

Compact Cylinder

CQS Series

ø12, ø16, ø20, ø25

Ideal for machine designs with small space requirements

The "D-M9" auto switch will not protrude from switch mounting groove.

Square body shape gives you flexibility for designing machine.

Cross-section of a cylinder tube is the same configuration regardless of w/ switch or w/o switch.

Auto switch mounting allows for flexible designing requirements

3 faces on ø12, ø16, and all 4 faces including port side on ø20, ø25.

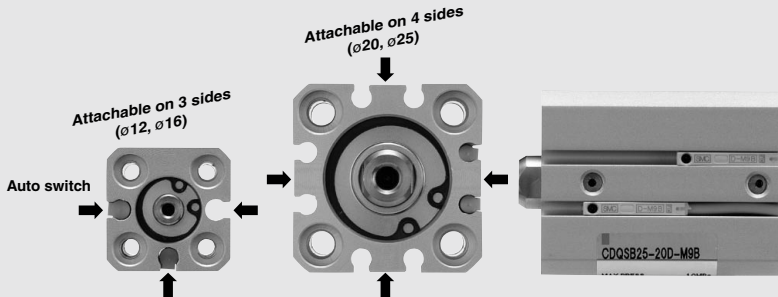
2 way basic mounting: Through-hole or both ends tapped

Basic mounting is 2 way. You can choose either through-hole or both ends tapped mounting.

**Non-rotating accuracy
Non-rotating rod**

Hexagonal cross sectional shape piston rod for high non-rotation accuracy.

ø12, ø16 — ±1°
ø20, ø25 — ±0.7°



| | | | Bore size (mm) | Stroke (mm) | Page | |
|------------------------------|---------------|--|------------------|--|--|-----|
| Standard | Double acting | Single rod CQS | 12, 16 20, 25 | Standard stroke ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | 693 | |
| | | Double rod CQSW | | Long stroke ø12 } 35, 40, 45, 50, 75, 100 ø16 } 125, 150, 175, 200 ø20 } 75, 100, 125, 150, 175, 200 ø25 } 75, 100, 125, 150, 175, 200, 250, 300 | | |
| | Single acting | Return/Extend CQS | | ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | 706 | |
| | Double acting | Single rod CQSK | | ø12 } 5, 10 ø16 } 5, 10 ø20 } 5, 10 ø25 } 5, 10 | 714 | |
| Double rod CQSKW | | ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | | 724 | | |
| Non-rotating Rod | Double acting | Single rod CQSK | | 12, 16 20, 25 | ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | 732 |
| | | Double rod CQSKW | | | ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | 740 |
| Anti-lateral Load | Double acting | Single rod CQS□S | | | ø12 } 5, 10, 15, 20 ø16 } 25, 30 ø20 } 5, 10, 15, 20, 25 ø25 } 30, 35, 40, 45, 50 | 740 |



Smooth cylinder (Low friction) CQSY

Refer to Best Pneumatics No. 2-3.



Low-speed cylinder CQSX

Refer to Best Pneumatics No. 2-3.

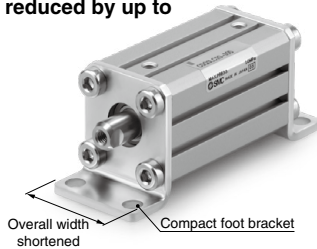
- CUJ
- CU
- CQS**
- JCQ
- CQ2
- RQ
- CQM
- CQU
- MU

- D-□
- X□
- Technical Data

Reduction of
installation
space

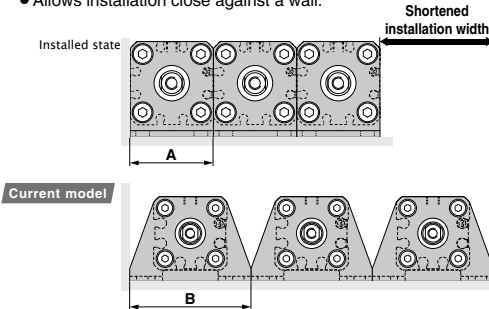
Added compact type foot brackets.

- Compact foot bracket has the same width as the cylinder.
Overall width reduced by up to **43%** (for $\phi 12$)



■ More compact installation space possible

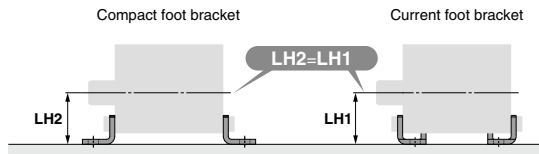
- Short pitch mounting is possible.
- Allows installation close against a wall.



| Bore size (mm) | Compact foot type width A (mm) | Current foot type width B (mm) | Reduced width for short pitch mounting (mm) | | |
|----------------|---------------------------------------|---------------------------------------|---|---------|---------|
| | | | 1 unit | 2 units | 3 units |
| 12 | 25 | 44 | 19 | 38 | 57 |
| 16 | 29 | 48 | 19 | 38 | 57 |
| 20 | 36 | 62 | 26 | 52 | 78 |
| 25 | 40 | 66 | 26 | 52 | 78 |

* Short pitch mounting is possible only without auto switch.
Consult with SMC for mounting with auto switch.

■ Height from the bottom of brackets to the center of a cylinder is the same as the current model.



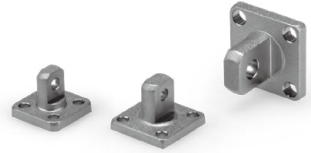
Applicable cylinders: C(D)QS, C(D)QSW, C(D)QS (Single acting, return/extend), C(D)QSK, C(D)QSKW (Non-rotating), C(D)QS□S (Anti-lateral load)

Reduction
in labor
for design

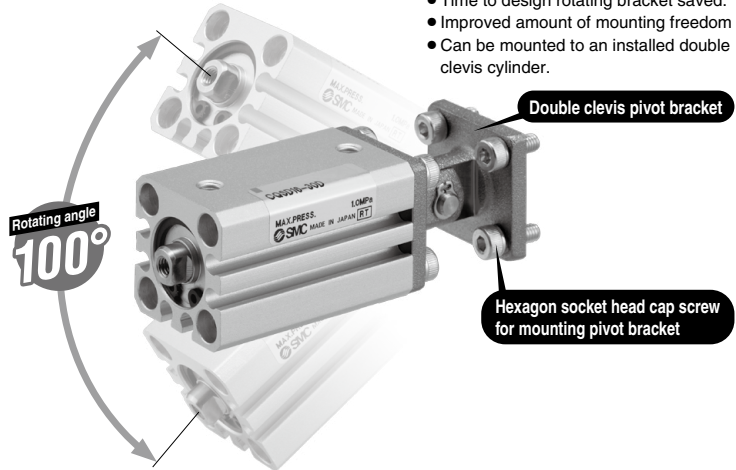
Added pivot brackets for double clevis.

■Rotating angle: Max. 100°

(For $\phi 12$, $\phi 16$)



- Time to design rotating bracket saved.
- Improved amount of mounting freedom
- Can be mounted to an installed double clevis cylinder.



Applicable cylinders: CQS (Bore size $\phi 12$ to $\phi 25$, Mounting bracket, Applicable only to double clevis.)

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical
Data

Combinations of Standard Products and Made

CQS Series

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

| Symbol | Specification | Applicable bore size | CQS (Standard) | | | | |
|------------------------------------|--|----------------------|----------------|------------|-----------------------|------------------------|---|
| | | | Double acting | | Single acting | | |
| | | | Single rod | Double rod | Single rod/ Extension | Single rod/ Retraction | |
| | | | ø12 to ø25 | | | | |
| Standard | Standard | ø12 to ø25 | ● | ● | ● | ● | |
| D | Built-in magnet | | ● | ● | ● | ● | |
| CQS□-□M | Rod end male thread | | ● | ● | ● | ● | |
| CQS□-□C | With rubber bumper | | ● | ● | ○ | ○ | |
| CQS□-□F | With boss on head end | | ● | — | ● | ● | |
| CQS^F_g | Foot, Flange | | ● | ● | ● | ● | |
| CQSD | Double clevis type | | ● | — | ● | ● | |
| 10-, 11- | Clean series | | ● | ○ | ○ | ○ | |
| 25A- | Copper (Cu) and zinc (Zn)-free ⁽⁵⁾ | | ● | ○ | ○ | ○ | |
| 20- | Copper ⁽⁴⁾ and Fluorine-free | | ● | ● | ● | ● | |
| CQS□M | Cylinder with Stable Lubrication Function (Lube-retainer) ⁽⁶⁾ | | ø20 to ø25 | ● | ○ | ○ | ○ |
| XB6 | Heat-resistant cylinder (-10 to 150 °C) | | ø12 to ø25 | ○ | ○ | ○ | ○ |
| XB7 | Cold-resistant cylinder (-40 to 70 °C) | | | ○ | ○ | ○ | ○ |
| XB9 | Low-speed cylinder (5 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 on rod side | ○ | | ○ | ○ | ○ | |
| XC85 | Grease for food processing equipment | ○ | | ○ | ○ | ○ | |
| XC92 | Dust resistant cylinder | ○ | | ○ | ○ | ○ | |
| X235 | Change of piston rod end of double rod cylinder | — | | ○ | — | — | |
| X271 | Fluororubber seal | ○ | | ○ | ○ | ○ | |
| X525 | Long stroke of adjustable extension stroke cylinder (-XC8) | ○ | | — | ○ | ○ | |
| X526 | Long stroke of adjustable retraction stroke cylinder (-XC9) | ○ | | — | ○ | ○ | |
| X633 | Intermediate stroke of double rod type | — | | ○ | — | — | |
| X636 | Long stroke of dual stroke single rod | ○ | | — | ○ | — | |
| X1876 | With concave shape end boss on the cylinder tube head side | ø20, ø25 | | ○ | — | ○ | ○ |

Note 1) A rubber bumper comes as standard.
 Note 2) For ø12 and ø16 only. (○) for ø20 and ø25.
 Note 3) Refer to Best Pneumatics No. 2-3 for low-speed cylinders.

Note 4) Copper-free for the externally exposed part. For details, refer to the **Web Catalog**.
 Note 5) For details, refer to the SMC website.
 Note 6) Only the products with an auto switch and without rubber bumper are compatible.

to Order Specifications

CQS Series

| CQSK (Non-rotating rod) | | CQS (Long stroke) | | CQS□S (Anti-lateral load) | | CQSY Smooth cylinder (Low friction) ⁽³⁾ | | CQSX Low-speed cylinder ⁽³⁾ | |
|----------------------------|------------|----------------------|------------------|------------------------------|------------------|---|------------------|---|------------|
| Double acting | | Double acting | | Double acting | | Double acting | | Double acting | |
| Single rod | Double rod | Single rod | Single rod | Single rod | Single rod | Single rod | Single rod | Single rod | Single rod |
| ø12 to ø25 | | | | | | | | | |
| ● | ● | ● | ● | ● | ● | ● | ● | | |
| ● | ● | ● | ● | ● | ● | ● | ● | | |
| ● | ● | ● | ● | ● | ● | ● | ● | | |
| ○ | ○ | ● ⁽¹⁾ | ● ⁽¹⁾ | ● ⁽¹⁾ | ● ⁽¹⁾ | ● ⁽¹⁾ | ● | | |
| ● | — | ○ | ● | ● | ○ | ○ | ○ | | |
| ● | ● | ● | ● | ● | ● | ● | ● | | |
| ● | — | ● | ● | ● | ● | ● | ● | | |
| ○ | ○ | ○ | ○ | ○ | — | — | ● | | |
| ○ | ○ | ● | ● | ● | ○ | ○ | ○ | | |
| ○ | ○ | ● | ● | ● | — | — | — | | |
| — | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ○ | ○ | ○ | ○ | ○ | — | — | — | | |
| ○ | ○ | ○ | ○ | ○ | — | — | — | | |
| ○ | ○ | ◎ | ◎ | ◎ | ○ | ○ | ○ | | |
| ○ | ○ | ○ | ○ | ○ | — | — | — | | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | | |
| ◎ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ○ | ○ | ◎ ⁽²⁾ | ◎ ⁽²⁾ | ◎ ⁽²⁾ | ◎ ⁽²⁾ | ◎ ⁽²⁾ | ◎ ⁽²⁾ | | |
| ○ | ○ | ◎ | ◎ | ◎ | — | — | — | | |
| — | — | ○ | ○ | ○ | — | — | — | | |
| — | ○ | — | — | — | — | — | — | | |
| ○ | ○ | ◎ | ◎ | ◎ | — | — | — | | |
| ○ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ○ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| — | ◎ | — | — | — | — | — | — | | |
| ○ | — | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | — | — | — | ◎ | ○ | ○ | — | | |

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical
Data



CQS Series

Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

Operating Precautions

Caution

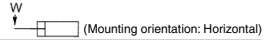
- All loads to piston rod must be applied in axial direction only.
 - When a lateral load is applied unavoidably, ensure that it should not exceed the allowable lateral load to the rod end as specified in graph (1) to (5).
 - When installing a cylinder, centering should be required accurately.
 - Adoption of guide mechanism is strongly recommended for the case when CQS is used as stopper to prevent non-rotating piston rod from side loads.
- 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 by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.

