

Compact Cylinder: Anti-lateral Load Type

Series CQS□S

ø12, ø16, ø20, ø25

How to Order

With auto switch CQS B S 20-30 D C - **M9BW** - **Number of auto switches**

With auto switch (Built-in magnet)

Mounting style

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

Cushion

| | |
|---|------------------------|
| S | Anti-lateral load type |
|---|------------------------|

Bore size

| | |
|----|-------|
| 12 | 12 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |

Cylinder stroke (mm)

| 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 590.

Auto switch

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

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

Body option

| | |
|----|---|
| C | With rubber bumper Rod end female thread |
| CM | With rubber bumper Rod end male thread |
| CF | With rubber bumper Boss on head side |

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) CDQSLS12-25D

Made to Order
Refer to page 590 for details.

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 | | | M9BV | | | | M9B | ● | ● | ● | ○ | ○ | — | | |
| | 3-wire (NPN) | | | M9NWV | | | | M9NW | ● | ● | ● | ○ | ○ | IC circuit | | |
| | Diagnostic indication (2-color indication) | | | 3-wire (PNP) | M9PWV | M9PW | | ● | ● | ● | ○ | ○ | — | IC circuit | | |
| | Water resistant (2-color indication) | | | 2-wire | M9BWV | M9BW | | ● | ● | ● | ○ | ○ | — | | | |
| | | | | 3-wire (NPN) | M9NAV | M9NA | | ○ | ○ | ● | ○ | ○ | — | IC circuit | | |
| | | | | 3-wire (PNP) | M9PAV | M9PA | | ○ | ○ | ● | ○ | ○ | — | | | |
| 2-wire | | M9BAV | M9BA | ○ | ○ | ● | ○ | ○ | — | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | — | A96V | A96 | ● | — | ● | — | — | — | IC circuit | — |
| | | | No | 2-wire | 24 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.

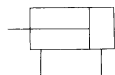
* Auto switches are shipped together (not assembled).

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□S



JIS Symbol



Made to Order Specifications
(For details, refer to pages 1401, 1426 and 1508.)

| Symbol | Specifications |
|--------|---|
| ~XB10 | Intermediate stroke (Using exclusive body) |
| ~XC6 | Piston rod, retaining ring, rod end nut made of stainless steel |
| ~X271 | Fluororubber seals |
| ~X1876 | With concave shape end boss on the cylinder tube head side |

Body Option

| Description | Application |
|---------------------|---|
| Rod end male thread | Available for Double acting, Single rod models. |

Mounting Bracket Part No.

| Bore size (mm) | Foot (1) | Flange | Double clevis |
|----------------|----------|----------|---------------|
| 12 | CQS-L012 | CQS-F012 | CQS-D012 |
| 16 | CQS-L016 | CQS-F016 | CQS-D016 |
| 20 | CQS-L020 | CQS-F020 | CQS-D020 |
| 25 | CQS-L025 | CQS-F025 | CQS-D025 |



Note1) When ordering foot bracket, order 2 pieces per cylinder.

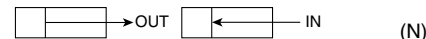
Note2) Parts belonging to each bracket are as follows.
Foot or Flange style: Body mounting bolt
Double clevis style: Clevis pin, type C retaining ring for axis, Body mounting bolt

Standard 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 | 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) | 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 ²) | 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. | |
|-----------------|--------------|--|--------------|
| Part no. | | Refer to “How to Order” for the standard model no. (page 589). | |
| Standard stroke | Description | Intermediate strokes by the 1 mm interval are available by using spacers with standard stroke cylinders. | |
| | Stroke range | Bore size | Stroke range |
| | | 12, 16 | 1 to 29 |
| | | 20, 25 | 1 to 49 |
| Example | | Part no.: CQSBS25–47D CQSBS25-50D with 3 mm width spacer inside. B dimension is 77.5 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.

Compact Cylinder: Anti-lateral Load Type **Series CQS□S**

Mass/Without Auto Switch

(g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 37 | 43 | 50 | 57 | 63 | 70 | — | — | — | — |
| 16 | 49 | 57 | 66 | 74 | 83 | 92 | — | — | — | — |
| 20 | 75 | 88 | 101 | 114 | 127 | 140 | 153 | 165 | 178 | 191 |
| 25 | 109 | 125 | 140 | 156 | 172 | 188 | 204 | 220 | 236 | 252 |

For standard strokes

Calculation: (Example) **CQSDS20-20DCM**

- Cylinder mass: CQSBS20-20DC 114 g
- Option mass: Rod end male thread 10 g
- : Double clevis style 92 g
- 216 g

Mass/With Auto Switch (Built-in magnet)

(g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 45 | 51 | 58 | 65 | 71 | 78 | — | — | — | — |
| 16 | 59 | 67 | 76 | 85 | 94 | 103 | — | — | — | — |
| 20 | 106 | 119 | 132 | 145 | 157 | 170 | 183 | 195 | 208 | 221 |
| 25 | 151 | 167 | 183 | 199 | 215 | 231 | 246 | 262 | 278 | 294 |

Additional Mass

(g)

