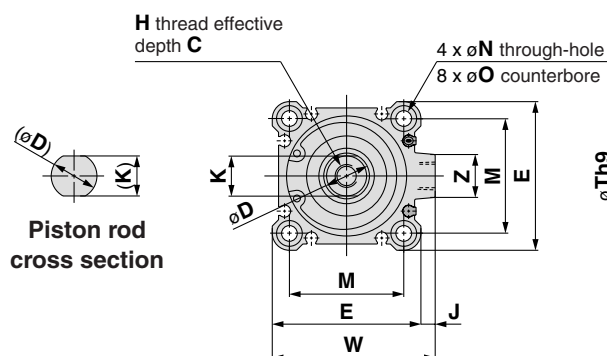
Series CQ2K

Dimensions

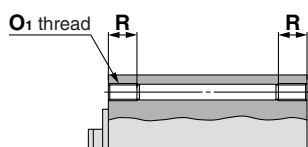
Ø40 to Ø63/With Auto Switch

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

Basic (Through-hole): CDQ2KB

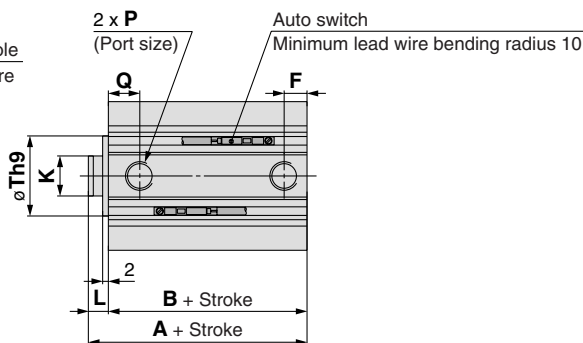


Both ends tapped: CDQ2KA

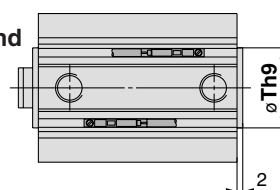


Both Ends Tapped (mm)

Bore size (mm)	Ø1	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18



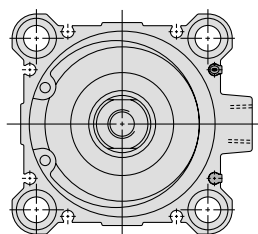
With boss on head end



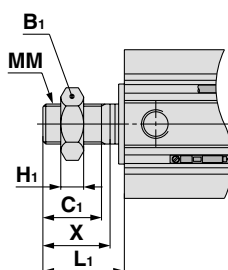
With Boss on Head End (mm)

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

Rod end male thread



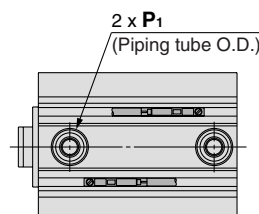
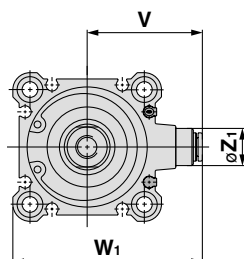
Ø63 Cylinder tube form



Rod End Male Thread (mm)

Bore size (mm)	B1	C1	H1	L1	MM	X
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5
63	27	26	11	33.5	M18 x 1.5	28.5

Built-in one-touch fittings



Built-in One-touch Fittings (mm)

Bore size (mm)	Z1	P1	V	W1
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

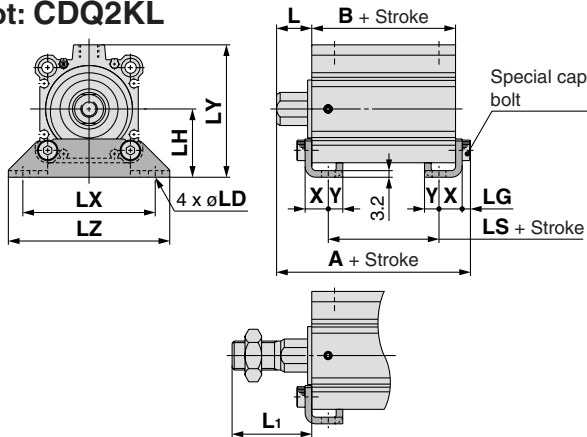
Basic

Bore size																				(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	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																		
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																		
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																		

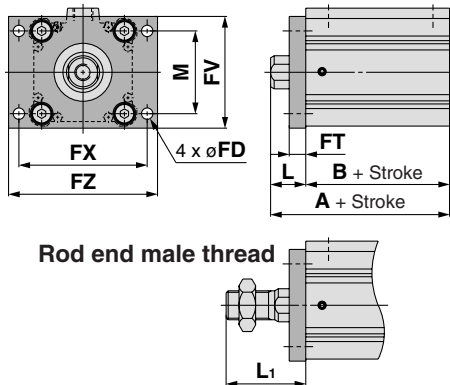
* For details about the rod end nut and accessory brackets, refer to page 19.

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

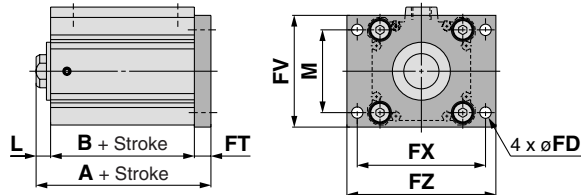
Foot: CDQ2KL



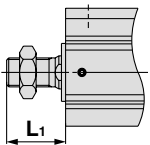
Rod end flange: CDQ2KF



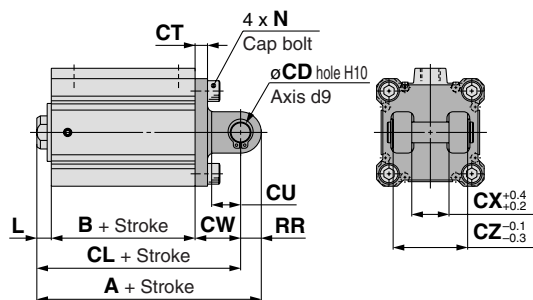
Head end flange: CDQ2KG



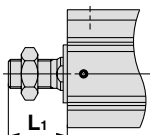
Rod end male thread



Double clevis: CDQ2KD



Rod end male thread



* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pins 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 End Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		(mm)				
		A	B	A	B	FD	FT	FV	FX	FZ
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 End Flange

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch	(mm)	
		A	A	L	L ₁
40	5 to 50	44.5	54.5	7	28.5
	75,100	54.5			
50	10 to 50	47.5	57.5	8	33.5
	75,100	57.5			
63	10 to 50	53	63	8	33.5
	75,100	63			

(* Dimensions except A, L and L₁ are the same as rod end flange.)

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			(mm)		
		A	B	CL	A	B	CL	CD	CT	CU
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

Mounting

B	Through-hole (Standard)	ø12 to ø63
A	Both ends tapped	
L	Foot	ø40 to ø63
F	Flange	

* Mounting brackets are shipped together (but not assembled).
* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQ2KWB" on pages 100 and 102.

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
TF	G	
F	Built-in one-touch fittings (Note)	

Note) Bore sizes available with one-touch fittings are ø32 to ø63.
* For cylinders without an auto switch, M threads are compatible only for ø32 with 5 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 the applicable auto switch model.

Auto switch mounting groove

Z	ø12 to ø25	2 sides
	ø32 to ø63	4 sides

Body option

Nil	Standard (Rod end female thread)
C	With rubber bumper (Only ø12 with auto switch)
M	Rod end male thread

Action

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

Cylinder stroke (mm)
For "Standard Stroke", refer to page 97.

Built-in Magnet Cylinder Model
If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2KWB32-30DZ

Applicable Auto Switches/Refer to pages 180 to 188 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 switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
	3-wire (PNP)			M9PV				M9P	●	●	●	○	—	○				
	2-wire			M9BV				M9B	●	●	●	○	—	○				
	Diagnostic indication (2-color indication)			3-wire (NPN)				5 V, 12 V	M9NVW	M9NW	●	●	●	○	—	○		IC circuit
	3-wire (PNP)			5 V, 12 V				M9PVW	M9PW	●	●	●	○	—	○			
	Water resistant (2-color indication)			2-wire				12 V	M9BVW	M9BW	●	●	●	○	—	○		—
				3-wire (NPN)				5 V, 12 V	M9NAV	M9NA	○	○	●	○	—	○		IC circuit
				3-wire (PNP)				5 V, 12 V	M9PAV	M9PA	○	○	●	○	—	○		
				2-wire				12 V	M9BAV	M9BA	○	○	●	○	—	○		—
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)				—	—	P3DW	●	—	●	●	—	○		—
Reed switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	
				2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	—	—	Relay, PLC
			5 V, 12 V			100 V or less	A90V	A90	●	—	●	—	—	—	—	IC circuit		

* Lead wire length symbols: 0.5 m Nil (Example) M9NV
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

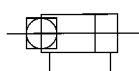
* Solid state auto switches marked with "○" are produced upon receipt of order.
* D-P3DW□ type is available from ø32 up to ø63 only.

* There are other applicable auto switches other than the listed above. For details, refer to page 179.
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
* Refer to page 187 for the D-P3DW□ type.



Symbol

Non-rotating rod,
Double acting



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	±2°	±1°			±0.8°			

* Bore size ø12 cylinder with a switch comes with a rubber bumper as standard.

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

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

Standard Stroke

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 Stroke

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 96.	
Description	Dealing with the stroke by the 5 mm interval is available by installing spacer with 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. 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	Screw-in type	—	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Note 1) M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4
			TN	—	—	—	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4
			TF	—	—	—	—	G 1/8	G 1/8	G 1/4	G 1/4
		Built-in one-touch fittings		—	—	—	—	ø6/4 Note 2)	ø6/4	ø8/6	ø8/6
	Rod end male thread		●	●	●	●	●	●	●	●	

Note 1) For a ø32 cylinder without an auto switch, M5 x 8 is used for 5-stroke piping dimension. Thus, do not enter a symbol for the port thread type.

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

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

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

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and “Handling
Precautions for SMC Products” (M-
E03-3) for Actuators and Auto
Switches Precautions.

Retaining Ring Installation/Removal

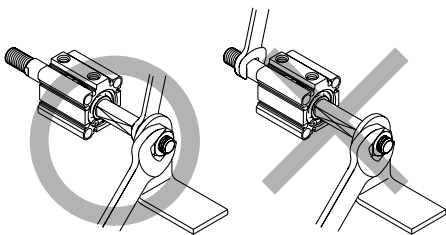
⚠ Caution

- 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 flats 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 flats and apply reverse torque.



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

Mounting Bracket/Part No.

Bore size (mm)	Foot Note 1)	Flange
40	CQ-L040	CQ-F040
50	CQ-L050	CQ-F050
63	CQ-L063	CQ-F063

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

Note 2) Parts belonging to each bracket are as follows.
Foot or Flange: Body mounting bolt

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

Mass

Mass

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 Mass

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**

Cylinder mass: CQ2KWB40-20DZ 424 g

Option mass: 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

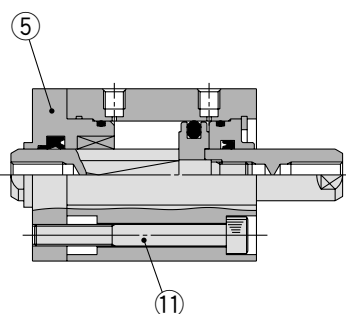
Auto Switch

Made to Order

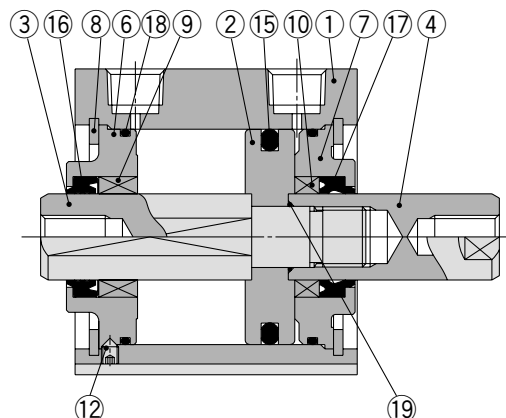
Series CQ2KW

Construction

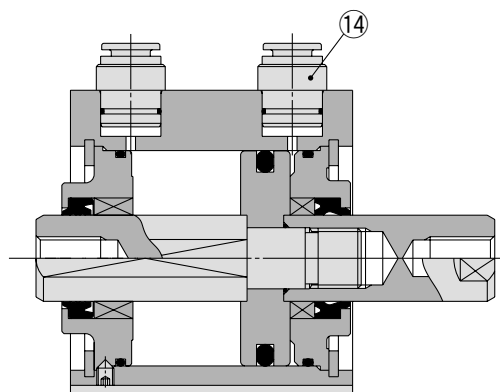
ø12 to ø32



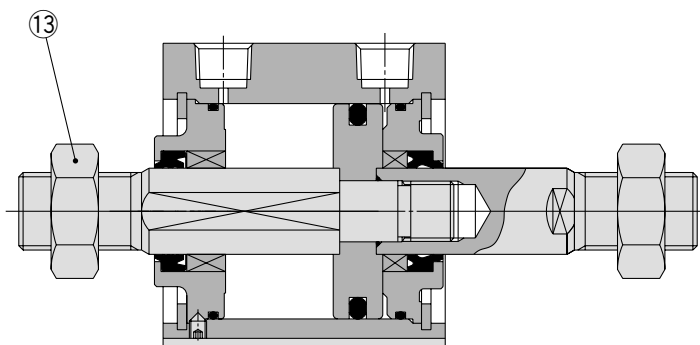
ø40 to ø63



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	Set of nos. above 15, 16, 17, 18
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)

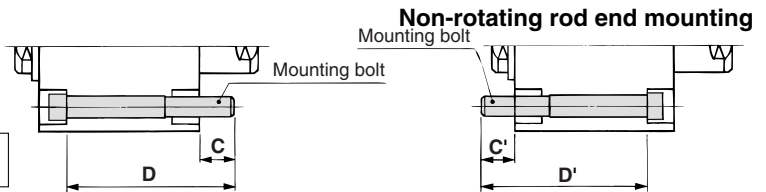
Mounting Bolt for CQ2KWB/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQ2KWB is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 40L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size	C'	D'	Mounting bolt size
CQ2KWB12-5D	8.3	40	M3 x 40L	8.3	40	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	M3 x 40L	7.5	40	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	M5 x 40L	8	40	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	M5 x 45L	10	45	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	M5 x 50L	7.5	45	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 size
CQ2KWB40-5DZ	7	45	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
CQ2KWB50-10DZ	12.5	125	x 125L
-75DZ		150	x 150L
-100DZ		150	x 150L
CQ2KWB63-10DZ	13.5	55	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

* $\phi 40$ to $\phi 63$: C' and D' dimensions are the same as C and D.

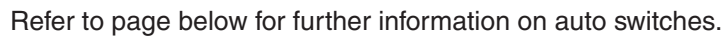
Copper and Fluorine-free Series (For CRT manufacturing process)

20 — CQ2KWB — Bore size — Stroke D (M) (Z)
 • $\phi 16, \phi 20, \phi 25, \phi 32, \phi 40, \phi 50, \phi 63$
 • Copper and fluorine-free series

To prevent 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						
Maximum operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Screw-in piping						
Piston speed	50 to 500 mm/s						
Mounting	Through-hole						
Auto switch	Mountable						



Mass

(g)

(g)

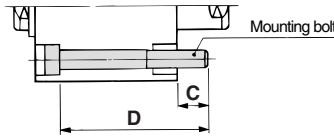
Add each mass of auto switches when auto switches are mounted.

Mounting Bolt for CDQ2KWB/With Auto Switch

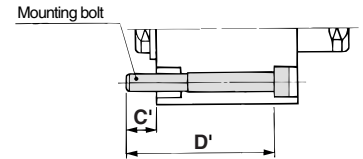
Mounting method: Mounting bolt for through-hole mounting of the CDQ2KWB is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 40L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Non-rotating rod end mounting



Cylinder model	C	D	Mounting bolt size	C'	D'	Mounting bolt size
CDQ2KWB12-5DCZ	6.1	40	M3 x 40L	6.1	45	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	M3 x 45L	7.5	50	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	M5 x 45L	11	55	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	M5 x 45L	10	55	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	M5 x 60L	7.5	55	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 size
CDQ2KWB40-5DZ	7	55	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	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	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

* $\phi 40$ to $\phi 63$: C' and D' dimensions are the same as C and D.

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

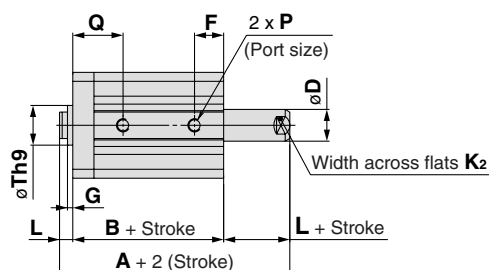
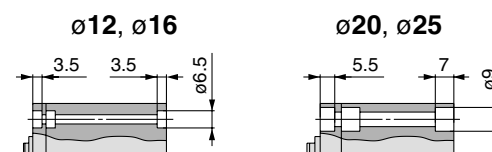
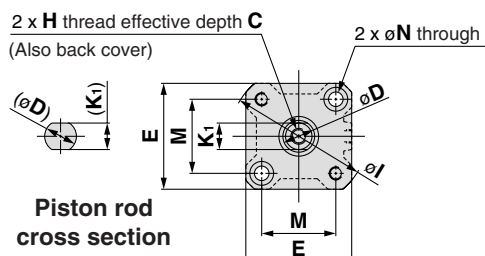
Series CQ2KW

Dimensions

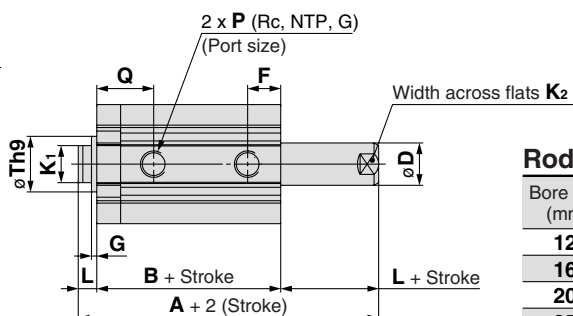
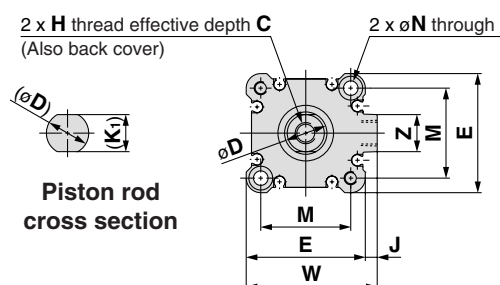
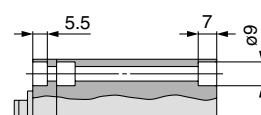
ø12 to ø32/Without Auto Switch

Basic (Through-hole): CQ2KWB

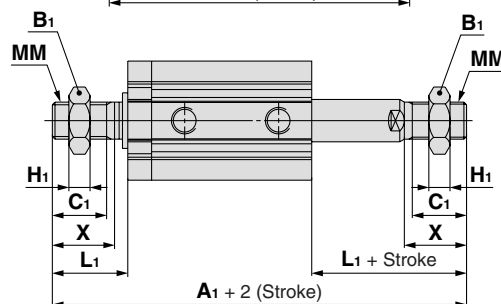
ø12 to ø25



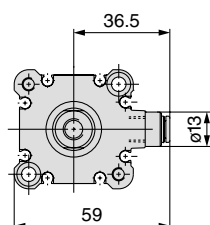
ø32



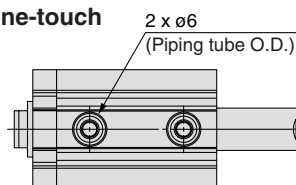
Rod end male thread



Built-in one-touch fittings: ø32



Built-in one-touch fittings



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

* In the case of built-in one-touch fittings, the 5 mm stroke with ø32 is the same external dimensions as 10 mm stroke.

Basic

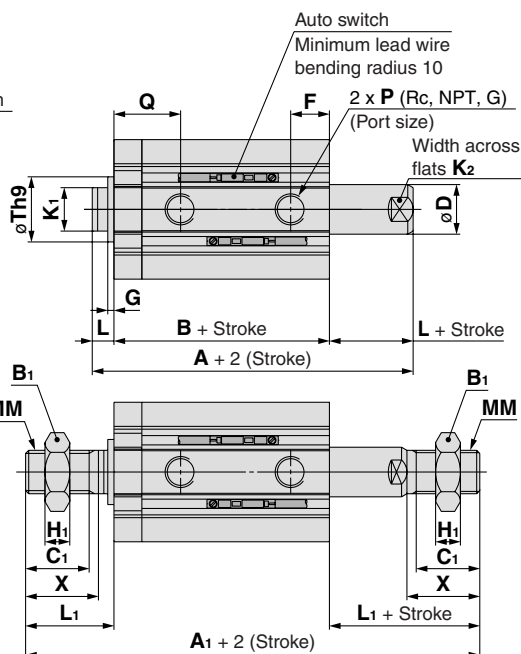
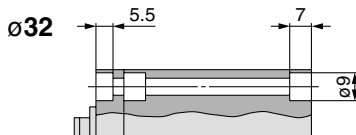
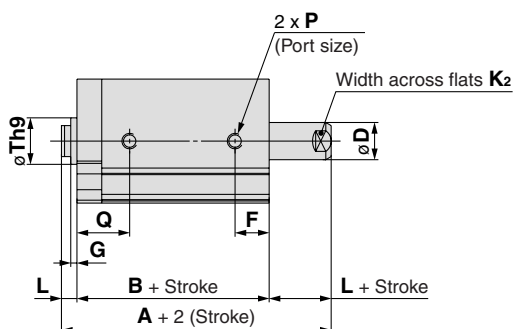
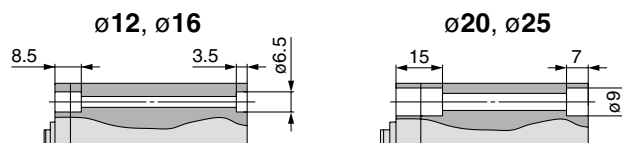
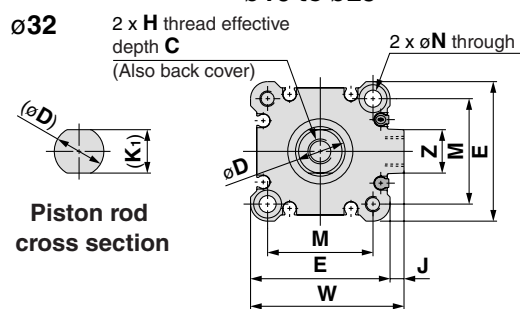
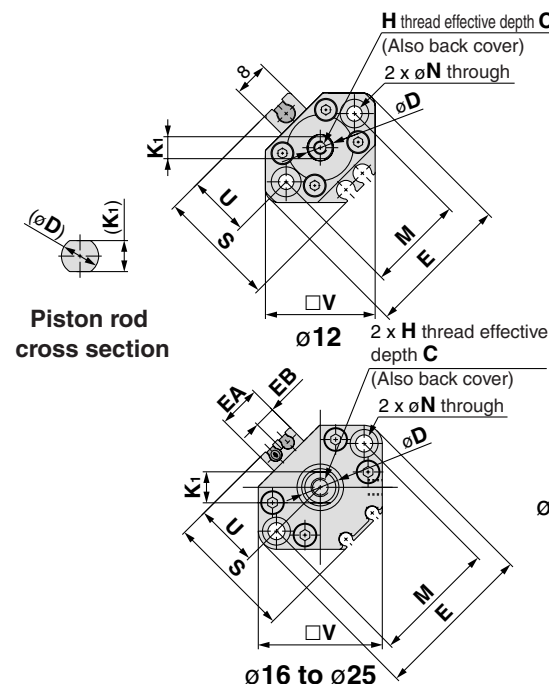
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	G	H	I	J	K ₁	K ₂	L	M	N	P	Q	Th9	W	Z
12	5 to 30	37.2	30.2	6	6	25	10	1.5	M3 x 0.5	32	—	5.2	5	3.5	15.5	3.5	M5 x 0.8	15	15 ⁰ _{-0.043}	—	—
16	5 to 30	38	31	8	8	29	10	1.5	M4 x 0.7	38	—	6	6	3.5	20	3.5	M5 x 0.8	15	20 ⁰ _{-0.052}	—	—
20	5 to 50	43	34	7	10	36	9.5	2	M5 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	—	—														1/8				
	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 width across flats (K₂) are not constant.

Ø12 to Ø32/With Auto Switch

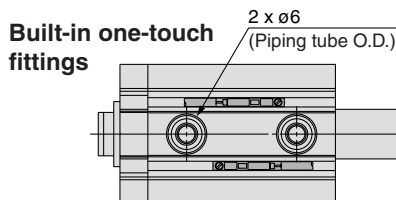
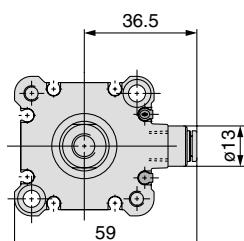
Basic (Through-hole): CDQ2KWB

**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: ø32



Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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 width across flats (K_2) are not constant.

Made to Order

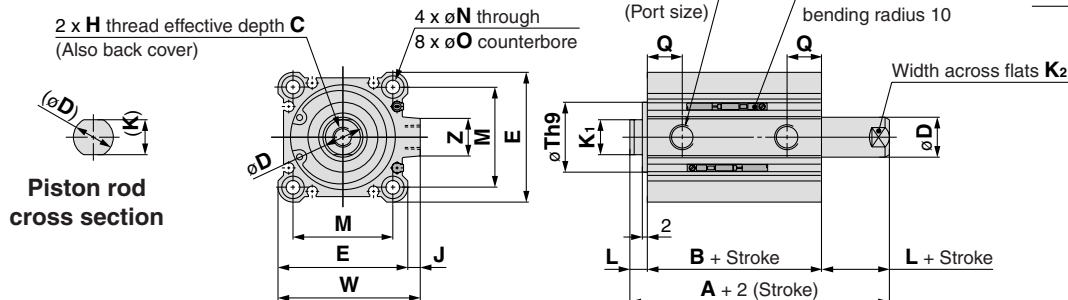
Series CQ2KW

Dimensions

ø40 to ø63

Both ends tapped: CQ2KWA/CDQ2KWA

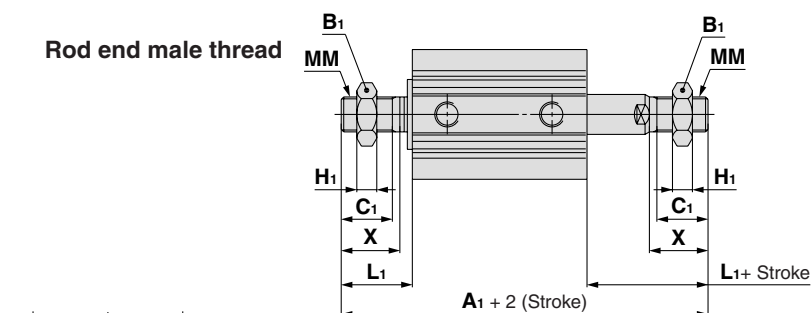
Basic (Through-hole): CQ2KWB/CDQ2KWB



Both Ends Tapped (mm)

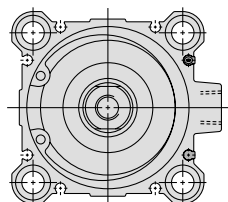
Bore size (mm)	O ₁	R
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18

Rod end male thread



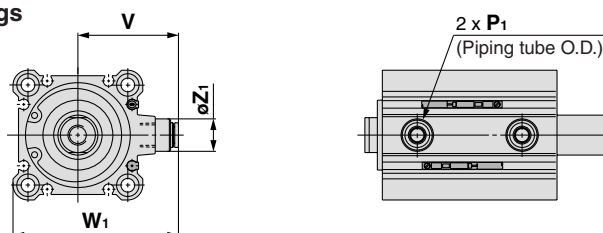
Rod End Male Thread (mm)

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



Cylinder tube form for ø63

Built-in one-touch fittings



Built-in One-touch Fittings (mm)

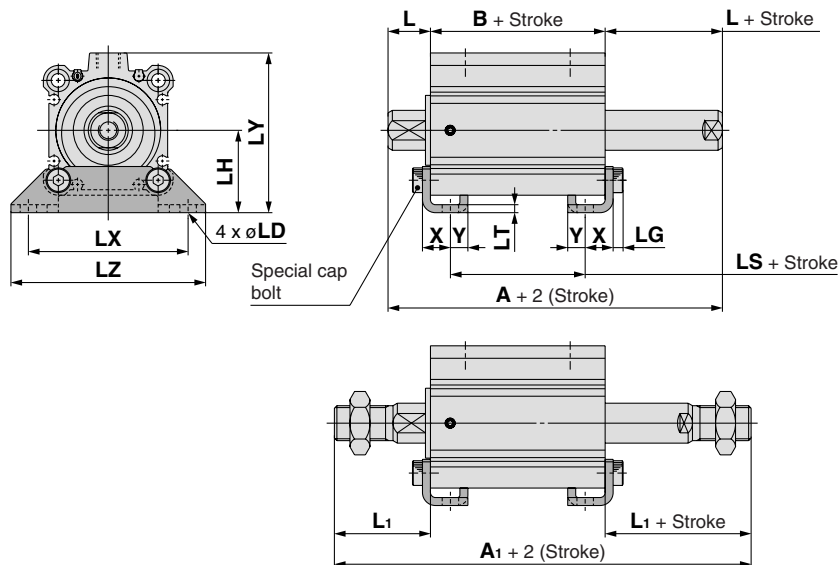
Bore size (mm)	Z ₁	P ₁	V	W ₁
40	13	6	40.5	66.5
50	16	8	50	82
63	16	8	56.5	95

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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 width across flats (K₂) are not constant.

Foot: CQ2KWL/CDQ2KWL



Rod End Male Thread

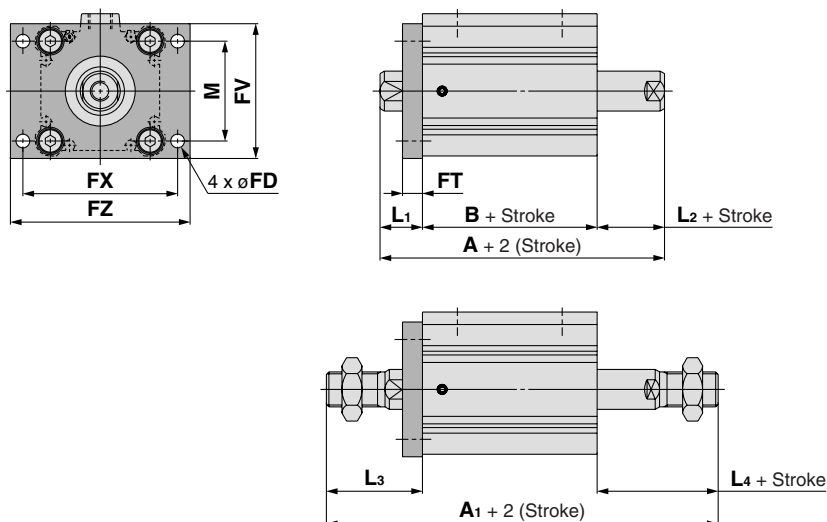
Bore size (mm)	Without auto switch	With auto switch	(mm)
40	A₁	A₁	L₁
40	117	127	38.5
50	127.5	137.5	43.5
63	129	139	43.5

Foot

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			L	LD	LG	LH	LT	LX	LY	LZ	X	Y
		A	B	LS	A	B	LS										
40	5 to 50	74	40	24	84	50	34	17	6.6	4	33	3.2	64	68	78	11.2	7
	75, 100	84	50	34													
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

Bore size (mm)	Without auto switch	With auto switch	(mm)	
	A₁	A₁	L₃	L₄
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 mounting position and its mounting height, refer to pages 173 to 176.

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

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 CQP2" on pages 110 and 113.

Type

Nil	Pneumatic
H	Air-hydro (Note)

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
TN	Rc	ø32 to ø100
TF	NPT	
	G	

Made to Order
Refer to page 108 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 the applicable auto switch model.

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)
For "Standard Stroke", refer to page 108.

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

Applicable Auto Switches/Refer to pages 180 to 188 of this series and 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 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		3-wire (NPN)				24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●	○		—	○	IC circuit			
				3-wire (PNP)							M9PWV	M9PW	●	●	●	○		—	○				
				2-wire							M9BWV	M9BW	●	●	●	○		—	○		—		
				3-wire (NPN)							M9NAV	M9NA	○	○	●	○		—	○			IC circuit	
	3-wire (PNP)			M9PAV	M9PA	○	○				●	○	—	○									
	2-wire			M9BAV	M9BA	○	○				●	○	—	○	—								
	4-wire			5 V, 12 V	—	F79F	●				—	●	○	—		○		IC circuit					
	Magnetic field resistant (2-color indication)			2-wire (Non-polar)	—	—	P4DW				—	—	●	●	—	○			—				
Reed switch	_____	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	Relay, PLC						
								Connector	2-wire	24 V	12 V	100 V or less	A72	A72H	●			—	●	—	—	—	
													A93V	A93	●			—	●	—	—	—	
													A90V	A90	●			—	●	—	—	—	IC circuit
	12 V	—		A73C									—	●	—	●		●	●	—			
	Diagnostic indication (2-color indication)	Grommet		Yes				2-wire	24 V	5 V, 12 V	24 V or less	A80C	—	●	—	●		●	●	—	IC circuit		
												—	—	A79W	—	●		—	●	—		—	—

* 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.
* D-P4DWL type is available from ø40 up to ø100 only.
* Only for 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 131.
* 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

Pneumatic

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
	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 dose not include the amount of bumper change.

Air-hydro

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 Actuators Precautions (5).

Standard Stroke

Pneumatic (Non-lube)

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

Air-hydro

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 Stroke

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 107.	
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with 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 space inside. B dimension is 115.5 mm.	



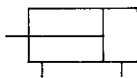
- Air-hydro type is excluded.
- In the case of spacer type, intermediate stroke with bumper for ø40 to ø100, it can be manufactured by 5 mm intervals in 5 mm and 55 to 95 mm.



Rod end male thread

JIS Symbol

Double acting, Single rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of 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 made of stainless steel
—XC35	With coil scraper
—XC36	With boss on rod end
—X271	Fluororubber seals

Refer to pages 127 to 130 for the specifications of cylinders with auto switches.