Retaining Ring Installation/Removal

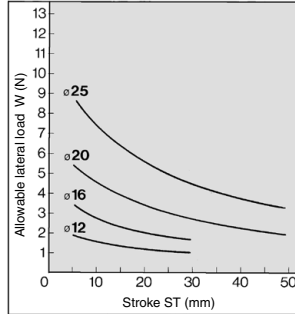
Caution

- 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 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.

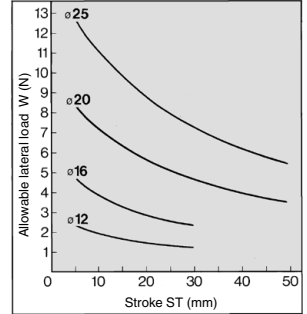
Allowable Lateral Load at Rod End



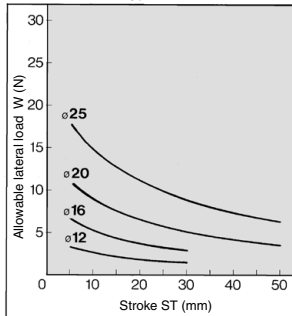
Graph (1) Standard: Non-rotating Rod Type/Without Auto Switch



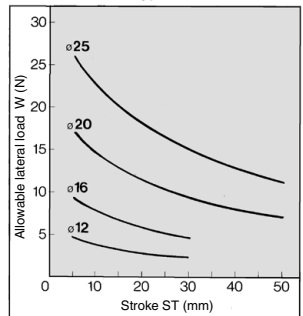
Graph (2) Standard: Non-rotating Rod Type/With Auto Switch



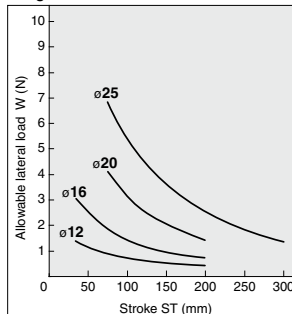
Graph (3) Anti-lateral Load Type/Without Auto Switch



Graph (4) Anti-lateral Load Type/With Auto Switch



Graph (5) Long Stroke/With & Without Auto Switch



Note 1) Graph (1) to (5): Rod end female thread

Note 2) Lateral load allowance varies depending upon rod end shape dimensions or load value (distance to the center of the gravity of load). Please consult with SMC.

Compact Cylinder: Standard Type Double Acting, Single Rod CQS Series

ø12, ø16, ø20, ø25

How to Order

With auto switch CQDS B 20-30 D [] - [] - [] - M9BW [] - []

With auto switch (Built-in magnet)
Mounting type
Bore size
Number of auto switches
Auto switch
Body option
Action

Made to Order
Refer to page 694 for details.

Mounting type

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

Bore size

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

Number of auto switches

| | |
|-----|----------|
| NII | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------|
| NII | Without auto switch |
|-----|---------------------|

Body option

<Standard stroke>

| | |
|-----|---------------------|
| NII | Standard |
| C | With rubber bumper |
| M | Rod end male thread |
| F | Boss on head end |

<Long stroke>

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

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) CDQSL25-30D

Cylinder stroke (mm)

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

For "Manufacture of Intermediate Strokes", refer to page 694.

Applicable Auto Switches

Refer to pages 1575 to 1701 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 (NII) | 1 (M) | 3 (L) | 5 (Z) | | | | |
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | | M9PV | M9P | ● | ● | ● | ○ | ○ | | |
| | | | | 2-wire | | | | M9BV | M9B | ● | ● | ● | ○ | ○ | | ○ |
| | | | | 3-wire (NPN) | | | | M9NWV | M9NW | ● | ● | ● | ○ | ○ | | ○ |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 24 V | 5 V, 12 V | — | M9BWW | M9BW | ● | ● | ● | ○ | ○ | IC circuit | |
| | | | | 2-wire | | | | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ○ | ● | ● | | |
| | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ○ | ● | ● | IC circuit | |
| | | | | 2-wire | | | | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ○ | ● | ● | | |
| Magnetic field resistant (2-color indicator) | Grommet | No | 2-wire (Non-polar) | 24 V | 12 V | — | — | P3DWA ^{**} | ● | ● | ● | ○ | ○ | — | | |
| | | | 3-wire (NPN equivalent) | | | | A96V | A96 | ● | ● | ● | ○ | ○ | | | |
| Reed auto switch | — | Grommet | Yes | 2-wire | 24 V | 12 V | 100 V 100 V or less | A93V ^{**2} | A93 | ● | ● | ● | ○ | Relay, PLC | | |
| | | | | | | | | A90V | A90 | ● | ● | ● | ○ | | ○ | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

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

* Lead wire length symbols: 0.5 m..... NII (Example) M9NW
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NLW
 5 m..... Z (Example) M9NZW

* Solid state auto switches marked with "○" are produced upon receipt of order.
 ** Available only for ø25.

It is mounted away from the port side to avoid interference with fittings.

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

* Auto switches are shipped together (not assembled).

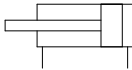
Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV type auto switches cannot be mounted on the port surface, depending on the cylinder's stroke and the fitting size for piping. Consult with SMC for details.

CQS Series

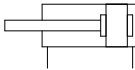


Symbol

Without cushion



Rubber bumper



Made to Order: Individual Specifications

(For details, refer to pages 750 to 752)

| Symbol | Specifications |
|--------|---|
| -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 |

Made to Order Specifications

[Click here for details](#)

| 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 |
| -XC85 | Grease for food processing equipment |
| -XC92 | Dust resistant cylinder |

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.

Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) 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 IDK series in the Best Pneumatics No. 6](#).

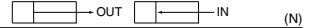
Specifications

| 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: $^{+1.4*}_0$ | | | | |
| 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 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. | Exclusive body (-XB10) | | | |
|-----------------|--|---|--------------|-----------|--------------|
| Part no. | Refer to "How to Order" for the standard model no. (page 693). | Suffix "-XB10" to the end of standard model no. (page 693). | | | |
| Standard stroke | Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. Dealing with the stroke in 1 mm increments 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 |
| Long stroke | Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. Dealing with the stroke in 1 mm increments by using an exclusive body with the specified stroke. | | | |
| | | Bore size | Stroke range | Bore size | Stroke range |
| | 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 747 to 749 for cylinders with auto switches.

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

Weight/Without Auto Switch (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
| 12 | 29 | 36 | 42 | 49 | 56 | 63 | 93 | 100 | 107 | 113 | 147 | 180 | 213 | 246 | 279 | 312 | — | — |
| 16 | 38 | 47 | 56 | 64 | 73 | 82 | 119 | 128 | 136 | 145 | 187 | 229 | 271 | 313 | 355 | 397 | — | — |
| 20 | 63 | 75 | 88 | 101 | 114 | 127 | 140 | 153 | 166 | 178 | 306 | 370 | 434 | 498 | 562 | 627 | — | — |
| 25 | 91 | 107 | 123 | 139 | 155 | 171 | 186 | 202 | 218 | 234 | 399 | 478 | 557 | 636 | 715 | 794 | 952 | 1110 |

For standard stroke

Calculation: (Example) **CQSD20-20DCM**

- Cylinder weight: CQSB20-20D.....101 g
- Additional weight: Rod end male thread.....10 g
- Additional weight: Rubber bumper.....-2 g
- Additional weight: Double clevis type.....92 g

201 g

Weight/With Auto Switch (Built-in magnet) (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
| 12 | 37 | 43 | 50 | 57 | 63 | 70 | 94 | 101 | 108 | 114 | 148 | 181 | 214 | 247 | 280 | 313 | — | — |
| 16 | 48 | 57 | 66 | 74 | 83 | 92 | 121 | 129 | 137 | 146 | 188 | 231 | 273 | 315 | 357 | 399 | — | — |
| 20 | 93 | 106 | 119 | 132 | 144 | 157 | 170 | 182 | 195 | 208 | 311 | 375 | 439 | 503 | 567 | 632 | — | — |
| 25 | 134 | 150 | 166 | 182 | 197 | 213 | 229 | 245 | 261 | 277 | 406 | 485 | 564 | 643 | 721 | 800 | 958 | 1116 |

Additional Weight (g)

| Bore size (mm) | | 12 | 16 | 20 | 25 |
|---|-------------|-----------|-----------|-----------|-----------|
| Rod end male thread | Male thread | 1.5 | 3 | 6 | 12 |
| | Nut | 1 | 2 | 4 | 8 |
| With boss on head end | | 0.7 | 1.3 | 2 | 3 |
| Rubber bumper * (No need to add for long stroke) | | 0 | 1 | -2 | -3 |
| Compact foot type (Including mounting bolt) | | 41 (39) | 51 (47) | 121 (115) | 140 (131) |
| Foot type (Including mounting bolt) | | 55 (53) | 65 (61) | 159 (153) | 181 (172) |
| Rod side flange type (Including mounting bolt) | | 58 (56) | 70 (66) | 143 (137) | 180 (171) |
| Head side flange type (Including mounting bolt) | | 56 | 66 | 137 | 171 |
| Double clevis type (Including pin, snap ring, bolt) | | 34 | 40 | 92 | 127 |

(): denotes the values of long stroke model.

Mounting Bracket Part No.

| Bore size (mm) | Foot (1) | Compact foot (1) | Flange | Double clevis |
|----------------|----------|------------------|----------|---------------|
| 12 | CQS-L012 | CQS-LC012 | CQS-F012 | CQS-D012 |
| 16 | CQS-L016 | CQS-LC016 | CQS-F016 | CQS-D016 |
| 20 | CQS-L020 | CQS-LC020 | CQS-F020 | CQS-D020 |
| 25 | CQS-L025 | CQS-LC025 | CQS-F025 | CQS-D025 |

Note1) When ordering foot and compact foot brackets, order 2 pieces per cylinder.

Note2) Parts belonging to each bracket are as follows.

Foot, Compact foot, Flange type: Body mounting bolt
Double clevis type: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

- CUJ**
- CU**
- CQS**
- JCQ**
- CQ2**
- RQ**
- CQM**
- CQU**
- MU**

- D-□**
- X□**
- Technical Data



Clean Series (Standard stroke is only available.)

10 — C(D)QSB Bore size — Stroke D(M)

Clean Series

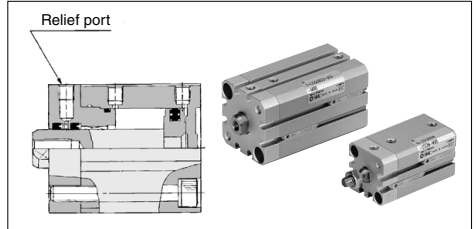
| | |
|----|-------------|
| 10 | Relief type |
| 11 | Vacuum type |

The type which is applicable for using inside the clean room graded ISO Class 4 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

| | |
|----------------------------|--------------------------------------|
| Action | Double acting, Single rod |
| Bore size (mm) | ø12, ø16, ø20, ø25 |
| Proof pressure | 1.5 MPa |
| Maximum operating pressure | 1.0 MPa |
| Rubber bumper | None |
| Piping | Screw-in piping |
| Piston speed | 30 to 400 mm/s |
| Mounting | Through-hole/Both ends tapped common |
| Auto switch | Mountable |

Note) For details, please contact SMC.



For details, refer to the "Pneumatic Clean Series" (CAT.E02-23)

Smooth Cylinder

CQS Y Mounting Bore size — Stroke DC(M)

Smooth Cylinder

Smooth operation with a little sticking and slipping at low speed.
Dual-side low friction operation is possible.



Some of the parts are different from the dimensions of the double acting, single rod type.

Refer to Best Pneumatics No. 2-3.

Low-speed Cylinder

CQS X Mounting Bore size — Stroke D(C)(M)

Low-speed Cylinder

Smooth operation with a little sticking and slipping at low speed.
Can start smoothly with a little ejection even after being rendered for hours.



