

# Compact Cylinder: Standard Type Double Acting, Double Rod Series CQSW

ø12, ø16, ø20, ø25

## How to Order

**With auto switch** CQSW B 20-30 D C - [ ]

**With auto switch** CDQSW B 20-30 D C - M9BW [ ] - [ ]

**With auto switch**  
(Built-in magnet)

**Mounting style**

B	Through-hole/Both ends tapped common (Standard)
L	Foot style
F	Flange style

\* Mounting brackets are shipped together, (but not assembled).  
\* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQSW" on page 564.

**Bore size**

12	12 mm
16	16 mm
20	20 mm
25	25 mm

**Cylinder stroke (mm)**

**Standard Stroke**

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

For "Manufacture of Intermediate Strokes", refer to page 561.

**Number of auto switches**

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

**Auto switch**

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

**Body option**

Nil	Standard
C	With rubber bumper
M	Rod end male thread

\* Combination of body options is available.

**Action**

D	Double acting
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**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) CDQSWL25-30D

**Applicable Auto Switch/**Refer to pages 1263 to 1371 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	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
	3-wire (PNP)			12 V		M9PV		M9P	●	●	●	○	○			
	2-wire			12 V		M9BV		M9B	●	●	●	○	○			
	3-wire (NPN)			5 V, 12 V		M9NWV		M9NW	●	●	●	○	○			
	Diagnostic indication (2-color indication)			3-wire (PNP)	12 V	M9PWV		M9PW	●	●	●	○	○	IC circuit		
	Water resistant (2-color indication)			2-wire	12 V	M9BWV		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	○	○	●	○	○	—		
	Reed switch			—	Grommet	Yes		3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	
No		2-wire	24 V				12 V	100 V	A93V	A93	●	—	●	—	—	—
						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) M9NWZ

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

\* Since there are other applicable auto switches than listed, refer to page 597 for details.

\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329.

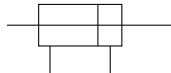
\* Auto switches are shipped together (not assembled).

Note) There is the case A9□V/M9□V/M9□WV/M9□AVL type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

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



JIS Symbol



**Made to Order Specifications**  
(For details, refer to pages 1373 to 1565.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat-resistant cylinder (-10 to 150 °C) (without an auto switch)
-XB7	Cold-resistant cylinder (-40 to 70 °C) (without an auto switch)
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Using exclusive body)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC6	Piston rod, retaining ring, rod end nut made of stainless steel
-XC36	With boss in rod side
-X235	Change of piston rod end of double rod cylinder
-X271	Fluororubber seals
-X633	Intermediate stroke of double rod cylinder

## Body Option

Description	Application
Rod end male thread	Available for all standard models of double acting, double rod.
Rubber bumper	

## Mounting Bracket Part No.

Bore size (mm)	Foot <sup>(1)</sup>	Flange
12	CQS-L012	CQS-F012
16	CQS-L016	CQS-F016
20	CQS-L020	CQS-F020
25	CQS-L025	CQS-F025



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

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

Foot or Flange style: Body mounting bolt

## Specifications

Bore size (mm)		12	16	20	25
Action		Double acting, Double rod			
Fluid		Air			
Lubrication		Not required (Non-lube)			
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)			
Cushion		None, Rubber bumper			
Rod end thread		Female thread			
Stroke length tolerance		+1.0 mm * 0			
Mounting		Through-hole/Both ends tapped common			
Piston speed		50 to 500 mm/s			
Allowable kinetic energy (J)	Standard type	0.022	0.038	0.055	0.09
	With rubber bumper	0.043	0.075	0.11	0.18

\* Stroke length tolerance does not include the deflection of the bumper.

## Theoretical Output

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)		
				0.3	0.5	0.7
12	6	IN	84.8	25	42	59
		OUT				
16	8	IN	151	45	75	106
		OUT				
20	10	IN	236	71	118	165
		OUT				
25	12	IN	378	113	189	264
		OUT				

## 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. (page 560).	Suffix "-XB10" to the end of standard model no. (page 560).
Description	Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders.	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
Example	Part no.: CQSWB25-47D-X633	Part no.: CQSWB25-47D-XB10
	CQSWB25-50D with 3 mm width spacer inside. B dimension is 79 mm.	Makes 47 stroke tube. B dimension is 76 mm.