- Minimum stroke for auto switch mounting
- Auto switch proper mounting position (detection at stroke end) and height
- Operating range
- Auto switch mounting bracket/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

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and “Handling
Precautions for SMC Products” (M-
E03-3) for Actuators and Auto
Switches Precautions.

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

- 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	Screw-in type	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
							NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
							G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
	Rod end male thread		●	●	●	●	●	●	●	●	●	●
Rubber bumper		●	●	●	●				●	●	●	
Air-hydro	Mounting	Through-hole (Standard)	—	—	●	●	●	●	●	●	●	●
	Built-in magnet		—	—	●	●	●	●	●	●	●	●
	Piping	Screw-in type	—	—	M5 x 0.8	M5 x 0.8	Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
	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

Mass

Mass

(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 Mass

(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

- Cylinder mass: CQP2B32-20D 222 g
- Option mass: Rod end male thread 43 g
- With rubber bumper —3 g

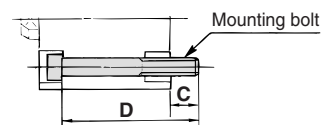
262 g

Mounting Bolt for CQP2/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting
of the CQP2B is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 25L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CQP2B12-5D	6.5	25	M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D	5	50	x 50L
CQP2B16-5D		25	M3 x 25L
-10D		30	x 30L
-15D		35	x 35L
-20D		40	x 40L
-25D		45	x 45L
-30D	7.5	50	x 50L
CQP2B20-5D		25	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	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 size
CQP2B32-5D		30	M5 x 30L
-10D		35	x 35L
-15D		40	x 40L
-20D		45	x 45L
-25D		50	x 50L
-30D	9	55	x 55L
-35D		60	x 60L
-40D		65	x 65L
-45D		70	x 70L
-50D		75	x 75L
-75D		110	x 110L
-100D		135	x 135L
CQP2B40-5D	7.5	35	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		45	M6 x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D	12.5	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 size
CQP2B63-10D		50	M8 x 50L
-15D		55	x 55L
-20D		60	x 60L
-25D		65	x 65L
-30D		70	x 70L
-35D	14.5	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		55	M10 x 55L
-15D		60	x 60L
-20D		65	x 65L
-25D		70	x 70L
-30D		75	x 75L
-35D	15	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		65	M10 x 65L
-15D		70	x 70L
-20D		75	x 75L
-25D		80	x 80L
-30D		85	x 85L
-35D	15.5	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

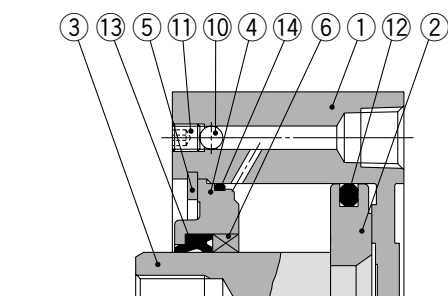
With Auto
Switch

Auto Switch

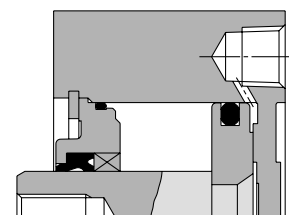
Made to Order

Series CQP2

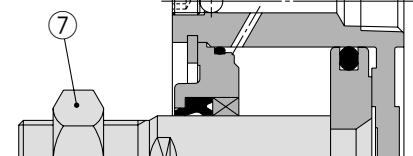
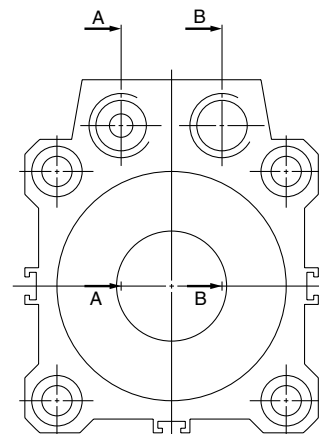
Construction



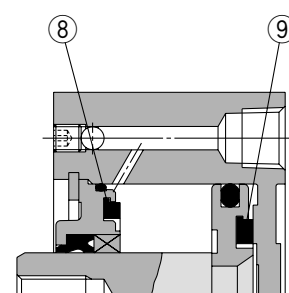
A-A section (Port on rod end)



B-B section (Port on head end)



Rod end male thread



With rubber bumper

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 casting	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 balls	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.		Note
	Pneumatic (Non-lube)	Air-hydro type	
12	CQ2B12-PS	—	Set of left nos. 12, 13, 14
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

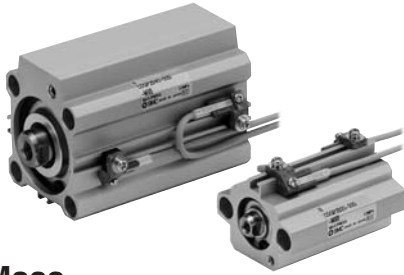
Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

To prevent 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									
Rubber bumper	None									
Piping	Screw-in piping									
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 page below for further information on auto switches.

Auto switch specifications	P.180 to 188, P. 1263 to 1371 in Best Pneumatics No. 2
Auto switch proper mounting position and height	P.127 to 130
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass

Additional Mass (g)

Bore size (mm)	12	16	20	25	32
Rod end male thread	1.5	3	6	12	26
Nut	1	2	4	8	17
With rubber bumper	0	-1	-2	-3	-3

Bore size (mm)	40	50	63	80	100
Rod end male thread	27	53	53	120	175
Nut	17	32	32	49	116
With rubber bumper	-7	-9	-18	-31	-56

Mass (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

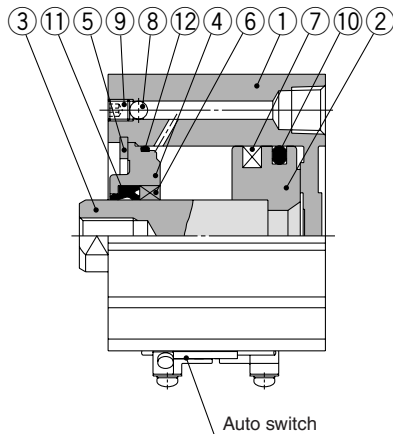
Calculation: (Example) **CDQP2B32-20DCM**
 • Cylinder mass: CDQP2B32-20D..... 290 g
 • Option mass: Rod end male thread..... 43 g
 With rubber bumper..... -3 g
 330 g

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

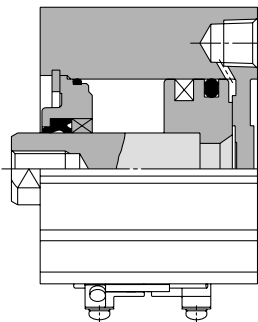
Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable bore size	Mass (g)
BQ-1	ø12 to ø25	1.5
BQ-2	ø32 to ø100	1.5
BQ2-012	ø12 to ø100	5

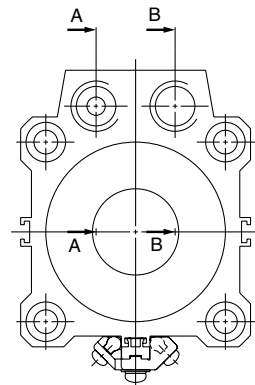
Construction



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 balls	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 (Non-lube)	Air-hydro	
12	CQ2B12-PS	—	Set of nos. at left ⑩, ⑪, ⑫
16	CQ2B16-PS	CQ2BH20-PS	
20	CQ2B20-PS	CQ2BH25-PS	
25	CQ2B25-PS	CQ2BH32-PS	
32	CQ2B32-PS	CQ2BH40-PS	
40	CQ2B40-PS	CQ2BH50-PS	
50	CQ2B50-PS	CQ2BH63-PS	
63	CQ2B63-PS	CQ2BH80-PS	
80	CQ2B80-PS	CQ2BH100-PS	
100	CQ2B100-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)

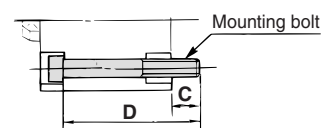
Series CQP2

Mounting Bolt for CDQP2/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQP2B is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CDQP2B12-5D	5.5	35	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	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	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	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

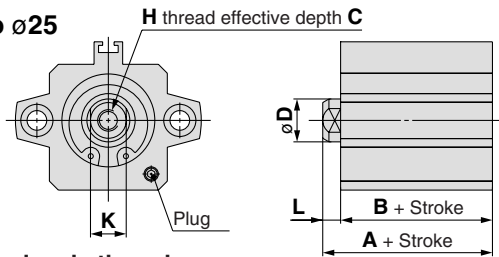
Cylinder model	C	D	Mounting bolt size
CDQP2B32-5D	9	40	M5 x 40L
-10D		45	x 45L
-15D		50	x 50L
-20D		55	x 55L
-25D		60	x 60L
-30D		65	x 65L
-35D		70	x 70L
-40D		75	x 75L
-45D		80	x 80L
-50D		85	x 85L
-75D	7.5	110	x 110L
-100D		135	x 135L
CDQP2B40-5D		45	M5 x 45L
-10D		50	x 50L
-15D		55	x 55L
-20D		60	x 60L
-25D		65	x 65L
-30D		70	x 70L
-35D		75	x 75L
-40D		80	x 80L
-45D	12.5	85	x 85L
-50D		90	x 90L
-75D		115	x 115L
-100D		140	x 140L
CDQP2B50-10D		55	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 size
CDQP2B63-10D	14.5	60	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	15	150	x 150L
CDQP2B80-10D		65	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	15.5	130	x 130L
-100D		155	x 155L
CDQP2B100-10D		75	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

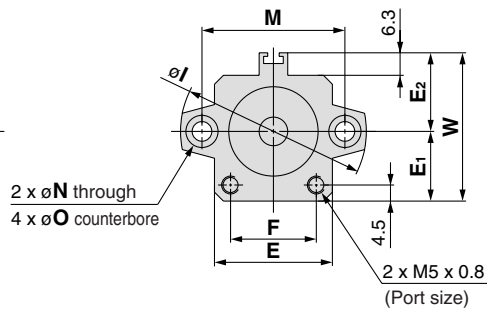
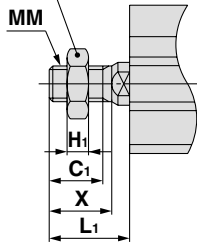
ø12 to ø100/Without Auto Switch

ø12 to ø25



Rod end male thread

Width across flats 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

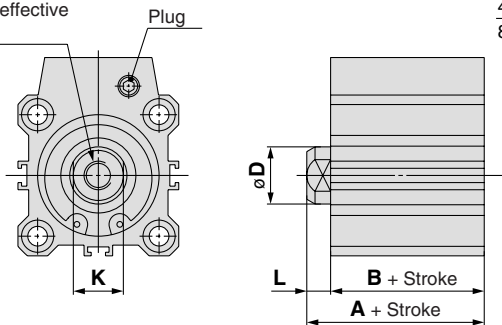
Basic

(mm)

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

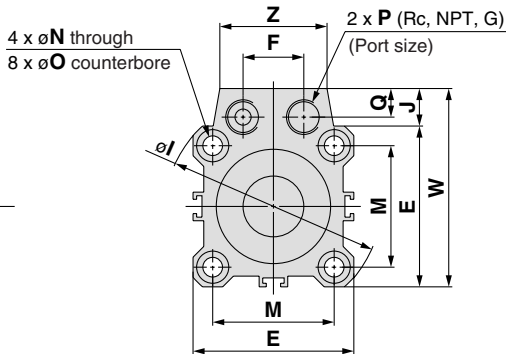
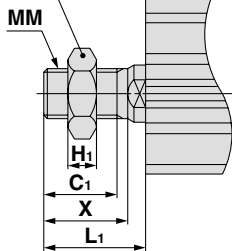
ø32 to ø100

H thread effective depth C



Rod end male thread

Width across flats 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

Basic

(mm)

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	13	16	52	17	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	62	30
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	15	20	64	22	M10 x 1.5	86	13	17	8	50	6.6	11 depth 8	1/4	10	77	39
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	15	20	77	22	M10 x 1.5	103	13	17	8	60	9	14 depth 10.5	1/4	10	90	39
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	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
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	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
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	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

Note) External dimensions with rubber bumper are the same as Basic, as shown above.

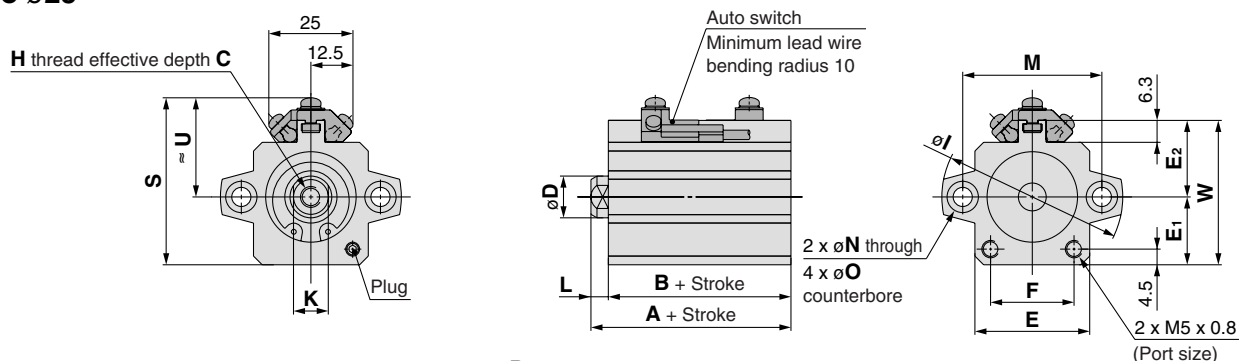
* For details about the rod end nut and accessory brackets, refer to page 19.

Series CQP2

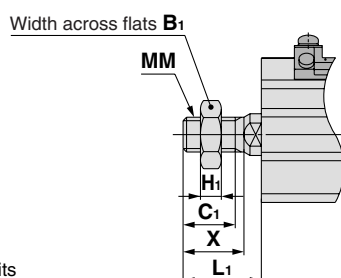
Dimensions

ø12 to ø100/With Auto Switch

ø12 to ø25



Rod end male thread



Rod End Male Thread

(mm)

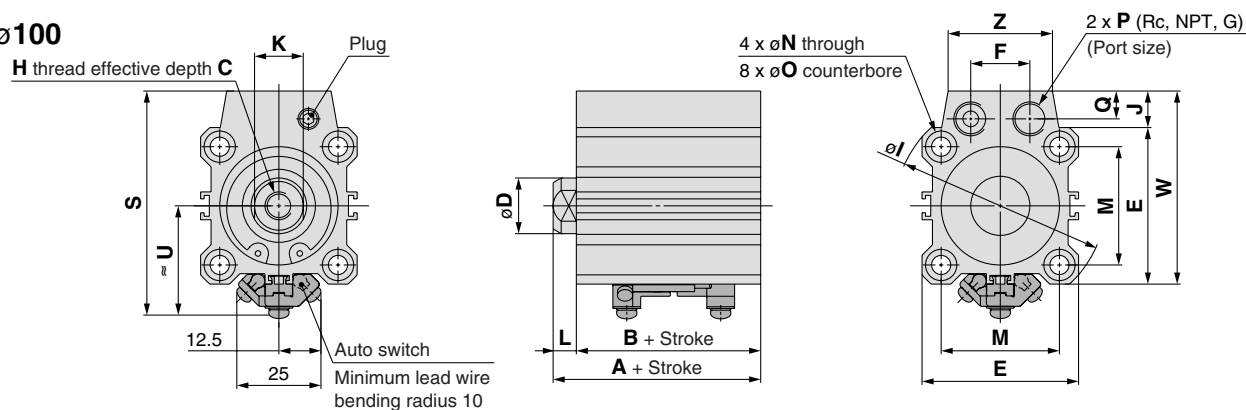
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
12	8	9	4	14	M5 x 0.8	10.5
16	10	10	5	15.5	M6 x 1.0	12
20	13	12	5	18.5	M8 x 1.25	14
25	17	15	6	22.5	M10 x 1.25	17.5

Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

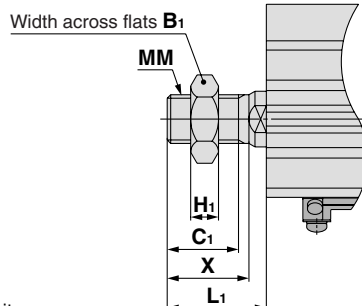
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E ₁	E ₂	F	H	I	K	L	M	N	O	S	U	W
12	5 to 30	31.5	28	6	6	23	13	14	14	M3 x 0.5	32	5	3.5	22	3.5	6.5 depth 3.5	33.5	20.5	27
16	5 to 30	34	30.5	8	8	26	15	17	17	M4 x 0.7	38	6	3.5	28	3.5	6.5 depth 3.5	38.5	23.5	32
20	5 to 50	36	31.5	7	10	30	17	19	21	M5 x 0.8	47	8	4.5	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) External dimensions with rubber bumper are the same as Basic, as shown above.

ø32 to ø100



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

Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

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) External dimensions with rubber bumper are the same as Basic, 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

With auto switch **CQP2B50** **-10T** **-** **M9BW**

With auto switch
(Built-in magnet)
CDQP2B50 **-10T** **-** **M9BW**

Mounting
B Through-hole

* Cylinder mounting bolts are not included.
Order them separately referring to
"Mounting Bolt for CQP2" on pages 118
and 121.

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	

Cylinder stroke (mm)
For "Standard Stroke", refer to page 117.

Auto switch

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

* Refer to the below table for the
applicable auto switch model.

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 page 117
for details.

Applicable Auto Switches/Refer to pages 180 to 188 of this series and 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 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	●	●	●	○	—	○	—								
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)			5 V, 12 V	M9NWV	M9NW	●	●	●	○	—	○		IC circuit					
				3-wire (PNP)			12 V	M9PWV	M9PW	●	●	●	○	—	○			—				
	Water resistant (2-color indication)			2-wire			5 V, 12 V	M9BWB	M9BW	●	●	●	○	—	○		IC circuit					
				3-wire (NPN)			5 V, 12 V	M9NAV	M9NA	○	○	●	○	—	○			IC circuit				
		3-wire (PNP)		12 V			M9PAV	M9PA	○	○	●	○	—	○	—							
		2-wire		12 V			M9BAV	M9BA	○	○	●	○	—	○	—							
	With diagnostic output (2-color indication)	4-wire		5 V, 12 V			—	F79F	●	—	●	○	—	○	IC circuit							
	Reed switch	_____		Grommet			Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—		●	—	—	—	IC circuit	Relay, PLC
												—	200 V	A72	A72H		●	—	●	—		
Connector			2-wire	12 V	100 V	A93V		A93				●	—	●	—	—	—	IC circuit				
				5 V, 12 V	100 V or less	A90V		A90				●	—	●	—	—	—					
Diagnostic indication (2-color indication)		Grommet		12 V	—	A73C		—				●	—	●	●	●	—	IC circuit				
				5 V, 12 V	24 V or less	A80C		—				●	—	●	●	●	—		IC circuit			
			—	—	A79W	—		●				—	●	—	—	—	—					

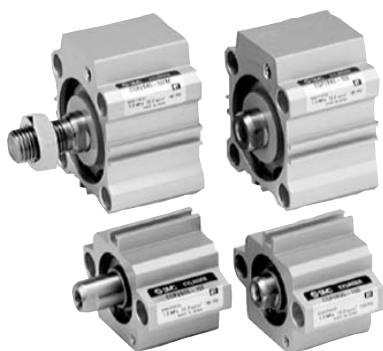
* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWZ
None N (Example) J79CN

* 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 131.

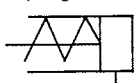
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Series CQP2

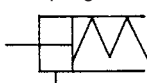


JIS Symbol

Single acting,
Spring return



Single acting,
Spring extend



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XA□	Change of rod end shape
—XC6	Piston rod and rod end nut made of stainless steel
—XC36	With boss on rod end
—X271	Fluororubber seals



Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and “Handling
Precautions for SMC Products” (M-
E03-3) for Actuators and Auto
Switches Precautions.

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 installation.

Mounting

- 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 Stroke

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

Manufacture of Intermediate Stroke

(Except single acting, spring return)

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to “How to Order” for the standard model no. on page 116.	
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with 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. 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	Screw-in type	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	Rc 1/8	Rc 1/8	Rc 1/4
							NPT 1/8	NPT 1/8	NPT 1/4
							G 1/8	G 1/8	G 1/4
Rod end male thread		●	●	●	●	●	●	●	

Refer to pages 127 to 130 for the specifications of cylinders with auto switches.

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

Theoretical Output

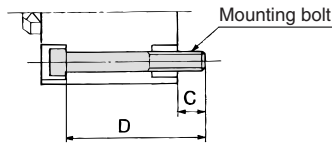
Action	Bore size (mm)	Operating pressure (MPa)		
		0.3	0.5	0.7
Spring return	12	21	44	66
	16	45	86	126
	20	79	142	205
	25	126	224	323
	32	211	372	533
	40	338	589	841
	50	535	928	1316
Spring extend	12	14	31	48
	16	24	54	85
	20	71	118	165
	25	113	189	264
	32	181	302	422
	40	317	528	739
	50	495	825	1150

Mounting Bolt for CQP2/Without Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CQP2B is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

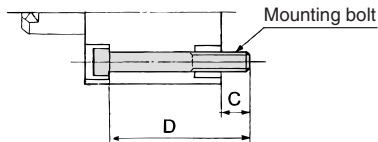
Example) Bolt M3 x 25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Spring Return

Cylinder model	C	D	Mounting bolt size
CQP2B12-5S	6.5	25	M3 x 25L
-10S		30	x 30L
CQP2B16-5S	5	25	M3 x 25L
-10S		30	x 30L
CQP2B20-5S	7.5	25	M5 x 25L
-10S		30	x 30L
CQP2B25-5S	9.5	30	M5 x 30L
-10S		35	x 35L
CQP2B32-5S	9	30	M5 x 30L
-10S		35	x 35L
CQP2B40-5S	7.5	35	M5 x 35L
-10S		40	x 40L
CQP2B50-10S	12.5	45	M6 x 45L
-20S		55	x 55L



Spring Extend

Cylinder model	C	D	Mounting bolt size
CQP2B12-5T	6.5	25	M3 x 25L
-10T		30	x 30L
CQP2B16-5T	5	25	M3 x 25L
-10T		30	x 30L
CQP2B20-5T	7.5	25	M5 x 25L
-10T		30	x 30L
CQP2B25-5T	9.5	30	M5 x 30L
-10T		35	x 35L
CQP2B32-5T	9	30	M5 x 30L
-10T		35	x 35L
CQP2B40-5T	7.5	35	M5 x 35L
-10T		40	x 40L
CQP2B50-10T	12.5	45	M6 x 45L
-20T		55	x 55L

Mass

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

Additional Mass

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**

- Cylinder mass: CQP2B32-10S 173 g
 - Option mass: Rod end male thread 43 g
- 216 g

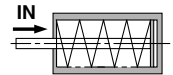
Spring Force

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

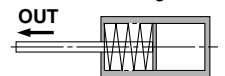
Single acting, Spring return

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

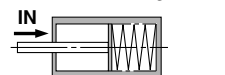
Single acting, Spring extend

Spring state with first mounting load



When spring is set in cylinder

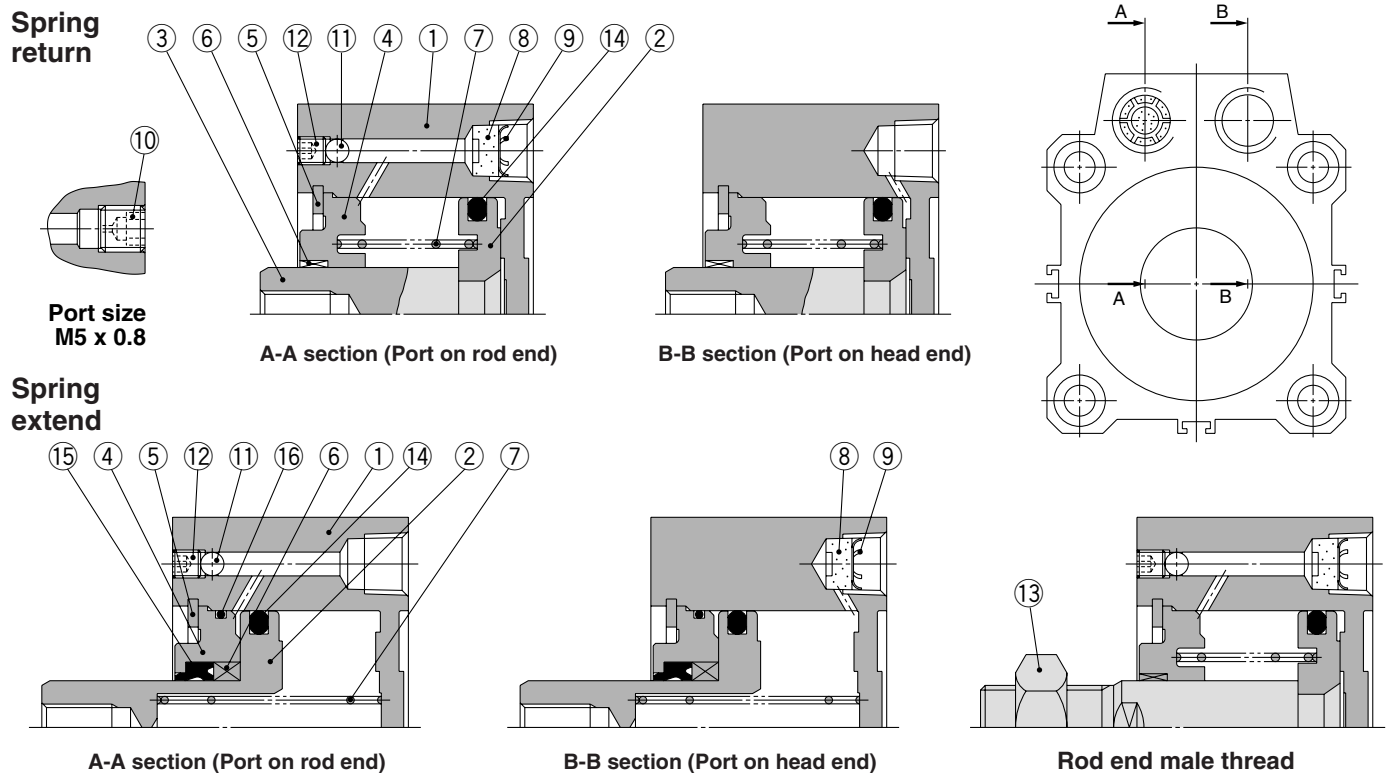
Spring state with second mounting load



When spring is compressed with air

Series CQP2

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 Rc 1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5 x 0.8
11	Steel balls	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
Note	A set includes 14.	Kits include items 14, 15 and 16 from the table above.
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)

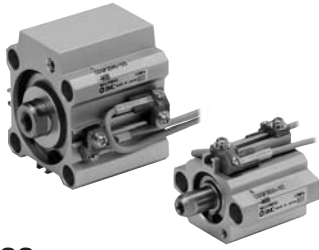
20 — CQP2B Bore size — Stroke $\frac{S}{T}(M)$
 Copper and fluorine-free series ø12, ø16, ø20, ø25, ø32, ø40, ø50

To prevent 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						
Maximum operating pressure	1.0 MPa						
Rubber bumper	None						
Piping	Screw-in piping						
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 page below for further information on auto switches.

Auto switch specifications	P.180 to 188, P. 1263 to 1371 in Best Pneumatics No. 2
Auto switch proper mounting position and height	P.127 to 130
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass

Mass (g)		Cylinder stroke (mm)			
Action	Bore size (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 Mass

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

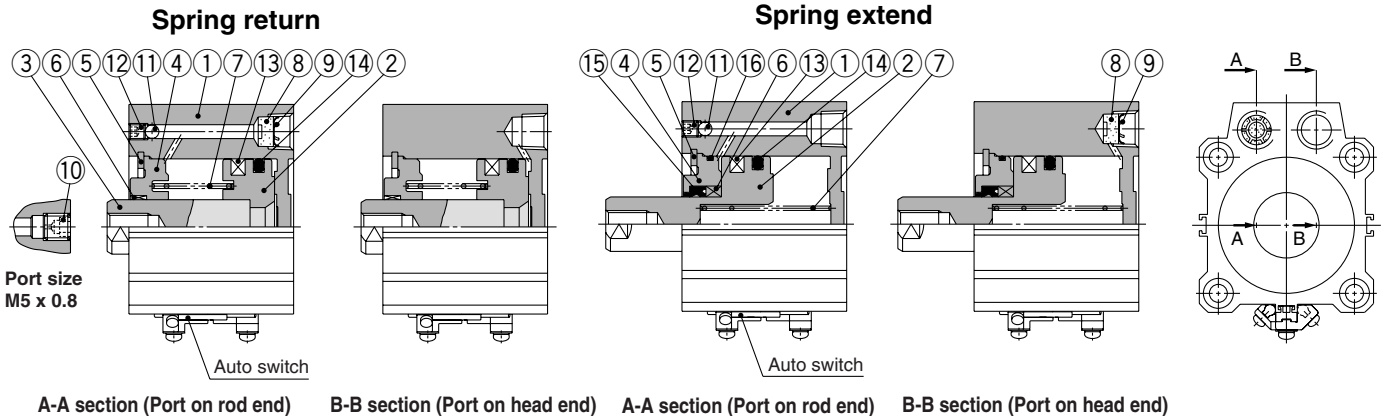
Calculation: (Example) **CDQP2B32-10SM**

- Cylinder mass: CDQP2B32-10S.....242 g
- Option mass: Rod end male thread..... 43 g

285 g

Add each mass 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 Rc 1/8, 1/4
9	Retaining ring	Carbon tool steel	
10	Plug with fixed orifice	Alloy steel	Port size M5 x 0.8
11	Steel balls	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
Note	A set includes 14.	Kits include items 14, 15 and 16 from the table above
How to Order	* Seal kit includes 14. Order the seal kit, based on each bore size.	* Seal kit includes 14, 15, 16. Order the seal kit, based on each bore size.

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

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

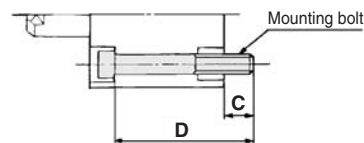
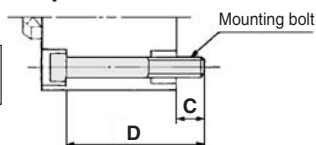
Series CQP2

Mounting Bolt for CDQP2/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQP2B is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Spring Return

Cylinder model	C	D	Mounting bolt size
CDQP2B12-5S	5.5	35	M3 x 35L
-10S		40	x 40L
CDQP2B16-5S	8	40	M3 x 40L
-10S		45	x 45L
CDQP2B20-5S	10.5	40	M5 x 40L
-10S		45	x 45L
CDQP2B25-5S	9.5	40	M5 x 40L
-10S		45	x 45L
CDQP2B32-5S	9	40	M5 x 40L
-10S		45	x 45L
CDQP2B40-5S	7.5	45	M5 x 45L
-10S		50	x 50L
CDQP2B50-10S	12.5	55	M6 x 55L
-20S		60	x 60L

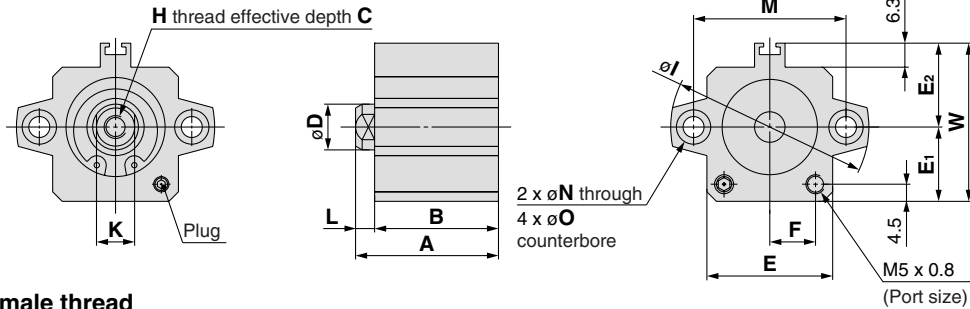
Spring Extend

Cylinder model	C	D	Mounting bolt size
CDQP2B12-5T	6.1	40	M3 x 40L
-10T		45	x 45L
CDQP2B16-5T	8	40	M3 x 40L
-10T		45	x 45L
CDQP2B20-5T	10.5	40	M5 x 40L
-10T		45	x 45L
CDQP2B25-5T	9.5	40	M5 x 40L
-10T		45	x 45L
CDQP2B32-5T	9	40	M5 x 40L
-10T		45	x 45L
CDQP2B40-5T	7.5	45	M5 x 45L
-10T		50	x 50L
CDQP2B50-10T	12.5	55	M6 x 55L
-20T		65	x 65L

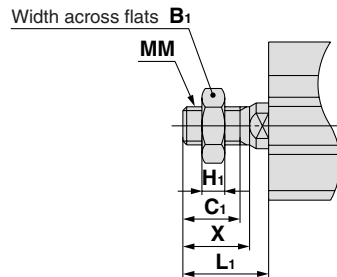
Dimensions

ø12 to ø50/Spring Return Without Auto Switch

ø12 to ø25



Rod end male thread



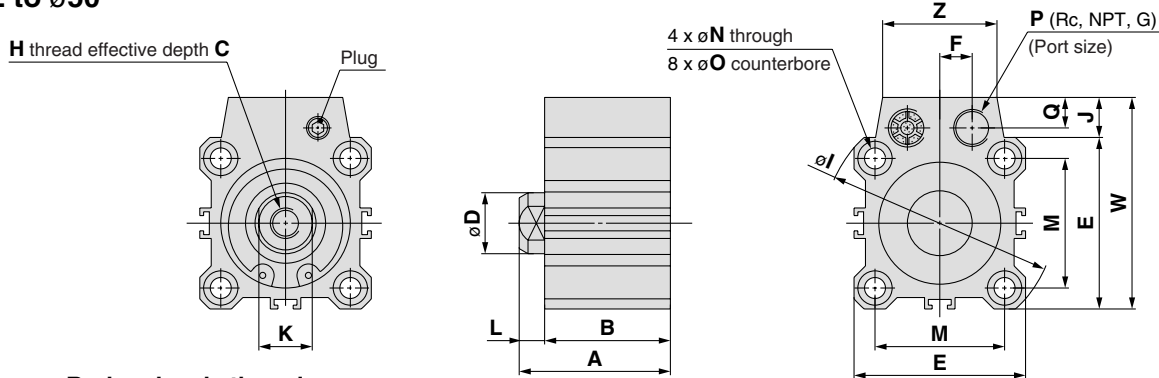
Rod End Male Thread (mm)

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

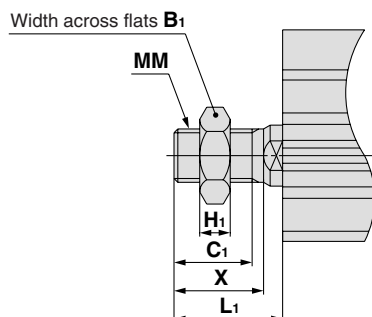
Basic

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														
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

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

Basic

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

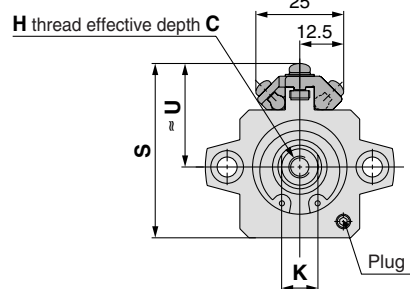
* For details about the rod end nut and accessory brackets, refer to page 19.