The dimensions are the same as the double acting, single rod type.

Refer to Best Pneumatics No. 2-3.

Specifications

| Bore size (mm) | 12 | 16 | 20 | 25 |
|-------------------------------|---|----|----|----|
| Type | Pneumatic (Non-lube) | | | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.05 MPa | | | |
| Maximum operating pressure | 0.7 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* | | | |
| Mounting | Through-hole/Both ends tapped common | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable leakage | 0.5 L/min (ANR) or less | | | |

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

Minimum operating pressure (MPa)

| Bore size (mm) | 12 | 16 | 20 | 25 |
|----------------------------|------|----|------|----|
| Minimum operating pressure | 0.03 | | 0.02 | |

Specifications

| Bore size (mm) | 12 | 16 | 20 | 25 |
|-------------------------------|---|----|----|----|
| Type | Pneumatic (Non-lube) | | | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Rubber bumper | None, Rubber bumper* | | | |
| Rod end thread | Female thread | | | |
| Stroke length tolerance | Standard stroke $\begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | | | |
| Mounting | Through-hole/Both ends tapped common | | | |
| Piston speed | ø12, ø16: 1 to 300 mm/s ø20, ø25: 0.5 to 300 mm/s | | | |

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

Minimum operating pressure (MPa)

| | 12 | 16 | 20 | 25 |
|----------------------------|------|------|-------|-------|
| Minimum operating pressure | 0.03 | 0.03 | 0.025 | 0.025 |

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

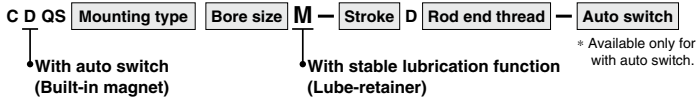
D-□

-X□

Technical Data

CQS Series

Compact Cylinder with Stable Lubrication Function (Lube-retainer)

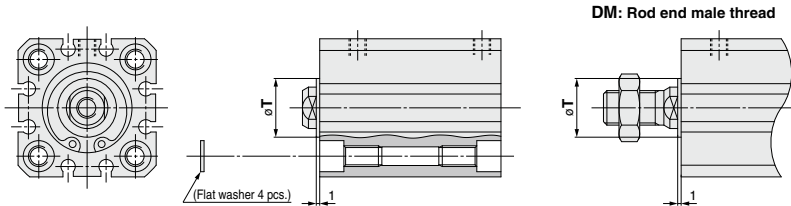


Specifications

| | |
|----------------------------|---------------------------|
| Bore size (mm) | 20, 25 |
| Action | Double acting, Single rod |
| Minimum operating pressure | 0.1 MPa |
| Piston speed | 50 to 500 mm/s |
| Cushion | None |

* Specifications other than those shown above are the same as the standard model.

Dimensions (Dimensions other than those shown below are the same as the standard model.)



| Bore size | Standard stroke | T (mm) |
|-----------|------------------------|--------|
| 20 | 5, 10, 15, 20, 25, 30, | 15 |
| 25 | 35, 40, 45, 50 | 18 |

* The mounting dimensions of the mounting bracket are the same as the standard model.

Mounting Bracket Part No.

| Bore size (mm) | Foot | Compact foot | Flange |
|----------------|-----------|--------------|-----------|
| 20 | CQS-LM020 | CQS-LCM020 | CQS-FM020 |
| 25 | CQS-LM025 | CQS-LCM025 | CQS-FM025 |

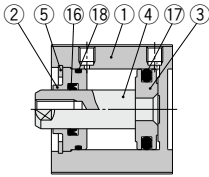
* The double clevis type is the same as the standard model.

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

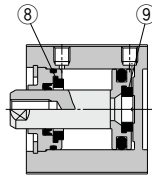
For details, refer to the **Web Catalog**.

Construction

Basic type

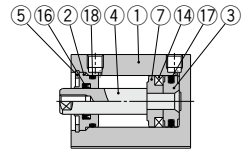


With rubber bumper

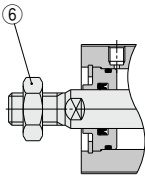


With auto switch (Built-in magnet)

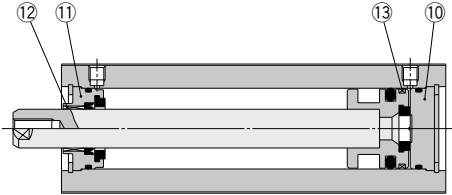
ø12, ø16



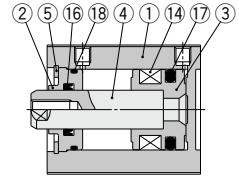
Rod end male thread



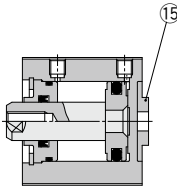
Long stroke



ø20, ø25



With boss on head end



Component Parts

| No. | Description | Material | Note |
|-----|------------------------|-------------------|------------------|
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Collar | Aluminum alloy | Anodized |
| 3 | Piston | Aluminum alloy | |
| 4 | Piston rod | Stainless steel | |
| 5 | Retaining ring | Carbon tool steel | Phosphate coated |
| 6 | Rod end nut | Carbon steel | Zinc chromated |
| 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 | Centering location ring | Aluminum alloy | Anodized |
| 16* | Rod seal | NBR | |
| 17* | Piston seal | NBR | |
| 18* | Tube gasket | NBR | |

Replacement Parts: Seal Kit (Basic type)

| Bore size (mm) | Kit no. | Contents |
|----------------|-----------|---------------------------------|
| 12 | CQSB12-PS | Set of nos. above 16, 17, 18 |
| 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 16, 17, 18 |
| 16 | CQSB16-L-PS | |
| 20 | CQSB20-L-PS | |
| 25 | CQSB25-L-PS | |

* Seal kit includes 16, 17, 18. 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

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

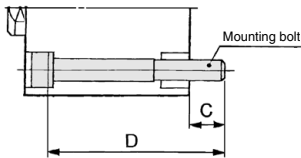
Technical Data

Mounting Bolt for CQS without Auto Switch

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

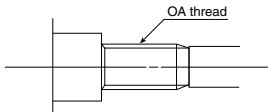
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x25L 4 pcs.



Note 1) The appropriate plain washer must be used for through-hole mounting.

Note 2) Please contact SMC for details concerning the mounting bolts to be used with $\phi 12$ and $\phi 16$ that exceed 30 mm strokes, or $\phi 20$ and $\phi 25$ that exceed 50 mm strokes.



| Cylinder model | C | D | Mounting bolt part no. |
|------------------|-----|----|------------------------|
| CQSB12-5D | | 25 | CQ-M3 x 25L |
| -10D | 6.5 | 30 | x 30L |
| -15D | | 35 | x 35L |
| -20D | | 40 | x 40L |
| -25D | | 45 | x 45L |
| -30D | | 50 | x 50L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| CQSB16-5D | | 25 | CQ-M3 x 25L |
| -10D | 6.5 | 30 | x 30L |
| -15D | | 35 | x 35L |
| -20D | | 40 | x 40L |
| -25D | | 45 | x 45L |
| -30D | | 50 | x 50L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

| Cylinder model | C | D | Mounting bolt part no. |
|------------------|-----|----|------------------------|
| CQSB20-5D | | 25 | CQ-M5 x 25L |
| -10D | 6.5 | 30 | x 30L |
| -15D | | 35 | x 35L |
| -20D | | 40 | x 40L |
| -25D | | 45 | x 45L |
| -30D | | 50 | x 50L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| CQSB25-5D | | 30 | CQ-M5 x 30L |
| -10D | 8.5 | 35 | x 35L |
| -15D | | 40 | x 40L |
| -20D | | 45 | x 45L |
| -25D | | 50 | x 50L |
| -30D | | 55 | x 55L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| -250DC | | | |
| -300DC | | | |

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

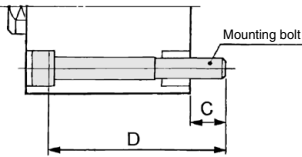
Material: Chromium molybdenum steel
Surface treatment: Nickel plated

Mounting Bolt for CDQS with Auto Switch

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

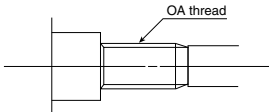
Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x30L 4 pcs.



Note 1) The appropriate plain washer must be used for through-hole mounting.

Note 2) Please contact SMC for details concerning the mounting bolts to be used with $\phi 12$ and $\phi 16$ that exceed 30 mm strokes, or $\phi 20$ and $\phi 25$ that exceed 50 mm strokes.



Accessory

For accessory bracket for the **CQS series**, refer to page 796, since it is commonly used with the **CQ2 series**.

- Single knuckle joint
- Pin for knuckle
- Double knuckle joint
- Rod end nut

| Cylinder model | C | D | Mounting bolt part no. |
|-------------------|-----|----|------------------------|
| CDQSB12-5D | | 30 | CQ-M3 x 30L |
| -10D | 6.5 | 35 | x 35L |
| -15D | | 40 | x 40L |
| -20D | | 45 | x 45L |
| -25D | | 50 | x 50L |
| -30D | | 55 | x 55L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| CDQSB16-5D | | 30 | CQ-M3 x 30L |
| -10D | 6.5 | 35 | x 35L |
| -15D | | 40 | x 40L |
| -20D | | 45 | x 45L |
| -25D | | 50 | x 50L |
| -30D | | 55 | x 55L |
| -35DC | | | |
| -40DC | | | |
| -45DC | | | |
| -50DC | | | |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

| Cylinder model | C | D | Mounting bolt part no. |
|-------------------|-----|----|------------------------|
| CDQSB20-5D | | 35 | CQ-M5 x 35L |
| -10D | 6.5 | 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 |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| CDQSB25-5D | | 40 | CQ-M5 x 40L |
| -10D | 8.5 | 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 |
| -75DC | | | |
| -100DC | | | |
| -125DC | | | |
| -150DC | | | |
| -175DC | | | |
| -200DC | | | |
| -250DC | | | |
| -300DC | | | |

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

Secure the cylinder by using the OA screws that are provided with the cylinder tube.

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQS Series

Dimensions: $\phi 12$ to $\phi 25$

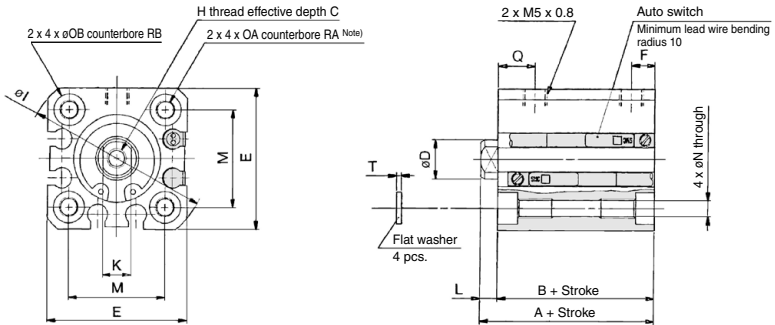
Basic type (Through-hole/Both ends tapped common): CQSB/CDQSB

* For the auto switch mounting position and its mounting height, refer to page 747.

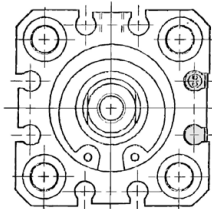
$\phi 12$



$\phi 16$

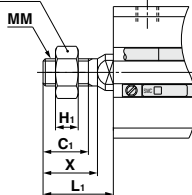


$\phi 20, \phi 25$

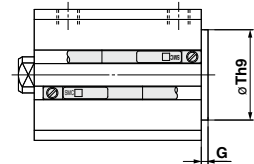


Rod end male thread

Width across flats B_1



With boss on head end



• Length with intermediate stroke

(1) Spacer ... The dimensions will be identical to those of the nearest long stroke. Those that exceed the standard stroke will have the long stroke dimensions.

(2) Exclusive body (-XB10)....Add stroke. Also, the stroke length that exceeds the standard stroke would be the long stroke dimension.

Rod End Male Thread

| Bore size (mm) | B_1 | C_1 | H_1 | Standard stroke | | Long stroke | MM | X |
|----------------|-------|-------|-------|-----------------|-------|-------------|------|-----|
| | | | | L_1 | L_1 | | | |
| 12 | 8 | 9 | 4 | 14 | 24 | M5 x 0.8 | 10.5 | |
| 16 | 10 | 10 | 5 | 15.5 | 25.5 | M6 x 1.0 | 12 | |
| 20 | 13 | 12 | 5 | 18.5 | 28.5 | M8 x 1.25 | 14 | |
| 25 | 17 | 15 | 6 | 22.5 | 32.5 | M10 x 1.25 | 17.5 | |

With Boss on Head End (mm)

| Bore size (mm) | G | Th_9 |
|----------------|-----|-----------------------------------|
| | | |
| 16 | 1.5 | 20 ⁰ _{-0.052} |
| 20 | 2 | 13 ⁰ _{-0.043} |
| 25 | 2 | 15 ⁰ _{-0.043} |

Note1) The product with boss on head end is applicable to only the standard stroke.