Refer to pages 595 to 597 for cylinders with auto switches.

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

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

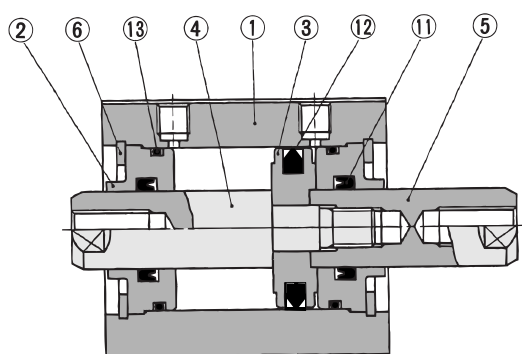
-X□

Individual  
-X□

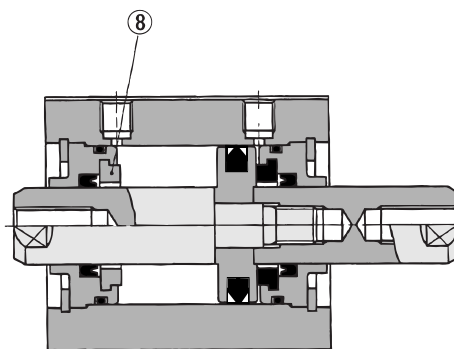
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## Construction

### Basic style

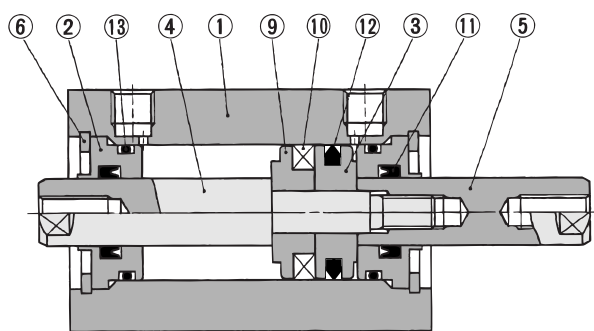


### With rubber bumper

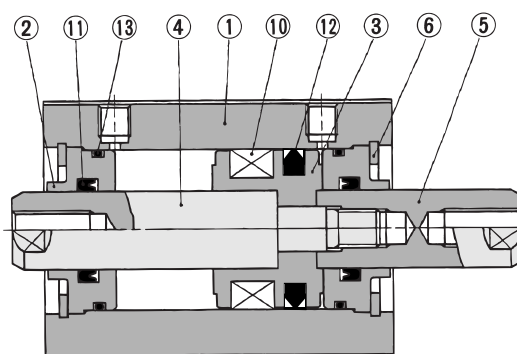


### With auto switch (Built-in magnet)

ø12, ø16



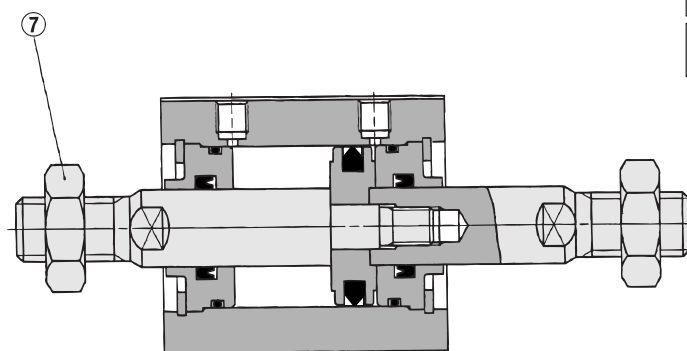
ø20, ø25



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Collar	Aluminum alloy	Anodized
3	Piston	Aluminum alloy	Chromated
4	Piston rod A	Stainless steel	
5	Piston rod B	Stainless steel	
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Rod end nut	Carbon steel	Nickel plated
8	Bumper	Urethane	
9	Spacer for switch	Aluminum alloy	Chromated
10	Magnet	—	
11	Rod seal	NBR	
12	Piston seal	NBR	
13	Tube gasket	NBR	

### Rod end male thread



### Replacement Parts/Seal Kit

Bore size (mm)	Kit no.	Contents
12	CQSWB12-PS	Set of nos. above ⑪, ⑫, ⑬
16	CQSWB16-PS	
20	CQSWB20-PS	
25	CQSWB25-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)**

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual  
-X□

Technical  
data