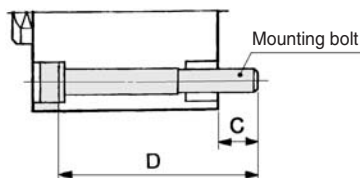
| Bore size (mm) | | 12 | 16 | 20 | 25 |
|---|-------------|-----|----|-----|-----|
| Rod end male thread | Male thread | 1.5 | 3 | 6 | 12 |
| | Nut | 1 | 2 | 4 | 8 |
| Foot style (Including mounting bolt) | | 55 | 65 | 159 | 181 |
| Rod side flange style (Including mounting bolt) | | 58 | 70 | 143 | 180 |
| Head side flange style (Including mounting bolt) | | 56 | 66 | 137 | 171 |
| Double clevis style (Including pin, retaining ring, bolt) | | 34 | 40 | 92 | 127 |

Mounting Bolt for CQSBS

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

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

Example) Bolt M3 x 30L 4 pcs.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

| Cylinder model | C | D | Mounting bolt size |
|--------------------|-----|----|--------------------|
| CQSBS12-5DC | 6.5 | 30 | M3 x 30L |
| -10DC | | 35 | x 35L |
| -15DC | | 40 | x 40L |
| -20DC | | 45 | x 45L |
| -25DC | | 50 | x 50L |
| -30DC | | 55 | x 55L |
| CQSBS16-5DC | 6.5 | 30 | M3 x 30L |
| -10DC | | 35 | x 35L |
| -15DC | | 40 | x 40L |
| -20DC | | 45 | x 45L |
| -25DC | | 50 | x 50L |
| -30DC | | 55 | x 55L |
| CQSBS20-5DC | 6.5 | 30 | M5 x 30L |
| -10DC | | 35 | x 35L |
| -15DC | | 40 | x 40L |
| -20DC | | 45 | x 45L |

| Cylinder model | C | D | Mounting bolt size |
|---------------------|-----|----|--------------------|
| CQSBS20-25DC | 6.5 | 50 | M5 x 50L |
| -30DC | | 55 | x 55L |
| -35DC | | 60 | x 60L |
| -40DC | | 65 | x 65L |
| -45DC | | 70 | x 70L |
| -50DC | | 75 | x 75L |
| CQSBS25-5DC | 8.5 | 35 | M5 x 35L |
| -10DC | | 40 | x 40L |
| -15DC | | 45 | x 45L |
| -20DC | | 50 | x 50L |
| -25DC | | 55 | x 55L |
| -30DC | | 60 | x 60L |
| -35DC | | 65 | x 65L |
| -40DC | | 70 | x 70L |
| -45DC | | 75 | x 75L |
| -50DC | | 80 | x 80L |

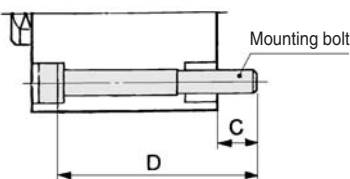
Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Mounting Bolt for CDQBS with Auto Switch

Mounting method: Mounting bolt for through-hole mounting style of CDQBS 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.



Note) When mounting a cylinder with through-hole, be sure to use the attached plain washer.

| Cylinder model | C | D | Mounting bolt size |
|--------------------|-----|----|--------------------|
| CDQBS12-5DC | 6.5 | 35 | M3 x 35L |
| -10DC | | 40 | x 40L |
| -15DC | | 45 | x 45L |
| -20DC | | 50 | x 50L |
| -25DC | | 55 | x 55L |
| -30DC | | 60 | x 60L |
| CDQBS16-5DC | 6.5 | 35 | M3 x 35L |
| -10DC | | 40 | x 40L |
| -15DC | | 45 | x 45L |
| -20DC | | 50 | x 50L |
| -25DC | | 55 | x 55L |
| -30DC | | 60 | x 60L |
| CDQBS20-5DC | 6.5 | 40 | M5 x 40L |
| -10DC | | 45 | x 45L |
| -15DC | | 50 | x 50L |
| -20DC | | 55 | x 55L |

| Cylinder model | C | D | Mounting bolt size |
|---------------------|-----|----|--------------------|
| CDQBS20-25DC | 6.5 | 60 | M5 x 60L |
| -30DC | | 65 | x 65L |
| -35DC | | 70 | x 70L |
| -40DC | | 75 | x 75L |
| -45DC | | 80 | x 80L |
| -50DC | | 85 | x 85L |
| CDQBS25-5DC | 8.5 | 45 | M5 x 45L |
| -10DC | | 50 | x 50L |
| -15DC | | 55 | x 55L |
| -20DC | | 60 | x 60L |
| -25DC | | 65 | x 65L |
| -30DC | | 70 | x 70L |
| -35DC | | 75 | x 75L |
| -40DC | | 80 | x 80L |
| -45DC | | 85 | x 85L |
| -50DC | | 90 | x 90L |

Material: Chromium molybdenum steel
Surface treatment: Nickel plated

CUJ
CU
CQS
CQ2
RQ
CQM
MU

D-□
-X□
Individual
-X□
Technical data