

# Compact Cylinder: Standard Type

## Double Acting, Single Rod

# Series CQS

ø12, ø16, ø20, ø25

### How to Order

**CQS B 20 - 30 D** - **M9BW**

**With auto switch** **CDQS B 20 - 30 D** - **M9BW**

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

**Mounting style**

<b>B</b>	Through-hole/Both ends tapped common (Standard)
<b>L</b>	Foot style
<b>F</b>	Rod side flange style
<b>G</b>	Head side flange style
<b>D</b>	Double clevis style

**Bore size**

<b>12</b>	12 mm
<b>16</b>	16 mm
<b>20</b>	20 mm
<b>25</b>	25 mm

**Cylinder stroke (mm)**

Bore size	Standard stroke	Long stroke
<b>12, 16</b>	5, 10, 15, 20, 25, 30	35, 40, 45, 50, 75, 100, 125, 150, 175, 200
<b>20</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	75, 100, 125, 150, 175, 200
<b>25</b>		75, 100, 125, 150, 175, 200, 250, 300

**Number of auto switches**

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

**Auto switch**

<b>Nil</b>	Without auto switch
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**Body option**

**<Standard stroke>**

<b>Nil</b>	Standard
<b>C</b>	With rubber bumper
<b>M</b>	Rod end male thread
<b>F</b>	Boss on head side

**<Long stroke>**

<b>C</b>	With rubber bumper Rod end female thread (Standard)
<b>CM</b>	With rubber bumper Rod end male thread

**Action**

<b>D</b>	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) CDQSL25-30D

**Made to Order**  
Refer to page 552 for details.

**For "Manufacture of Intermediate Strokes", refer to page 552.**

**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)				M9PV	M9P	●	●	●	○	○		
	2-wire			12 V		M9BV		M9B	●	●	●	○	○			
	3-wire (NPN)			5 V, 12 V		M9NWV		M9NW	●	●	●	○	○			
	3-wire (PNP)					M9PWV		M9PW	●	●	●	○	○			
	2-wire			12 V		M9BWV		M9BW	●	●	●	○	○			
	3-wire (NPN)			5 V, 12 V		M9NAV		M9NA	○	○	●	○	○			
	3-wire (PNP)					M9PAV		M9PA	○	○	●	○	○			
	Water resistant (2-color indication)	Grommet	No	2-wire	12 V	M9BAV	M9BA	○	○	●	○	○	○	—		
				3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
Reed switch	—	Grommet	Yes	2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	Relay, PLC
						100 V or less	A90V	A90	●	—	●	—	—	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.

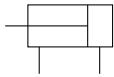
\* Since there are other applicable auto switches than listed, refer to page 597 for details.  
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329.  
\* Auto switches are shipped together (not assembled).

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.

# Series CQS



## 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
-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
-XC36	With boss in rod side
-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
-X1876	With concave shape end boss on the cylinder tube head side

## Body Option

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

\* Rubber bumper is standard equipment for long stroke type.

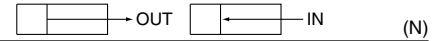
## Specifications

Bore size (mm)		12	16	20	25
Action		Double acting, Single 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		Standard stroke: $^{+1.0}_0$ Long stroke: $^{+1.4}_0$ *			
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.

\* Only rubber bumper is available for the long stroke type.

## 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	113	34	57	79
16	8	IN	151	45	75	106
		OUT	201	60	101	141
20	10	IN	236	71	118	165
		OUT	314	94	157	220
25	12	IN	378	113	189	264
		OUT	491	147	245	344

