

Compact Cylinder: Non-rotating Rod Double Acting, Single Rod

CQ2K Series

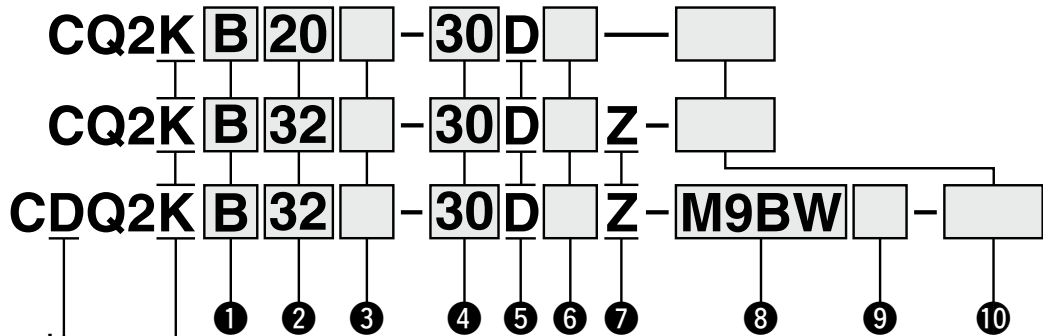
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63

How to Order

Without auto switch
ø12 to ø25

Without auto switch
ø32 to ø63

With auto switch



With auto switch magnet

The overall length of the cylinder with an auto switch magnet is longer than that of the cylinder without an auto switch magnet by the length of the built-in magnet. For details, refer to the dimensions of each size.

• Non-rotating rod

1 Mounting

B	Through-hole	ø12 to ø63
A	Both ends tapped	ø40, ø50, ø63
L	Foot	
LC	Compact foot	
F	Rod flange	
G	Head flange	
D	Double clevis	

* Mounting brackets are shipped together with the product but do not come assembled.

* A through-hole type mounting bolt is available as an option. For details:

Without auto switch magnet ⇒ p. 81

With auto switch magnet ⇒ p. 82

2 Bore size

12 ^{*1}	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

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

Example) CDQ2KB12-30DCZ

3 Port thread type

Nil	M thread	ø12 to ø25
	Rc	ø32 to ø63
TN	NPT	
TF	G	
F	Built-in One-touch fittings* ¹	

*1 The bore sizes available with One-touch fittings are ø32 to ø63.

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

4 Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇒ p. 145) [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, 35, 40, 45, 50, 75, 100

* For the manufacturing of intermediate strokes ⇒ p. 79

5 Action

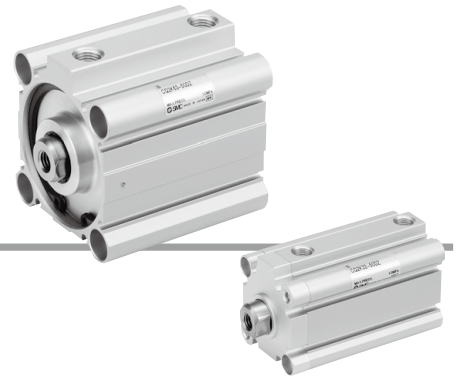
D	Double acting
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6 Body option

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

* Combined body options "FM" can be selected.

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7 Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø63	4 surfaces

8 Auto switch

Nil	Without auto switch magnet
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* For applicable auto switches, refer to the table below.

9 Number of auto switches

Nil	2
S	1
n	n

10 Made to order common specifications

For details ⇨ p. 79

Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDQ2KB32-30DZ

For details on **auto switch mounting** ⇨ p. 139 to 152

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Minimum Stroke for Auto Switch Mounting
- Operating Range
- Auto Switch Mounting Brackets/Part Nos.

Applicable Auto Switches / Refer to the **Web Catalog** for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]					Pre-wired connector	Applicable load			
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)					
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○			
	2-wire			M9BV				M9B	●	●	●	○	—	○	—			
	3-wire (NPN)			M9NVW				M9NW	●	●	●	○	—	○		IC circuit		
	3-wire (PNP)			M9PWV				M9PW	●	●	●	○	—	○	—			
	2-wire			M9BWW				M9BW	●	○	●	○	—	○		—		
	3-wire (NPN)			M9NAV*1				M9NA*1	○	○	●	○	—	○	IC circuit			
	3-wire (PNP)			M9PAV*1				M9PA*1	○	○	●	○	—	○		—		
	2-wire			M9BAV*1				M9BA*1	○	○	●	○	—	○	—			
	2-wire (Non-polar)			—				P3DWA	●	—	●	●	—	○		—		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	100 V or less	A96V	A96	●	—	●	—	—	—		IC circuit	Relay, PLC
				2-wire				A93V*2	A93	●	●	●	●	—	—	—	—	
								A90V	A90	●	—	●	—	—	—	—	—	

*1 Water-resistant type auto switches can be mounted on the models on page 77, but SMC cannot guarantee water resistance.