Series CQP2

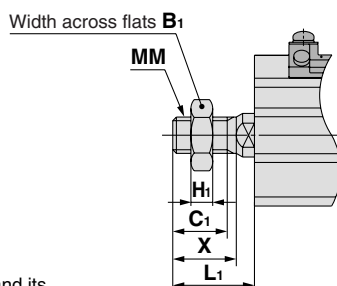
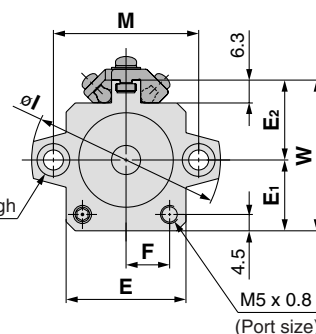
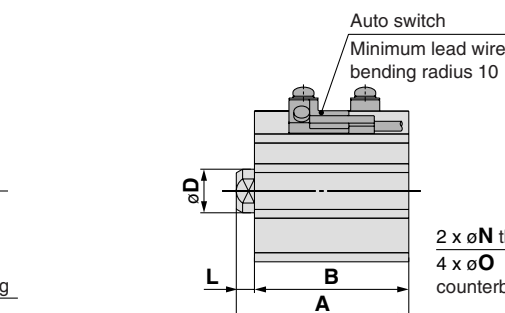
Dimensions

ø12 to ø50/Spring Return With Auto Switch

ø12 to ø25



Rod end male thread



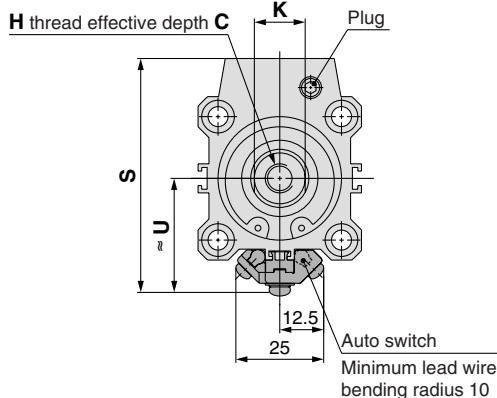
Rod End Male Thread (mm)

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

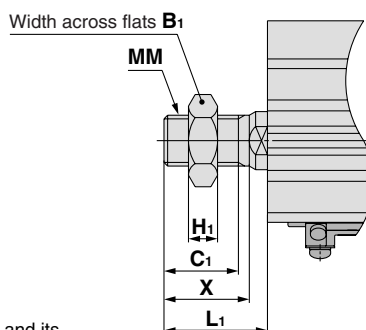
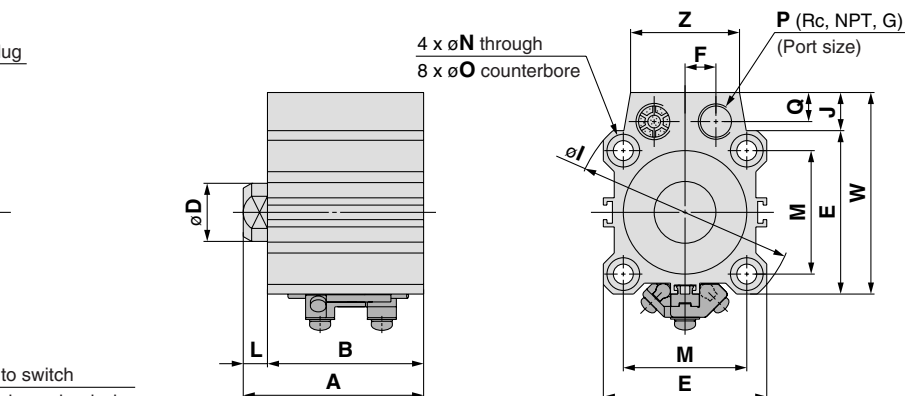
Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

Bore size (mm)	A		B		C	D	E	E ₁	E ₂	F	H	I	K	L	M	N	O	S	U	W
12	5st	10st	5st	10st	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

Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

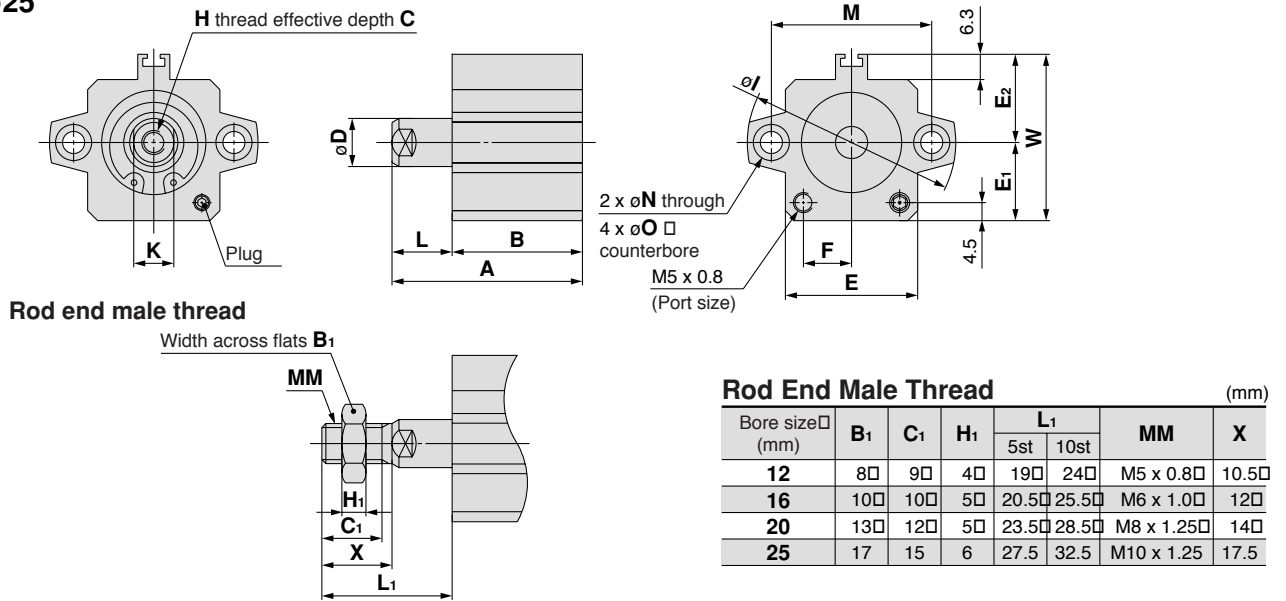
Bore size (mm)	A			B			C	D	E	F	H	I	J	K	L	M	N	O	P	Q	S	U	W	Z
32	5st	10st	20st	5st	10st	20st	13	16	45	8.5	M8 x 1.25	60	10.5	14	7	34	5.5	9 depth 7	1/8	8	65.5	32.5	55.5	30
40	51.5	56.5	—	44.5	49.5	—	13	16	52	8.5	M8 x 1.25	69	10	14	7	40	5.5	9 depth 7	1/8	8	72	36	62	30
50	—	58.5	68.5	—	50.5	60.5	15	20	64	11	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

ø12 to ø50/Spring Extend Without Auto Switch

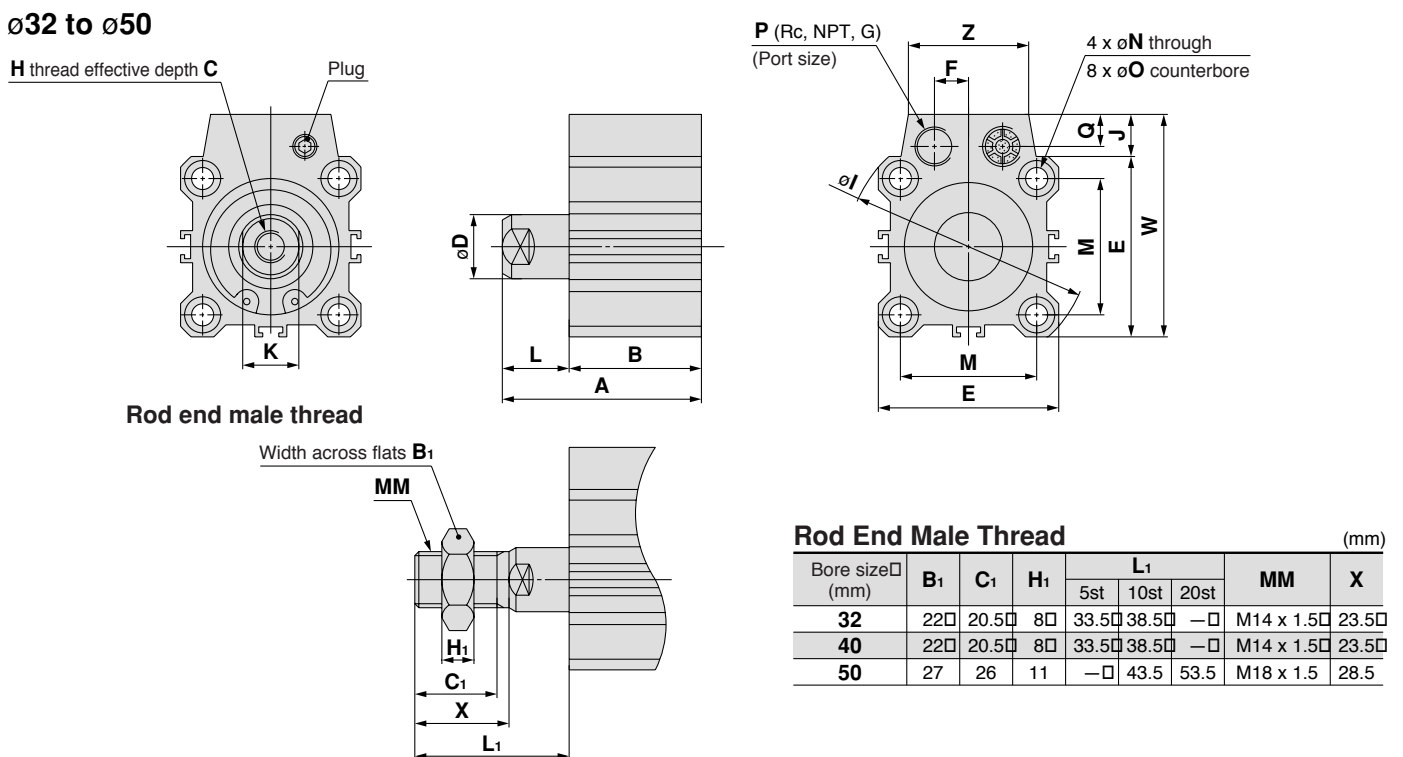
ø12 to ø25



Basic

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										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

ø32 to ø50



Basic

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

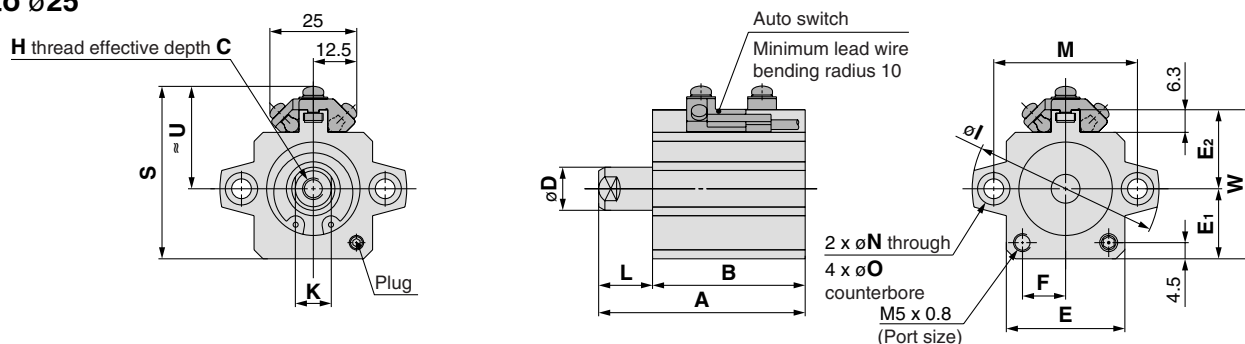
* For details about the rod end nut and accessory brackets, refer to page 19.

Series CQP2

Dimensions

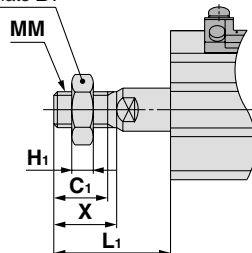
ø12 to ø50/Spring Extend With Auto Switch

ø12 to ø25



Rod end male thread

Width across flats B_1



Rod End Male Thread

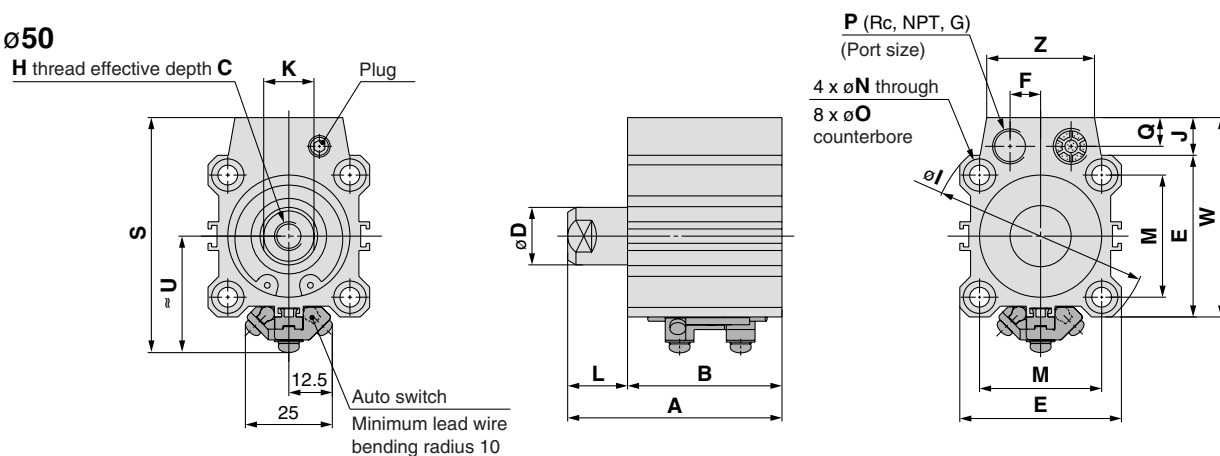
(mm)

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

Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

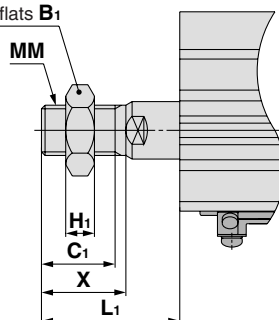
Bore size (mm)	A		B		C	D	E	E_1	E_2	F	H	I	K	L			M	N	O	S	U	W
	5st	10st	5st	10st										5st	10st							
12	45.9	55.9	37.4	42.4	6	6	23	13	14	7	M3 x 0.5	32	5	8.5	13.5		22	3.5	6.5 depth 3.5	33.5	20.5	27
16	44	54	35.5	40.5	8	8	26	15	17	8.5	M4 x 0.7	38	6	8.5	13.5		28	3.5	6.5 depth 3.5	38.5	23.5	32
20	46	56	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 flats B_1



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

Basic For auto switch mounting position and its mounting height, refer to pages 127 to 130.

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
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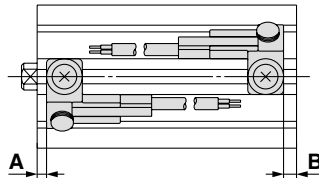
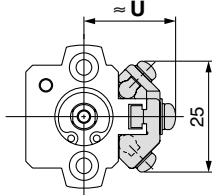
Compact Cylinder/*Series CQ2* With Auto Switch 1

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

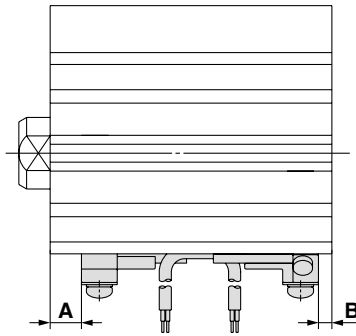
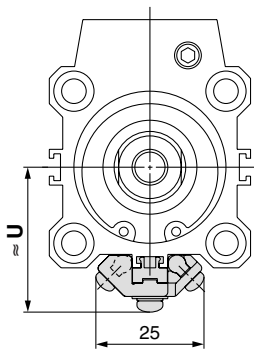
Applicable Cylinder Series: CDQP2, CDQP2□□□□□S/□T (Axial piping)

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



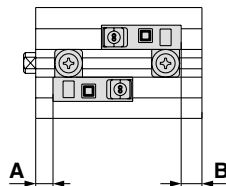
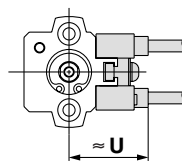
ø32 to ø100



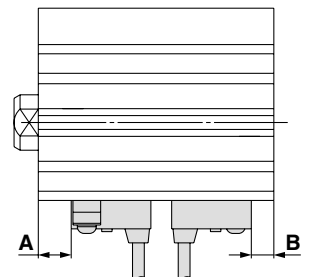
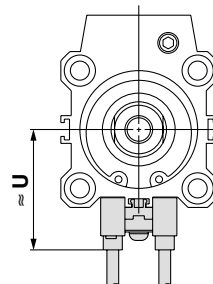
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F

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

ø12 to ø25

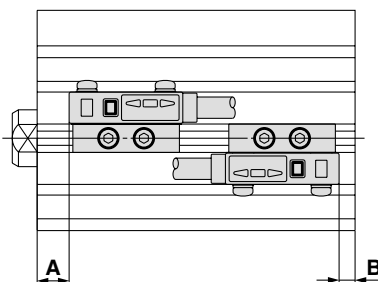
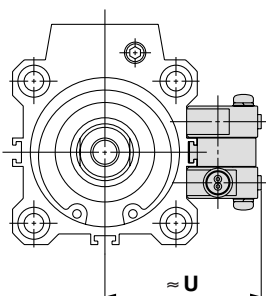


ø32 to ø100



D-P4DWL

ø40 to ø100



Auto Switch Proper Mounting Position

Applicable Cylinder Series: CDQP2 (Axial piping)

(mm)

Auto switch model Bore size	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 Bore size	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 Bore size	D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A7□ D-A80		D-A7□H D-A80H D-F7□ D-J79 D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL		D-A73C D-A80C		D-F7□V D-F7□WV D-F7BAVL		D-J79C		D-A79W		D-P4DWL	
	U	U	U	U	U	U	U	U	U	U	U	U	U	U	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	—	—	—	—	—	—	—	—

Compact Cylinder/*Series CQ2* With Auto Switch 2

2 Minimum Stroke for Auto Switch Mounting

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

(mm)

Number of auto switch mounted	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
1 pc.	5	5	10	10	15	15	20	15
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

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion).
It may vary substantially depending on an ambient environment.

4 Auto Switch Mounting Bracket/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 surface
	Auto switch mounting rail side only	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 bracket are used as a set. 	①BQ-2 ②BQ2-012 Two kinds of auto switch bracket 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 ø40 to ø100 of D-P4DWL type are 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.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order BQ-2 separately, since auto switch spacers (for BQ-2) are not included.)

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

The above stainless steel screws are used when a cylinder is shipped with D-F7BAL, F7BAVL-type 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 the details of BBA2.

Note 5) When D-M9□A(V)L is mounted, order auto switch mounting brackets BQ2-012S, BQ-2 or the stainless steel screw set BBA2 separately.

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Applicable bore size	Mass (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

Compact Cylinder/*series CQ2* With Auto Switch 3

Besides the models listed in How to Order, the following auto switches are applicable.

Refer to Best Pneumatics No. 2 for details.

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

Auto switch type	Part no.	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	Grommet (In-line)	Water resistant (2-color indication)	
	D-F79, F7P, J79		—	
	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)	ø40 to ø100

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to Best Pneumatics No. 2 for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to Best Pneumatics No. 2 for details.

* When using a magnetic field resistant solid state auto switch D-P3DW□ type, please contact SMC separately. (Applicable bore size: ø32 to ø100)

Compact Cylinder: Anti-lateral Load

Series CQ2

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

With auto switch CQ2 B S 32 - 30 D C Z - M9BW -

Mounting

B	Through-hole (Standard)
A	Both ends tapped
L	Foot
F	Rod end flange
G	Head end 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 CQ2BS" on pages 137 and 138.

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)

For "Standard Stroke", refer to page 133.

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 sides
---	---------

Auto switch

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

* Refer to the below table for the applicable auto switch model.

Number of auto switches

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

Made to Order
Refer to page 133 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2LS40-30DCZ

Applicable Auto Switches/Refer to pages 180 to 188 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 switch	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
Reed switch	Water resistant (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	M9BV	M9B	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
Reed switch	Magnetic field resistant (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	M9NAV	M9NA	○	○	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
Reed switch	Magnetic field resistant (2-color indication)	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	M9PAV	M9PA	○	○	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
Reed switch	Magnetic field resistant (2-color indication)	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	M9BAV	M9BA	○	○	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
Reed switch	Magnetic field resistant (2-color indication)	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	M9P3V	M9P3	○	○	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												
				3-wire (PNP)												
				2-wire												
				3-wire (NPN)												

* 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 "O" are produced upon receipt of order.

* There are other applicable auto switches other than the listed above. For details, refer to page 179.

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

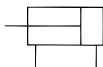
* Refer to page 187 for the D-P3DW type.

Series CQ2



JIS Symbol

Double acting,
Single rod



Made to Order

(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XB10	Intermediate stroke (Using exclusive body)
—XC6	Piston rod and rod end nut made of stainless steel
—XC26	With a split pin for double clevis pin and double knuckle pin and a flat washer
—XC27	Double clevis pins and double knuckle pins made of stainless steel 304
—X271	Fluororubber seals

⚠ Precautions

Be sure to read before handling.
Refer to back pages 1 and 2 for
Safety Instructions and “Handling
Precautions for SMC Products” (M-
E03-3) for Actuators and Auto
Switches Precautions.

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 dose not include the amount of dumper change.

Standard Stroke

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 Stroke

Description	Spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to “How to Order” for the standard model no. on page 132.	Suffix “-XB10” to the end of standard model no. on page 132.
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.
Stroke range	Bore size	Bore size
	Stroke range	Stroke range
	32 to 100	1 to 99
	32, 40	6 to 99
	50 to 100	11 to 99
Example	Part no.: CQ2BS50-57DCZ CQ2BS50-75DCZ with 18 mm width spacer inside. B dimension is 125.5 mm.	Part no.: CQ2BS50-57DCZ-XB10 Makes 57 stroke tube. B dimension is 107.5 mm.

• In the case of an exclusive body 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	Screw-in type	Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
			NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
			G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
	Rod end male thread		●	●	●	●	●	●
	With rubber bumper (Standard)		●	●	●	●	●	●
	With boss on head end		●	●	●	●	●	●

Refer to pages 173 to 178 for the specifications of cylinders with auto switches.

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

Copper and Fluorine-free Series (For CRT manufacturing process)

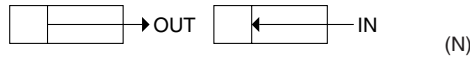
20-CQ2BS Bore size - Stroke DC(M)Z
 Copper and fluorine-free series
 ø32, ø40, ø50, ø63
 ø80, ø100

To prevent 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 equipment)					
Piping	Screw-in piping					
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

Mass

Mass

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 Mass

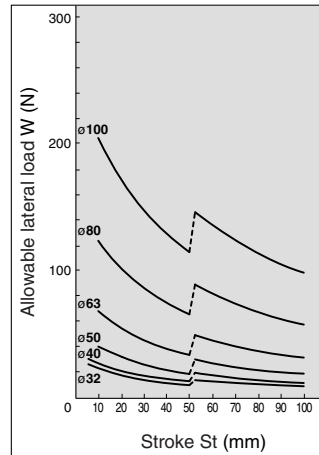
Bore size (mm)		32	40	50	63	80	100
Both ends tapped		6	6	6	19	45	45
Rod end male thread	Male thread	26	27	53	53	120	175
	Nut	17	17	32	32	49	116
Foot (Including mounting bolt)		142	154	243	320	690	1057
Rod end flange (Including mounting bolt)		180	214	373	559	1056	1365
Head end flange (Including mounting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

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

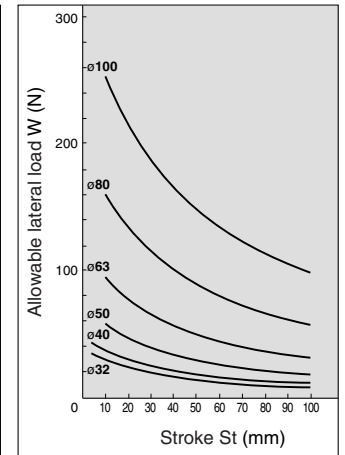
- Cylinder mass: CQ2BS32-20DCZ 193 g
- Option mass: Both ends tapped 6 g
- Rod end male thread 43 g
- Double clevis 151 g
- 393 g

Allowable 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

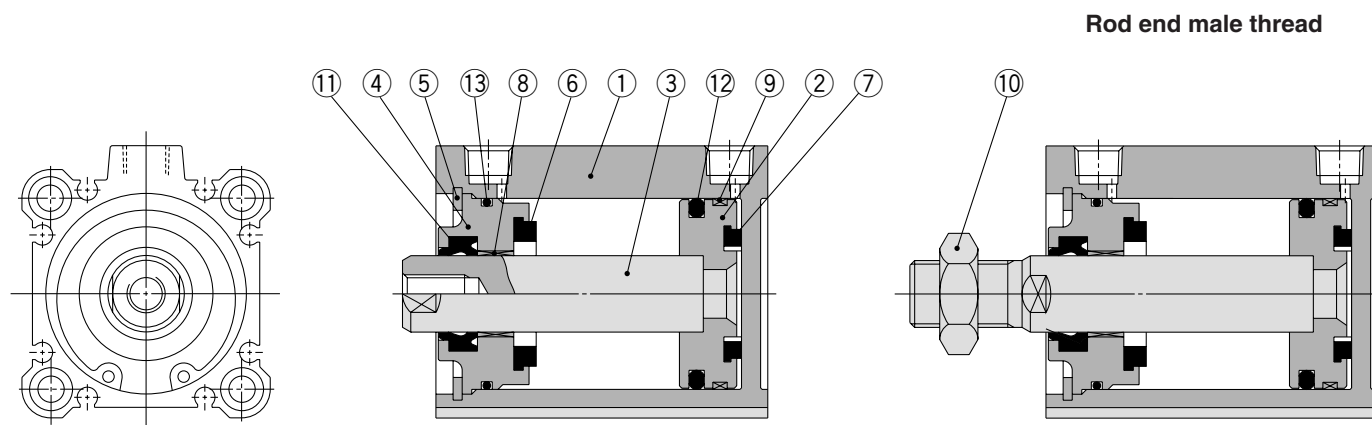
With Auto Switch

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	Set of nos. at left ⑪, ⑫, ⑬
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)

Mounting Bracket/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) Order two foot brackets per cylinder.

Note 2) Parts belonging to each bracket are as follows. Foot or Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

Compact Cylinder: Anti-lateral Load

Series CDQ2

With Auto Switch



Refer to page below for further information on auto switches.

Auto switch specifications	P.180 to 188
Auto switch proper mounting position and height	P.173 to 178
Minimum stroke for auto switch mounting	
Operating range	
Auto switch mounting bracket/Part no.	

Mass

Mass

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

(g)

Additional Mass

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 bolt)	142	154	243	320	690	1057
Rod end flange (Including mounting bolt)	180	214	373	559	1056	1365
Head end flange (Including mounting bolt)	165	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)	151	196	393	554	1109	1887

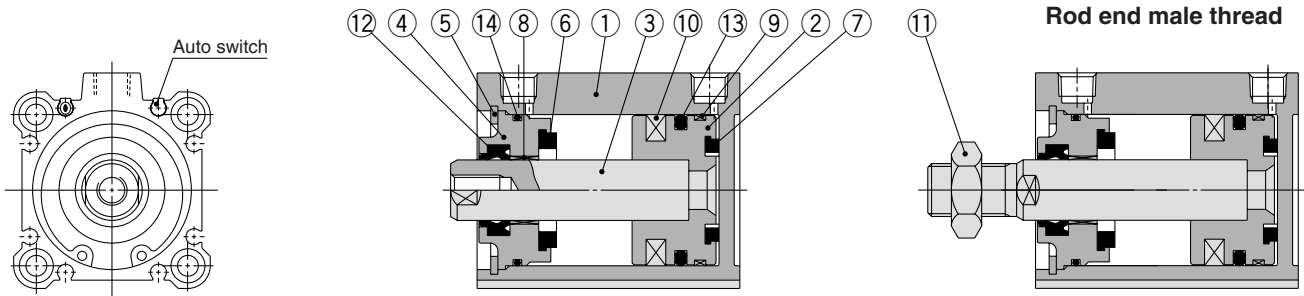
(g)

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

- Cylinder mass: CDQ2BS32-20DCZ 250 g
 - Option mass: Both ends tapped 6 g
 - Rod end male thread 43 g
 - Double clevis 151 g
- 450 g

Add each mass 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 end nut	Carbon steel	
12	Rod seal	NBR	
13	Piston seal	NBR	
14	Tube gasket	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
32	CQ2B32-PS	Set of nos. at left ⑫, ⑬, ⑭
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	
80	CQ2B80-PS	
100	CQ2B100-PS	

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

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

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

Series CQ2

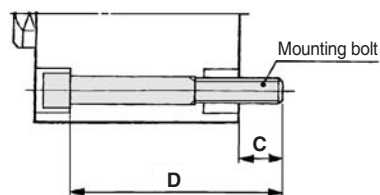
Mounting Bolt

Mounting method: Mounting bolt for through-hole mounting of the CQ2BS is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 25L 2 pcs.

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Mounting Bolt for CQ2BS/Without Auto Switch

Cylinder model	C	D	Mounting bolt size
CQ2BS32-5DCZ	9	40	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	M5 x 45L
-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	M6 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		130	x 130L
-100DCZ		155	x 155L

Cylinder model	C	D	Mounting bolt size
CQ2BS63-10DCZ	14.5	60	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	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	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

Cylinder model	C	D	Mounting bolt size
CDQ2BS32-5DCZ	9	50	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	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	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 size
CDQ2BS63-10DCZ	14.5	70	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	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	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

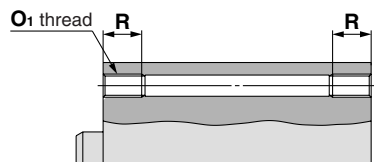
ø32 to ø50

(In the case of auto switches, A and B dimensions will be only changed. Refer to the dimension chart.)

Basic (Through-hole): CQ2BS/CDQ2BS

Both ends tapped: CQ2AS/CDQ2AS

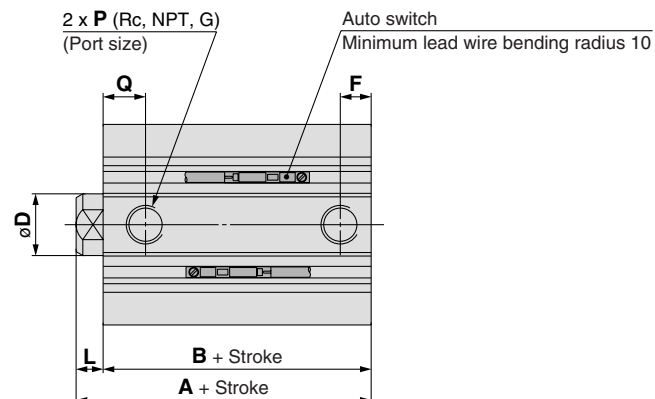
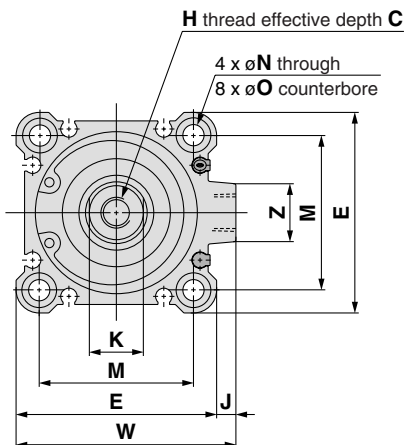
CDQ2AS



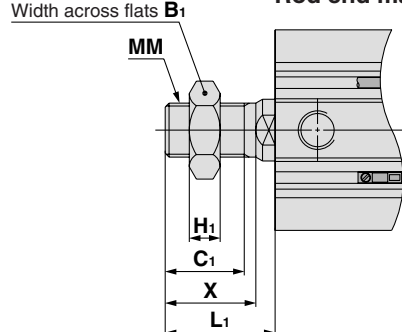
Both Ends Tapped

(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



Rod end male thread



Dimensions of with boss on head end are equivalent to the CQ2 series, double acting, single rod. Refer to page 15.