## Manufacture of Intermediate Stroke

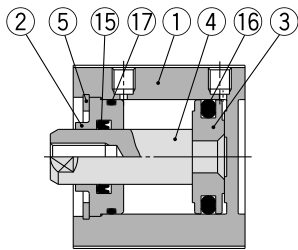
Description		Spacer is installed in the standard stroke body.		Exclusive body (-XB10)	
Part no.		Refer to “How to Order” for the standard model no. (page 551).		Suffix “-XB10” to the end of standard model no. (page 551).	
Standard stroke	Description	Intermediate strokes by the 1 mm interval are available 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	Stroke range	Bore size	Stroke range
		12, 16	1 to 29	12, 16	6 to 29
		20, 25	1 to 49	20, 25	6 to 49
Long stroke	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	Stroke range	Bore size	Stroke range
		12, 16	31 to 199	12, 16	31 to 199
		20	51 to 199	20	51 to 199
		25	51 to 299	25	51 to 299
Example		Part no.: CQSB25-47D CQSB25-50D with 3 mm width spacer inside. B dimension is 72.5 mm.		Part no.: CQSB25-47D-XB10 Makes 47 stroke tube. B dimension is 69.5 mm.	

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

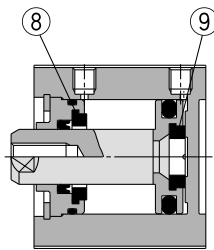
- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Switch mounting bracket/Part no.

## Construction

Basic style

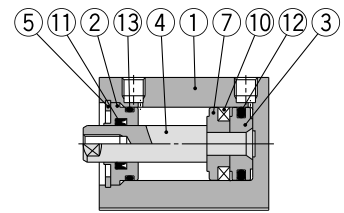


With rubber bumper

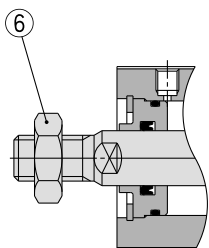


With auto switch (Built-in magnet)

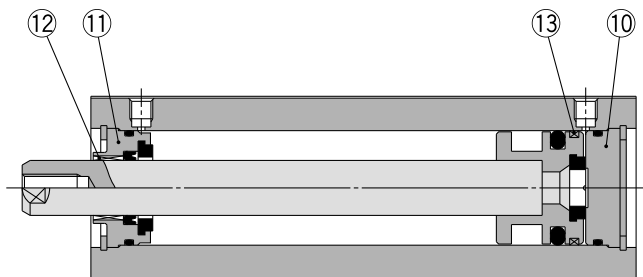
ø12, ø16



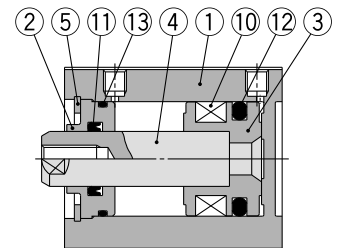
Rod end male thread



Long stroke



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	Stainless steel	
5	Retaining ring	Carbon tool steel	Phosphate coated
6	Rod end nut	Carbon steel	Nickel plated
7	Spacer for switch type	Aluminum alloy	Chromated
8	Bumper A	Urethane	
9	Bumper B	Urethane	
10	Bottom plate	Aluminum alloy	Anodized

### Component Parts

No.	Description	Material	Note
11	Collar	Aluminum alloy	Anodized
12	Bushing	Oil-impregnated sintered alloy	
13	Wear ring	Resin	
14	Magnet	—	
15 *	Rod seal	NBR	
16 *	Piston seal	NBR	
17 *	Tube gasket	NBR	

### Replacement Parts: Seal Kit (Basic style)

Bore size (mm)	Kit no.	Contents
12	CQSB12-PS	Set of nos. above ⑮, ⑯, ⑰
16	CQSB16-PS	
20	CQSB20-PS	
25	CQSB25-PS	

### Replacement Parts: Seal Kit (Long stroke)

Bore size (mm)	Kit no.	Contents
12	CQSB12-L-PS	Set of nos. above ⑮, ⑯, ⑰
16	CQSB16-L-PS	
20	CQSB20-L-PS	
25	CQSB25-L-PS	

\* Seal kit includes ⑮, ⑯, ⑰. Order the seal kit, based on each bore size. (The long stroke type includes 2 tube gaskets.)

\* 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