Note2) With boss on rod end : Option (Suffix "-XC36" to the end of part number.)

Note that only bore sizes $\phi 12$ and $\phi 16$ are applicable to the long stroke.

Basic Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | | | Long stroke range (mm) | Long stroke | | | | | | | | C | D | E | H | I | K | M | N | OA | OB | Q | RA | RB | T |
|----------------|----------------------------|---------------------|------|-----|-----|------------------|------|-----|-----|------------------------|--------------------------|----|-----|------|----|----|----|----------|-----|-----|------|-----|----------|-----|-----|-----|----|-----|---|----|----|---|
| | | Without auto switch | | | | With auto switch | | | | | With/Without auto switch | | | | | | | | | | | | | | | | | | | | | |
| | | A | B | F | L | A | B | F | L | | A | B | F | L | A | B | F | L | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 20.5 | 17 | 5 | 3.5 | 25.5 | 22 | 5 | 3.5 | 35 to 200 | 45.5 | 32 | 7.5 | 13.5 | 6 | 6 | 25 | M3 x 0.5 | 32 | 5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 | | | | |
| 16 | 5 to 30 | 20.5 | 17 | 5 | 3.5 | 25.5 | 22 | 5 | 3.5 | 35 to 200 | 45.5 | 32 | 7.5 | 13.5 | 8 | 8 | 29 | M4 x 0.7 | 38 | 6 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 | | | | |
| 20 | 5 to 50 | 24 | 19.5 | 5.5 | 4.5 | 34 | 29.5 | 5.5 | 4.5 | 75 to 200 | 55.5 | 41 | 8 | 14.5 | 7 | 10 | 36 | M5 x 0.8 | 47 | 8 | 25.5 | 5.4 | M6 x 1.0 | 9 | 8 | 10 | 7 | 1 | | | | |
| 25 | 5 to 50 | 27.5 | 22.5 | 5.5 | 5 | 37.5 | 32.5 | 5.5 | 5 | 75 to 300 | 59 | 44 | 9 | 15 | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 | | | | |

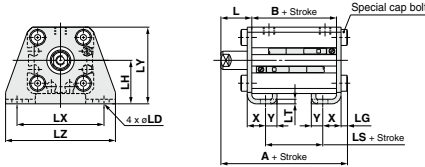
Note 1) For the following bore/stroke sizes through-hole is threaded over the entire length: Basic type $\phi 12$ and $\phi 16$; 5 stroke, $\phi 20$; 5 to 15 stroke, $\phi 25$; 5 to 10 stroke, $\phi 20$ with auto switch built-in magnet; 5 stroke.

Note 2) Rubber bumper type has the same dimensions as those indicated above.

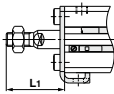
* For details about the rod end nut and accessory brackets, refer to page 796.

702

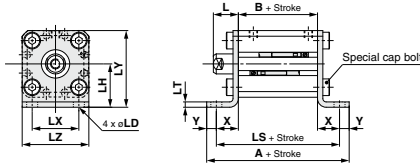
Foot type: CQSL/CDQSL



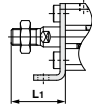
Rod end male thread



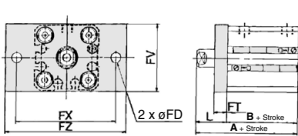
Compact foot type: CQSLC/CDQSLC



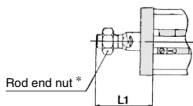
Rod end male thread



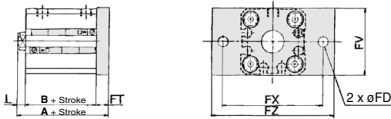
Rod side flange type: CQSF/CDQSF



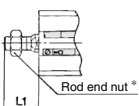
Rod end male thread



Head side flange type: CQSG/CDQSG



Rod end male thread



Foot Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | Long stroke range (mm) | | | Long stroke | | |
|----------------|----------------------------|---------------------|------|-----|------------------|------|------|------------------------|------|----|------------------|---|----|
| | | Without auto switch | | | With auto switch | | | Without auto switch | | | With auto switch | | |
| | | A | B | LS | A | B | LS | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 35.3 | 17 | 5 | 40.3 | 22 | 10 | 35 to 200 | 50.3 | 32 | 20 | | |
| 16 | 5 to 30 | 35.3 | 17 | 5 | 40.3 | 22 | 10 | 35 to 200 | 50.3 | 32 | 20 | | |
| 20 | 5 to 50 | 41.2 | 19.5 | 7.5 | 51.2 | 29.5 | 17.5 | 75 to 200 | 62.7 | 41 | 29 | | |
| 25 | 5 to 50 | 44.7 | 22.5 | 7.5 | 54.7 | 32.5 | 17.5 | 75 to 300 | 66.2 | 44 | 29 | | |

| Bore size (mm) | L | L1 | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|------|-----|-----|----|-----|----|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact Foot Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | Long stroke range (mm) | | | Long stroke | | |
|----------------|----------------------------|---------------------|------|------|------------------|------|------|------------------------|------|----|------------------|---|----|
| | | Without auto switch | | | With auto switch | | | Without auto switch | | | With auto switch | | |
| | | A | B | LS | A | B | LS | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 44.6 | 17 | 35.6 | 49.6 | 22 | 40.6 | 35 to 200 | 59.6 | 32 | 50.6 | | |
| 16 | 5 to 30 | 45.6 | 17 | 35.6 | 50.6 | 22 | 40.6 | 35 to 200 | 60.6 | 32 | 50.6 | | |
| 20 | 5 to 50 | 57.5 | 19.5 | 45.9 | 67.5 | 29.5 | 55.9 | 75 to 200 | 79 | 41 | 67.4 | | |
| 25 | 5 to 50 | 60.5 | 22.5 | 48.9 | 70.5 | 32.5 | 58.9 | 75 to 300 | 82 | 44 | 70.4 | | |

| Bore size (mm) | L | L1 | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|------|-----|----|-----|------|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod Side Flange Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | Long stroke range (mm) | | Long stroke | |
|----------------|----------------------------|---------------------|------|------|------------------|-----------|--|------------------------|----|------------------|--|
| | | Without auto switch | | | With auto switch | | | Without auto switch | | With auto switch | |
| | | A | B | A | B | | | A | B | | |
| 12 | 5 to 30 | 30.5 | 17 | 35.5 | 22 | 35 to 200 | | 45.5 | 32 | | |
| 16 | 5 to 30 | 30.5 | 17 | 35.5 | 22 | 35 to 200 | | 45.5 | 32 | | |
| 20 | 5 to 50 | 34 | 19.5 | 44 | 29.5 | 75 to 200 | | 55.5 | 41 | | |
| 25 | 5 to 50 | 37.5 | 22.5 | 47.5 | 32.5 | 75 to 300 | | 59 | 44 | | |

| Bore size (mm) | FD | FT | FV | FX | FZ | L | L1 |
|----------------|-----|-----|----|----|----|------|------|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head Side Flange Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | Long stroke range (mm) | | | Long stroke | | | |
|----------------|----------------------------|---------------------|------|-----|------------------|------|------|------------------------|------|-----------|------------------|----|------|------|
| | | Without auto switch | | | With auto switch | | | Without auto switch | | | With auto switch | | | |
| | | A | B | L1 | A | B | L1 | A | B | L1 | A | B | L1 | |
| 12 | 5 to 30 | 26 | 17 | 3.5 | 14 | 31 | 22 | 3.5 | 14 | 35 to 200 | 51 | 32 | 13.5 | 24 |
| 16 | 5 to 30 | 26 | 17 | 3.5 | 15.5 | 31 | 22 | 3.5 | 15.5 | 35 to 200 | 51 | 32 | 13.5 | 25.5 |
| 20 | 5 to 50 | 32 | 19.5 | 4.5 | 18.5 | 42 | 29.5 | 4.5 | 18.5 | 75 to 200 | 63.5 | 41 | 14.5 | 28.5 |
| 25 | 5 to 50 | 35.5 | 22.5 | 5 | 22.5 | 45.5 | 32.5 | 5 | 22.5 | 75 to 300 | 67 | 44 | 15 | 32.5 |

| Bore size (mm) | FD | FT | FV | FX | FZ |
|----------------|-----|-----|----|----|----|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 |
| 20 | 6.6 | 8 | 39 | 48 | 60 |
| 25 | 6.6 | 8 | 42 | 52 | 64 |

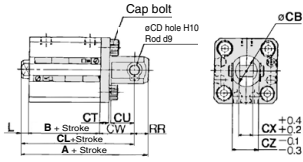
Flange bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 796.

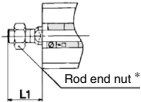
CQS Series

Dimensions: $\varnothing 12$ to $\varnothing 25$

Double clevis type: CQSD/CDQSD



Rod end male thread



Double Clevis Type

| Bore size (mm) | Standard stroke range (mm) | Standard stroke | | | | | | | | | | Long stroke range (mm) | Long stroke | | | | |
|----------------|----------------------------|---------------------|------|------|-----|----------------|------------------|------|------|-----|----------------|------------------------|-------------|----|------------------|------|----------------|
| | | Without auto switch | | | | | With auto switch | | | | | | Without | | With auto switch | | |
| | | A | B | CL | L | L ₁ | A | B | CL | L | L ₁ | | A | B | CL | L | L ₁ |
| 12 | 5 to 30 | 40.5 | 17 | 34.5 | 3.5 | 14 | 45.5 | 22 | 39.5 | 3.5 | 14 | 35 to 200 | 66.5 | 32 | 59.5 | 13.5 | 24 |
| 16 | 5 to 30 | 41.5 | 17 | 35.5 | 3.5 | 15.5 | 46.5 | 22 | 40.5 | 3.5 | 15.5 | 35 to 200 | 66.5 | 32 | 60.5 | 13.5 | 25.5 |
| 20 | 5 to 50 | 51 | 19.5 | 42 | 4.5 | 18.5 | 61 | 29.5 | 52 | 4.5 | 18.5 | 75 to 200 | 82.5 | 41 | 73.5 | 14.5 | 28.5 |
| 25 | 5 to 50 | 57.5 | 22.5 | 47.5 | 5 | 22.5 | 67.5 | 32.5 | 57.5 | 5 | 22.5 | 75 to 300 | 89 | 44 | 79 | 15 | 32.5 |

| Bore size (mm) | CB | CD | CT | CU | CW | CX | CZ | RR |
|----------------|----|----|----|----|----|-----|----|----|
| 12 | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 6 |
| 16 | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 6 |
| 20 | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 9 |
| 25 | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 10 |

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

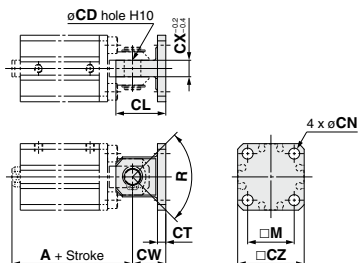
* For details about the double clevis pivot bracket, refer to page 705.

* For details about the rod end nut and accessory brackets, refer to page 796.

CQS Series Accessory Dimensions

Double Clevis Pivot Bracket

Bore size $\varnothing 12$ to $\varnothing 25$



| Bracket part no. | Bore size | Stroke range | A | | CW | CT | CL | CX | CD | M | CZ | R | CN | Hexagon socket head cap screw for mounting pivot bracket (Accessory) |
|------------------|-----------|--------------|---------------------|------------------|----|----|----|-----|----|------|----|------|-----|--|
| | | | Without auto switch | With auto switch | | | | | | | | | | |
| CQ-C012 | 12 | 5 to 30 | 34.5 | 39.5 | 14 | 4 | 19 | 5 | 5 | 15.5 | 25 | 100° | 4.5 | M4 x 10L |
| CQ-C016 | 16 | 5 to 30 | 35.5 | 40.5 | 15 | 4 | 21 | 6.5 | 5 | 20 | 28 | 100° | 4.5 | M4 x 10L |
| CQ-C020 | 20 | 5 to 50 | 42 | 52 | 18 | 5 | 27 | 8 | 8 | 25.5 | 35 | 80° | 6.6 | M6 x 12L |
| CQ-C025 | 25 | 5 to 50 | 47.5 | 57.5 | 20 | 5 | 30 | 10 | 10 | 28 | 40 | 90° | 6.6 | M6 x 12L |

* The double clevis pin and retaining ring are not included.