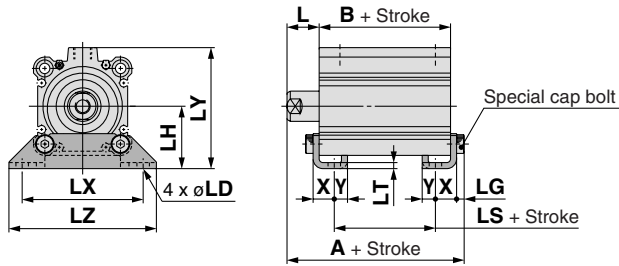
Rod End Male Thread

(mm)

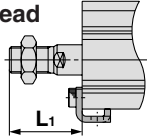
Bore size (mm)	B ₁	C ₁	H ₁	L ₁	MM	X
32	22	20.5	8	28.5	M14 x 1.5	23.5
40	22	20.5	8	28.5	M14 x 1.5	23.5
50	27	26	11	33.5	M18 x 1.5	28.5

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																	

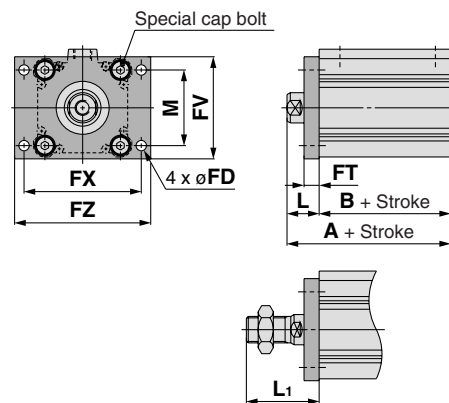
Foot: CQ2LS/CDQ2LS



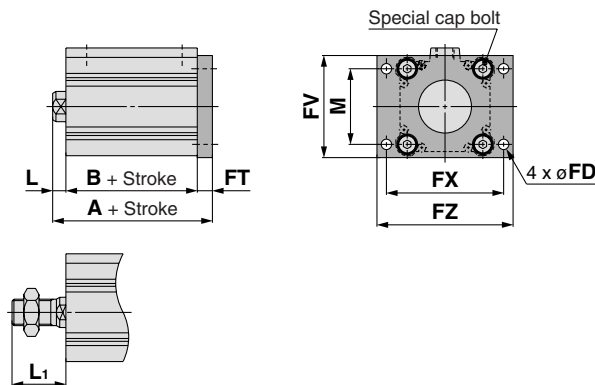
Rod end male thread



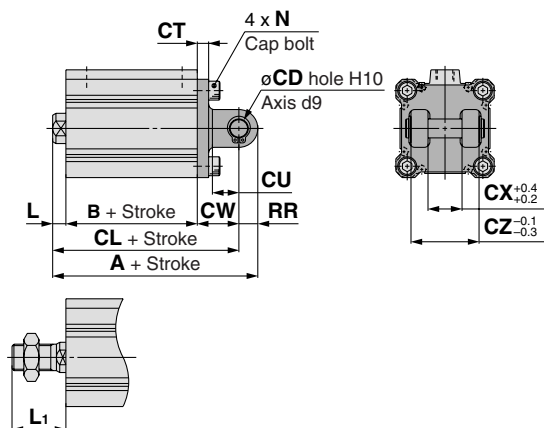
Rod end flange: CQ2FS/CDQ2FS



Head end flange: CQ2GS/CDQ2GS



Double clevis: CQ2DS/CDQ2DS



Foot

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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod End 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							

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head End Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		(mm)	
		A	A	A	A	L	L ₁
32	5 to 50	48	58	58	7	28.5	
	75, 100	58					
40	5 to 50	54.5	64.5	64.5	7	28.5	
	75, 100	64.5					
50	10 to 50	57.5	67.5	67.5	8	33.5	
	75, 100	67.5					

(* Dimensions except A, L and L₁ are the same as rod end flange.) Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			(mm)		
		A	B	CL	A	B	CL	CD	CT	CU
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						

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 pins and retaining rings are included.

Series CQ2

Dimensions

ø63 to ø100

(In the case of auto switches, A and B dimensions will be only changed. Refer to the dimension chart.)

Basic (Through-hole): CQ2BS/CDQ2BS

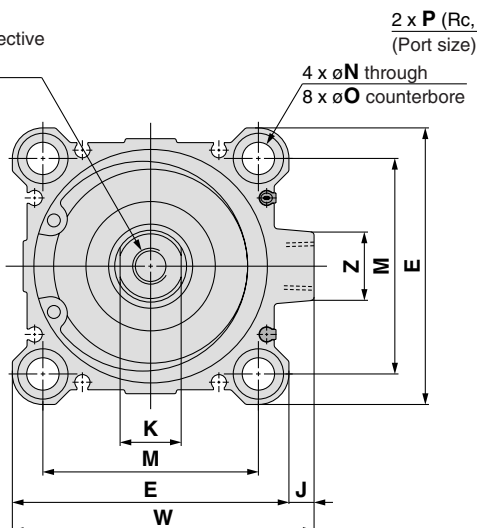
Dimensions of with boss on head end are equivalent to the CQ2 series, double acting, single rod. Refer to page 17.

Both ends tapped: CQ2AS/CDQ2AS

Both Ends Tapped

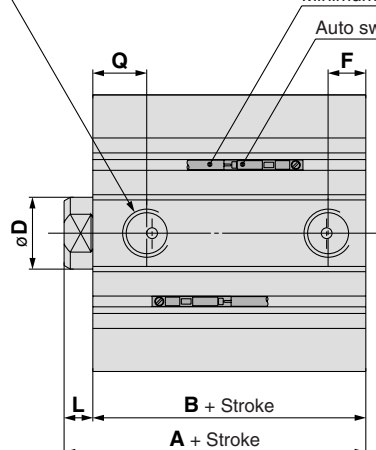
Bore size (mm)	O ₁	R
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22

H thread effective depth C

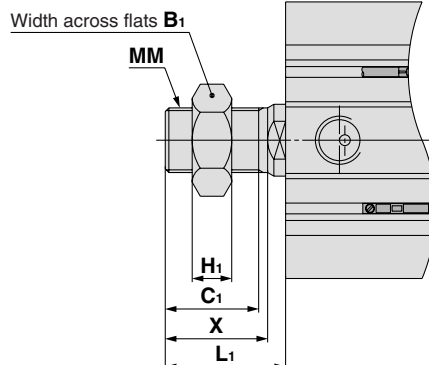


2 x P (Rc, NPT, G)
(Port size)

Minimum lead wire bending radius 10



Rod end male thread



Rod End Male Thread

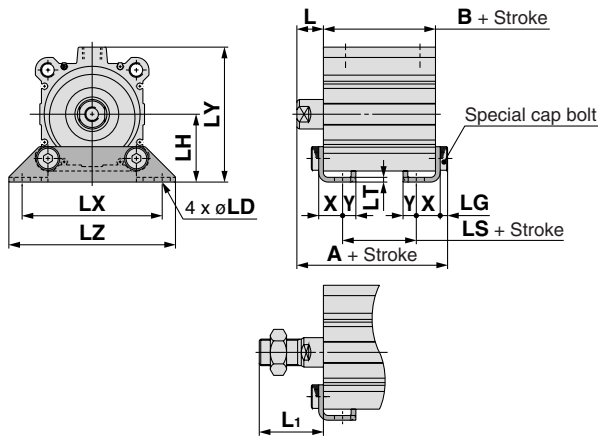
(mm)

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

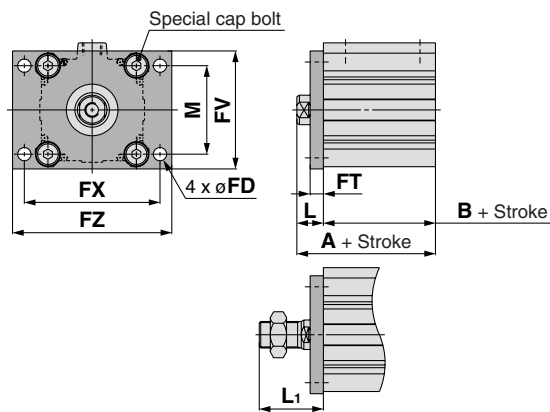
(mm)

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	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																	

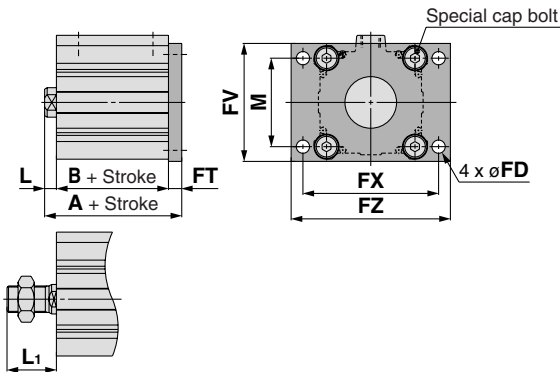
Foot: CQ2LS/CDQ2LS



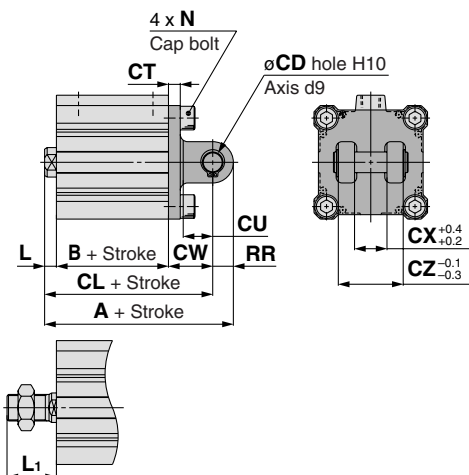
Rod end flange: CQ2FS/CDQ2FS



Head end flange: CQ2GS/CDQ2GS



Double clevis: CQ2DS/CDQ2DS



Foot

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

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod End Flange

Bore size (mm)	Stroke range (mm)	Without auto switch		With auto switch		(mm)				
		A	B	A	B	FD	FT	FV	FX	FZ
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							

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head End Flange

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

(* Dimensions except A, L and L₁ are the same as rod end flange.) Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis

Bore size (mm)	Stroke range (mm)	Without auto switch			With auto switch			(mm)		
		A	B	CL	A	B	CL	CD	CT	CU
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						

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 pins and retaining rings are included.

Compact Cylinder: With End Lock

Series C B Q 2

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

How to Order

With auto switch CDBQ2 B 40 - 30 D C - H N - M9BW -

With auto switch
(Built-in magnet)

Mounting

ø20, ø25 ø32 to ø100

B	Through-hole/Both ends tapped common (Standard)	B	Through-hole (Standard) Note 2)
L	Foot	A	Both ends tapped
F	Rod end flange	L	Foot
G	Head end flange	F	Rod end flange
D	Double clevis	G	Head end flange
		D	Double clevis

Note 1) Mounting brackets are shipped together (but not assembled).
Note 2) At the 75, and 100 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 <td>NPT <td>ø32 to ø100</td> </td>	NPT <td>ø32 to ø100</td>	ø32 to ø100
TF	G	

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 the applicable auto switch model.

Manual release type

N	Non-lock type
L	Lock type

Lock position

H	Head end lock
R	Rod end lock

Made to Order
Refer to page 145 for details.

Body option

C	With rubber bumper, Rod end female thread (Standard)
CM	With rubber bumper, Rod end male thread

Action

D	Double acting

Cylinder stroke (mm)

For "Standard Stroke" and "Manufacture of Intermediate of Stroke", refer to page 145.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDBQ2L32-30DC-RL

Applicable Auto Switches/Refer to pages 180 to 188 of this series and 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 to ø40 to ø100													
Solid state switch	_____	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV		M9N		●	●	●	○	—	○	IC circuit	Relay, PLC				
		3-wire (PNP)		M9PV				M9P		●	●	●	○	—	○								
		M9BV		M9B				●	●	●	○	—	○										
	Diagnostic indication (2-color indication)	Connector		2-wire				—	J79C	—	●	—	●	●	●	—	—	—		—	—	—	
		Grommet		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		○	○	●	○		—	○		
				2-wire							M9BAV		M9BA		○	○	●	○		—	○		
With diagnostic output (2-color indication)	Grommet	4-wire	5 V, 12 V	—	—	F79F	●	—	●	○	—	○	—	—	—	IC circuit							
Magnetic field resistant (2-color indication)		2-wire (Non-polar)	—	—	—	P4DW	—	—	●	●	—	○	—	—									
Reed switch	_____	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V		A96		●	—	●	—	—	—	—	—	IC circuit	Relay, PLC		
								—	200 V	—	A72	—	A72H	●	—	●	—	—	—			—	—
		Connector		2-wire		24 V	12 V	100 V	A93V		A93		●	—	●	—	—	—	—	—		—	
	5 V, 12 V						100 V or less	A90V		A90		●	—	●	—	—	—	—	—	—			
	12 V						—	A73C		—		●	—	●	●	●	—	—	—	—			
	5 V, 12 V						24 V or less	A80C		—		●	—	●	●	●	—	—	—	—			
	Diagnostic indication (2-color indication)	Grommet		Yes		—	—	A79W		—		●	—	●	—	—	—	—	—				

* 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.
* D-P4DWL type is available from ø40 up to ø100 only.
* Only for 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 159.
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.
* When D-A9□(V)/M9□(V)/M9□□(V)/M9□□(V) types with ø32 to ø50 are mounted on a side other than the port side, order auto switch mounting brackets separately. Refer to page 158 for details.

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 lock unit



Made to Order
(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XC26	With a split pin for double clevis pin and double knuckle pin and a flat washer

Refer to pages 155 to 158 for the specifications of cylinders with auto switches.

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

Standard Stroke

Bore size	Standard stroke (mm)
20 to 63	10, 15, 20, 25, 50, 75, 100
80, 100	25, 50, 75, 100

Manufacture of Intermediate Stroke

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 144.	
Description	Dealing with the stroke by the 5 mm interval is available by installing spacer with 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 Bracket/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

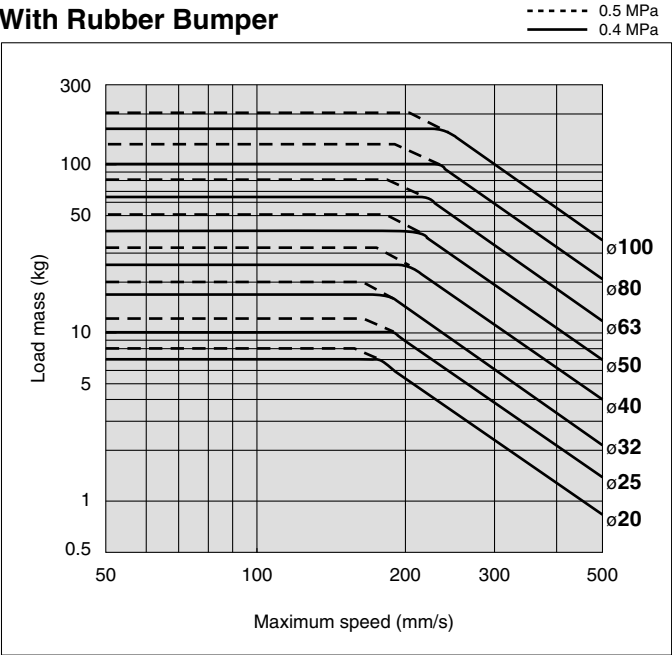
Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) Parts belonging to each bracket are as follows. Foot or Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

Note 3) Clevis pin and retaining ring are included with the double clevis style.

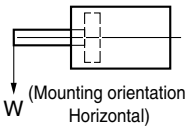
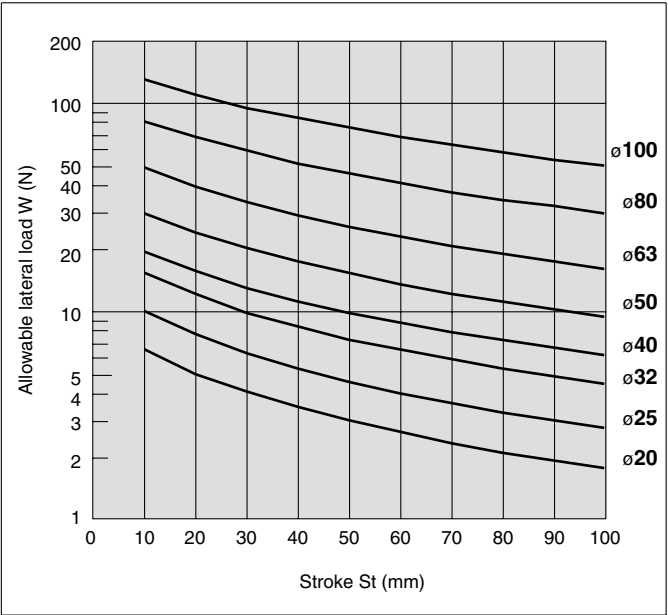
Allowable Kinetic Energy

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

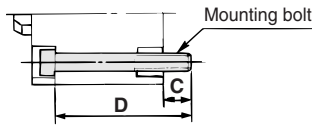
Made to Order

Series CBQ2

Mounting Bolt for CBQ2

Mounting method: Mounting bolt for through-hole mounting of the CBQ2 is available as an option.
Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M5 x 75L 4 pcs.



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 size
C□BQ2B20-10DC-H□	10	75	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	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	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	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 size
C□BQ2B50-10DC-H□	12.5	90	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	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	M10 x 135L
-50DC-H□	13	160	x 160L
C□BQ2B100-25DC-H□		145	M10 x 145L
-50DC-H□		170	x 170L

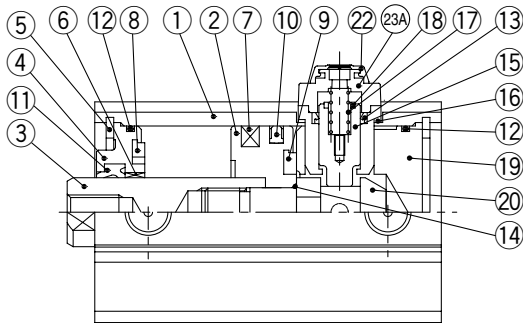
With Rod End Lock (R□)

Cylinder model	C	D	Mounting bolt size
C□BQ2B20-10DC-R□	6.5	65	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	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	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	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

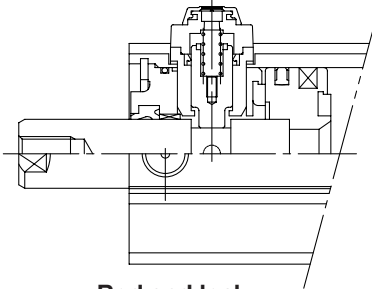
Cylinder model	C	D	Mounting bolt size
C□BQ2B50-10DC-R□	12.5	80	M6 x 80L
-15DC-R□		85	x 85L
-20DC-R□		90	x 90L
-25DC-R□		95	x 95L
-50DC-R□		120	x 120L
-75DC-R□		145	x 145L
-100DC-R□		170	x 170L
C□BQ2B63-10DC-R□	14.5	85	M8 x 85L
-15DC-R□		90	x 90L
-20DC-R□		95	x 95L
-25DC-R□		100	x 100L
-50DC-R□		125	x 125L
-75DC-R□		150	x 150L
-100DC-R□		175	x 175L
C□BQ2B80-25DC-R□	15	130	M10 x 130L
-50DC-R□	15.5	155	x 155L
C□BQ2B100-25DC-R□		140	M10 x 140L
-50DC-R□		165	x 165L

Construction

ø32 to ø63

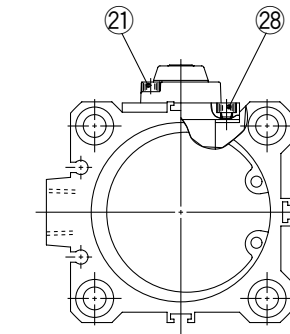
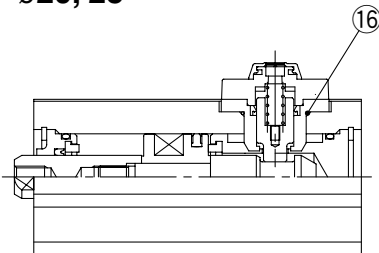


Head end lock

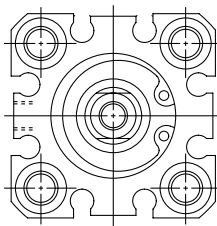


Rod end lock

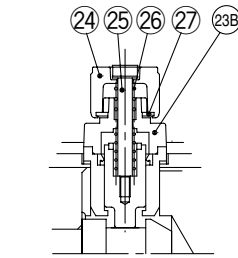
ø20, 25



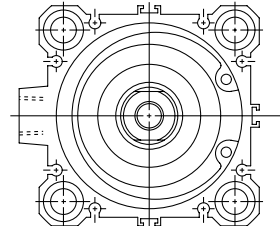
Cylinder tube form for ø32 to ø63



Cylinder tube form for ø25 or less

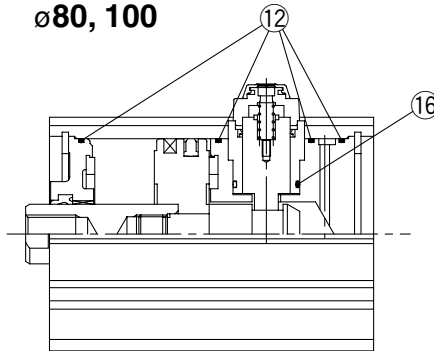


Manual release (Lock type): Suffix L



Cylinder tube form for ø80 or more

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 casting	ø50 or more, Painted after chromated
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Bushing	Copper alloy	R□ Used for all bore sizes H□ Used for ø40 and larger
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, 100
13	Lock piston seal	NBR	
14	Piston gasket	NBR	Nothing for ø20, 25
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
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 With End Lock

Bore size (mm)	Kit no.	Contents
20	CBQ2B20-PS	Set of nos. above ⑩, ⑪, ⑫, ⑬, ⑯, ⑰, ⑱, ⑳ and 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, ⑰, ⑱, ⑳. 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)

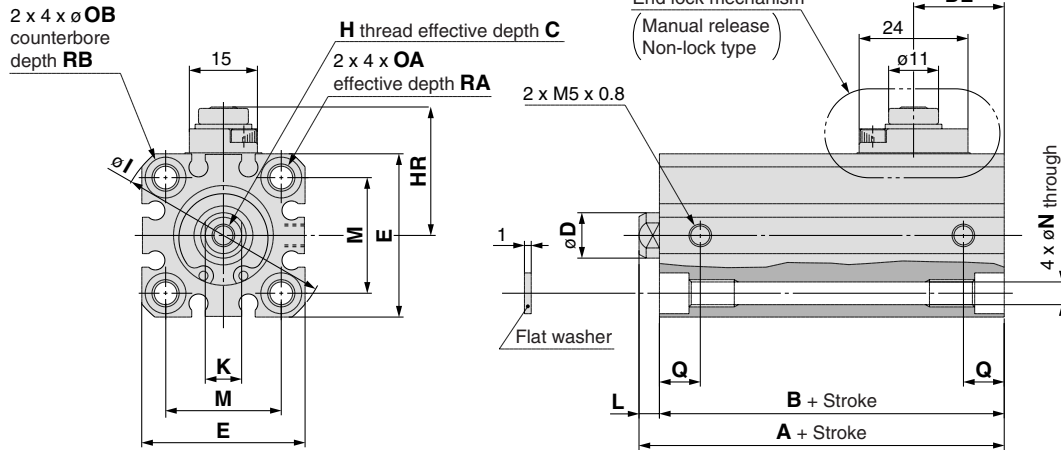
Series CBQ2

Dimensions

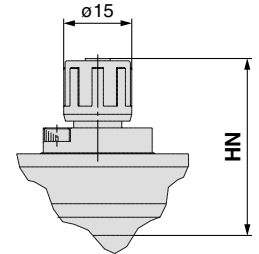
ø20, ø25

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

With head end lock



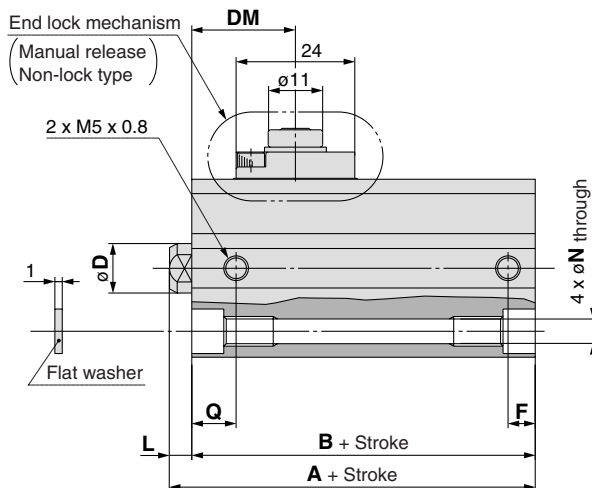
End lock mechanism (Manual release lock type)



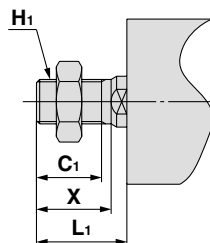
End Lock Mechanism Dimensions (mm)

Bore size (mm)	DL	DM	HR	HN (Max.)
20	20	21	28.5	40
25	21	21	29.5	41

With rod end lock



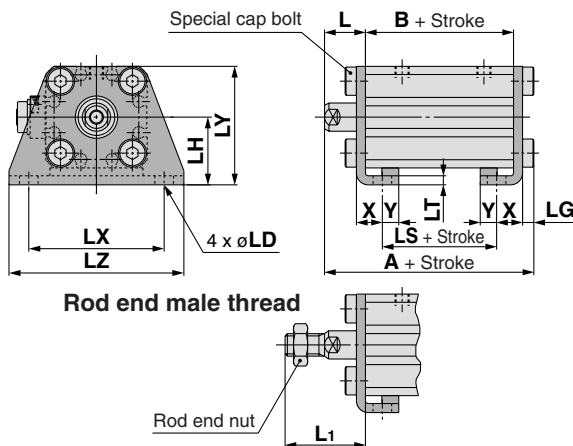
Rod end male thread



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

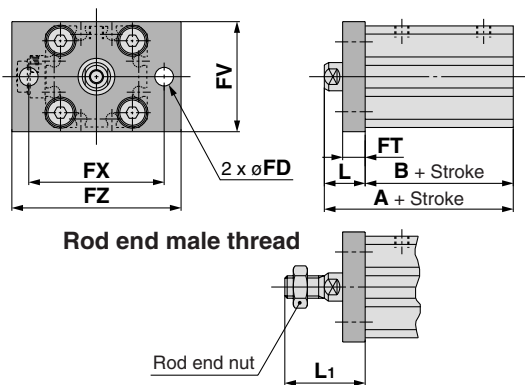


Foot

Bore size (mm)	Standard stroke	(mm)					
		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	9.2	5.8
	50, 75, 100	15	32.5	6.6	4	26	3.2	52	46	66	10.7	5.8

Rod end flange: CBQ2F/CDBQ2F

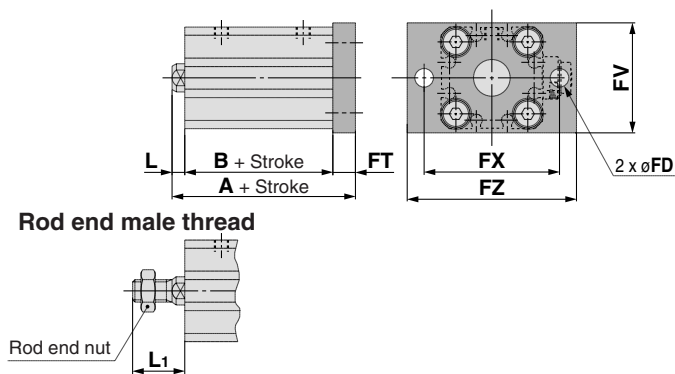


Rod End Flange

Bore size (mm)	Standard stroke	(mm)			
		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	14.5	28.5
	50, 75, 100	6.6	8	42	52	64	15	32.5

Head end flange: CBQ2G/CDBQ2G

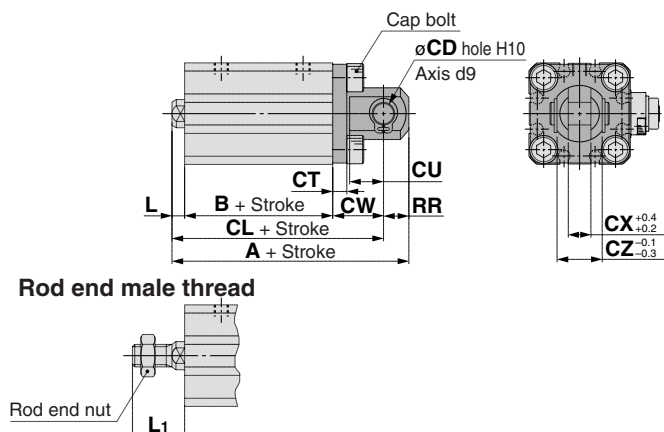


Head End Flange

Bore size (mm)	Standard stroke	(mm)							
		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	48	60
	50, 75, 100	6.6	8	42	52	64

Double clevis: CBQ2D/CDBQ2D



Double Clevis

Bore size (mm)	Standard stroke	(mm)									
		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	16	9
	50, 75, 100	10	5	14	20	10	20	10

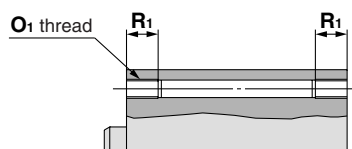
Series CBQ2

Dimensions

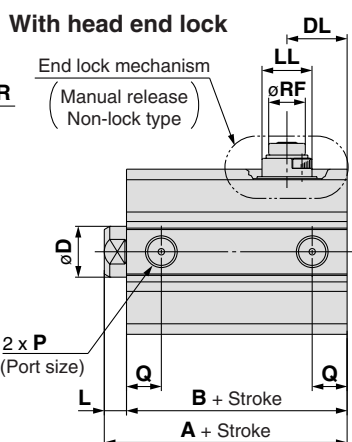
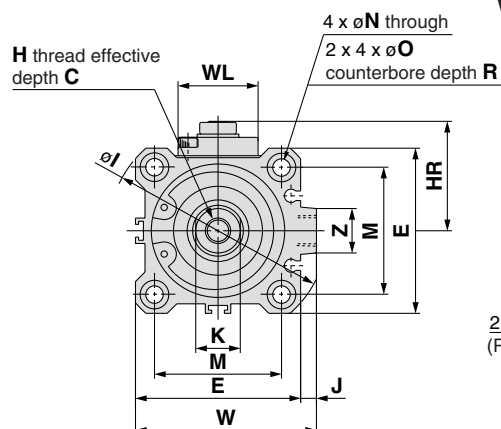
ø32 to ø100

Basic (Through-hole): CBQ2B/CDBQ2B

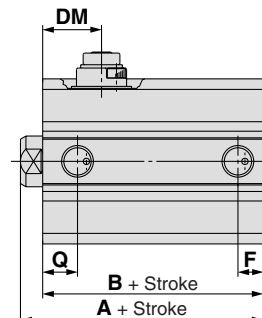
Both ends tapped: CBQ2A/CDBQ2A



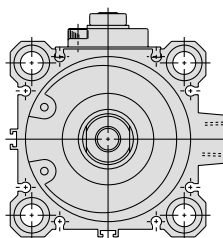
Bore size (mm)	O ₁	R ₁
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



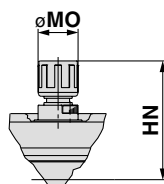
With rod end lock



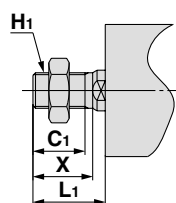
ø63, ø80, ø100
Cylinder tube form



End lock mechanism
(Manual release lock type)



Rod end male thread



End Lock Mechanism Dimensions

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

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		26	28.5	M18 x 1.5	33.5
80	25, 50 75, 100	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		15	20	77	M10 x 1.5	103	7	17	60	9	14	Rc1/4	10.5	84	19
80	25, 50, 75, 100	21	25	98	M16 x 2.0	132	6	22	77	11	17.5*	Rc3/8	13.5*	104	26
100		27	30	117	M20 x 2.5	156	6.5	27	94	11	17.5*	Rc3/8	13.5*	123.5	26

* At the 75 and 100 strokes with ø80, 100, both ends tapped (A) is the standard. Through-hole (B) is not available.

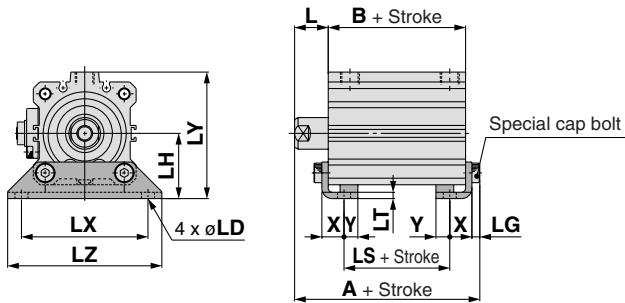
With Head End Lock

Bore size (mm)	Standard stroke	A	B	L	Q
32	10, 15, 20, 25 50, 75, 100	72.5	65.5	7	12.5
40		82	75	7	14
50		83.5	75.5	8	14
63		85	77	8	15.5
80	25, 50 75, 100	121 136	111 116	10 20	18 19
100	25, 50 75, 100	132.5 147.5	120.5 125.5	12 22	22 23

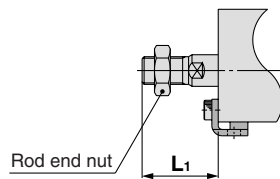
With Rod End Lock

Bore size (mm)	Standard stroke	A	B	F	L	Q
32	10, 15, 20, 25 50, 75, 100	65	58	7.5	7	10.5
40		71.5	64.5	8	7	11
50		73.5	65.5	10.5	8	10.5
63		79	71	10.5	8	15
80	25, 50 75, 100	113.5 136	103.5 116	12.5 19	10 20	16 19
100	25, 50 75, 100	125 147.5	113 125.5	13 23	12 22	23 23

Foot: CBQ2L/CDBQ2L



Rod end male thread

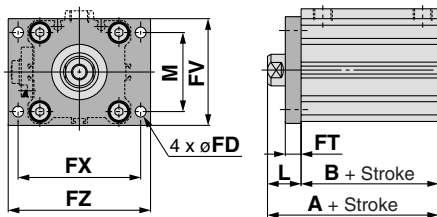


Foot

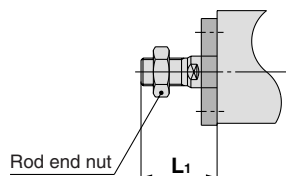
Bore size (mm)	Standard stroke	With head end lock			With rod end lock			(mm)		
		A	B	LS	A	B	LS	L	L ₁	LD
32	10, 15, 20, 25 50, 75, 100	89.7	65.5	49.5	82.2	58	42	17	38.5	6.6
40		99.2	75	59	88.7	64.5	48.5	17	38.5	6.6
50		101.7	75.5	52.5	91.7	65.5	42.5	18	43.5	9
63		103.2	77	51	97.2	71	45	18	43.5	11
80	25, 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

Rod end flange: CBQ2F/CDBQ2F



Rod end male thread



Rod End 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					

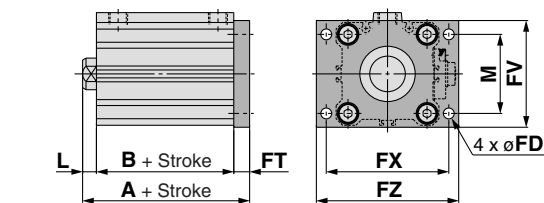
Bore size (mm)	Standard stroke	L	L ₁	M
32	10, 15, 20, 25 50, 75, 100	17	38.5	34
40		17	38.5	40
50		18	43.5	50
63		18	43.5	60
80	25, 50, 75, 100	20	53.5	77
100		22	53.5	94

Series CBQ2

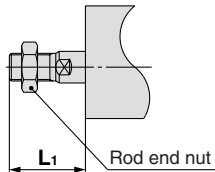
Dimensions

ø32 to ø100

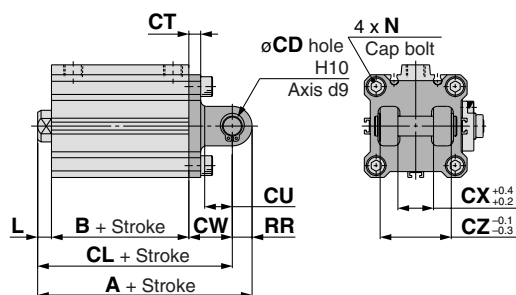
Head end flange: CBQ2G/CDBQ2G



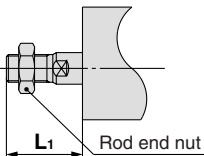
Rod end male thread



Double clevis: CBQ2D/CDBQ2D



Rod end male thread



Head End 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

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				12	43.5
	75, 100	214.5	125.5	192.5	214.5	125.5	192.5	22	13	31	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	25, 50, 75, 100	38	28	56	M12 x 1.75	18
100		45	32	64	M12 x 1.75	22



Series CBQ2

Specific Product Precautions

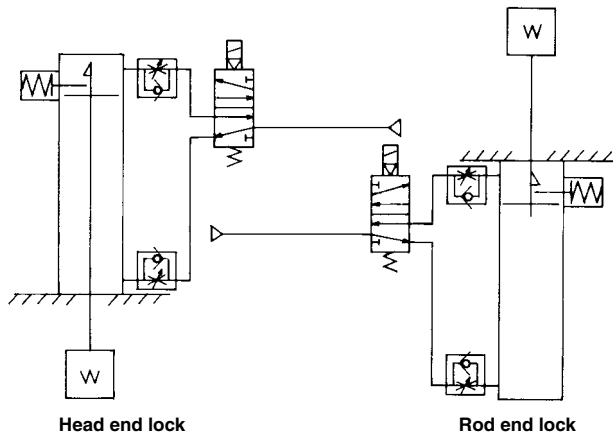
Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for Actuators and Auto Switches Precautions.