Please contact SMC regarding water-resistant types with the model numbers on page 77.

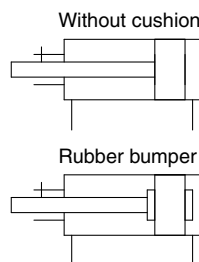
*2 The 1 m lead wire is only applicable to the D-A93.

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

* Solid state auto switches marked with "○" are produced upon receipt of order.
* The D-P3DWA□ type is only available in sizes ø25 to ø63.

* There are applicable auto switches other than those listed above. For details ⇨ p. 152

Symbol



Made to Order Common Specifications
(For details ⇨ p. 155 to 188)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat-resistant cylinder (-10 to 150°C)
-XB10	Intermediate stroke (Using exclusive body)
-XC2(A)	Rod end length increased by 10 mm (For foot and flange bracket)
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC26	With split pins for double clevis pin/ double knuckle joint pin and flat washers
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
-XC36	With boss on rod end*1
-XC85	Grease for food processing equipment
-X1876	Cylinder tube: With concave boss on head end

*1 The standard model can be used for the type with boss on the rod end (-XC36).

* Stainless steel accessories are also available.
For details ⇨ p. 26

Moisture Control Tube IDK Series



When operating an actuator with a small bore size and a short stroke at a high frequency, dew condensation (water droplets) may occur inside the piping depending on the conditions.
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

⚠ Precautions

**Refer to pages 189 and 190 before
handling the products.**

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 temperatures	Without auto switch magnet: -10 to 70°C (No freezing) With auto switch magnet: -10 to 60°C							
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*1							
Stroke length tolerance	+1.0 mm*2 0							
Rod non-rotating accuracy	±2°	±1°			±0.8°			

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

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

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

Manufacturing of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to "How to Order" for the standard model number. (⇨ p. 77)	Suffix "-XB10" to the end of standard model number. (⇨ p. 77)
Description	Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm increments are available by using an exclusive body with the specified stroke.
Stroke range	Bore size	Bore size
	Stroke range	Stroke range
	12, 16	1 to 29
	20, 25	1 to 49
Example	32 to 63	1 to 99
	50, 63	11 to 99
Example	Part no.: CQ2KB50-57DZ CQ2KB50-75DZ with 18 mm width spacer inside The B dimension is 115.5 mm.	Part no.: CQ2KB50-57DZ-XB10 Makes 57 mm stroke tube. The B dimension is 97.5 mm.

Mounting Bracket Part Nos.

Bore size [mm]	Foot*1	Compact foot*1	Flange	Double clevis	Double clevis pivot bracket
40	CQ-L040	CQ-LC040	CQ-F040	CQ-D040	CQ-C040
50	CQ-L050	CQ-LC050	CQ-F050	CQ-D050	CQ-C050
63	CQ-L063	CQ-LC063	CQ-F063	CQ-D063	CQ-C063

*1 When ordering foot and compact foot brackets, order 2 pieces per cylinder.

* Parts included with each type of bracket are as follows.

Foot, Compact foot, Flange: Body mounting bolts

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

* For details on accessory brackets (Options) ⇨ p. 21 to 27

* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).

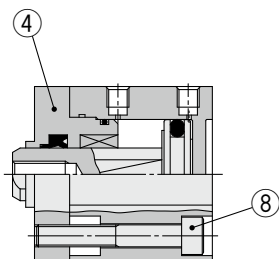
Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.