Double clevis pivot bracket material: Carbon steel
Surface treatment: Nickel plated

CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical
Data

Compact Cylinder: Standard Type Double Acting, Double Rod

CQSW Series

∅12, ∅16, ∅20, ∅25

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 type

| | |
|-----------|---|
| B | Through-hole/Both ends tapped common (Standard) |
| L | Foot type |
| LC | Compact foot type |
| F | Flange type |

* 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 710.

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 |

Standard Stroke

Number of auto switches

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

Auto switch

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

* 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. CM

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) CDQSWL25-30D

Applicable Auto Switches/Refer to pages 1575 to 1701 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 auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ● | ○ | | | |
| | | | | 2-wire | M9BV | | M9B | ● | ● | ● | ○ | — | | | |
| | | | | 3-wire (NPN) | M9NWV | | M9NV | ● | ● | ● | ○ | IC circuit | | | |
| | Diagnostic indication (2-color indicator) | | | 3-wire (PNP) | 5 V, 12 V | | M9PWV | M9PW | ● | ● | ● | ○ | — | | |
| | | | | 2-wire | | | M9BWW | M9BW | ● | ● | ● | ○ | — | | |
| | | | | 3-wire (NPN) | 5 V, 12 V | | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ○ | ○ | — | | |
| | | | | 3-wire (PNP) | | | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ○ | ○ | IC circuit | | |
| Water resistant (2-color indicator) | 2-wire | 12 V | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ○ | ○ | — | | | | | | |
| | 2-wire (Non-polar) | — | — | P3DWA ^{**} | ● | ● | ● | ○ | — | | | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | A96V | A96 | ● | — | ● | — | — | IC circuit | — |
| | | | | 2-wire | | | 24 V | 12 V | A93V ^{*2} | A93 | ● | ● | ● | — | — |
| | | | | No | — | — | 100 V or less | A90V | A90 | ● | — | ● | — | — | IC circuit |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

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

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV
1 m..... M (Example) M9NWV
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NZ

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

** Available only for ∅25.

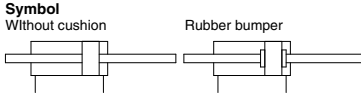
It is mounted away from the port side to avoid interference with fittings.

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

* Auto switches are shipped together (not assembled).

Note) There is the case D-A9□V/M9□V/M9□V/M9□AV 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.



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 | | | | |
| 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.

Made to Order
Made to Order: Individual Specifications
(For details, refer to pages 750 and 751.)

| Symbol | Specifications |
|--------|---|
| -X235 | Change of piston rod end of double rod cylinder |
| -X271 | Fluororubber seals |
| -X633 | Intermediate stroke of double rod cylinder |

Made to Order Specifications

[Click here for details](#)

| 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 |
| -XC85 | Grease for food processing equipment |

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 (1) | Compact foot (1) | Flange |
|----------------|----------|------------------|----------|
| 12 | CQS-L012 | CQS-LC012 | CQS-F012 |
| 16 | CQS-L016 | CQS-LC016 | CQS-F016 |
| 20 | CQS-L020 | CQS-LC020 | CQS-F020 |
| 25 | CQS-L025 | CQS-LC025 | CQS-F025 |

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

Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange type: Body mounting bolt

Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) 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 IDK series in the Best Pneumatics No. 6.](#)

Theoretical Output

(N)

| 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 | | | | |
| 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 706). | Suffix "-XB10" to the end of standard model no. (page 706). |
| Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. | Dealing with the stroke in 1 mm increments by using an exclusive body with the specified stroke. |
| Stroke range | Bore size | Bore size |
| | Stroke range | Stroke range |
| | | |
| Example | Part no.: CQSWB25-47D-X633 | Part no.: CQSWB25-47D-XB10 |
| | CQSWB25-50D with 3 mm width spacer inside. | Makes 47 stroke tube. |
| | B dimension is 79 mm. | B dimension is 76 mm. |

Refer to pages 747 to 749 for cylinders with auto switches.

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

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

Weight/Without Auto Switch (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 38 | 46 | 54 | 62 | 69 | 77 | — | — | — | — |
| 16 | 50 | 61 | 71 | 81 | 92 | 102 | — | — | — | — |
| 20 | 89 | 104 | 120 | 136 | 152 | 167 | 183 | 199 | 215 | 231 |
| 25 | 127 | 146 | 166 | 186 | 206 | 227 | 247 | 267 | 287 | 308 |

Weight/With Auto Switch (Built-in magnet) (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 46 | 54 | 62 | 70 | 77 | 85 | — | — | — | — |
| 16 | 60 | 71 | 81 | 91 | 102 | 112 | — | — | — | — |
| 20 | 119 | 134 | 150 | 166 | 182 | 198 | 214 | 230 | 245 | 261 |
| 25 | 154 | 174 | 195 | 215 | 235 | 255 | 276 | 296 | 316 | 336 |

Additional Weight (g)

| Bore size (mm) | | 12 | 16 | 20 | 25 |
|--|-------------|----|----|-----|-----|
| Rod end male thread | Male thread | 3 | 6 | 12 | 24 |
| | Nut | 2 | 4 | 8 | 16 |
| With rubber bumper | | 0 | -1 | -2 | -2 |
| Foot type (Including mounting bolt) | | 55 | 65 | 159 | 181 |
| Compact foot type (Including mounting bolt) | | 41 | 51 | 121 | 140 |
| Rod side flange type (Including mounting bolt) | | 58 | 70 | 143 | 180 |

Calculation: (Example) **CQSWF12-10DM**

- Cylinder weight: CQSWB12-10D.....46 g
- Additional weight: Rod end male thread.....5 g
- : Rod side flange type..... 58 g

109 g

⚠ Caution

Retaining Ring Installation/Removal

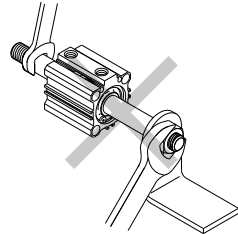
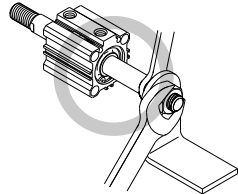
1. For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
2. Even if a proper plier (tool for installing type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out 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.

⚠ Warning

Mounting

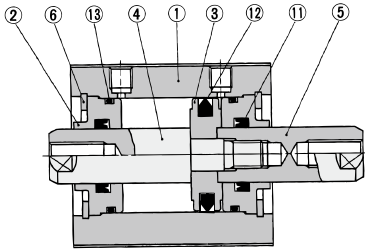
Do not apply the reverse torque to the piston rods sticking out from both sides of this cylinder at the same time. The torque makes connection threads inside loosen, which may cause an accident or malfunction.

Install or remove a load while the piston rod width across flats are secured. Do not fix the other side of piston rod width across flat and apply the reverse torque.

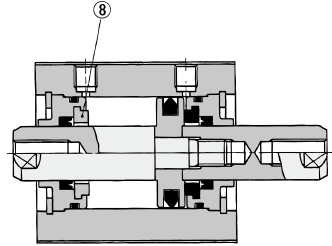


Construction

Basic type

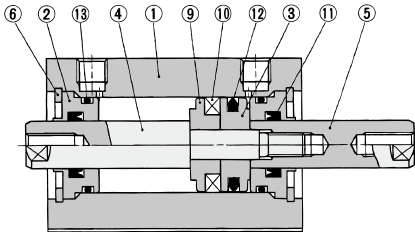


With rubber bumper

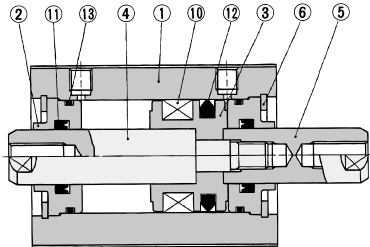


With auto switch (Built-in magnet)

ø12, ø16



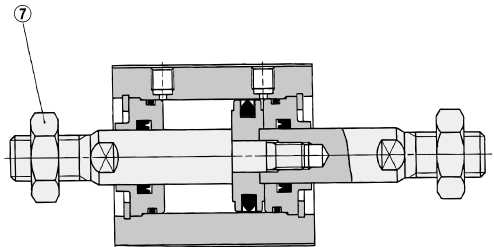
ø20, ø25



Component Parts

| No. | Description | Material | Note |
|-----|-------------------|-------------------|------------------|
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Collar | Aluminum alloy | Anodized |
| 3 | Piston | Aluminum alloy | |
| 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 | Zinc chromated |
| 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

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical
Data

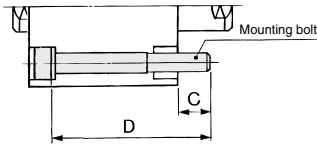
CQSW Series

Mounting Bolt for CQSW

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

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x30L 4 pcs.



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

| Cylinder model | C | D | Mounting bolt part no. |
|-------------------|-----|----|------------------------|
| CQSWB12-5D | | 30 | CQ-M3 x 30L |
| -10D | 6.5 | 35 | x 35L |
| -15D | | 40 | x 40L |
| -20D | | 45 | x 45L |
| -25D | | 50 | x 50L |
| -30D | | 55 | x 55L |
| CQSWB16-5D | | 30 | CQ-M3 x 30L |
| -10D | 6.5 | 35 | x 35L |
| -15D | | 40 | x 40L |
| -20D | | 45 | x 45L |
| -25D | | 50 | x 50L |
| -30D | | 55 | x 55L |
| CQSWB20-5D | | 35 | CQ-M5 x 35L |
| -10D | 10 | 40 | x 40L |
| -15D | | 45 | x 45L |
| -20D | | 50 | x 50L |

| Cylinder model | C | D | Mounting bolt part no. |
|--------------------|----|-------|------------------------|
| CQSWB20-25D | | 55 | CQ-M5 x 55L |
| -30D | 10 | 60 | x 60L |
| -35D | | 65 | x 65L |
| -40D | | 70 | x 70L |
| -45D | | 75 | x 75L |
| -50D | | 80 | x 80L |
| CQSWB25-5D | | 35 | CQ-M5 x 35L |
| -10D | 7 | 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 | |

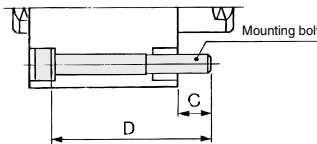
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSW with Auto Switch

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

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3x35L 4 pcs.



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

| Cylinder model | C | D | Mounting bolt part no. |
|--------------------|-----|----|------------------------|
| CDQSWB12-5D | | 35 | CQ-M3 x 35L |
| -10D | 6.5 | 40 | x 40L |
| -15D | | 45 | x 45L |
| -20D | | 50 | x 50L |
| -25D | | 55 | x 55L |
| -30D | | 60 | x 60L |
| CDQSWB16-5D | | 35 | CQ-M3 x 35L |
| -10D | 6.5 | 40 | x 40L |
| -15D | | 45 | x 45L |
| -20D | | 50 | x 50L |
| -25D | | 55 | x 55L |
| -30D | | 60 | x 60L |
| CDQSWB20-5D | | 45 | CQ-M5 x 45L |
| -10D | 10 | 50 | x 50L |
| -15D | | 55 | x 55L |
| -20D | | 60 | x 60L |

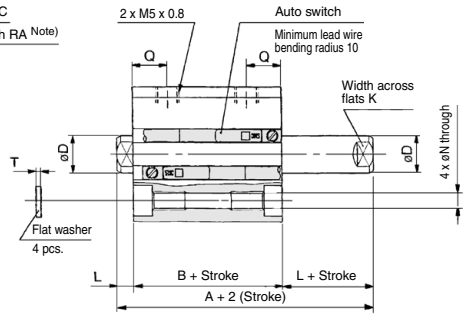
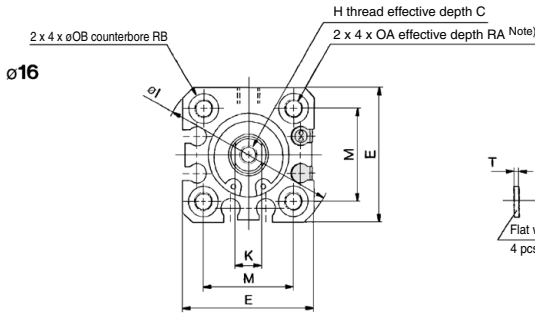
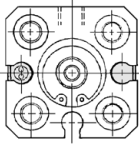
| Cylinder model | C | D | Mounting bolt part no. |
|---------------------|----|-------|------------------------|
| CDQSWB20-25D | | 65 | CQ-M5 x 65L |
| -30D | 10 | 70 | x 70L |
| -35D | | 75 | x 75L |
| -40D | | 80 | x 80L |
| -45D | | 85 | x 85L |
| -50D | | 90 | x 90L |
| CDQSWB25-5D | | 45 | CQ-M5 x 45L |
| -10D | 7 | 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 | 85 | x 85L | |
| -50D | 90 | x 90L | |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