Use the Recommended Pneumatic Circuit

Caution

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



Operating Precautions

Caution

- Do not use 3-position solenoid valves.**
Avoid use in combination with 3-position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.
- Back pressure is required when 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 figure above. There is a possibility that the lock may not be released. (Refer to the section on releasing the lock.)
- Release the lock when mounting or adjusting the cylinder.**
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.
- Operate with a load ratio of 50% or less.**
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
- Do not operate multiple cylinders in synchronization.**
Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.
- Use a speed controller with meter-out control.**
Lock cannot be released occasionally by meter-in control.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**
If the cylinder piston does not reach the end of stroke, locking and unlocking may not be possible.
- Adjust the position of an auto switch, so that it could work at the both positions where it is distanced from the stroke and a backlash (2 mm) .**
When a 2-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

- 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 disengaging the lock.

Exhaust Speed

Caution

- 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

- 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)

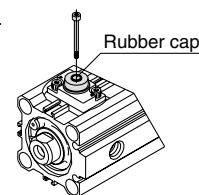
Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

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

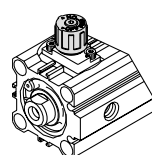
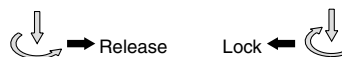
Remove the bolt for normal operation.

It can cause lock malfunction or faulty release.

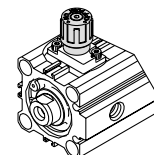


1. Manual release (Lock type)

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 M/O button clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on M/O button. The correct position is confirmed by a click sound "click". If not confirmed, locking is not done.



Manually locked state



Manually unlocked state

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

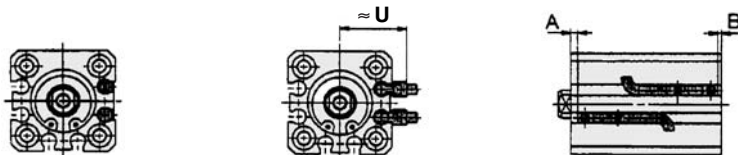
Compact Cylinder/*series CQ2* With Auto Switch 1

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

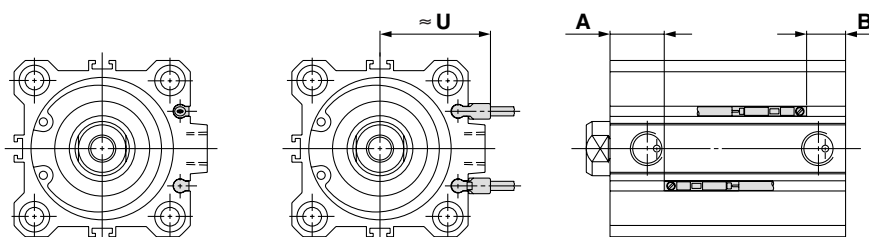
Applicable Cylinder Series: CDBQ2 (With end lock)

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

ø20, ø25



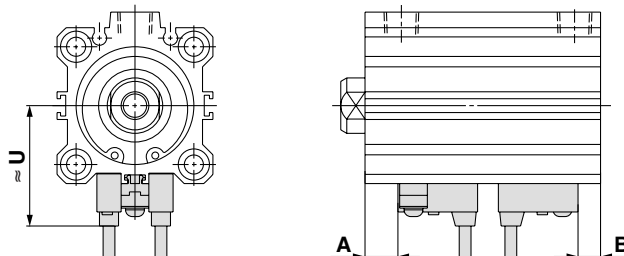
ø32 to ø100



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

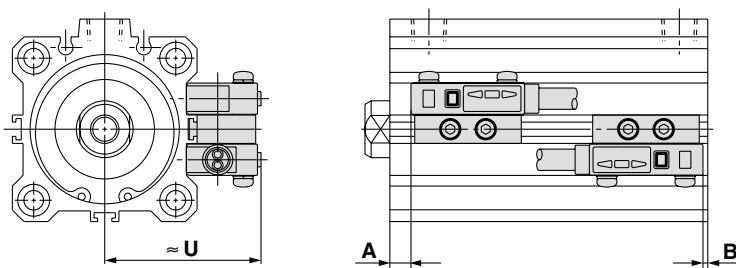
D-F7NTL
D-F7BAL
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□WV
D-F7□V
D-F7BAVL

ø32 to ø100



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		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) Dimensions in parentheses for ø20 and ø25 are for 50, 75 and 100 strokes, and dimensions in parentheses for ø80 and ø100 are for 75 and 100 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

Compact Cylinder/*series CQ2* With Auto Switch 2

2 Minimum Stroke for Auto Switch Mounting

Applicable Cylinder Series: CDBQ2 (With end lock)

(mm)

Number of auto switch mounted	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
1 pc.	5	5	10	10	15	15	20	15
2 pcs.	5	10	10	15	15	20	20	15

3 Operating Range

Applicable Cylinder Series: CDBQ2 (With end lock)

(mm)

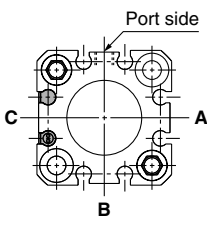
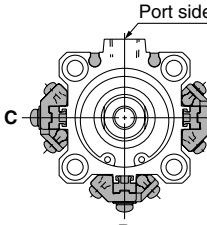
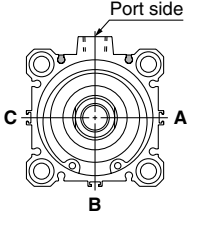
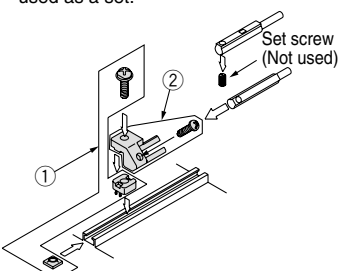
Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-A9□(V)	10	10	9.5 (9.5)	9.5 (9.5)	9.5 (8.5)	11.5 (11)	9 (10)	11.5 (10.5)
D-M9□(V) D-M9□W(V) D-M9□A(V)L	5.5	5.5	6 (5.5)	6 (5.5)	7 (6)	7.5 (6.5)	8 (7)	8.5 (7)
D-A7□(H)(C) D-A80□(H)(C)	—	—	12	11	10	12	12	13
D-A79W	—	—	13	14	14	16	15	17
D-F7□(V) 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

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

* Except for a bore size over ø32 of the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types, the values above are measured when the conventional switch installation groove is attached without using the auto switch mounting bracket BQ2-012.

* The values in parentheses for a bore size over ø32 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 Bracket/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	Auto switch mounting surface		Auto switch mounting surface
	Port/A/B/C side	Port side	A/B/C side	Port/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	Auto switch mounting brackets are not required.	Auto switch mounting brackets are not required.	① BQ-2 ② BQ2-012 Two kinds of auto switch bracket are used as a set. 	Auto switch mounting brackets are not required.

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
 CDQ2B32-50D-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.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel (with nuts) is available. Use it in accordance with the operating environment. (Please order BQ-2 separately, since auto switch spacers (for BQ-2) are not included.)

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

The above stainless steel mounting screws are used when a cylinder is shipped with D-F7BAL, F7BAVL-type water resistant 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 the details of BBA2.

Note 6) When D-M9□A(V)L 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 screw set BBA2 separately.

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Mass (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

Compact Cylinder/*series CQ2* With Auto Switch 3

Besides the models listed in How to Order, the following auto switches are applicable.

Refer to Best Pneumatics No. 2 for details.

Applicable Cylinder Series: CDBQ2 (With end lock)

Auto switch type	Part no.	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	Grommet (In-line)	Water resistant (2-color indication)	
	D-F79, F7P, J79		—	
	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)	ø40 to ø100

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to Best Pneumatics No. 2 for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to Best Pneumatics No. 2 for details.

* When using a magnetic field resistant solid state auto switch D-P3DW□ type, please contact SMC separately. (Applicable bore size: ø32 to ø100)

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

Without auto switch
ø32 to ø100

With auto switch

CQ2 B 20 R - 30 D —
CQ2 B 32 R - 30 D Z —
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 end flange	(ø40 to ø100)
G	Head end 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 CQ2" on pages 162 and 164.

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 page 161 for details.

Auto switch

Nil Without auto switch

* Refer to the below table for the applicable auto switch model.

Auto switch mounting groove

Z	ø20 to ø25	2 sides
	ø32 to ø100	4 sides

Body option

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

Action

D Double acting

Cylinder stroke (mm)

Refer to the standard stroke table on page 161.

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 185 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 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.

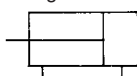
* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

Series CQ2



JIS Symbol

Double acting,
Single rod



Made to Order
(For details, refer to pages 189 to 217.)

Symbol	Specifications
—XC6	Retaining ring, piston rod, rod end nut made of stainless steel

Refer to pages 173 to 178 for the specifications of cylinders with an auto switch.

- Minimum stroke for auto switch mounting
- Auto switch proper mounting position (detection at stroke end) and height
- Operating range
- Auto switch mounting bracket/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 Stroke

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 Stroke

Description	Spacer is installed in the standard stroke body.	
Part no.	Refer to "How to Order" for the standard model no. on page 160.	
Description	Dealing with the stroke by the 1 mm interval is available by installing spacer with 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. 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	Screw-in type	—	M5 x 0.8	M5 x 0.8	^{Note)} M5 x 0.8 Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
			TN	—	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4	NPT 3/8	NPT 3/8
			TF	—	—	G 1/8	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8
Rod end male thread		●	●	●	●	●	●	●	●	●	

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

Theoretical Output



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

Mounting Bracket/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) Order two foot brackets per cylinder.

Note 2) Parts belonging to each bracket are as follows. Foot or Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

Mounting Bolt for CQ2

Mounting method: Mounting bolt for through-hole mounting of the CQ2B is available as an option.

Ordering: Add the word "Bolt" in front of the bolts to be used.

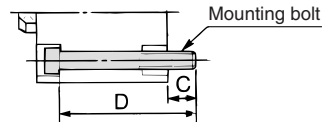
Example) Bolt M3 x 25L 4 pcs.

Cylinder model	C	D	Mounting bolt size
CQ2B20³-5D	7.5	35	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
CQ2B25³-5D	9.5	40	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
CQ2B32³-5DZ	9	40	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
CQ2B32³-5DZ	9	40	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
CQ2B32³-5DZ	9	120	x 120L
-100DZ		145	x 145L

Cylinder model	C	D	Mounting bolt size
CQ2B40³-5DZ	7.5	35	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
CQ2B50³-10DZ	12.5	45	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
CQ2B50³-10DZ	12.5	145	x 145L
-100DZ		150	x 150L
CQ2B63³-10DZ	14.5	50	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 size
CQ2B80³-10DZ	15	55	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
CQ2B100³-10DZ	15.5	155	x 155L
-15DZ		65	M10 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		105	x 105L
-100DZ		140	x 140L
-100DZ		165	x 165L

Material: Chromium molybdenum steel
Surface treatment: Nickel plated



Mass

Mass Without Auto Switch

Stroke	5	10	15	20	25	30	35	40	45	50	75	100
Bore size												
ø20	112	126	141	155	169	184	198	212	227	241	—	—
ø25	149	165	182	197	213	229	245	261	277	293	—	—
ø32	203	224	246	267	288	309	330	352	373	394	544	650
ø40	220	241	263	284	306	327	349	371	392	414	568	680
ø50	—	378	411	444	476	509	542	575	608	641	879	1051
ø63	—	547	585	623	662	700	738	776	814	852	1125	1321
ø80	—	973	1034	1094	1154	1214	1275	1335	1395	1455	1873	2169
ø100	—	1703	1783	1863	1944	2024	2104	2185	2265	2345	2915	3323

Additional Mass

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
	Nut	4	8	17	17	32	32	49
Foot (Including mounting bolt)	—	—	—	154	243	320	690	1057
Rod end flange (Including mounting bolt)	—	—	—	214	373	559	1056	1365
Head end flange (Including mounting bolt)	—	—	—	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)	—	—	—	196	393	554	1109	1887

Calculation: (Example) **CQ2D40R-20DMZ**

• Cylinder mass: CQ2B40R-20DZ 284 g

• Option mass: Both ends tapped 6 g

Rod end male thread 44 g

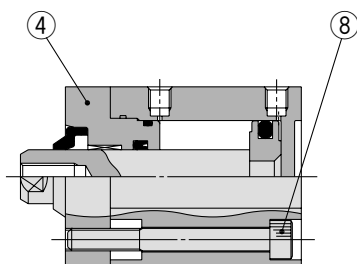
Double clevis 196 g

530 g

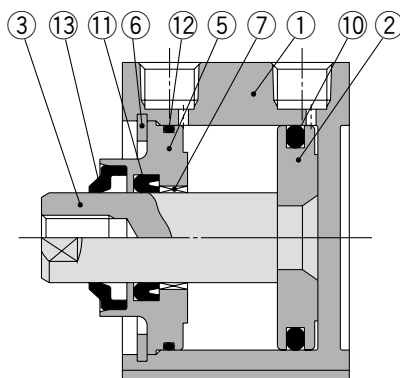
Add each mass of auto switches when auto switches are mounted.

Construction

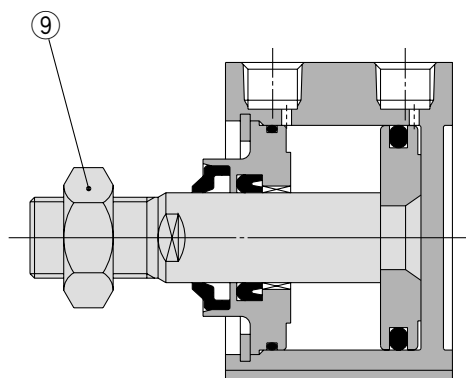
Basic (Bore size $\phi 20$ to $\phi 32$)



Basic (Bore size $\phi 40$ to $\phi 100$)



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 Carbon steel	$\phi 20$ to $\phi 25$ $\phi 32$ to $\phi 100$, Hard chrome plated
4	Rod cover	Aluminum alloy	$\phi 20$ to $\phi 32$, Anodized
5	Collar	Aluminum alloy	$\phi 40$ to $\phi 100$, Anodized
6	Retaining ring	Carbon tool steel	$\phi 40$ to $\phi 100$, Phosphate coated
7	Bushing	Oil-impregnated sintered alloy Bearing alloy	$\phi 20$, $\phi 25$ $\phi 32$ to $\phi 100$
8	Hexagon socket head cap screw	Chromium molybdenum steel	$\phi 20$ to $\phi 32$, 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	Set of nos. at left ⑩ ⑪ ⑫
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)

⚠ Precautions

Be sure to read before handling. Refer to back pages 1 and 2 for Safety Instructions and "Handling Precautions for SMC Product" (M-E03-3) for Actuators and Auto Switches Precautions.

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 the hydraulic cylinder, 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 leaks or faulty lock-up.

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, 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 cleaning solvent) that splashes on the cylinder, the operating life of seals may be reduced dramatically. In cases where special additives are used, or where liquid caused trouble with the conventional nitrile or fluororubber seals in the past, request an investigation or set up a test period for the use of the seals.

Examples of cleaning solvents

Shimron, 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)

Compact Cylinder: Water Resistant Double Acting, Single Rod Series **CDQ2** With Auto Switch



Mass

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

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	120	175
	Nut	4	8	17	17	32	49	116
Foot (Including mounting bolt)	—	—	—	154	243	320	690	1057
Rod end flange (Including mounting bolt)	—	—	—	214	373	559	1056	1365
Head end flange (Including mounting bolt)	—	—	—	198	348	534	1017	1309
Double clevis (Including pin, retaining ring, bolt)	—	—	—	196	393	554	1109	1887

Calculation: (Example) **CDQ2D40R-20DMZ**
 • Cylinder mass: CDQ2B40R-20DZ 358 g
 • Option mass: Both ends tapped 6 g
 Rod end male thread 44 g
 Double clevis 196 g
 604 g

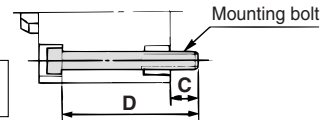
Add each mass of auto switches when auto switches are mounted.

Mounting Bolt for CDQ2/With Auto Switch

Mounting method: Mounting bolt for through-hole mounting of the CDQ2B is available as an option.
 Ordering: Add the word "Bolt" in front of the bolts to be used.

Example) Bolt M3 x 35L 2 pcs.

Material: Chromium molybdenum steel
 Surface treatment: Nickel plated



Cylinder model	C	D	Mounting bolt size
CDQ2B20 ^ø -5DZ	10.5	50	M5 x 50L
-10DZ		55	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	9.5	90	x 90L
-50DZ		95	x 95L
CDQ2B25 ^ø -5DZ		50	M5 x 50L
-10DZ		55	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
CDQ2B32 ^ø -5DZ	9	50	M5 x 50L
-10DZ		55	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		120	x 120L
-100DZ		145	x 145L

Cylinder model	C	D	Mounting bolt size
CDQ2B40 ^ø -5DZ	7.5	45	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	12.5	85	x 85L
-50DZ		90	x 90L
-75DZ		115	x 115L
-100DZ		140	x 140L
CDQ2B50 ^ø -10DZ		55	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		120	x 120L
-100DZ		145	x 145L
CDQ2B63 ^ø -10DZ	14.5	60	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
-75DZ		125	x 125L
-100DZ		150	x 150L

Cylinder model	C	D	Mounting bolt size
CDQ2B80 ^ø -10DZ	15	65	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	15.5	105	x 105L
-75DZ		130	x 130L
-100DZ		155	x 155L
CDQ2B100 ^ø -10DZ		75	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
-75DZ		140	x 140L
-100DZ		165	x 165L

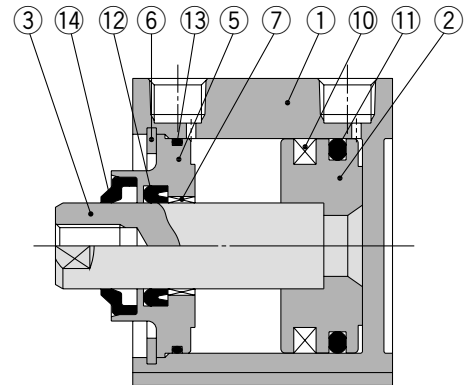
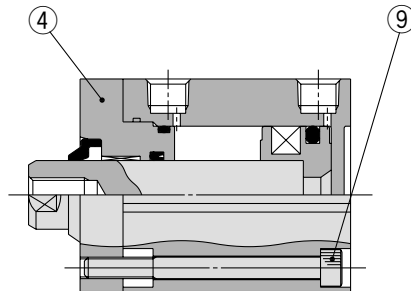
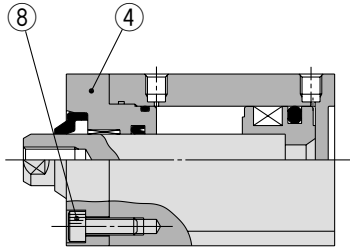
Series CQ2

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	Set of nos. at left ⑪, ⑫, ⑬
25	CQ2B25R-PS	CQ2B25V-PS	
32	CQ2B32R-PS	CQ2B32V-PS	
40	CQ2B40R-PS	CQ2B40V-PS	
50	CQ2B50R-PS	CQ2B50V-PS	
63	CQ2B63R-PS	CQ2B63V-PS	
80	CQ2B80R-PS	CQ2B80V-PS	
100	CQ2B100R-PS	CQ2B100V-PS	

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

* A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a rod cover and collar, but also with a rod cover assembly and collar assembly. Contact SMC separately for how to order them.

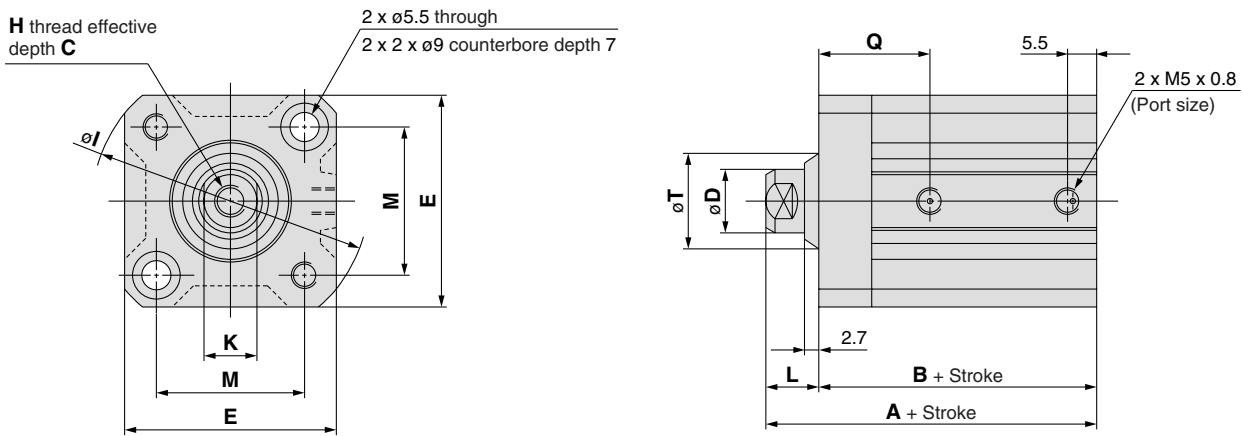
* Since the seal kit does not include a grease pack, order it separately.

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

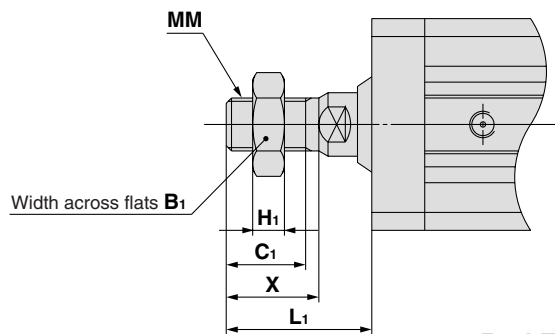
Dimensions

Ø20, Ø25/Without Auto Switch

Basic (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

Basic

(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 161 for the calculation on the longitudinal dimension of the 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

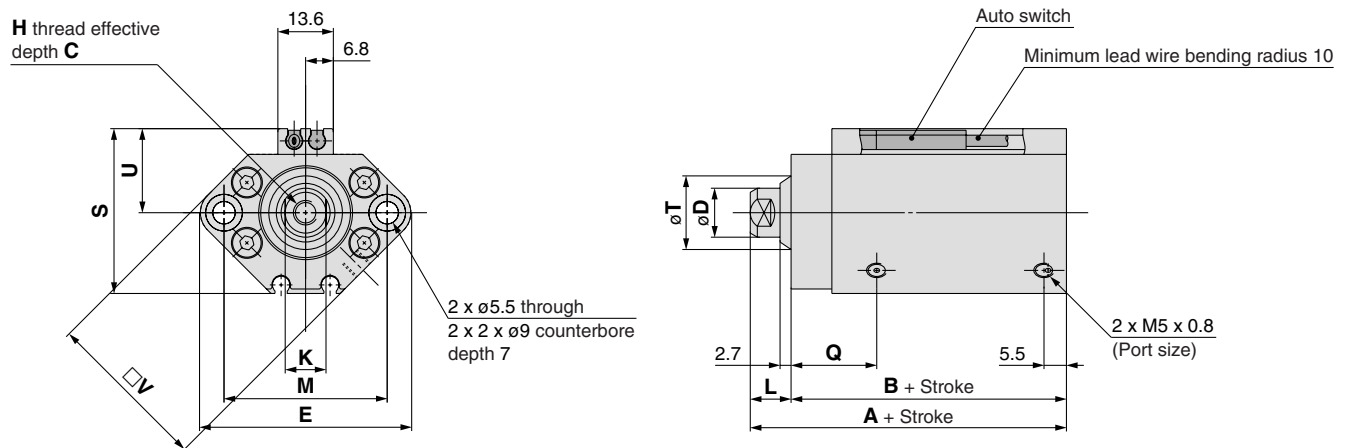
Made to Order

Series CQ2

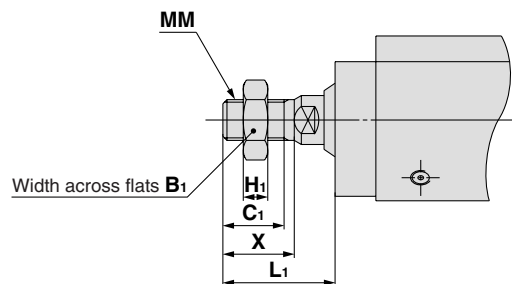
Dimensions

Ø20, Ø25/With Auto Switch

Basic (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

Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176. (mm)

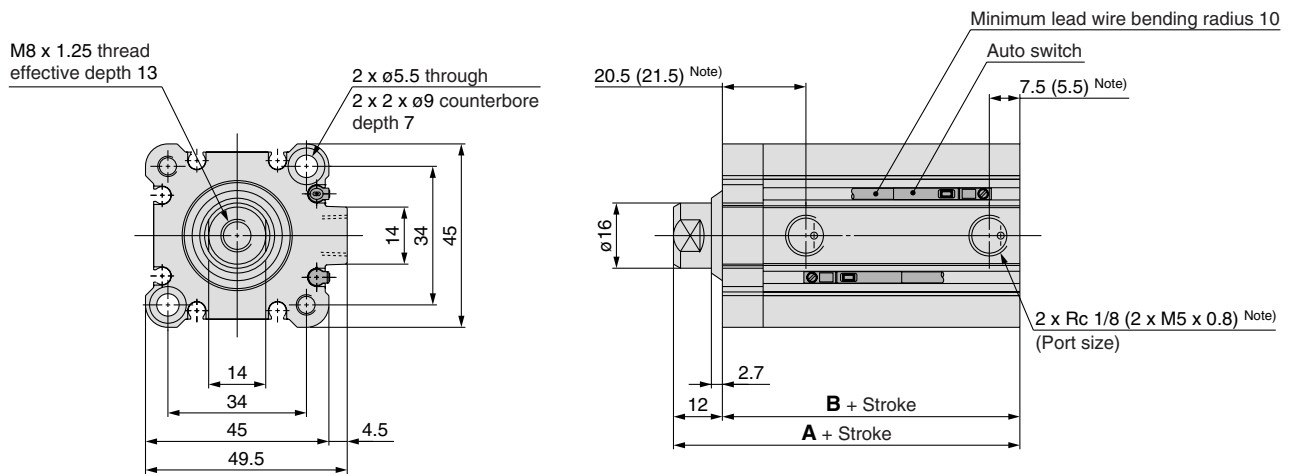
Bore size (mm)	Stroke range (mm)	A	B	C	D	E	H	K	L	M	Q	S	T	U	V
20	5 to 50	51	41.5	7	10	47	M5 x 0.8	8	9.5	36	20.5	35.5	16.1	18	36
25	5 to 50	52.5	42.5	12	12	52	M6 x 1.0	10	10	40	21	40.5	18.1	21	40

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

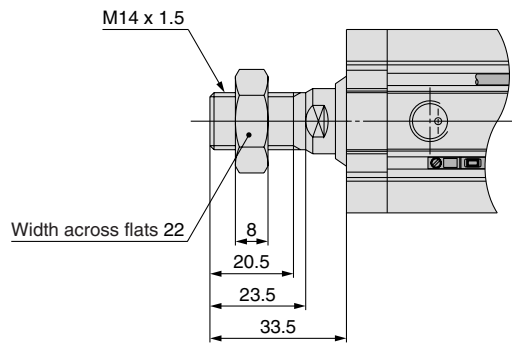
* Refer to page 161 for the calculation on the longitudinal dimension of the intermediate strokes.

Dimensions

ø32



Rod end male thread



Note) (): Without an auto switch, 5 mm strokes.

Stroke range	Without auto switch		With auto switch		(mm)		
	A	B	A	B	—	TN	TF
5 to 50	45	33	55	43	Rc 1/8	NPT 1/8	G 1/8
75, 100	55	43					

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

* Refer to page 161 for the calculation on the longitudinal dimension of the 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

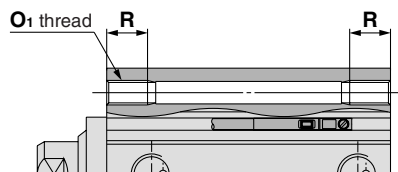
Series CQ2

Dimensions

Ø40, Ø50

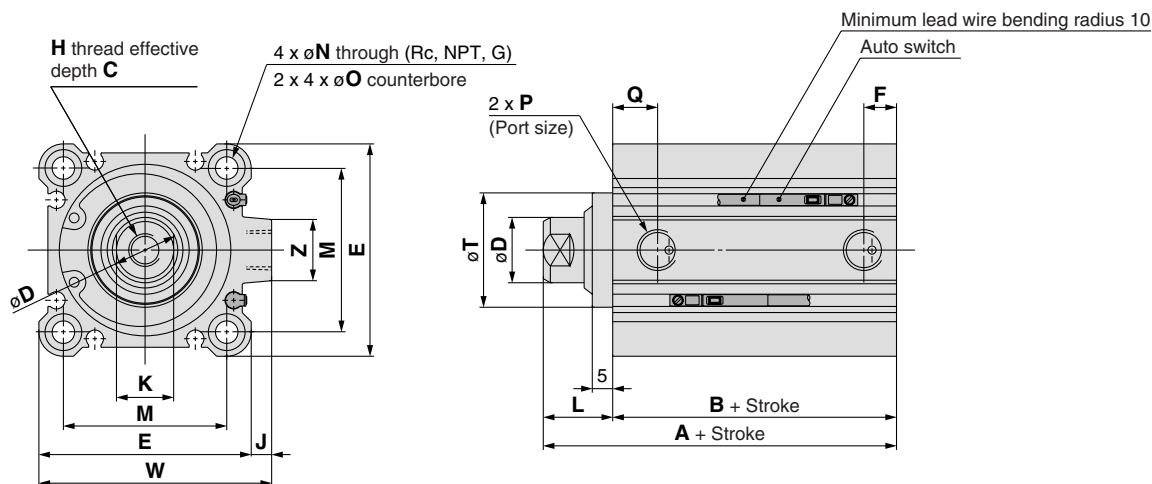
Both ends tapped: CQ2A/CDQ2A

Basic (Through-hole):
CQ2B/CDQ2B

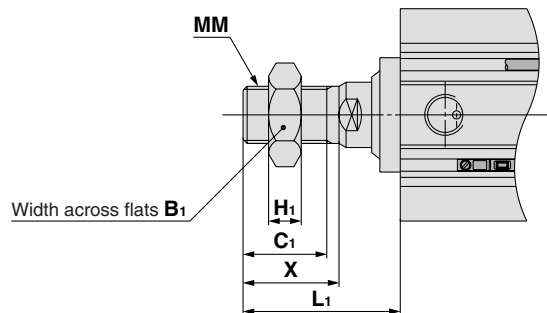


Both Ends
Tapped (mm)

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

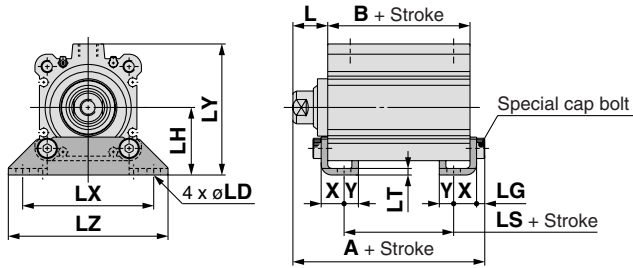
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176. (mm)

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																		

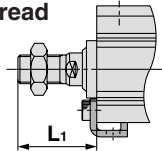
Note 1) For details about the rod end nut and accessory brackets, refer to page 19.

Note 2) Refer to page 161 for the calculation on the longitudinal dimension of the intermediate strokes.