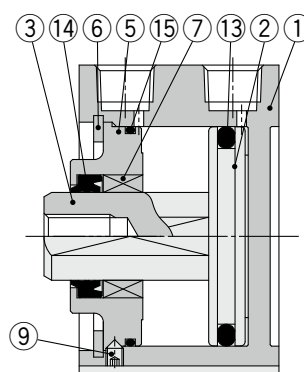
Construction

Without auto switch magnet

ø12 to ø32

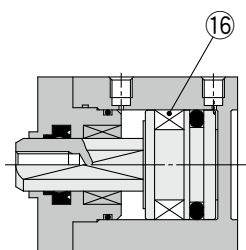


ø40 to ø63

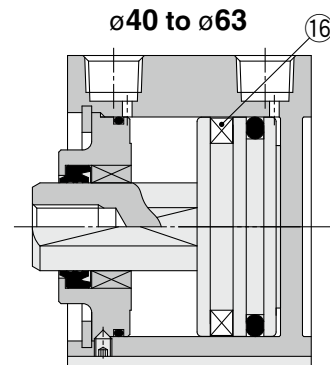


With auto switch magnet

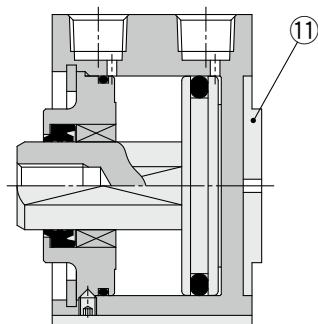
ø12 to ø32



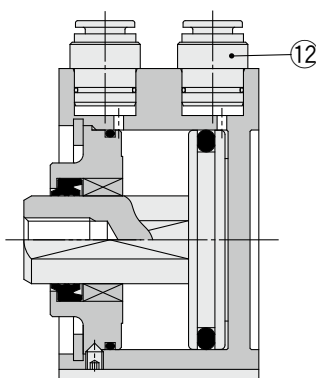
ø40 to ø63



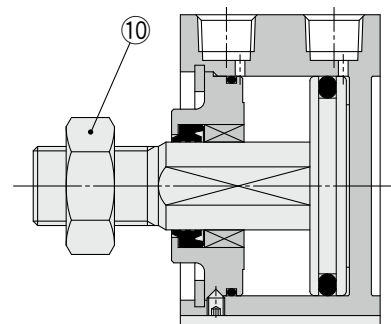
With boss on head end



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	
3	Piston rod	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø63, Hard chrome plating
4	Rod cover	Brass	ø12, Electroless nickel plating
		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 plating
9	Hexagon socket head set screw	Alloy steel	ø40 to ø63, Nickel plating
10	Rod end nut	Carbon steel	Zinc chromated
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	
16	Magnet	—	

Replacement Parts/Seal Kit

Bore size [mm]	Kit no.	Contents
12	CQ2KB12-PS	Set of nos. 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.

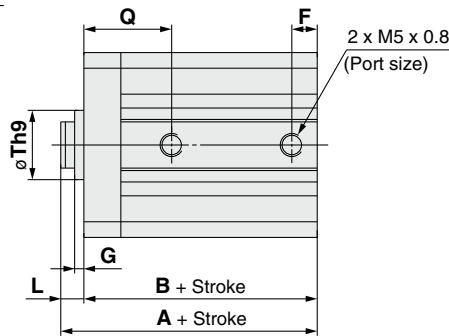
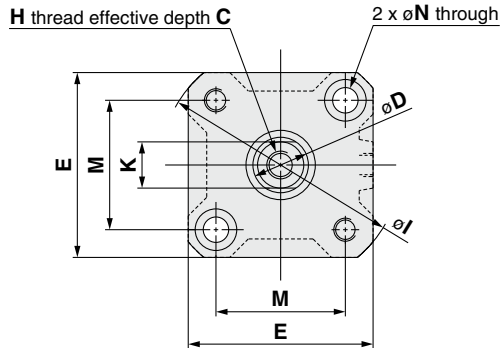
* The seal kit does not include a grease pack. Order it separately.

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

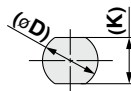
Bore Size

ø12 to ø25 Without Auto Switch Magnet

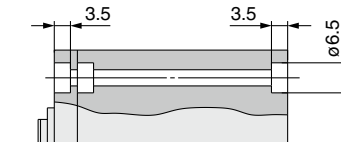
Through-hole: CQ2KB



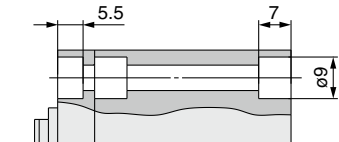
Piston rod
cross section



ø12, ø16



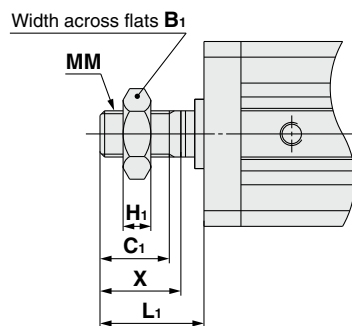
ø20, ø25



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	16	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	17	15 ⁰ _{-0.043}

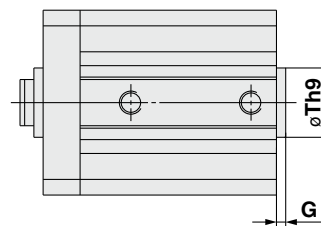
* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

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

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}

With End Lock Double Acting, Single Rod	CBQ2
Axial Piping Single Acting, Spring Return, Single Rod	CQP2
Axial Piping Double Acting, Single Rod	CQP2
Water Resistant Double Acting, Single Rod	CQ2-R/V
Water Resistant Double Acting, Double Rod	CQ2W-R/V
Non-rotating Rod Double Acting, Single Rod	CQ2KW
Non-rotating Rod Double Acting, Double Rod	CQ2K
Long Stroke Double Acting, Single Rod	CQ2
Long Stroke Double Acting, Double Rod	CQ2W
Anti-lateral Load Double Acting, Single Rod	CQ2S
Standard Single Acting, Spring Return, Single Rod	CQ2
Standard Double Acting, Single Rod	CQ2W
Standard Double Acting, Double Rod	CQ2