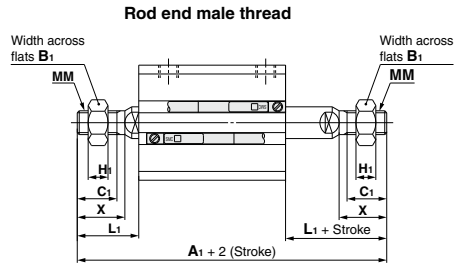
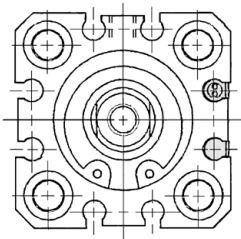
Dimensions: $\phi 12$ to $\phi 25$

Basic type (Through-hole/Both ends tapped common): CQSWB/CDQSWB

$\phi 12$



$\phi 20, \phi 25$



Rod End Male Thread

| Bore size (mm) | Without auto switch | | With auto switch | | B ₁ | C ₁ | H ₁ | L ₁ | MM | X |
|----------------|---------------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|----|---|
| | A ₁ | A ₁ | A ₁ | A ₁ | | | | | | |
| 12 | 50 | 55 | 8 | 9 | 4 | 14 | M5 x 0.8 | 10.5 | | |
| 16 | 53 | 58 | 10 | 10 | 5 | 15.5 | M6 x 1.0 | 12 | | |
| 20 | 63 | 73 | 13 | 12 | 5 | 18.5 | M8 x 1.25 | 14 | | |
| 25 | 74 | 84 | 17 | 15 | 6 | 22.5 | M10 x 1.25 | 17.5 | | |

Basic Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | C | D | E | H | I | K | L | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|----|------------------|----|----|----|----|----------|----|----|-----|------|-----|----------|-----|-----|----|----|-----|
| | | A | B | A | B | | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 29 | 22 | 34 | 27 | 6 | 6 | 25 | M3 x 0.5 | 32 | 5 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 16 | 5 to 30 | 29 | 22 | 34 | 27 | 8 | 8 | 29 | M4 x 0.7 | 38 | 6 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 20 | 5 to 50 | 35 | 26 | 45 | 36 | 7 | 10 | 36 | M5 x 0.8 | 47 | 8 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 8 | 10 | 7 | 1 |
| 25 | 5 to 50 | 39 | 29 | 49 | 39 | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 |

Note 1) For basic type $\phi 20$ and $\phi 25$ with 5 stroke, through-hole is threaded over the entire length.

Note 2) Rubber bumper type has the same dimensions as those indicated above

Note 3) The positions of width across flats on both sides are not the same.

* For details about the rod end nut and accessory brackets, refer to page 796.

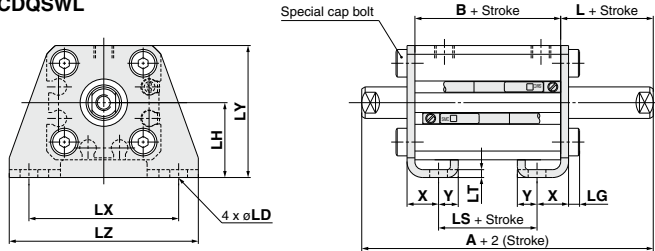
- CUJ
- CU
- CQS
- JCQ
- CQ2
- RQ
- CQM
- CQU
- MU

- D-
- X
- Technical Data

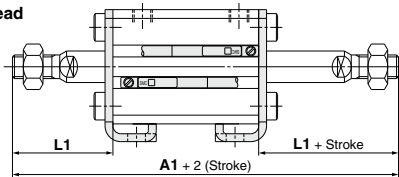
CQSW Series

Dimensions: $\varnothing 12$ to $\varnothing 25$

Foot type: CQSWL/CDQSWL



Rod end male thread

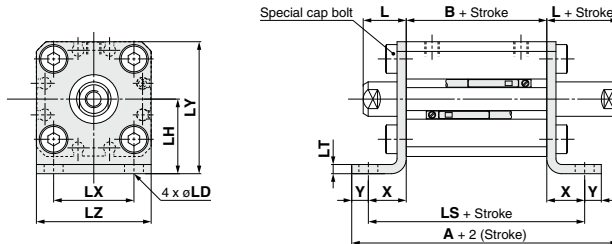


Foot Type

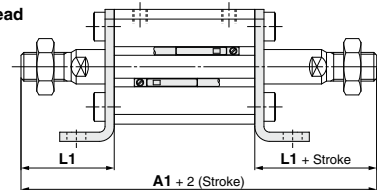
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | L | L1 | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|----|----|----|------------------|-----|----|----|------|------|-----|-----|----|-----|----|------|----|------|-----|
| | | A | A1 | B | LS | A | A1 | B | LS | | | | | | | | | | | |
| 12 | 5 to 30 | 49 | 70 | 22 | 10 | 54 | 75 | 27 | 15 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 5 to 30 | 49 | 73 | 22 | 10 | 54 | 78 | 27 | 15 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 5 to 50 | 55 | 83 | 26 | 14 | 65 | 93 | 36 | 24 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 5 to 50 | 59 | 94 | 29 | 14 | 69 | 104 | 39 | 24 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot type: CQSWLC/CDQSWLC



Rod end male thread



Compact Foot Type

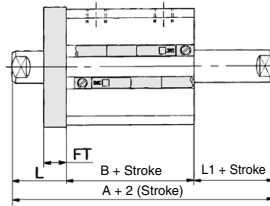
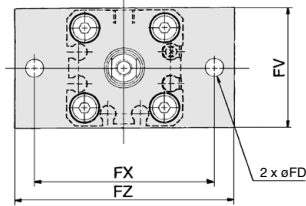
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | L | L1 | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|----|----|------|------------------|-----|----|------|------|------|-----|----|-----|------|------|----|------|-----|
| | | A | A1 | B | LS | A | A1 | B | LS | | | | | | | | | | |
| 12 | 5 to 30 | 49.3 | 70 | 22 | 40.6 | 54.3 | 75 | 27 | 45.6 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 5 to 30 | 49.8 | 73 | 22 | 40.6 | 54.8 | 78 | 27 | 45.6 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 5 to 50 | 59.5 | 83 | 26 | 52.4 | 69.5 | 93 | 36 | 62.4 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 5 to 50 | 63 | 94 | 29 | 55.4 | 73 | 104 | 39 | 65.4 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

* For details about the rod end nut and accessory brackets, refer to page 796.

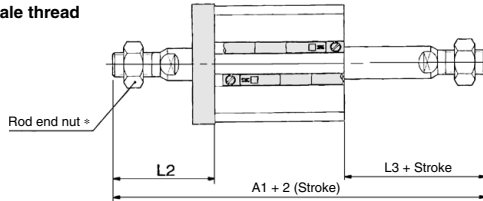
Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Dimensions: $\varnothing 12$ to $\varnothing 25$

Flange type: CQSWF/CDQSWF



Rod end male thread



Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | FD | FT | FV | FX | FZ | L | L1 | L2 | L3 |
|----------------|-------------------|---------------------|----|----|------------------|----|----|-----|-----|----|----|----|------|-----|------|------|
| | | A | A1 | B | A | A1 | B | | | | | | | | | |
| 12 | 5 to 30 | 39 | 60 | 22 | 44 | 65 | 27 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 3.5 | 24 | 14 |
| 16 | 5 to 30 | 39 | 63 | 22 | 44 | 68 | 27 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 3.5 | 25.5 | 15.5 |
| 20 | 5 to 50 | 45 | 73 | 26 | 55 | 83 | 36 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 4.5 | 28.5 | 18.5 |
| 25 | 5 to 50 | 49 | 84 | 29 | 59 | 94 | 39 | 6.6 | 8 | 42 | 52 | 64 | 15 | 5 | 32.5 | 22.5 |

* For details about the rod end nut and accessory brackets, refer to page 796.
 Note 1) The positions of width across flats on both sides are not the same.

Flange bracket material: Carbon steel
 Surface treatment: Nickel plated

- CUJ**
- CU**
- CQS**
- JCQ**
- CQ2**
- RQ**
- CQM**
- CQU**
- MU**

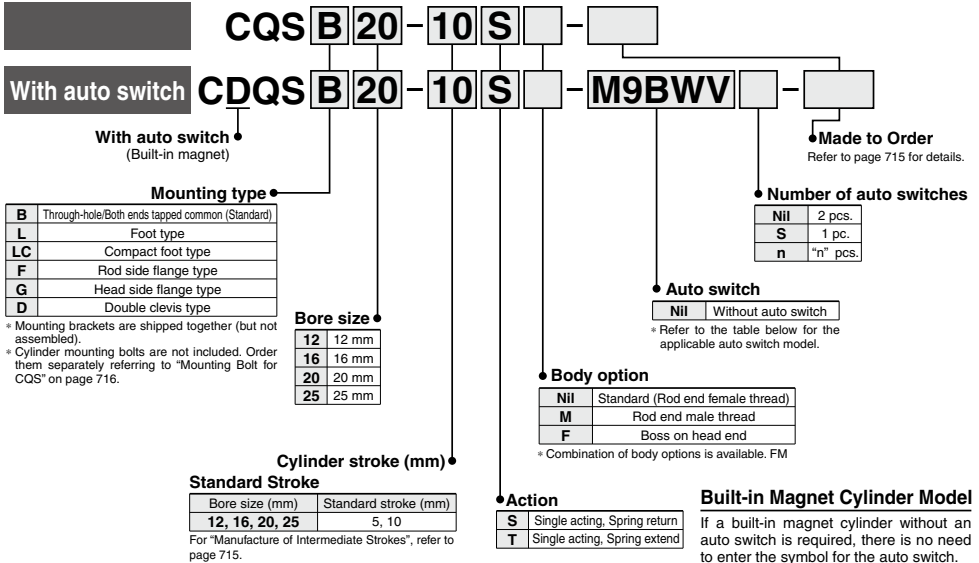
- D-□**
- X□**
- Technical Data

Compact Cylinder: Standard Type Single Acting, Single Rod

CQS Series

∅12, ∅16, ∅20, ∅25

How to Order



Applicable Auto Switches/Refer to pages 1575 to 1701 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 auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV (M9N) | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | | | | |
| | | | | 3-wire (PNP) | | | M9PV (M9P) | ● | ● | ● | ○ | ○ | | | | | | |
| | | | | 2-wire | M9B (M9B) | | ● | ● | ● | ○ | ○ | | | | | | | |
| | Diagnostic indication (2-color indicator) | | | 3-wire (NPN) | 5 V, 12 V | | M9NWV (M9NW) | ● | ● | ● | ○ | ○ | | | IC circuit | | | |
| | | | | 3-wire (PNP) | | | M9PWV (M9PW) | ● | ● | ● | ○ | ○ | | | | | | |
| | | | | 2-wire | M9BWW (M9BWW) | | ● | ● | ● | ○ | ○ | | | | | | | |
| Water resistant (2-color indicator) | 3-wire (NPN) | 5 V, 12 V | M9NAV ^{*1} (M9NA) ^{*1} | ○ | ○ | ○ | ○ | ○ | IC circuit | | | | | | | | | |
| | 3-wire (PNP) | | M9PAV ^{*1} (M9PA) ^{*1} | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | A96V | A96 | ● | ● | ● | ● | — | IC circuit | — | | | |
| | | | | 2-wire | | | A93V ^{*2} | A93 | ● | ● | ● | ● | — | — | Relay, PLC | | | |
| | | | | No | 2-wire | | 24 V | 12 V | 100 V | A90V | A90 | ● | — | ● | — | — | IC circuit | — |
| | | | | | | | | | 100 V or less | A90V | A90 | ● | — | ● | — | — | — | IC circuit |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

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

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NWV
1 m..... M (Example) M9NWW
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWWZ

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

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

* Auto switches are shipped together (not assembled).