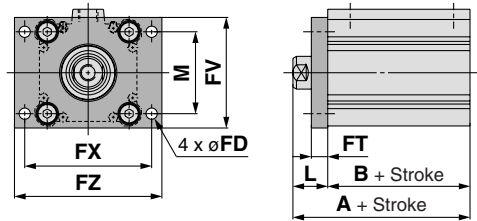
Foot: CQ2L/CDQ2L



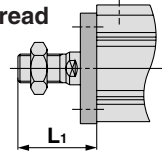
Rod end male thread



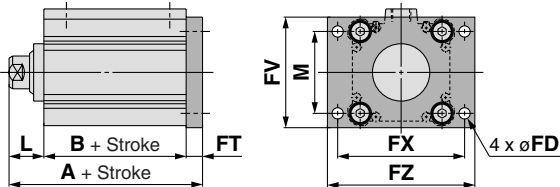
Rod end flange: CQ2F/CDQ2F



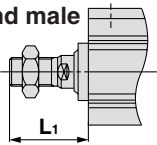
Rod end male thread



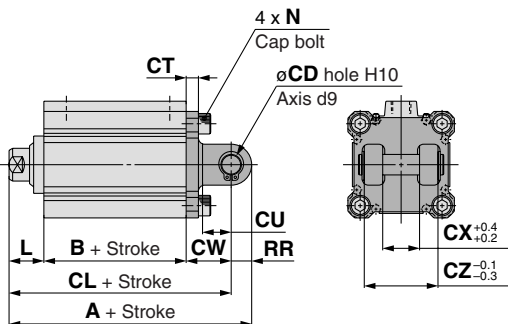
Head end flange: CQ2G/CDQ2G



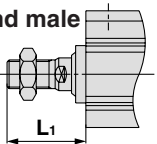
Rod end male thread



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 End 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 End Flange

Bore size (mm)	Stroke range (mm)	Without auto switch	With auto switch
		A	A
40	5 to 50	54.5	64.5
	75, 100	64.5	
50	10 to 50	57.5	67.5
	75, 100	67.5	

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

(* Dimensions except A are the same as rod end flange.)

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

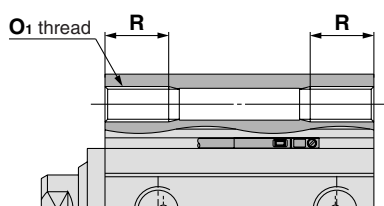
* For details about the rod end nut and accessory brackets, refer to page 19.
* Double clevis pins and retaining rings are included.

Series CQ2

Dimensions

ø63 to ø100

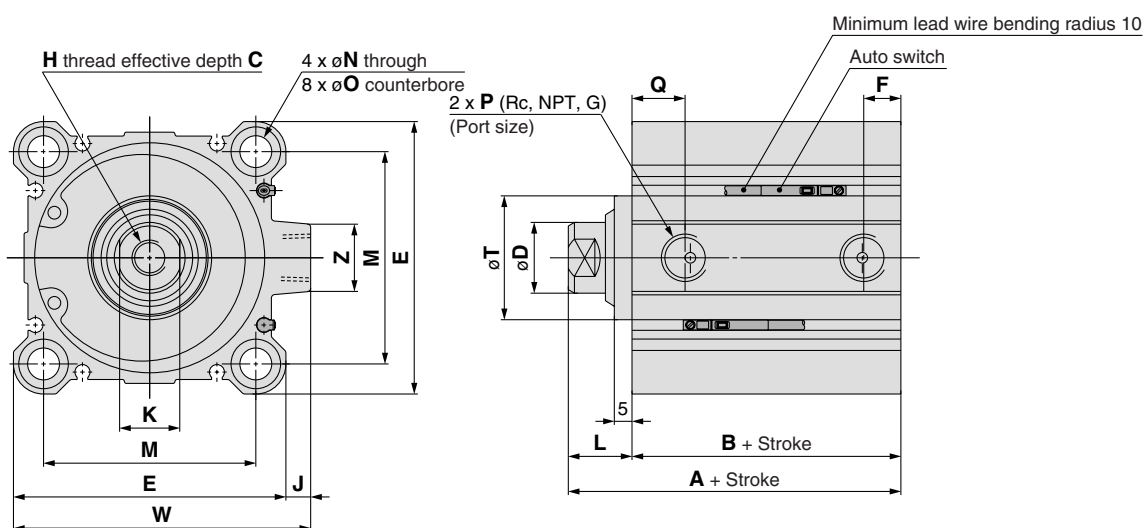
Both ends tapped: CQ2A/CDQ2A



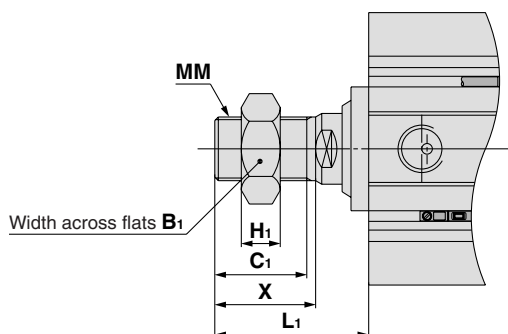
Both Ends Tapped

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

Basic (Through-hole)



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

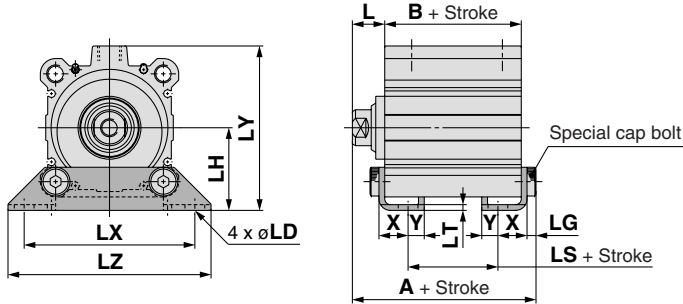
Basic For auto switch mounting position and its mounting height, refer to pages 173 to 176.

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
63	10 to 50	54	36	64	46	15	20	77	10.5	M10 x 1.5	7	17	18	60	9	14 depth 10.5	1/4	15	35
	75, 100	64	46																
80	10 to 50	63.5	43.5	73.5	53.5	21	25	98	12.5	M16 x 2.0	6	22	20	77	11	17.5 depth 13.5	3/8	16	43
	75, 100	73.5	53.5																
100	10 to 50	75	53	85	63	27	30	117	13	M20 x 2.5	6.5	27	22	94	11	17.5 depth 13.5	3/8	23	59
	75, 100	85	63																

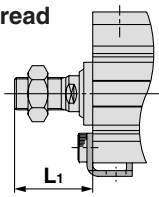
Bore size (mm)	W	Z
63	84	19
80	104	25
100	123.5	25

* For details about the rod end nut and accessory brackets, refer to page 19.
Note) Refer to page 161 for the calculation on the longitudinal dimension of the intermediate strokes.

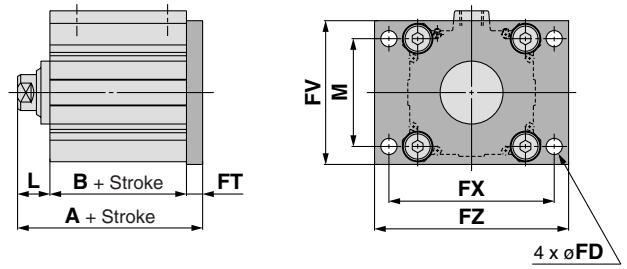
Foot: CQ2L/CDQ2L



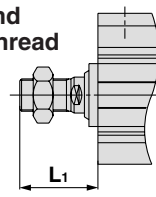
Rod end male thread



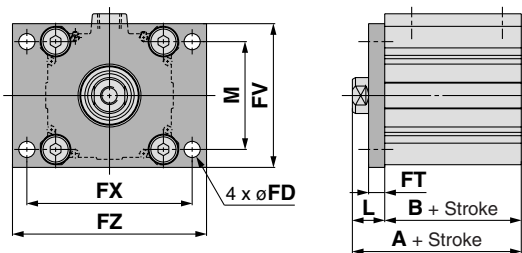
Head end flange: CQ2G/CDQ2G



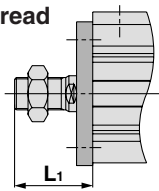
Rod end male thread



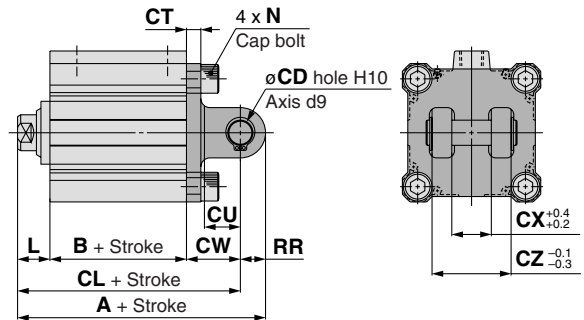
Rod end flange: CQ2F/CDQ2F



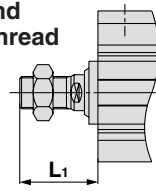
Rod end male thread



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
		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									

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					

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod End 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								
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 End Flange

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	

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
		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								

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					

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 pins and retaining rings are included.

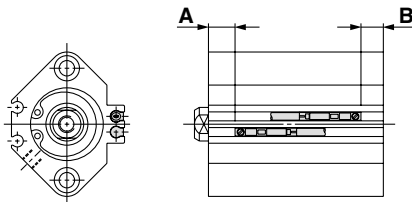
Compact Cylinder/*Series CQ2* With Auto Switch 1

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

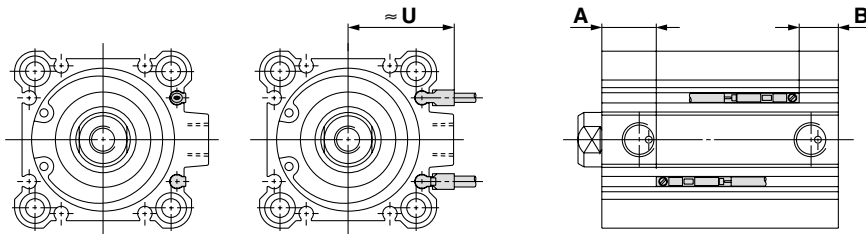
Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/-□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load), CDQ2□R/□V (Water resistant)

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



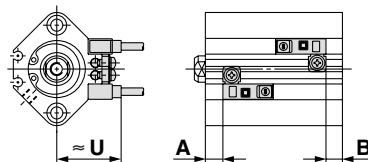
ø32 to ø100



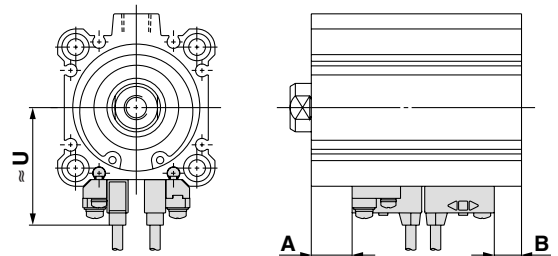
D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F

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

ø12 to ø25

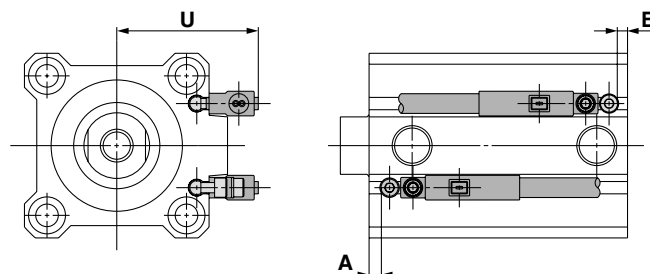


ø32 to ø100



D-P3DW□

ø32 to ø100



Auto Switch Proper Mounting Position

Applicable Cylinder Series: CDQ2 (Double acting, Single rod)

(mm)

Auto switch model Bore size	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 Bore size	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-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 Bore size	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.

Compact Cylinder/*Series CQ2* With Auto Switch 2

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

Auto Switch Proper Mounting Position

Applicable Cylinder Series: CDQ2K (Non-rotating rod)

(mm)

Auto switch model Bore size	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	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 Bore size	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	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

Applicable Cylinder Series: CDQ2 (Long stroke)

(mm)

Auto switch model Bore size	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
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

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 Bore size	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
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.

Auto Switch Mounting Height

**Applicable Cylinder Series:
CDQ2□R/□V (Water resistant)**

(mm)

Auto switch model Bore size	D-M9□AL D-M9□AVL		D-F7BAL D-F7BAVL	
	A	B	A	B
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.

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

(mm)

Auto switch model Bore size	D-M9□V	D-A9□V	D-F7□ D-J79 D-F7□W D-J79W D-F7BAL D-F79F D-F7NTL D-A7□H D-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
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	28.5	26.5	36	26.5	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.

* The D-P3DW□ is available from ø32 to ø100.

Compact Cylinder/*Series CQ2* With Auto Switch 3

2 Minimum Stroke for Auto Switch Mounting

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

(mm)

Number of auto switch mounted	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□
1 pc.	5	5	10	10	15	15	20	15
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.

3 Operating Range

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

(mm)

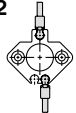
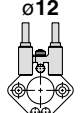
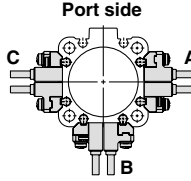
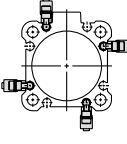
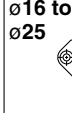
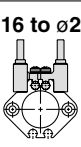
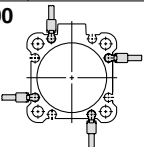
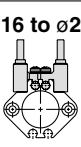
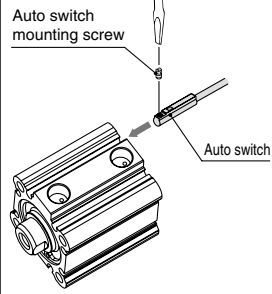
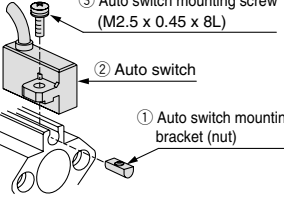
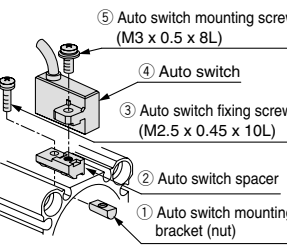
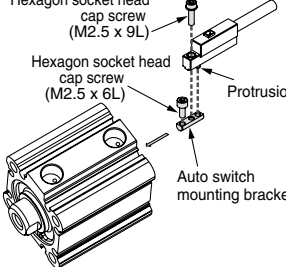
Auto switch model	Bore size									
	12	16	20	25	32	40	50	63	80	100
D-A9□(V)	7.5	9.5	10	9	9	9.5	9.5	11	10.5	10.5
D-M9□(V) D-M9□W(V) D-M9□A(V)L	3	5	5.5	5.5	5	5	6	6.5	7	7.5
D-A7□(H)(C) D-A80□(H)(C)	9.5	12	12	11	10.5	11.5	11	13	11.5	11.5
D-A79W	13	14.5	15.5	14	14	15.5	14.5	17	15	15.5
D-F7□(V) D-J79(C) D-F7□W(V) D-F7BA(V)L D-F7NTL D-F79F	4.5	5.5	5	5	5	5	5	6	7	8
D-P3DW□	—	—	—	—	3	4.5	4.5	6	5.5	6.5

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V)L.

4 Auto Switch Mounting Bracket/Part No.

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2□□□-□S/□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQP2, 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 ø100	ø12 to ø25	ø32 to ø100	ø32 to ø100								
Auto switch mounting bracket part no.	—	BQ4-012	BQ5-032	BQ3-032S								
Auto switch mounting bracket fitting parts lineup/Mass	—	① Auto switch mounting screw (M2.5 x 8L) ② Auto switch mounting nut Mass: 1.5 g	① Auto switch fixing screw (M2.5 x 10L) ② Auto switch mounting screw (M3 x 8L) ③ Auto switch spacer ④ Auto switch mounting nut Mass: 3.5 g	① Hexagon socket head cap screw (M2.5 x 6L) ② Hexagon socket head cap screw (M2.5 x 9L) ③ Auto switch mounting bracket (nut) Mass: 2.5 g								
		When requesting the enclosure of the auto switch mounting bracket with the cylinder for shipment, add “-BQ” to the end of the cylinder part number. Standard model no. +BQ Example: CDQ2B-30DZ-BQ										
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								
	ø12 	ø12 										
	ø16 to ø25 	ø16 to ø25 										
ø32 to ø100 	ø16 to ø25 											
Mounting of auto switch	 • When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter. Tightening torque for auto switch mounting screw (N·m) <table><tr><th>Auto switch model</th><th>Tightening torque</th></tr><tr><td>D-M9□(V)</td><td rowspan="2">0.05 to 0.15</td></tr><tr><td>D-M9□W(V)</td></tr><tr><td>D-M9□A(V)L</td><td rowspan="2">0.10 to 0.20</td></tr><tr><td>D-A9□(V)</td></tr></table>	Auto switch model	Tightening torque	D-M9□(V)	0.05 to 0.15	D-M9□W(V)	D-M9□A(V)L	0.10 to 0.20	D-A9□(V)	① Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. ② 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. ③ 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. ④ 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. ⑤ The detection position can be changed under the conditions in step ③.  ③ Auto switch mounting screw (M2.5 x 0.45 x 8L) ② Auto switch ① Auto switch mounting bracket (nut)	① Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. ② 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 of the auto switch mounting nut. ③ Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. ④ Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. ⑤ 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. ⑥ 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. ⑦ The detection position can be changed under the conditions in step ⑤.  ⑤ Auto switch mounting screw (M3 x 0.5 x 8L) ④ Auto switch ③ Auto switch fixing screw (M2.5 x 0.45 x 10L) ② Auto switch spacer ① Auto switch mounting bracket (nut)	① 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. ② 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. ③ 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).* ④ If the detecting position is changed, go back to step ②. * 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. Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch. Note 2) The torque for tightening the hexagon socket head cap screw (M2.5 x 6L, M2.5 x 9L) is 0.2 to 0.3 N·m. Note 3) Tighten the hexagon socket head cap screws evenly.  Hexagon socket head cap screw (M2.5 x 9L) Hexagon socket head cap screw (M2.5 x 6L) Protrusion Auto switch mounting bracket
	Auto switch model	Tightening torque										
D-M9□(V)	0.05 to 0.15											
D-M9□W(V)												
D-M9□A(V)L	0.10 to 0.20											
D-A9□(V)												

Note) The 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.

* The auto switches applicable to the CDQ2□R/□V (water resistant) is the D-M9□A(V)L.

Compact Cylinder/*Series CQ2* With Auto Switch 4

Besides the models listed in How to Order, the following auto switches are applicable.

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for details.

Applicable Cylinder Series: **CDQ2, CDQ2W, CDQ2□□□-□S/-□T (Single acting), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 (Long stroke), CDQ2□S (Anti-lateral load)**

Auto switch type	Part no.	Electrical entry	Features	Applicable bore size
Reed	D-A72, A73	Grommet (Perpendicular)	—	ø12 to ø100
	D-A80		Without indicator light	
	D-A79W		Diagnostic indication (2-color indication)	
	D-A73C	Connector (Perpendicular)	—	
	D-A80C		Without indicator light	
	D-A72H, 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-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	

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1328 and 1329 in Best Pneumatics No. 2 for details.

Prior to Use

Auto Switches Common Specifications 1

⚠ Specific Product Precautions

Before handling auto switches, refer to “Handling Precautions for SMC Products” (M-E03-3) for Auto Switches Precautions.

Auto Switches Common Specifications

Type	Reed auto switch	Solid state auto switch
Leakage current	None	3-wire: 100 μ A or less, 2-wire: 0.8 mA or less
Operating time	1.2 ms	1 ms or less *2)
Impact resistance	300 m/s ²	1000 m/s ²
Insulation resistance	50 M Ω or more at 500 VDC Mega (Between lead wire and case)	
Withstand voltage	1500 VAC for 1 minute *1) (Between lead wire and case)	1000 VAC for 1 minute (Between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC60529 Standard IP67	

*1) Electrical entry: Connector type (A73C/A80C): 1000 VAC/min. (Between lead wire and the case)

*2) Excluding the solid state auto switches with a timer (D-F7NTL) and magnetic field resistant 2-color indication solid state auto switch (D-P3DW□).

The operating time for the D-P3DW□ is 40 ms or less.

Lead Wire

Lead wire length indication

(Example)

D-M9BW **L**

● Lead wire length

Nil	0.5 m
M	1 m
L	3 m
Z	5 m
N*	None

* Applicable for the connector type (D-□□C) only

Note 1) Lead wire length Z: 5 m

Applicable auto switches

Solid state auto switch: Manufactured upon receipt of order as standard.

Note 2) The standard lead wire length for water resistant 2-color indication solid state auto switches is 3 m.

(D-M9□A(V)L can be used with a lead wire of 0.5 m and 3 m.)

Note 3) 1 m (M): D-M9□(V), M9□W(V), M9□A(V)L only

Note 4) Lead wire length tolerance

Lead wire length	Tolerance
0.5 m	±15 mm
1 m	±30 mm
3 m	±90 mm
5 m	±150 mm

Solid state auto switch oil resistant flexible cable cord indication

Add a -61 to the end of the part number for the solid state auto switch flexible cord except D-M9□, M9□V, D-M9□W, M9□WV, D-M9□AL, and M9□AVL.

(Example)

D-F7PL-61

● Flexible specification

(The D-M9 series use flexible lead wire as standard.)

Lead wires with a connector indication

Part Number of Lead Wires with Connectors

(Applicable only for connector type)

Model	Lead wire length
D-LC05	0.5 m
D-LC30	3 m
D-LC50	5 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

Prior to Use

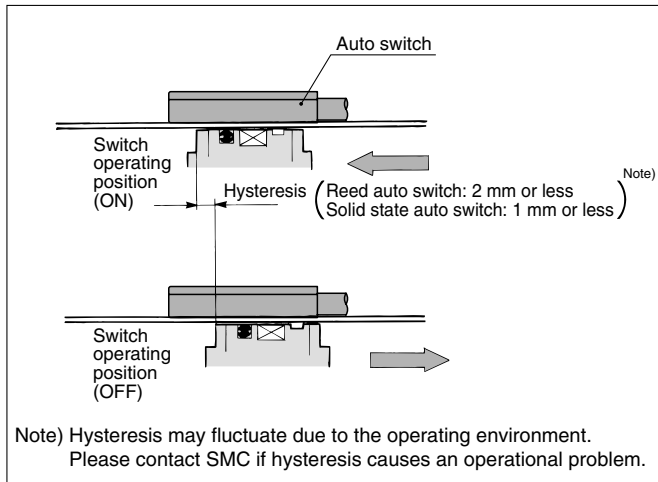
Auto Switches Common Specifications 2

⚠ Specific Product Precautions

Before handling auto switches, refer to “Handling Precautions for SMC Products” (M-E03-3) for Auto Switches Precautions.

Auto Switch Hysteresis

Hysteresis is the distance between the position at which piston movement operates an auto switch and the position at which reverse movement turns the switch off. This hysteresis is included in part of the operating range (one side).



Contact Protection Box: CD-P11, CD-P12

<Applicable switch models>

D-A7/A8, D-A7□H/A80H, D-A73C/A80C, D-A9/A9□V, and D-A79W type
The auto switches above do not have a built-in contact protection circuit. A contact protection box is not required for solid state auto switches due to their construction.

- ① Where the operation load is an inductive load.
- ② Where the wiring length to load is greater than 5 m.
- ③ Where the load voltage is 100/200 VAC.

Therefore, use a contact protection box with the switch for any of the above cases:

The contact life may be shortened (due to permanent energizing conditions.)

D-A72(H) must be used with the contact protection box regardless of load types and lead wire length since it is greatly affected by loads.

(Where the load voltage is 110 VAC)

When the load voltage is increased by more than 10% to the rating of applicable auto switches (except D-A73C/A80C/A79W) above, use a contact protection box (CD-P11) to reduce the upper limit of the load current by 10% so that it can be set within the range of the load current range, 110 VAC.

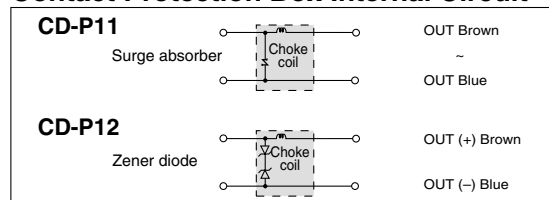
Contact Protection Box Specifications

Part no.	CD-P11		CD-P12
Load voltage	100 VAC or less	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

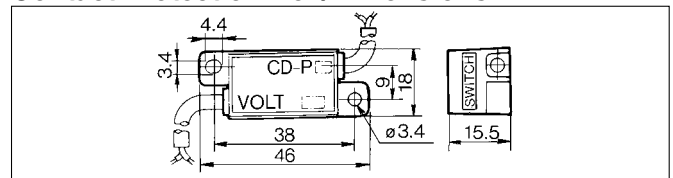
* Lead wire length — Auto switch connection side 0.5 m
Load connection side 0.5 m



Contact Protection Box Internal Circuit



Contact Protection Box/Dimensions



Contact Protection Box Connection

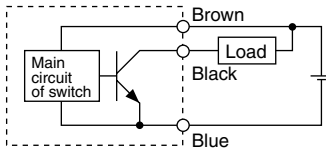
To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box, with a lead wire length of no more than 1 meter.

Prior to Use

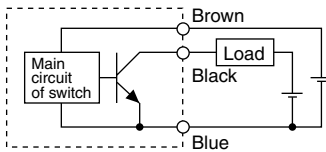
Auto Switches Connection and Example

Basic Wiring

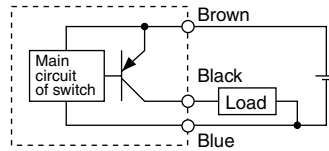
Solid state 3-wire, NPN



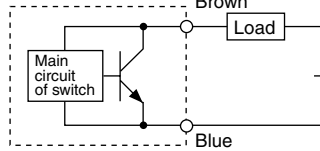
(Power supply for switch and load are separate.)



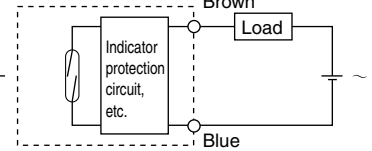
Solid state 3-wire, PNP



2-wire (Solid state)

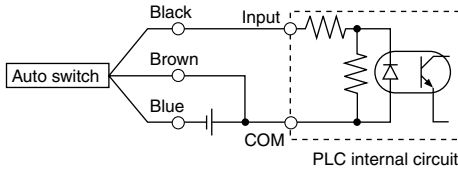


2-wire (Reed)

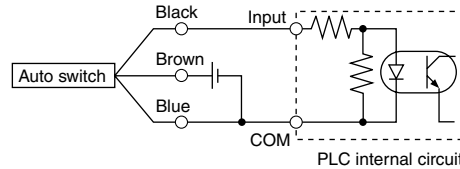


Example of Connection with PLC (Programmable Logic Controller)

• Sink input specifications 3-wire, NPN

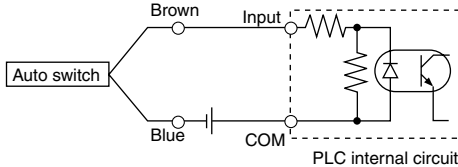


• Source input specifications 3-wire, PNP

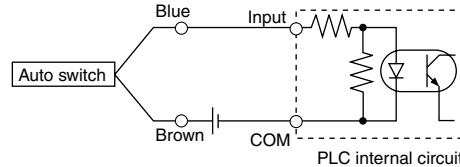


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

2-wire



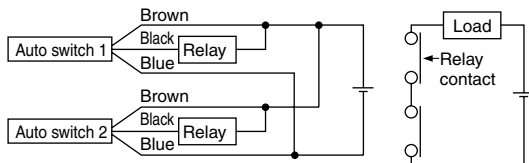
2-wire



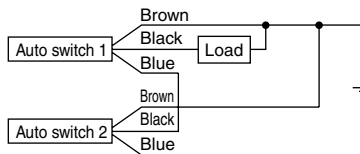
Example of AND (Series) and OR (Parallel) Connection

• 3-wire

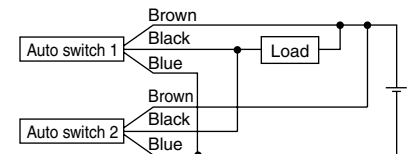
AND connection for NPN output (Using relays)



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



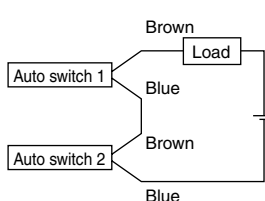
OR connection for NPN output



The indicator lights will light up when both auto switches are turned ON.

• 2-wire

2-wire with 2-switch AND connection

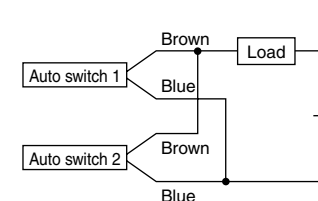


When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

Load voltage at ON = Power supply voltage – Residual voltage x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

Example: Power supply is 24 VDC
Internal voltage drop in auto switch is 4 V.

2-wire with 2-switch OR connection



(Solid state)

When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

Example: Load impedance is 3 kΩ.
Leakage current from auto switch is 1 mA.

(Reed)

Because there is no current leakage, the load voltage will not increase when turned OFF. 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.

Solid State Auto Switch Direct Mounting Style D-M9N(V)/D-M9P(V)/D-M9B(V) C €



Refer to SMC website for the details of the products conforming to the international standards.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)						
Auto switch model	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when turned ON.					
Standard	CE marking					

- Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9B(V)), 3 cores (D-M9N(V), D-M9P(V))

Note 1) Refer to page 180 for solid state auto switch common specifications.

Note 2) Refer to page 180 for lead wire lengths.

Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.



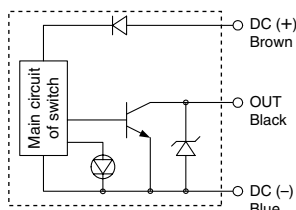
Caution

Precautions

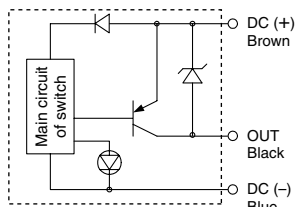
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

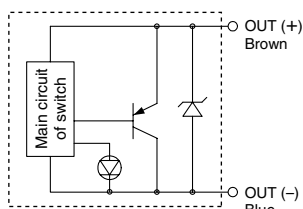
D-M9N(V)



D-M9P(V)



D-M9B(V)

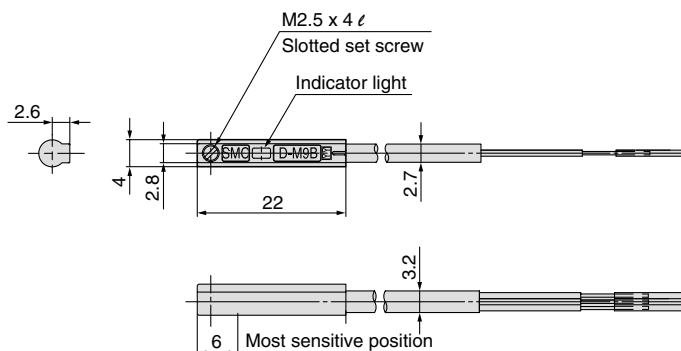


Mass

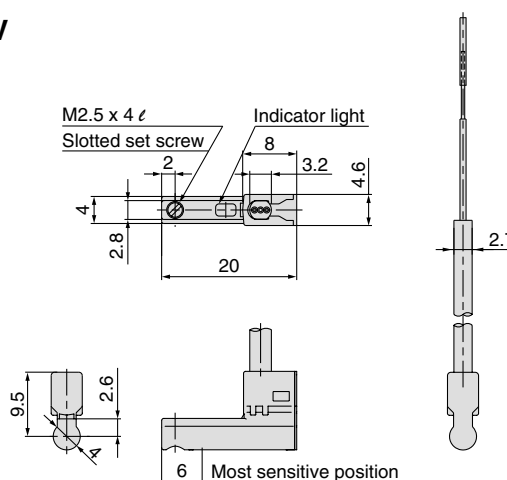
Auto switch model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

Dimensions

D-M9□



D-M9□V



Water Resistant 2-Color Indication Solid State Auto Switch: Direct Mounting Style D-M9NA(V)/D-M9PA(V)/D-M9BA(V) C €

Grommet

- Water (coolant) resistant type
- 2-wire load current is reduced (2.5 to 40 mA).
- The optimum operating position can be determined by the color of the light. (Red → Green ← Red)
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.



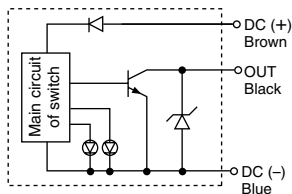
⚠ Caution

Precautions

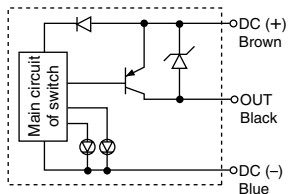
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

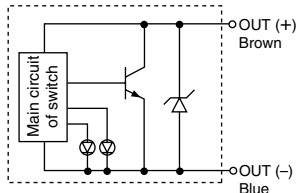
D-M9NA(V)



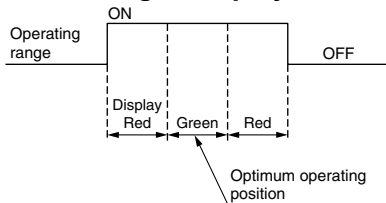
D-M9PA(V)



D-M9BA(V)



Indicator light/Display method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□A, D-M9□AV (With indicator light)						
Auto switch model	D-M9NA	D-M9NAV	D-M9PA	D-M9PAV	D-M9BA	D-M9BAV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating position Red LED illuminates. Optimum operating position Green LED illuminates.					
Standard	CE marking					

- Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9BA(V)), 3 cores (D-M9NA(V), D-M9PA(V))

Note 1) Refer to page 180 for solid state auto switch common specifications.

Note 2) Refer to page 180 for lead wire lengths.