Note 1) There is the case D-A9□V/M9□V/M9□V/M9□V 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.

Note 2) The D-M9□□□ (in-line entry) type auto switch in () cannot be mounted due to the manufacturable stroke. When this auto switch satisfies the conditions stated in Note 3) on page 749, it can be ordered separately.

Standard Specifications

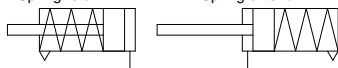
| Bore size (mm) | 12 | 16 | 20 | 25 |
|--------------------------------------|--|-------|----------|------|
| Action | Single acting, Single rod | | | |
| Fluid | Air | | | |
| Lubrication | Not required (Non-lube) | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.25 MPa | | 0.18 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 | | | |
| Rod end thread | Female thread | | | |
| Stroke length tolerance | +1.0 mm 0 | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable kinetic energy (J) | 0.022 | 0.038 | 0.055 | 0.09 |



Symbol

Single acting,
Spring return

Single acting,
Spring extend



Made to Order:

Individual Specifications

(For details, refer to pages 750 and 752.)

| Symbol | Specifications |
|--------|--|
| -X271 | Fluororubber seals |
| -X1876 | With concave shape end boss on the cylinder tube head side |

Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA | Change of rod end shape |
| -XB10 | Intermediate stroke (Using exclusive body), Extension type only |
| -XC6 | Piston rod, retaining ring, rod end nut made of stainless steel |
| -XC36 | With boss on rod side, ø12 and ø16 only |
| -XC85 | Grease for food processing equipment |

Body Option

| Description | Application |
|---------------------|---|
| Rod end male thread | Available for all standard models of single acting, single rod. |

Mounting Bracket Part No.

| Bore size (mm) | Foot (1) | Compact foot (1) | Flange | Double clevis |
|----------------|----------|------------------|----------|---------------|
| 12 | CQS-L012 | CQS-LC012 | CQS-F012 | CQS-D012 |
| 16 | CQS-L016 | CQS-LC016 | CQS-F016 | CQS-D016 |
| 20 | CQS-L020 | CQS-LC020 | CQS-F020 | CQS-D020 |
| 25 | CQS-L025 | CQS-LC025 | CQS-F025 | CQS-D025 |

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

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

Foot, Compact foot, Flange type: Body mounting bolt
Double clevis type: Clevis pin, Type C retaining ring
for axis, Body mounting bolt.

Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) 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 IDK series in the Best Pneumatics No. 6.](#)

Theoretical Output

(N)

| Action | Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm ²) | Operating pressure (MPa) | | | Retracted side | Extended side |
|---------------|----------------|---------------|---------------------|--------------------------------|--------------------------|-----|-----|----------------|---------------|
| | | | | | 0.3 | 0.5 | 0.7 | | |
| Spring return | 12 | 6 | IN | — | 20 | 43 | 65 | 14 | 4 |
| | | | OUT | 113 | — | — | — | — | — |
| | 16 | 8 | IN | — | 45 | 86 | 126 | 15 | 6 |
| | | | OUT | 201 | — | — | — | — | — |
| | 20 | 10 | IN | — | 78 | 141 | 204 | 15 | 6 |
| | | | OUT | 314 | — | — | — | — | — |
| 25 | 12 | IN | — | 126 | 224 | 323 | 21 | 11 | |
| | | OUT | 491 | — | — | — | — | — | |
| Spring extend | 12 | 6 | IN | 84.8 | 14 | 31 | 48 | 10 | 3 |
| | | | OUT | — | — | — | — | — | — |
| | 16 | 8 | IN | 151 | 24 | 54 | 85 | 19 | 4 |
| | | | OUT | — | — | — | — | — | — |
| | 20 | 10 | IN | 236 | 44 | 91 | 138 | 27 | 5 |
| | | | OUT | — | — | — | — | — | — |
| 25 | 12 | IN | 378 | 84 | 160 | 235 | 29 | 10 | |
| | | OUT | — | — | — | — | — | — | |

Manufacture of Intermediate Stroke

(Single acting, Spring retract type is excluded.)

| Description | Spacer is installed in the standard stroke body. | |
|--------------|--|--------------|
| Part no. | Refer to "How to Order" for the standard model no. (page 714). | |
| Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. | |
| Stroke range | Bore size | Stroke range |
| | 12 to 25 | 1 to 9 |
| Example | Part no.: CQSB20-3T CQSB20-5T with 2 mm width spacer inside. B dimension is 24.5 mm. | |

Refer to pages 747 to 749 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQS Series

Weight/Without Auto Switch Spring return (Spring extend) (g)

| Bore size (mm) | Cylinder stroke (mm) | |
|----------------|----------------------|-----------|
| | 5 | 10 |
| 12 | 29 (31) | 36 (37) |
| 16 | 39 (39) | 48 (47) |
| 20 | 63 (68) | 76 (79) |
| 25 | 92 (98) | 108 (113) |

* (): Denotes the values of spring extend.

Weight/With Auto Switch (Built-in magnet) Spring return (Spring extend) (g)

| Bore size (mm) | Cylinder stroke (mm) | |
|----------------|----------------------|-----------|
| | 5 | 10 |
| 12 | 37 (39) | 44 (45) |
| 16 | 49 (51) | 58 (59) |
| 20 | 94 (104) | 107 (115) |
| 25 | 130 (150) | 146 (165) |

* (): Denotes the values of spring extend.

Additional Weight (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 type (Including mounting bolt) | 55 | 65 | 159 | 181 | |
| Compact foot type (Including mounting bolt) | 41 | 51 | 121 | 140 | |
| Rod side flange type (Including mounting bolt) | 58 | 70 | 143 | 180 | |
| Head side flange type (Including mounting bolt) | 56 | 66 | 137 | 171 | |
| Double clevis type (Including pin, retaining ring, bolt) | 34 | 40 | 92 | 127 | |

Calculation: (Example) CQSG16-10S

- Cylinder weight: CQSB16-10S.....48 g
 - Additional weight: Head side flange type.....66 g
- 114 g

Mounting Bolt for CQS without Auto Switch

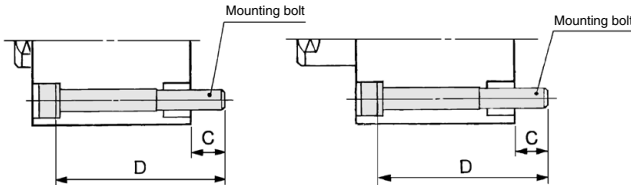
Mounting method: Mounting bolt for through-hole mounting type of CQS is available as an option.

Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x25L 4 pcs.

Single acting, Spring return

Single acting, Spring extend



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

Mounting Bolt for CDQS with Auto Switch

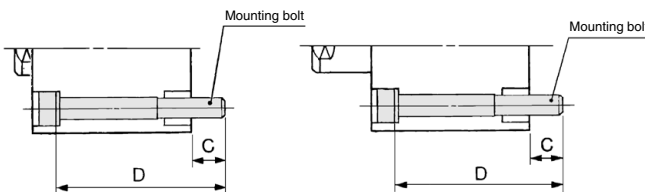
Mounting method: Mounting bolt for through-hole mounting type of CDQS is available as an option.

Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 4 pcs.

Single acting, Spring return

Single acting, Spring extend



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

⚠ Caution

Retaining Ring Installation/Removal

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 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.

Single Acting, Spring Return

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CQSB12-5S | 6.5 | 25 | CQ-M3 x 25L |
| | | 30 | x 30L |
| CQSB16-5S | 6.5 | 25 | CQ-M3 x 25L |
| | | 30 | x 30L |
| CQSB20-5S | 6.5 | 25 | CQ-M5 x 25L |
| | | 30 | x 30L |
| CQSB25-5S | 8.5 | 30 | CQ-M5 x 30L |
| | | 35 | x 35L |

Single Acting, Spring Extend

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CQSB12-5T | 6.5 | 25 | CQ-M3 x 25L |
| | | 30 | x 30L |
| CQSB16-5T | 6.5 | 25 | CQ-M3 x 25L |
| | | 30 | x 30L |
| CQSB20-5T | 6.5 | 25 | CQ-M5 x 25L |
| | | 30 | x 30L |
| CQSB25-5T | 8.5 | 30 | CQ-M5 x 30L |
| | | 35 | x 35L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Single Acting, Spring Return

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CDQSB12-5S | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| CDQSB16-5S | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| CDQSB20-5S | 6.5 | 35 | CQ-M5 x 35L |
| | | 40 | x 40L |
| CDQSB25-5S | 8.5 | 40 | CQ-M5 x 40L |
| | | 45 | 45L |

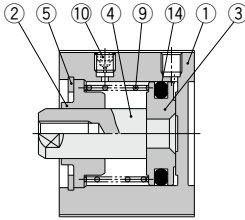
Single Acting, Spring Extend

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CDQSB12-5T | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| CDQSB16-5T | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| CDQSB20-5T | 6.5 | 35 | CQ-M5 x 35L |
| | | 40 | x 40L |
| CDQSB25-5T | 8.5 | 40 | CQ-M5 x 40L |
| | | 45 | x 45L |

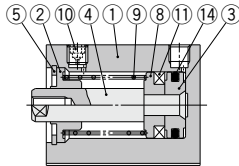
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Construction

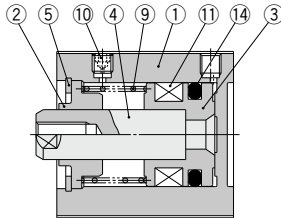
Single acting, Spring return



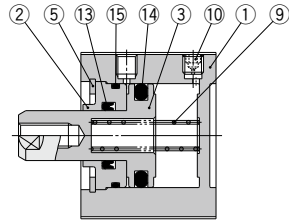
Single acting, Spring return/With auto switch (Built-in magnet) ø12, 16



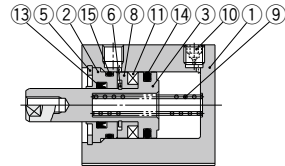
ø20, 25



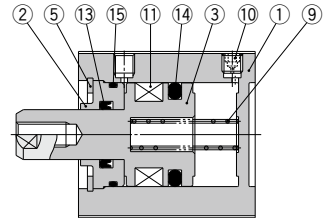
Single acting, Spring extend



Single acting, Spring extend/With auto switch (Built-in magnet) ø12, 16



ø20, 25



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|-------------------|------------------------------|
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Collar | Aluminum alloy | Anodized |
| 3 | Piston | Aluminum alloy | Single acting, Spring return |
| | | Stainless steel | Single acting, Spring extend |
| 4 | Piston rod | Stainless steel | |
| 5 | Retaining ring | Carbon tool steel | Phosphate coated |
| 6 | Retaining ring | Carbon tool steel | Nickel plated |
| 7 | Rod end nut | Carbon steel | Zinc chromated |
| 8 | Spacer for switch type | Aluminum alloy | Chromated |
| 9 | Return spring | Piano wire | Zinc chromated |
| 10 | Plug with fixed orifice | Alloy steel | Nickel plated |
| 11 | Magnet | — | |
| 12 | Centering location ring | Aluminum alloy | Anodized |
| 13* | Rod seal | NBR | |
| 14* | Piston seal | NBR | |
| 15* | Tube gasket | NBR | |

Replacement Parts/Seal Kit Single acting, Spring return

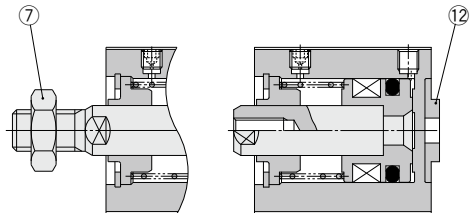
| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|---------------------|
| 12 | CQSB12-S-PS | Set of nos. above ⑭ |
| 16 | CQSB16-S-PS | |
| 20 | CQSB20-S-PS | |
| 25 | CQSB25-S-PS | |

* Seal kit includes 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 male thread

Single acting, Spring return
Single acting, Spring extend

With boss on head end



Replacement Parts/Seal Kit Single acting, Spring extend

| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|---------------------------|
| 12 | CQSB12-T-PS | Set of nos. above ⑬, ⑭, ⑮ |
| 16 | CQSB16-T-PS | |
| 20 | CQSB20-T-PS | |
| 25 | CQSB25-T-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)