Mass

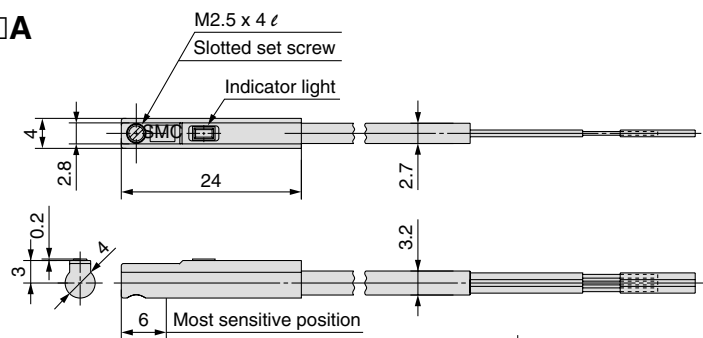
(g)

Auto switch model		D-M9NA(V)	D-M9PA(V)	D-M9BA(V)
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

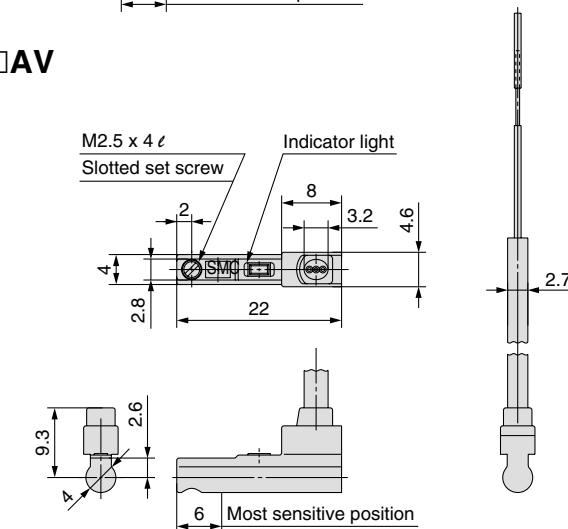
Dimensions

(mm)

D-M9□A



D-M9□AV



Reed Auto Switch Direct Mounting Style D-A90(V)/D-A93(V)/D-A96(V)



Grommet



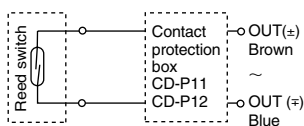
Caution

Precautions

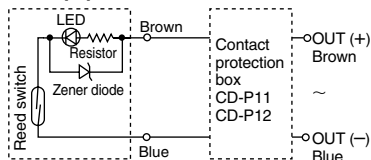
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

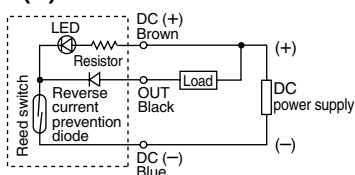
D-A90(V)



D-A93(V)



D-A96(V)



Note 1) Operating load is an induction load.

Note 2) Wiring to the load is 5 m or longer.

Note 3) Load voltage is 100 VAC.

Use the contact protection box in any of the above listed situations. The contact point life may decrease. (Refer to page 181 for contact protection box.)

Auto Switch Specifications



Refer to SMC website for the details of the products conforming to the international standards.

PLC: Programmable Logic Controller

D-A90, D-A90V (Without indicator light)			
Auto switch model	D-A90, D-A90V		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V ^{AC} _{DC} or less	48 V ^{AC} _{DC} or less	100 V ^{AC} _{DC} or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 Ω or less (Including lead wire length of 3 m)		
Standard	CE marking		
D-A93, D-A93V, D-A96, D-A96V (With indicator light)			
Auto switch model	D-A93, D-A93V		D-A96, D-A96V
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
^{Note 3)} Load current range and Maximum load current	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93: 2.4 V or less (up to 20 mA)/3 V or less (up to 40 mA) D-A93V: 2.7 V or less		0.8 V or less
Indicator light	Red LED illuminates when turned ON.		
Standard	CE marking		

Lead wires

D-A90(V)/D-A93(V)—Oilproof heavy-duty vinyl cord, ø2.7, 0.18 mm² x 2 cores (Brown, Blue), 0.5 m

D-A96(V)—Oilproof heavy-duty vinyl cord, ø2.7, 0.15 mm² x 3 cores (Brown, Black, Blue), 0.5 m

Note 1) Refer to page 180 for reed auto switch common specifications.

Note 2) Refer to page 180 for lead wire lengths.

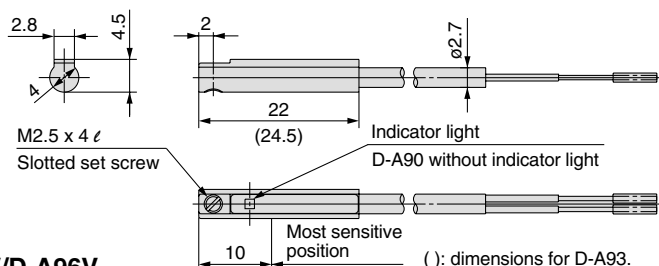
Note 3) Under 5 mA, the strength of the indicator light is poor. In some cases, visibility of the indicator light will not be possible where the output signal is less than 2.5 mA. However, there is no problem in terms of contact output, when an output signal exceeds 1 mA or more.

Mass

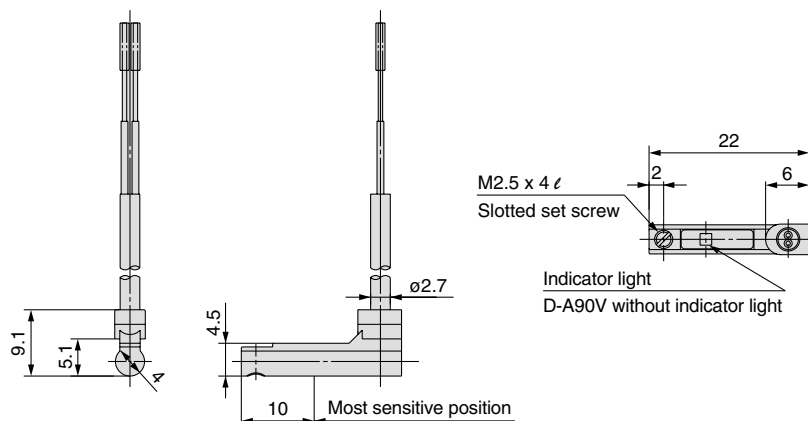
Model		D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length (m)	0.5	6	6	6	6	8	8
	3	30	30	30	30	41	41

Dimensions

D-A90/D-A93/D-A96



D-A90V/D-A93V/D-A96V



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

Magnetic Field Resistant 2-Color Indication Solid State Auto Switch

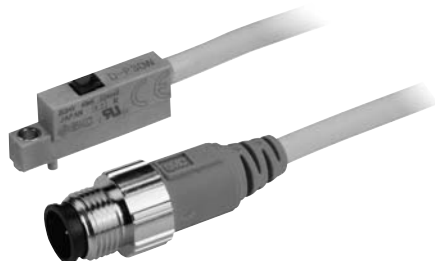
D-P3DWSC/D-P3DWSE

(Electrical entry: Pre-wired connector)



Refer to SMC website for the details of the products conforming to the international standards.

- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- The optimum operating position can be determined by the color of the light.
(Red → Green ← Red)



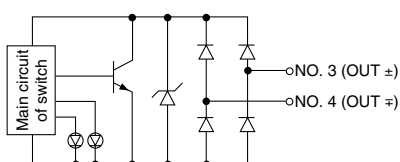
Caution

Precautions

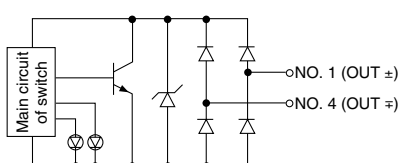
For single-phase AC welding machines. If it is used for current inverter welders (including rectifying type) and condenser type welders, the magnetic field resistance is reduced. Please contact SMC regarding the performance.

Auto Switch Internal Circuit

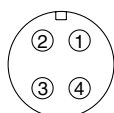
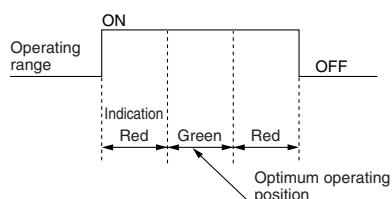
D-P3DWSC



D-P3DWSE



Indicator light/Display method



Connector pin

Auto Switch Specifications

PLC: Programmable Logic Controller

D-P3DWSC/E (With indicator light)		
Auto switch model	D-P3DWSC	D-P3DWSE
Applicable load	24 VDC relay, PLC	
Load voltage	24 VDC (20 to 28 VDC)	
Load current	6 to 40 mA	
Internal voltage drop	5 V or less	
Leakage current	1 mA or less at 24 VDC	
Operating time	40 ms or less	
Indicator light	Operating position.....Red LED illuminates. Optimum operating position.....Green LED illuminates.	
Standard	CE marking, UL (CSA)	

- Lead wires — Oilproof heavy-duty vinyl cord, $\phi 4.8$, 0.5 mm², 2 cores
- Impact resistance — Switch: 1000 m/s², Connector: 300 m/s²
- Polarity: Non-polar

Note) Refer to page 180 for solid state auto switch common specifications.

Magnetic Field Resistance

If the current of the AC welding machine is 16000 A or lower, the auto switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder/actuator or auto switch is 0 mm.

Please contact SMC when the AC welding current exceeds 16000 A.

Mass

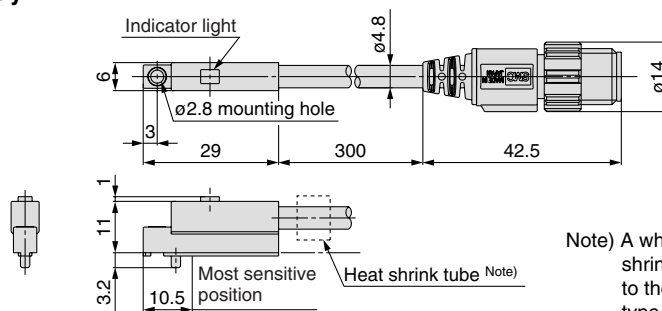
Unit: g

Auto switch model	D-P3DWSC	D-P3DWSE
Lead wire length (m)	0.3	23

Dimensions

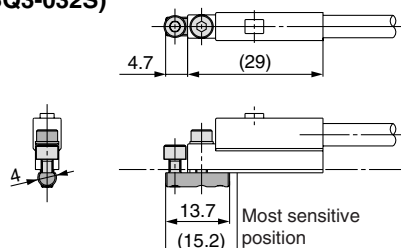
Unit: mm

Body



Auto switch mounting bracket

(For round groove mounting: BQ3-032S)



* When the auto switch is ordered on its own, the auto switch mounting bracket is not enclosed. In that case, please order it separately.

Magnetic Field Resistant 2-Color Indication Solid State Auto Switch

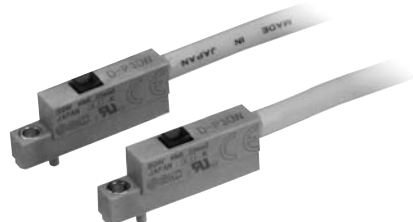
D-P3DW/L/Z

(Electrical entry: Grommet)



Refer to SMC website for the details of the products conforming to the international standards.

- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- The optimum operating position can be determined by the color of the light.
(Red → Green ← Red)



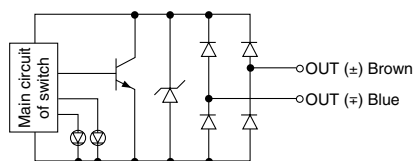
⚠ Caution

Precautions

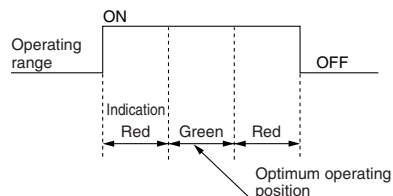
For single-phase AC welding machines. If it is used for current inverter welders (including rectifying type) and condenser type welders, the magnetic field resistance is reduced. Please contact SMC regarding the performance.

Auto Switch Internal Circuit

D-P3DW/L/Z



Indicator light/Display method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-P3DW/L/Z (With indicator light)	
Auto switch model	D-P3DW/L/Z
Applicable load	24 VDC relay, PLC
Load voltage	24 VDC (20 to 28 VDC)
Load current	6 to 40 mA
Internal voltage drop	5 V or less
Leakage current	1 mA or less at 24 VDC
Operating time	40 ms or less
Indicator light	Operating position.....Red LED illuminates. Optimum operating position.....Green LED illuminates.
Standard	CE marking, UL (CSA)

- Lead wires — Oilproof heavy-duty vinyl cord, $\phi 4.8$, 0.5 mm², 2 cores,
 - Polarity: Non-polar
- Note 1) Refer to page 180 for solid state auto switch common specifications.
Note 2) Refer to page 180 for lead wire lengths.

Magnetic Field Resistance

If the current of the AC welding machine is 16000 A or lower, the auto switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder/actuator or auto switch is 0 mm.

Please contact SMC when the AC welding current exceeds 16000 A.

Mass

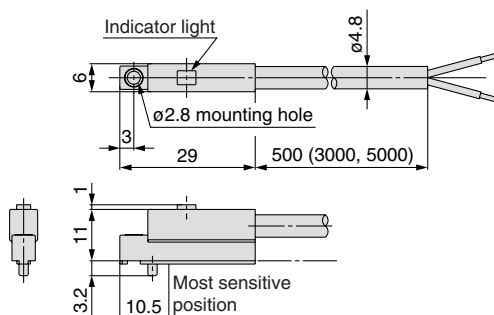
Unit: g

Auto switch model	D-P3DW/L/Z	
Lead wire length (m)	0.5	20
	3	102
	5	168

Dimensions

Unit: mm

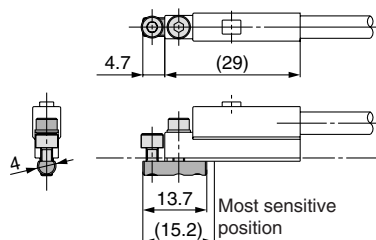
Body



Auto switch mounting bracket

(For round groove mounting:

BQ3-032S)



* When the auto switch is ordered on its own, the auto switch mounting bracket is not enclosed. In that case, please order it separately.

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. Contact your SMC sales representative if necessary.

Symbol	Specifications	CQ2 (Standard)				CQ2 (Large Bore Size) ^{Note 2)}	
		Double acting		Single acting		Double acting	
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod
-XA0 to XA30	Change of rod end shape	●	●	●	●		

Made to Order

Symbol	Specifications	CQ2 (Standard)				CQ2 (Large Bore Size)	
		Double acting		Single acting		Double acting	
		Single rod	Double rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod	Double rod
-XB6	Heat resistant cylinder (-10 to 150°C)	●	●				
-XB7	Cold resistant cylinder	●	●				
-XB9	Low-speed cylinder (10 to 50 mm/s)	●	●				
-XB10	Intermediate stroke (Using exclusive body)	●	●	●		●	●
-XB11	Long stroke (Air-hydro type only)	●					
-XB13	Low-speed cylinder (5 to 50 mm/s)	●	●				
-XB14	Cylinder with heat resistant auto switch ^{Note 2)}	●					
-XC4	With heavy duty scraper	●	●				
-XC6	Made of stainless steel (Rod, retaining ring, rod end nut 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 a split pin for double clevis pin and double knuckle pin and a flat washer	●		●	●		
-XC27	Double clevis and double knuckle joint pins made of stainless steel 304	●		●	●		
-XC35	With coil scraper	●	●				
-XC36	With boss on rod end	●	●	●	●		
-X144	Special port location	●	●	●	●		
-X202	Full length dimension is the same as Series CQ1.	●		●	●		
-X203	L dimension from rod cover is the same as Series CQ1.	●		●	●		
-X235	Special piston rod end for double rod cylinder		●				●
-X271	Fluororubber for seals	●	●	●	●	●	●
-X293	Full length dimension is the same as Series CQ1W.		●				
-X525	Long stroke of adjustable extension stroke cylinder (-XC8)	●					
-X526	Long stroke of adjustable retraction stroke cylinder (-XC9)	●					
-X633	Intermediate stroke of double rod cylinder		●				●
-X636	Long stroke of dual stroke single rod cylinder	●					
-X1876	Cylinder tube: With concave boss on head end	●		●	●		

CQ2 (Long Stroke) Double acting		CQ2K (Non-rotating Rod) Double acting		CQP2 (Axial Piping) Note 2)			CQ2□S (Anti-lateral Load) Double acting		CBQ2 (With End Lock) Note 2)		Page
Single rod		Single rod	Double rod	Single rod	Single rod/ Spring return	Single rod/ Spring extend	Single rod		Single rod		P. 191
●		●	●	●	●	●	●				
				●							P. 195
				●							P. 195
				●							P. 196
●		●	●				●				P. 197
				●							P. 198
				●							P. 198
●				●							P. 199
●				●	●	●	●				P. 200
		●									P. 200
		●									P. 201
		●									P. 202
		●									P. 203
		●									P. 204
●		● Note 1)					●		●		P. 205
							●				P. 206
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											P. 214
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			●								P. 215
		●					●				P. 216
											P. 217

Note 1) Only for ø40 to ø63. ø12 to ø32 are available as a special product. Note 2) 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

CQ2 (ø12 to ø25): Change of Rod End Shape

Applicable Series

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

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

⚠ Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "*" will be as follows to the rod diameter (D).
Enter any special dimension you desire.
ø12, ø16 → D - 1 mm ø20, ø25 → D - 2 mm
- In the case of double rod, fill in the dimension when the rod is retracted.
- It is impossible to manufacture when XA17 and XA18 are the same male thread diameter as the piston rod external diameter.
- Please contact SMC separately for the piston rod end pattern part numbers other than the table on the left and the cases other than the manufacturing conditions.

Symbol: A1 	Symbol: A2 	Symbol: A6 	Symbol: A7 With chamfer
Symbol: A11 	Symbol: A17 	Symbol: A18 	

Symbol

-XA1/2/6/7/11/17/18**Conditions of Manufacture**

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

Standard

Large Bore
Size

Long Stroke

Non-rotating
Rod

Axial Piping

Anti-lateral
Load

With End Lock

Water
ResistantWith Auto
Switch

Auto Switch

Made to Order

CQ2 (ø32 to ø100): Change of Rod End Shape

Applicable Series

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

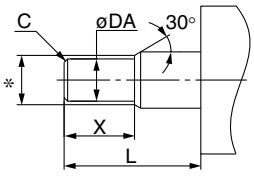
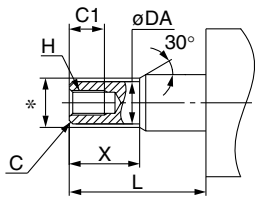
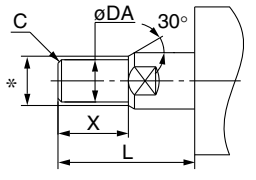
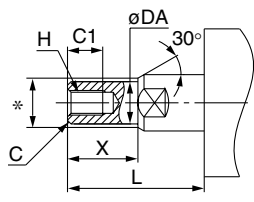
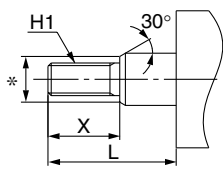
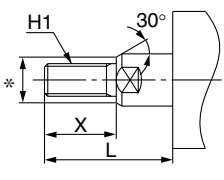
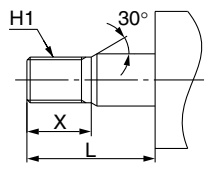
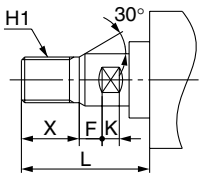
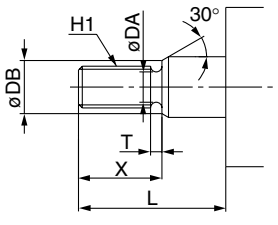
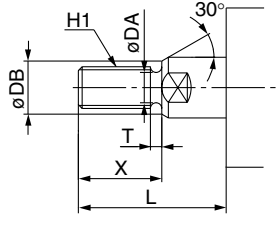
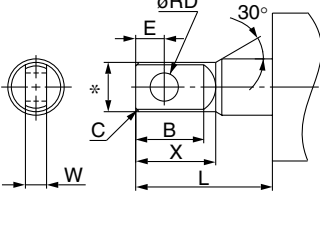
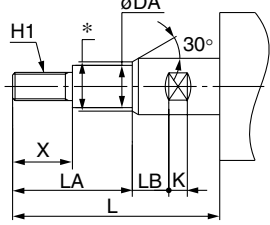
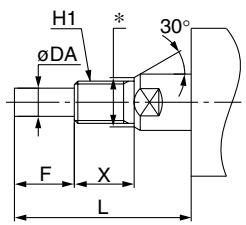
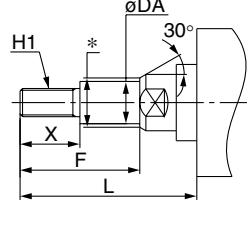
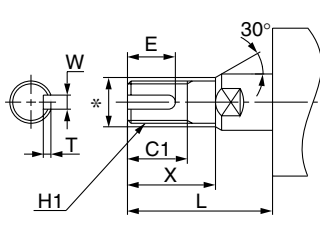
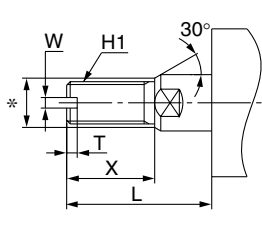
Note) Applicable for ø125 to ø200

⚠ Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "*" will be as follows to the rod diameter (D).
Enter any special dimension you desire.
D – 2 mm
- In the case of double rod, fill in the dimension when the rod is retracted.

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

Symbol
-XA1 to XA23/-XA26 to XA30

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)

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from −10°C.

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 with rubber bumper

How to Order

CQ2
CQ2W
CQP2

Standard model no. — XB6

Heat resistant cylinder ●

Specifications

Ambient temperature range	−10 to 150°C
Seal material	Fluororubber
Grease	Heat resistant grease
Specifications other than above and external dimensions	Same as standard



- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. But, as for the one with auto switch, and the heat resistant cylinder with heat resistant auto switch, since it will be differed depending on the series, please contact SMC.
 Note 4) Piston speed is ranged from 50 to 500 mm/s.
 Note 5) For cylinders with rubber bumper, please contact SMC.

Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Symbol

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

Air cylinder which changed the seal material and grease, so that it could be used even at lower temperature down to −40°C.

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 ø50 or more, with switch, with rubber bumper, with bracket

How to Order

CQ2
CQ2W
CQP2

Standard model no. — XB7

Cold resistant cylinder ●

Specifications

Ambient temperature range	−40 to 70°C
Seal material	Low nitrile rubber
Grease	Cold resistant grease
Auto switch	Not mountable
Dimensions	Same as standard
Additional specifications	Same as standard



- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Use dry air which is suitable for heatless air dryer, etc. not to cause the moisture to be frozen.
 Note 3) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 4) Mounting auto switch is impossible.
 Note 5) For cylinders with rubber bumper, please contact SMC.

Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Symbol

-XB9 Low-speed Cylinder (10 to 50 mm/s)

Even if driving at lower speeds 10 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

Applicable Series

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

How to Order

C□Q2

C□Q2W

C□QP2

Standard model no.

— XB9

Low speed cylinder ●

Specifications

Piston speed	10 to 50 mm/s
Dimensions	Same as standard
Additional specifications	Same as standard



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.

Standard

Large Bore
Size

Long Stroke

Non-rotating
Rod

Axial Piping

Anti-lateral
Load

With End Lock

Water
Resistant

With Auto
Switch

Auto Switch

Made to Order

Series CQ2

Made to Order 2

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

-XB10 Intermediate Stroke (Using exclusive body)

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	
	Non-rotating rod	CQ2K	Double acting, Single rod	Except ø12 to 32
	Large bore size	CQ2	Double acting, Single rod	
		CQ2W	Double acting, Double rod	
	Long stroke	CQ2	Double acting, Single rod	

How to Order

C□CQ2

C□CQ2W

C□CQ2K

Standard model no.

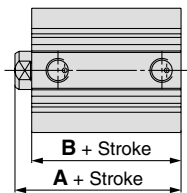
— XB10

Intermediate stroke ●

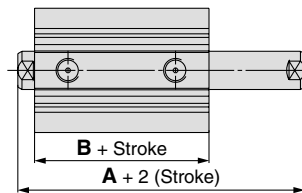
Specifications: Same as standard.

Dimensions: Series CQ2

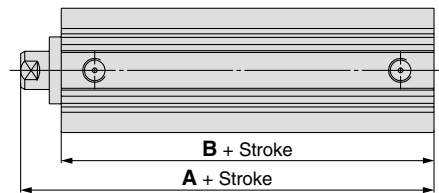
Double acting, Single rod



Double acting, Double rod



Double acting, Single rod/Long stroke



Bore size (mm)	Single rod				Applicable stroke
	A		B		
	49 stroke or less	51 to 99 stroke	49 stroke or less	51 to 99 stroke	Range (mm)
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)	Double rod				Applicable stroke
	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 (Long stroke)		Applicable stroke
	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	

* Dimensions of "with auto switch" and those of "without auto switch" are the same.



* (): Dimensions with auto switch

* Dimensions other than listed at left are the same as standard.

Note) Applicable stroke available by the 1 mm interval.

Bore size (mm)	Single rod (Single acting/Spring return)		Applicable stroke
	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

* (): Dimensions with auto switch

Symbol

-XB11 Long Stroke

Stroke which exceeds the standard stroke length

Applicable Series

Series	Model	Action	Note
CQ2	Air-hydro type (ø32 to ø100)	CQ2AH	Double acting, Single rod
Dimensions are the same as the CQ2 series long stroke type air cylinder.			

How to Order

Specifications: Same as standard.

Standard model no. **-XB11**

Long stroke type ●
* Enter a symbol for stroke required.

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 Long stroke, Non-rotating rod, Anti-lateral load			
Except Non-rotating rod			

How to Order

☐ CQ2
☐ CQ2W
☐ CQP2

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
Dimensions	Same as standard
Additional specifications	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.

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

-XB14 Cylinder with Heat Resistant Auto Switch

Heat resistant compact cylinder Series CDQ2 (ø16 to ø63) which can mount heat resistant solid state switch. (D-F7NJ $\frac{1}{2}$, Max. 150°C)

Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod Applicable to ø16 to ø63 Except the one with rubber bumper Body shape: Same as the existing product

How to Order

CDQ2 Standard model no. — F7NJL — XB14

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

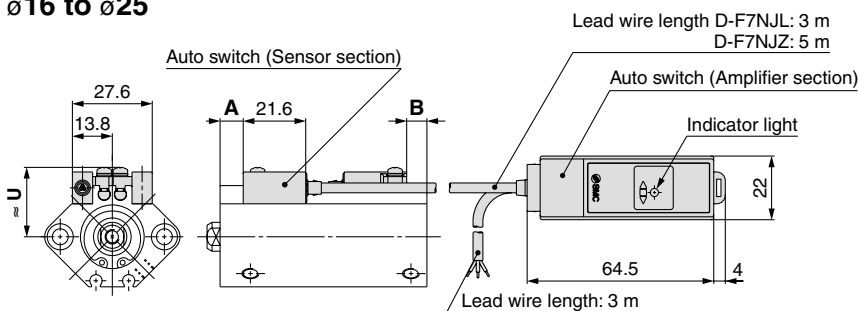
Bore size (mm)	Standard stroke (mm)									
	15	20	25	30	35	40	45	50	70	100
16	●	●	●	●						
20	●	●	●	●	●	●	●	●		
25	●	●	●	●	●	●	●	●		
32	●	●	●	●	●	●	●	●	●	●
40	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●	●	●	●
63	●	●	●	●	●	●	●	●	●	●

• Manufacturing of intermediate strokes
Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.

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

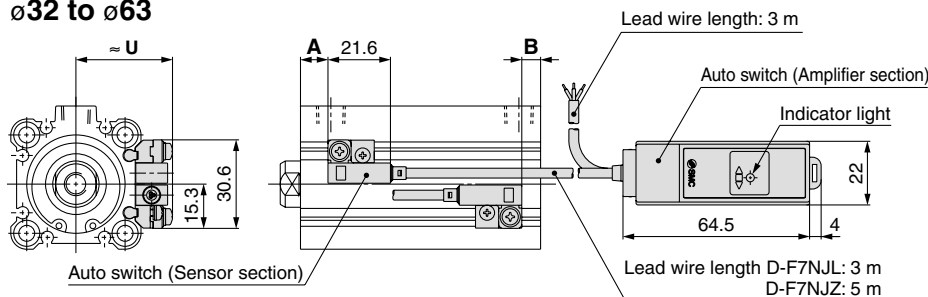
Auto Switch Proper Mounting Position (Detection at Stroke End)

ø16 to ø25



Bore size (mm)	(mm)		
	A	B	U
16	8	5.5	22.5
20	8	7	25.5
25	8	7.5	28
32	9.5	6.5	36
40	13.5	9	38
50	11.5	12	43.5
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)	BQ4-012			BQ5-032			

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Mass (g)
BQ4-012	1.5
BQ5-032	3.4

* Dimensions on the cylinder body is equivalent to the standard type, 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 table above.

Note 2) Tightening torque for auto switch mounting M3 screw should be set as 0.5 to 0.7 N·m.

Symbol

-XC4 With Heavy Duty Scraper

It is 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
	Axial piping	CQP2	Double acting, Single rod
	Long stroke	CQ2	Double acting, Single rod

How to Order

C□Q2
C□QP2

Standard model no. — **XC4**

With heavy duty scraper (SCB scraper)

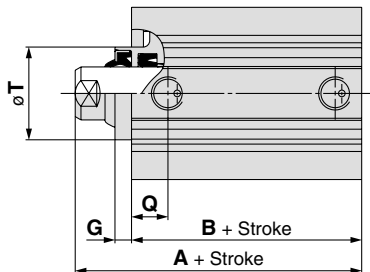
Specifications: Same as standard.

⚠ Caution

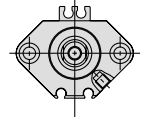
Do not replace heavy duty scrapers.

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

Series CQ2



- (): Dimensions with auto switch
- Other dimensions are the same as for CQ2/standard type.
- Bore size 32, without switch, 5 strokes: Q-dimension is 21.5.
- Relation between bore size 12 to 32 piping port and mounting holes is as the following diagram.
- Please contact SMC for bracket style.
- Applicable stroke available by the 5 mm interval.



Without switch: Bore size 20 to 32 With switch: Bore size 20, 25
With switch: Bore size 32

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 Made of Stainless Steel

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting, Single rod
		Single acting (Spring return/extend)	
	Axial piping	CQ2W	Double acting, Double rod
		CQP2	Double acting, Single rod
	Long stroke	Single acting (Spring return/extend)	
		CQ2	Double acting, Single rod
Anti-lateral load	CQ2	Double acting, Single rod	
	CQ2□S	Double acting, Single rod	

How to Order

C□Q2
C□Q2W
C□QP2
C□Q2□S

Standard model no. — **XC6**

Made of stainless steel

Specifications

Parts changed to stainless steel	Piston rod, Rod end nut
Specifications other than above and external dimensions	Same as standard



Note) The 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 CQ2

Made to Order 4

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

-XC8 Adjustable Stroke Cylinder/Adjustable Extension Type

It adjusts the extending stroke by the stroke adjustable mechanism equipped in the head side. (After the stroke is adjusted, with cushion on both sides is altered to single-sided, with cushion.)

Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Double acting
	Non-rotating rod	CQ2K	Double acting
	Air-hydro type	CQ2H	Double acting

How to Order

C□Q2B(H) **Bore size** — **Stroke** D(M)(Z) — XC8

Adjustable stroke cylinder/Adjustable extension type

Specifications

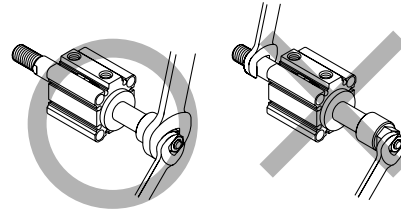
Series	Stroke adjustment range (mm)
CQ2	0 to 10

Note) Specifications other than above are the same as standard.

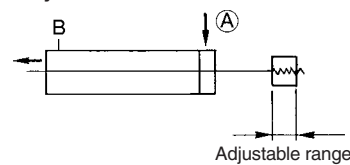
Precautions

Warning

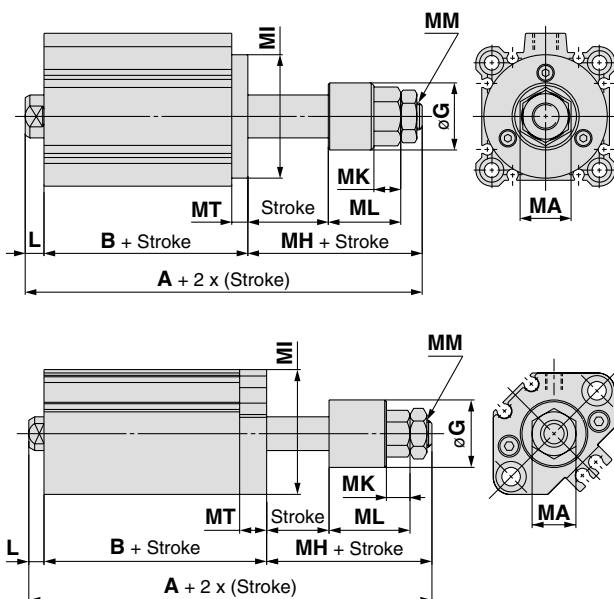
- When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
- To adjust the stroke, make sure to secure the wrench flats of the stopper bracket by a wrench, etc. before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side could loosen first. It may cause an accident or malfunction.



Symbol



Series CQ2/CQ2H



Bore size	A	B	L	MH	MT	MA	MI	MM	MK	ML	MG	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	
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	
32	78.5 (88.5)	36.5 (46.5)	7	35	6	17	ø38	M8 x 1.25	8	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 by the 5 mm interval

Symbol

-XC9 Adjustable Stroke Cylinder/Adjustable Retraction Type

The retract 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 ●

(After adjusting stroke, model with rubber bumper on both ends is changed to with rubber bumper on single end.)

Specifications

Series	Stroke adjustment range (mm)
CQ2	0 to 10

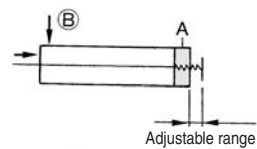
Note) Specifications other than above are the same as standard.

Precautions

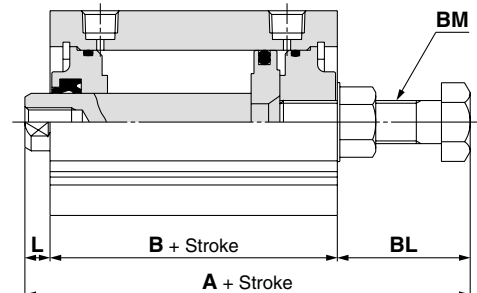
⚠ Warning

- 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 injure personnel 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	A	B	L	BL	BM	Stroke range (mm)
12	52 (59.2)	25.2 (32.4)	3.5	23.3	M5 x 0.8	5 to 30
16	53 (63)	26 (36)	3.5	23.5	M6 x 1	
20	61 (73)	26 (38)	4.5	30.5	M8 x 1.25	5 to 50
25	63.5 (73.5)	29 (39)	5	29.5	M8 x 1.25	
32	65.5 (75.5)	30.5 (40.5)	7	28	M8 x 1.25	
40	84 (94)	40 (50)	7	37	M12 x 1.5	10 to 50
50	84.5 (94.5)	40.5 (50.5)	8	36	M12 x 1.5	
63	88.5 (98.5)	42 (52)	8	38.5	M16 x 1.5	
80	109.5 (119.5)	51 (61)	10	48.5	M20 x 1.5	
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 by the 5 mm interval

Series CQ2

Made to Order 5

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	Double acting, Single rod	Except with bracket
	Air-hydro type		

How to Order

C□Q2B Bore size – Stroke S₁ + Stroke S₂ D(C)(M)(Z) – XC10

Dual stroke cylinder

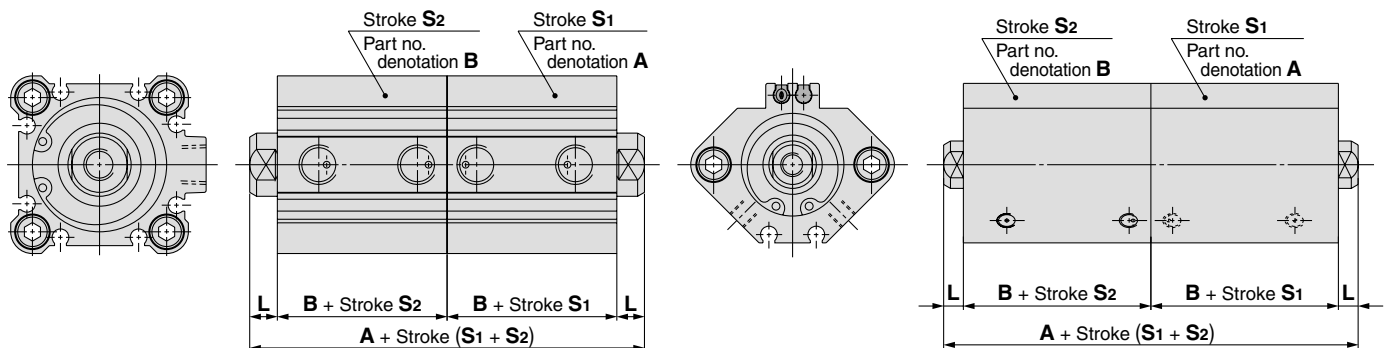
Specifications

Series	Bore size (mm)	Largest 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) Specifications other than above are the same as standard.

Construction/Dimensions (Other dimensions are the same as standard.)

Series CQ2



Bore size (mm)	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	5 to 100
40	73 (93)	93 (93)	29.5 (39.5)	39.5 (39.5)	7	
50	77 (97)	97 (97)	30.5 (40.5)	40.5 (40.5)	8	
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	10 to 100

Note 1) (): Dimensions with auto switch

Note 2) Applicable stroke available by the 5 mm interval

Note) In the case of bore sizes ø12 to ø25 with auto switch, port directions are different.

Symbol

-XC11 Dual Stroke Cylinder/Single Rod

Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.

Applicable Series

Series	Model	Action	Note
CQ2	Standard	Double acting, Single rod	Except with bracket
	Air-hydro type		

How to Order

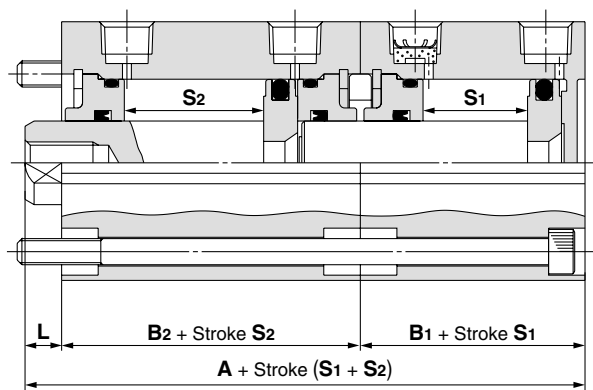
C□Q2B **Bore size** – **Stroke S₁** + **Stroke S₂ - S₁** **D(C)(M)(Z) – XC11**
 Dual stroke cylinder/Single rod

Specifications: Same as standard.

(For manufacturable stroke, 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	
40	76.5 (96.5)	29.5 (39.5)	40 (50)	7	
50	79 (99)	30.5 (40.5)	40.5 (50.5)	8	10 to 50
63	86 (106)	36 (46)	42 (52)	8	
80	104.5 (124.5)	43.5 (53.5)	51 (61)	10	
100	125.5 (145.5)	53 (63)	60.5 (70.5)	12	

Note 1) (): Dimensions with auto switch

Note 2) Applicable stroke available by the 5 mm interval

Note 3) Please contact SMC for long stroke type.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

Series CQ2

Made to Order 6

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

-XC26 With a Split Pin for Double Clevis Pin and Double Knuckle Pin and a Flat Washer

The pin of a double clevis (one of the mounting types) or a double knuckle joint (one of the accessories) is changed for a split pin, and the split pin and flat washer are added.

Applicable Series

Series	Model	Action
CQ2	Standard	CQ2
		Double acting, Single rod
		Single acting (Spring return/extend)
	Long stroke	CQ2□
	Anti-lateral load	CQ2□S
	Non-rotating rod	CQ2K
	Magnetic field resistant	CDQ2□P
	Copper-free compact	20-CQ2
		Double acting, Single rod
		Single acting (Spring return/extend)
	Copper-free long stroke	20-CQ2□
	Copper-free anti-lateral load	20-CQ2□S
		Double acting, Single rod

How to Order

● Product

CQ2D Standard model no. — XC26

• Double clevis

With double clevis pin, split pin and flat washer

● Parts assembly

CQ — D 032 — XC26

• Double clevis

• Double clevis pin

Bore size

012	12 mm
016	16 mm
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Y — G012, Z015A, G02, G03, G04, G05, G08, G10 — XC26

• Double knuckle joint

With double knuckle joint pin, split pin, and flat washer

IY — G012, J015SUS*, G02, G03, G04, G05, G08, G10 — XC26

• Clevis pin

• Knuckle pin

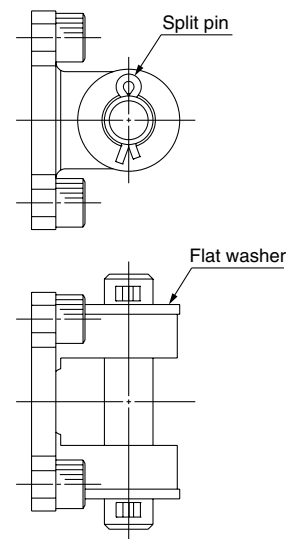
With clevis pin, knuckle pin, split pin, and flat washer

Specifications

Mounting	Double clevis (D) only
Changed parts	Knuckle pin, split pin, flat washer
Specifications other than above	Same as standard

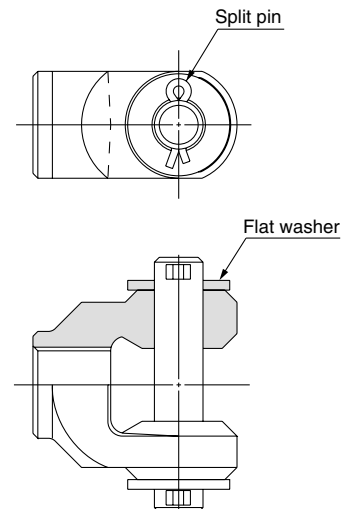
Dimensions: Same as Standard

Double clevis



- * For mounting bracket, split pin, clevis pin and flat washer are shipped together, (but not assembled).
- * Mounting method is the same as standard.

Double knuckle joint



- * For mounting bracket, split pin, knuckle pin and flat washer are shipped together, (but not assembled).
- * Mounting method is the same as standard.

Symbol

-XC27 Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel 304

To prevent 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	CQ2
		Double acting, Single rod
		Single acting (Spring return/extend)
	Long stroke	CQ2□
	Anti-lateral load	CQ2□S
	Non-rotating rod	CQ2K
	Magnetic field resistant	CDQ2□P
	Copper-free compact	20-CQ2
		Double acting, Single rod
		Single acting (Spring return/extend)
	Copper-free long stroke	20-CQ2□
	Copper-free anti-lateral load	20-CQ2□S
		Double acting, Single rod

How to Order

● **Product**

CQ2D — Standard model no. — XC27

• Double clevis

• Double clevis pin made of stainless steel

● **Parts assembly**

CQ — D 032 — XC27

• Double clevis

• Bore size

• Double clevis pin made of stainless steel

012	12 mm
016	16 mm
020	20 mm
025	25 mm
032	32 mm
040	40 mm
050	50 mm
063	63 mm
080	80 mm
100	100 mm

Y — G012, Z015A, G02, G03, G04, G05, G08, G10 — XC27

• Double knuckle joint

• Double knuckle joint pin made of stainless steel

IY — G012, J015SUS*, G02, G03, G04, G05, G08, G10 — XC27

• Clevis pin

• Knuckle pin

• Clevis pin made of stainless steel

• Knuckle pin

Specifications

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

Dimensions: Same as Standard

- * Mounting brackets are shipped together, (but not assembled).
- * Mounting method is the 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 7

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

-XC35 With Coil Scraper

It gets rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and protects the seals, etc.

Applicable Series

Series	Model	Action	Note
CQ2	Standard	CQ2	Applicable to ø32 to ø100, Except the one with bracket
		CQ2W	

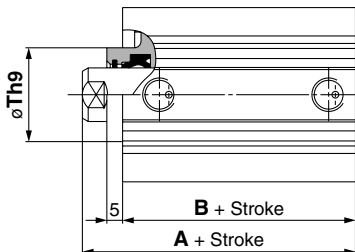
How to Order

Specifications: Same as standard.

Standard model no. — XC35

With coil scraper

Series CQ2



Bore size (mm)	A		B		Th9
	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 by the 5 mm interval

Symbol

-XC36 With Boss on Rod End

Cylinder with boss in rod side

Applicable Series

Series	Model	Action
CQ2	Standard	CQ2
		Single acting (Spring return/extend)
	Axial piping	CQ2W
		Double acting, Double rod
	CQP2	Double acting, Single rod
		Single acting (Spring return/extend)

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

Note 2) Except with bracket

Note 3) ø125 or more is excluded.

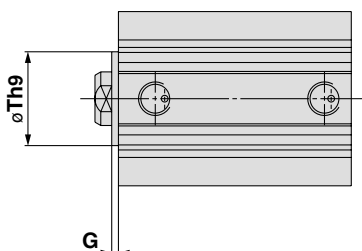
How to Order

Specifications: Same as standard.

Standard model no. — XC36

With boss on rod end

Dimensions



* Dimensions except mentioned above are the same as standard.

Series	CQ2	
	Th9	G
Bore size (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

This style is available for changing port location. (Only for $\phi 12$ to $\phi 25$ with auto switch)

How to Order

CDQ2 Standard model no. — X144 B

Special port location •

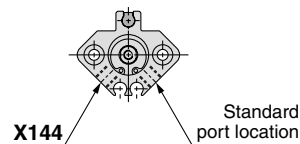
In the case of CDQ2□20/25, specify the port location with B, C and D.

Applicable Model

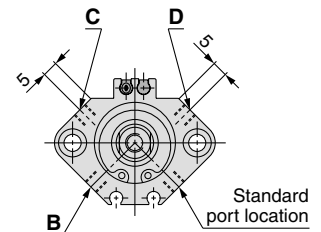
Action	Note
Double acting, Single rod	$\phi 12$ to $\phi 25$

Note) Specifications are the same as those of the CDQ2 series.

$\phi 12, \phi 16$



$\phi 20, \phi 25$



Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order

Series CQ2

Made to Order Individual Specifications 2

Please contact SMC for detailed dimensions, specifications, and lead times.



Symbol

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

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

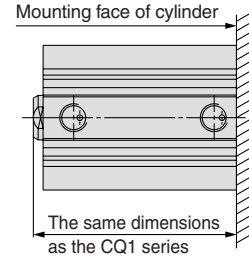
In a single rod style of the CQ2 series, A dimensions (from the head face to the rod end) and rod end female thread size are the same as the CQ1 series (previous model).

Applicable Model

Action		Note
Single rod	Double acting (Rubber bumper)	ø12, ø20, ø32, ø40, ø50, ø63, ø80, ø100
	Single acting (Spring return/ Spring extend)	ø12, ø20, ø32, ø40, ø50

Note 1) ø16 and ø25 are the new models so that they are not applicable.

Note 2) Strokes except mentioned below are available as standard products.

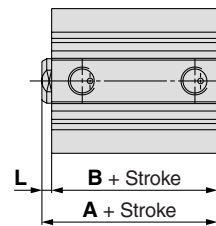
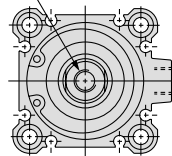


Specifications are the same as those of the CQ2 series standard.

Dimensions (Without auto switch)

**Double acting,
Single rod: Female thread**

H thread effective depth C



Bore size Stroke (mm)	ø12	ø20		ø32		ø40		ø50		ø63		ø80		ø100	
	15, 25	5, 10 20, 30 40, 50	15, 25 35, 45	5, 10 20, 30 40, 50	15, 25 35, 45	5, 10 20, 30 40, 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45	10, 20 30, 40 50	15, 25 35, 45
Symbol															
A	25.5	23 (25)	28	26.5 (28.5)	31.5	33	38	34	39	39.5	44.5	47	52	56.5	61.5
B	22	19.5	24.5	23	28	29.5	34.5	30.5	35.5	36	41	43.5	48.5	53	58
L	3.5	3.5 (5.5)	3.5	3.5 (5.5)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
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	

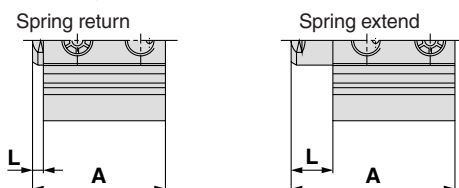
Note) (): Stroke 10 mm * H/C dimensions of ø32, ø40 and ø50 are different from the new CQ2 series model.

75 st, 100 st

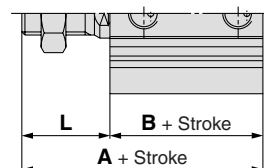
Bore size Stroke	ø32	ø40	ø50	ø63	ø80	ø100
Symbol	75 100	75 100	75 100	75 100	75 100	75 100
A	36.5	43	44	49.5	57	66.5
B	33	39.5	40.5	46	53.5	63
L	3.5	3.5	3.5	3.5	3.5	3.5

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

Single acting



Double acting: Rod end male thread



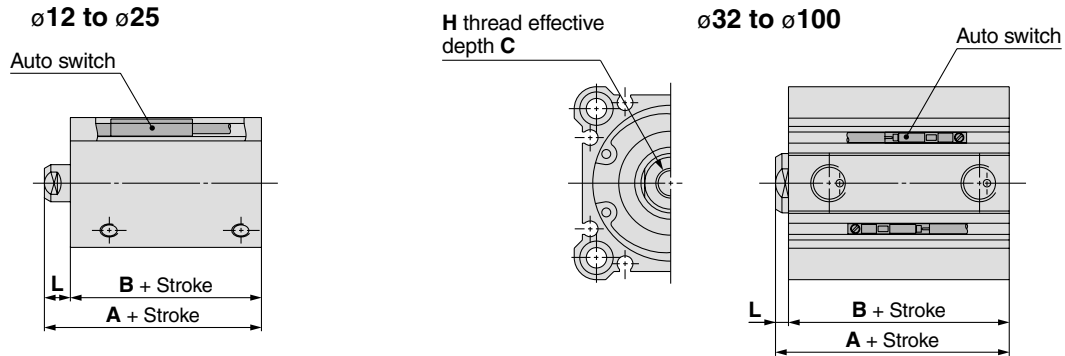
Action	Bore Stroke Symbol	ø20		ø32		ø40		ø50	
		5	10	5	10	5	10	10	20
Single acting, Spring return	A	28	35	31.5	38.5	38	43	44	54
	L	3.5	5.5	3.5	5.5	3.5		3.5	
Single acting, Spring extend	A	33	45	36.5	48.5	43	53	54	74
	L	8.5	15.5	8.5	15.5	8.5	13.5	13.5	23.5

Bore Stroke Symbol	ø12	ø20		ø32		ø40	ø50	ø63	ø80	ø100
	15, 25	10	15, 25 35, 45	10	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45
	A	36	40	43	53.5	56.5	63	69	74.5	92
B	22	19.5	24.5	23	28	34.5	35.5	41	48.5	58
L	14	20.5	18.5	30.5	28.5	28.5	33.5	33.5	43.5	43.5

Symbol
-X202

Dimensions (With auto switch)

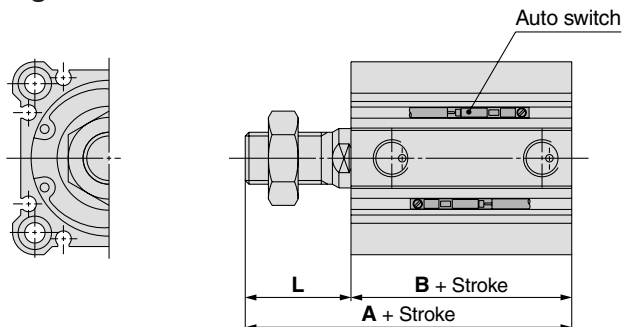
Double acting, Single rod: Female thread



Bore	ø12	ø20		ø32		ø40		ø50		ø63		ø80		ø100	
Stroke (mm)	15, 25	5, 10, 20 30, 40, 50	15, 25 35, 45	10, 20, 30 40, 50, 75 100	5, 15, 25 35, 45	10, 20, 30 40, 50, 75 100	5, 15, 25 35, 45	10, 20, 30 40, 50, 75 100	15, 25 35, 45	10, 20, 30 40, 50, 75 100	15, 25 35, 45	10, 20, 30 40, 50, 75 100	15, 25 35, 45	10, 20, 30 40, 50, 75 100	15, 25 35, 45
Symbol															
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	

* H/C dimensions of ø32, ø40 and ø50 are different from the new CQ2 series model.

Double acting: Rod end male thread



Bore	ø12	ø20		ø32	ø40	ø50	ø63	ø80	ø100
Stroke (mm)	15, 25	5, 10 20, 30 40, 50	15, 25 35, 45	5, 15, 25 35, 45	5, 15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45	15, 25 35, 45
Symbol									
A	47	53.5	58.5	66.5	73	79	84.5	102	111.5
B	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

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.

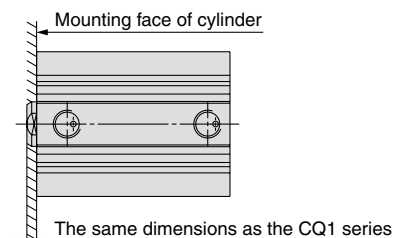
C□Q2 **Mounting** **Bore size** — 10 **Action** **Option** **Z — X203**

In a single rod cylinder of the CQ2 series, L dimension (from the rod face to the rod end) and 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	ø20, ø32, (ø40), (ø50), (ø63), (ø80), (ø100)
		Single acting (Spring return, Spring extend)	ø20, ø32, (ø40), (ø50)
	Male thread	Available as standard of the CQ2 series	

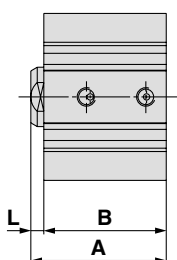
Note 1) ø16 and ø25 are the new models so that they are not applicable.
Note 2) (): Same dimensions as for -X202



Specifications are the same as those of the CQ2 series standard.

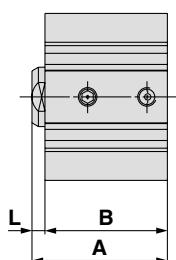
Dimensions: Applicable to CQ2B²⁰₃₂ -10D (C) Z Only

Double acting, Single rod



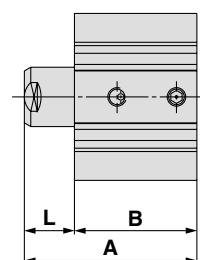
Symbol	Bore size	
	ø20	ø32
A	33	36.5
B	29.5	33
L	3.5	3.5

Single acting, Spring return



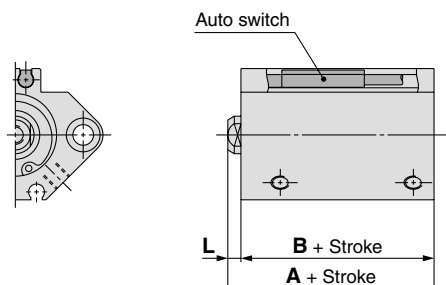
Symbol	Bore size	
	ø20	ø32
A	33	36.5
B	29.5	33
L	3.5	3.5

Single acting, Spring extend



Symbol	Bore size	
	ø20	ø32
A	43	46.5
B	29.5	33
L	13.5	13.5

With Auto Switch: Applicable to CQ2B-□D (C) (Z) Only



Symbol	Bore ø20	
	Stroke	Stroke
A	5, 10 20, 30 40, 50	15, 25 35, 45
B	35	40
L	31.5	36.5
L	3.5	3.5

Symbol

-X235 Special Piston Rod End for Double Rod Cylinder

Male thread is used at one piston rod end of double rod cylinder and female thread is used at the other end.

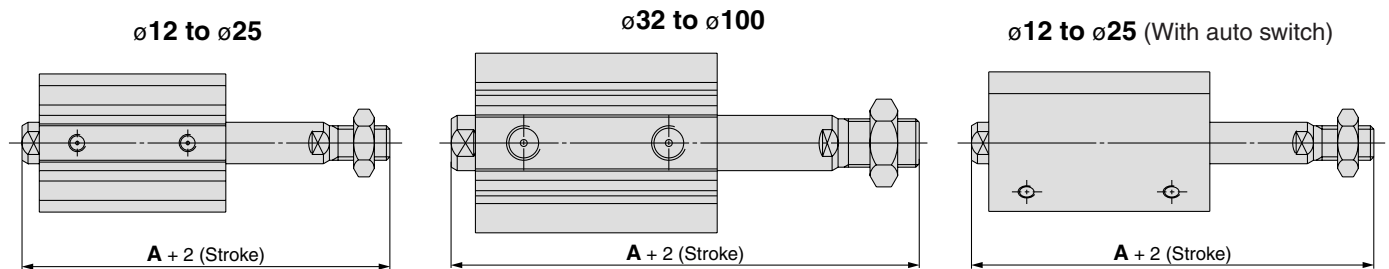
C□Q2W Mounting Bore size — Stroke D (Z) — X235

“D” in the case of “-X235”

Piston rod end
Male thread, Female thread

* Specifications: Same as standard.

Note) Please contact SMC for mounting bracket.



Symbol \ Bore (mm)	12	16	20	25	32	40	50	63	80	100
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)
Applicable stroke	5 to 30		5 to 50				10 to 50			

Note 1) Applicable stroke is available by the 5 mm interval.

Note 2) (): Dimensions with auto switch

Symbol

-X271 Fluororubber Seals

Material for seals is changed to fluororubber.

C□Q2 Standard model no. — X271

Fluororubber seals

* All variations except non-rotating rod is available.

Specifications are the same as for each variation of the CQ2 series.

Note) There is no change of the bumper material for a rubber bumper.

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

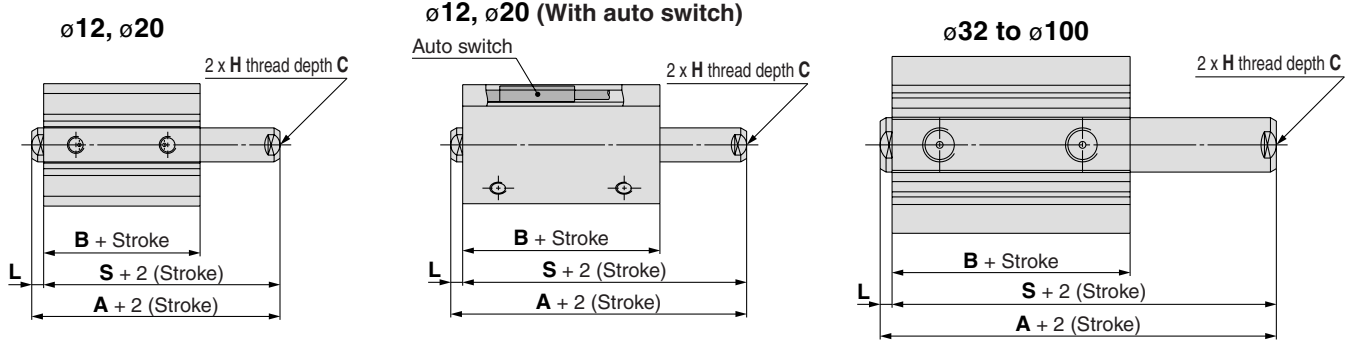
Full Length Dimension is the Same as the CQ1W Series.

C□Q2W

Standard model no.

— X293

The same dimensions as CQ1W



Without Auto Switch

Bore (mm) Stroke (mm)	12	20	32	40	50	63	80	100
5	5	5	5	5, 10	10, 20	10, 20	10, 20	10, 20
10	10	10	10, 20	15	15	15	15	15
20	20	20	30, 40	25	25	25	25	25
35			35	40	35	35	35	35
Symbol								
A	33	33	38	37	38	43	46.5	51.5
B	25.2	26	31	30.5	30.5	35.5	40	45
L	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
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
C	6	7	7	9	9	9	9	13

With Auto Switch

Bore (mm) Stroke (mm)	12	20	32	40	50	63	80	100
5	5	5	10	5	10	10	10	10
10	10	10	20	15	20	20	20	20
20	20	20	30	25	30	30	30	30
25			25	30	25	25	25	25
Symbol								
A	40	47	52	48	53	56.5	61.5	57.5
B	32.4	38	43	40.5	45.5	50	55	50.5
L	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
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
C	6	7	7	9	9	9	9	13

Symbol

-X525 Long Stroke of Adjustable Extension Stroke Cylinder (-XC8)

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

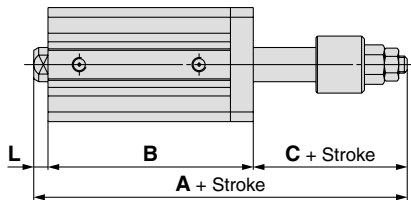
• Long stroke of XC8

Specifications are the same as for -XC8 of the CQ2 series.

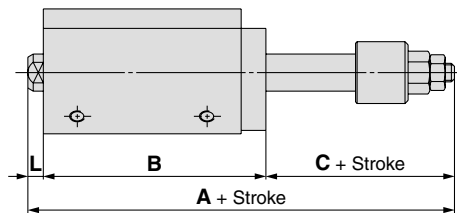
Refer to "Made to Order Common Specifications".

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

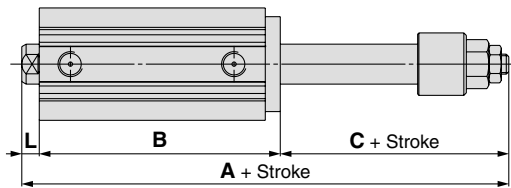
ø12 to ø25 (Without auto switch)



ø12 to ø25 (With auto switch)



ø32 to ø100



ø12, ø16

Bore (mm)	Symbol Stroke	A				B				C	L	Applicable stroke
		35st	40st	45st	50st	35st	40st	45st	50st			
12		99.9	104.9	109.9	114.9	72.4	77.4	82.4	87.4	24	3.5	35, 40
16		104.5	109.9	114.9	119.5	77	82	87	92	24	3.5	45, 50

ø20 to ø100

Bore (mm)	Symbol Stroke	A						B						C	L	Applicable stroke
		55 to 75st	80 to 100st	105 to 125st	130 to 150st	155 to 175st	180 to 200st	55 to 75st	80 to 100st	105 to 125st	130 to 150st	155 to 175st	180 to 200st			
20		155.5	180.5	—	—	—	—	122	147	—	—	—	—	29	4.5	55 to 100
25		156	181	—	—	—	—	122	147	—	—	—	—	29	5	
32		—	—	213.5	238.5	263.5	288.5	—	—	171.5	196.5	221.5	246.5	35	7	55 to 200
40		—	—	223	248	273	298	—	—	181	206	231	256	35	7	
50		—	—	235.5	260.5	285.5	310.5	—	—	183.5	208.5	233.5	258.5	44	8	
63		—	—	237	262	287	312	—	—	187	212	237	262	42	8	
80		—	—	260	285	310	335	—	—	198	223	248	273	52	10	
100		—	—	273.5	298.5	323.5	348.5	—	—	209.5	234.5	259.5	284.5	52	12	

Note 1) Dimensions of both auto switch type and non-auto switch type are the same.

Note 2) Applicable stroke is available by the 5 mm interval.

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)

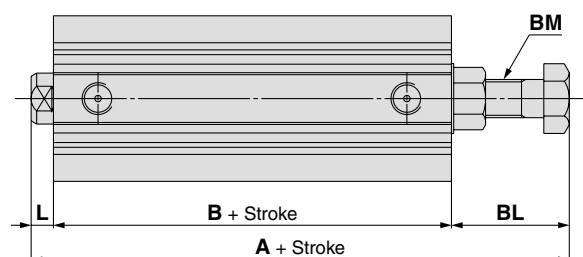
C□Q2 Mounting Bore size — Stroke D (M) (Z) — X526

Long stroke of XC9

Specifications are the same as for -XC9 of the CQ2 series. Refer to "Made to Order Common Specifications".

Note) Please contact SMC for model with bracket.

Dimensions



Symbol Bore (mm)	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 stroke type (available by the 5 mm interval) is for spacer so that dimensions are the same as for each style of 75, 100, 125, 150, 175, 200 stroke.

Symbol

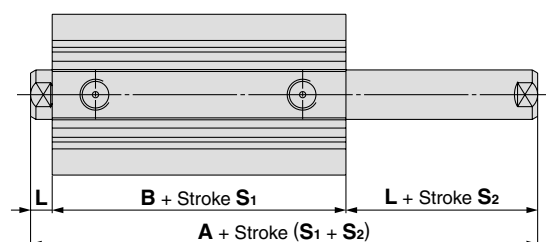
-X633 Intermediate Stroke of Double Rod Cylinder

C□Q2W Standard model no. — X633

* Specifications: Same as standard.

Note) Please contact SMC for model with bracket.

Dimensions



Symbol Bore (mm)	A	B	L	Stroke S1	Stroke S2
12	32.2 (39.4)	25.2 (32.4)	3.5	In the case of 5 to 30 stroke 5 mm intervals	In the case of 5 to 30 stroke 1 mm intervals
16	33 (43)	26 (36)	3.5		
20	35 (47)	26 (38)	4.5	In the case of 5 to 50 stroke 5 mm intervals	In the case of 5 to 50 stroke 1 mm intervals
25	39 (49)	29 (39)	5		
32	44.5 (54.5)	30.5 (40.5)	7		
40	54 (64)	40 (50)	7	In the case of 10 to 50 stroke 5 mm intervals	In the case of 10 to 50 stroke 1 mm intervals
50	56.5 (66.5)	40.5 (50.5)	8		
63	58 (68)	42 (52)	8		
80	71 (81)	51 (61)	10		
100	84.5 (94.5)	60.5 (70.5)	12		

Note 1) (): Dimensions with auto switch

Note 2) Installing a spacer inside the standard cylinder tube, stroke S1 has 5 mm intervals to controlling intermediate stroke by the 1 mm interval.

Example) In the case of CDQ2WB40-18DZ, stroke S1 is 20 mm and stroke S2 is 18 mm.

Note 3) Please consult with SMC for ø40 to ø100 with damper.

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)

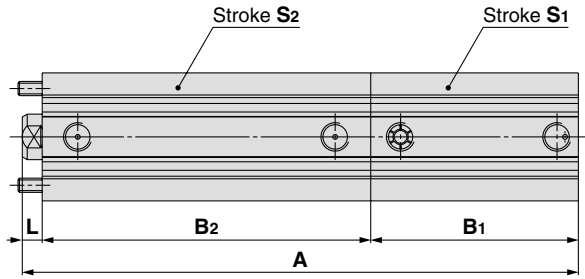
Bore size	Stroke
ø12, ø16	Max. stroke S ₂ : up to 50 mm
ø20 to ø100	Max. stroke S ₂ : up to 100 mm

Specifications are the same as for -XC11 of the CQ2 series.

Refer to "Made to Order Common Specifications".

Note) Please contact SMC for tap mounting and bracket mounting.

Series CQ2



Bore Size: ø12, ø16

(mm)

Symbol Bore	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)

Bore	Symbol	A		B ₁	B ₂		L	Stroke range	
	Stroke	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)

Bore	Symbol 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			≤ 50	55 to 75	80 to 100	55 to 75	80 to 100			
		≤ 55	55 to 75	≤ 50	55 to 75	80 to 100								
ø32	145.4 (155.5) + Stroke S 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 is available by the 5 mm interval

Series CQ2

Made to Order Individual Specifications 6

Please contact SMC for detailed dimensions, specifications, and lead times.



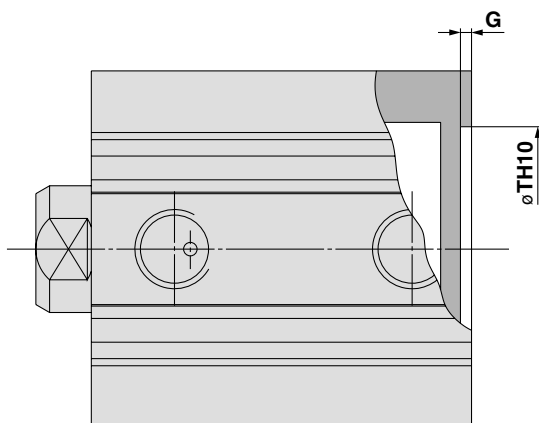
Symbol

-X1876 Cylinder Tube: With Concave Boss on Head End

C □ Q2 Mounting Bore size — Stroke D (C) (M) (Z)
S (M) (Z) — X1876
T (M) (Z)
 • With concave boss on head end

Specifications are the same as the CQ2 series.

Note) CQ2: Excluding ø12, ø16 and ø125 to ø200.



Series	CQ2	
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



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



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.

*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.

- | | |
|--|---|
| | 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. |

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.



Safety Instructions

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.

 Safety Instructions	Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.
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SMC Corporation

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