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

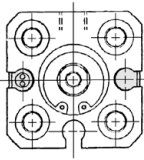
Technical Data

CQS Series

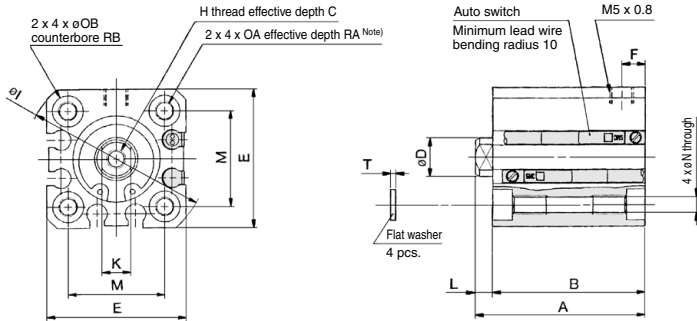
Dimensions: $\phi 12$ to $\phi 25$ /Single Acting, Spring Return

Basic type (Through-hole/Both ends tapped common): CQSB/CDQSB

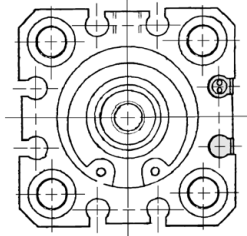
$\phi 12$



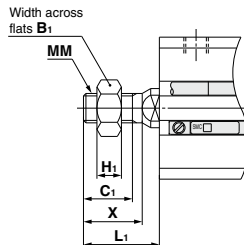
$\phi 16$



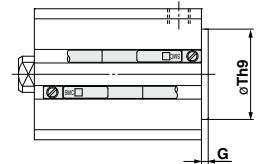
$\phi 20, \phi 25$



Rod end male thread



With boss on head end



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

Basic Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | C | D | E | F | H | I | K | L | M | N | OA | OB | RA | RB | T |
|----------------|-------------------|---------------------|------------------|-----------------|------------------|------------------|------------------|-----------------|------------------|----|----|----|-----|----------|----|----|-----|------|-----|----------|-----|----|----|-----|
| | | A | B | A | B | | | | | | | | | | | | | | | | | | | |
| | | 5 ST | 10 ST | 5 ST | 10 ST | 5 ST | 10 ST | 5 ST | 10 ST | | | | | | | | | | | | | | | |
| 12 | 5, 10 | 25.5 | 30.5 | 22 | 27 | 30.5 | 35.5 | 27 | 32 | 6 | 6 | 25 | 5 | M3 x 0.5 | 32 | 5 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7 | 4 | 0.5 |
| 16 | | 25.5 | 30.5 | 22 | 27 | 30.5 | 35.5 | 27 | 32 | 8 | 8 | 29 | 5 | M4 x 0.7 | 38 | 6 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7 | 4 | 0.5 |
| 20 | | 29 | 34 | 24.5 | 29.5 | 39 | 44 | 34.5 | 39.5 | 7 | 10 | 36 | 5.5 | M5 x 0.8 | 47 | 8 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 10 | 7 | 1 |
| 25 | | 32.5 | 37.5 | 27.5 | 32.5 | 42.5 | 47.5 | 37.5 | 42.5 | 12 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 10 | 7 | 1 |

Note) For basic type $\phi 12$ and $\phi 16$ with 5 stroke, through-hole is threaded over the entire length.

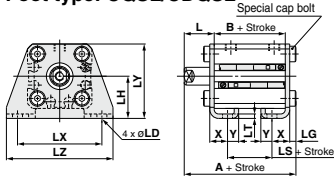
For basic type $\phi 20, \phi 25$ with 5 and 10 stroke, through-hole is threaded over the entire length.

With auto switch (Built-in magnet)/ $\phi 20$; 5 stroke.

* For details about the rod end nut and accessory brackets, refer to page 796.

Dimensions: $\varnothing 12$ to $\varnothing 25$ /Single Acting, Spring Return

Foot type: CQSL/CDQSL

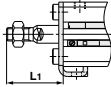


Foot Type

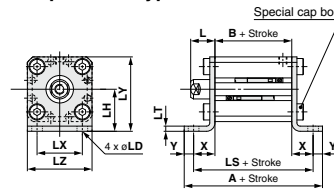
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|------|-----|------------------|------|------|------|----------------|-----|-----|----|-----|----|------|----|------|-----|
| | | A | B | LS | A | B | LS | | | | | | | | | | | |
| 12 | 5, 10 | 35.3 | 17 | 5 | 40.3 | 22 | 10 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | | 35.3 | 17 | 5 | 40.3 | 22 | 10 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | | 41.2 | 19.5 | 7.5 | 51.2 | 29.5 | 17.5 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | | 44.7 | 22.5 | 7.5 | 54.7 | 32.5 | 17.5 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Compact foot type: CQSLC/CDQSLC

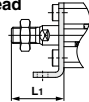


Compact Foot Type

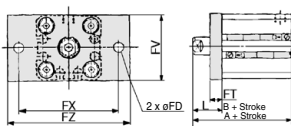
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|------|------|------------------|------|------|------|----------------|-----|----|-----|------|------|----|------|-----|
| | | A | B | LS | A | B | LS | | | | | | | | | | |
| 12 | 5, 10 | 44.6 | 17 | 35.6 | 49.6 | 22 | 40.6 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | | 45.6 | 17 | 35.6 | 50.6 | 22 | 40.6 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | | 57.5 | 19.5 | 45.9 | 67.5 | 29.5 | 55.9 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | | 60.5 | 22.5 | 48.9 | 70.5 | 32.5 | 58.9 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod end male thread



Rod side flange type: CQSF/CDQSF

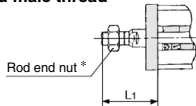


Rod Side Flange Type

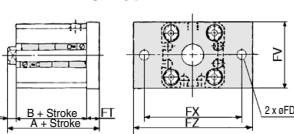
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|------|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5, 10 | 30.5 | 17 | 35.5 | 22 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | | 30.5 | 17 | 35.5 | 22 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | | 34 | 19.5 | 44 | 29.5 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | | 37.5 | 22.5 | 47.5 | 32.5 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head side flange type: CQSG/CDQSG

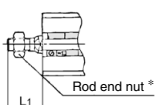


Head Side Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|-----|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5, 10 | 26 | 17 | 31 | 22 | 4.5 | 5.5 | 25 | 45 | 55 | 3.5 | 14 |
| 16 | | 26 | 17 | 31 | 22 | 4.5 | 5.5 | 30 | 45 | 55 | 3.5 | 15.5 |
| 20 | | 32 | 19.5 | 42 | 29.5 | 6.6 | 8 | 39 | 48 | 60 | 4.5 | 18.5 |
| 25 | | 35.5 | 22.5 | 45.5 | 32.5 | 6.6 | 8 | 42 | 52 | 64 | 5 | 22.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread

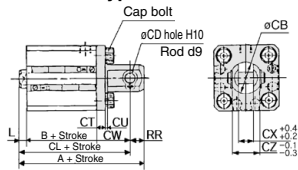


* For details about the rod end nut and accessory brackets, refer to page 796.

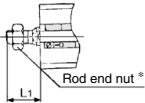
CQS Series

Dimensions: $\varnothing 12$ to $\varnothing 25$ /Single Acting, Spring Return

Double clevis type: CQSD/CDQSD



Rod end male thread



Double Clevis Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | CB | CD | CT | CU | CW | CX | CZ | L | L1 | RR |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----|----|----|----|-----|----|-----|------|----|
| | | A | B | CL | A | B | CL | | | | | | | | | | |
| 12 | 5, 10 | 40.5 | 17 | 34.5 | 45.5 | 22 | 39.5 | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 3.5 | 14 | 6 |
| 16 | | 41.5 | 17 | 35.5 | 46.5 | 22 | 40.5 | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 3.5 | 15.5 | 6 |
| 20 | | 51 | 19.5 | 42 | 61 | 29.5 | 52 | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 4.5 | 18.5 | 9 |
| 25 | | 57.5 | 22.5 | 47.5 | 67.5 | 32.5 | 57.5 | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 5 | 22.5 | 10 |

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

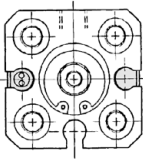
* For details about the double clevis pivot bracket, refer to page 705.

* For details about the rod end nut and accessory brackets, refer to page 796.

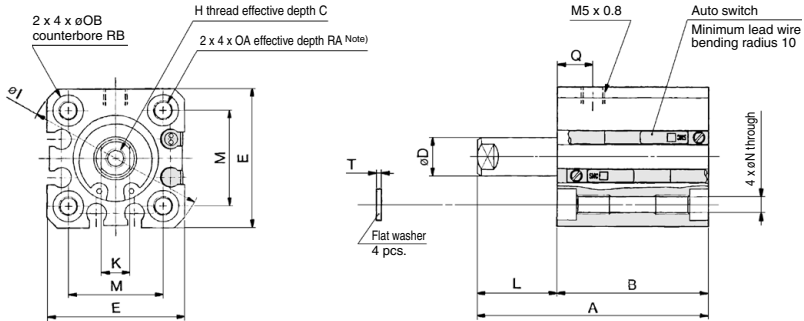
Dimensions: $\phi 12$ to $\phi 25$ /Single Acting, Spring Extend

Basic type (Through-hole/Both ends tapped common): CQSB/CDQSB

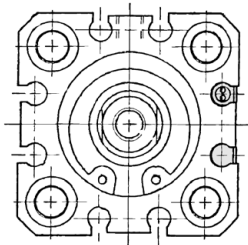
$\phi 12$



$\phi 16$

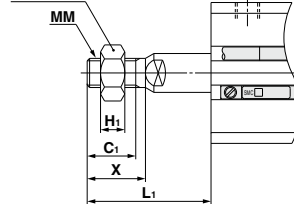


$\phi 20, \phi 25$

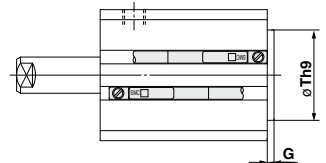


Rod end male thread

Width across flats **B₁**



With boss on head end



Rod End Male Thread

| Bore size (mm) | B ₁ | C ₁ | H ₁ | L ₁ | | MM | X |
|----------------|----------------|----------------|----------------|-----------------|------------------|------------|------|
| | | | | 5 ST | 10 ST | | |
| 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 |

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

Basic Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | C | D | E | H | I | K | L | | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|------------------|-----------------|------------------|------------------|------------------|------|------|----|----|----|----------|----|----|-----|------|------|-----|----------|-----|-----|----|----|-----|
| | | A | B | A | B | 5 ST | 10 ST | | | | | | | | | | | | | | | | | | |
| | | 5 ST | 10 ST | 5 ST | 10 ST | 5 ST | 10 ST | | | | | | | | | | | | | | | | | | |
| 12 | 5, 10 | 30.5 | 40.5 | 22 | 27 | 35.5 | 45.5 | 27 | 32 | 6 | 6 | 25 | M3 x 0.5 | 32 | 5 | 8.5 | 13.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| | | 30.5 | 40.5 | 22 | 27 | 35.5 | 45.5 | 27 | 32 | 8 | 8 | 29 | M4 x 0.7 | 38 | 6 | 8.5 | 13.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| | | 34 | 44 | 24.5 | 29.5 | 44 | 54 | 34.5 | 39.5 | 7 | 10 | 36 | M5 x 0.8 | 47 | 8 | 9.5 | 14.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 8 | 10 | 7 | 1 |
| 20 | 5, 10 | 37.5 | 47.5 | 27.5 | 32.5 | 47.5 | 57.5 | 37.5 | 42.5 | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 10 | 15 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 |
| 25 | | 37.5 | 47.5 | 27.5 | 32.5 | 47.5 | 57.5 | 37.5 | 42.5 | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 10 | 15 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 |

Note) For basic type $\phi 12$ and $\phi 16$ with 5 stroke, through-hole is threaded over the entire length.
For basic type $\phi 20, \phi 25$ with 5 and 10 stroke, through-hole is threaded over the entire length.
With auto switch (Built-in magnet)/ $\phi 20; 5$ stroke.

* For details about the rod end nut and accessory brackets, refer to page 796.

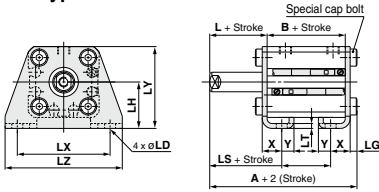
CJ
CU
CQS
JCQ
CQ2
RQ
CQM
CQU
MU

D-
-X
Technical Data

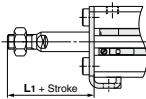
CQS Series

Dimensions: $\varnothing 12$ to $\varnothing 25$ /Single Acting, Spring Extend

Foot type: CQSL/CDQSL



Rod end male thread



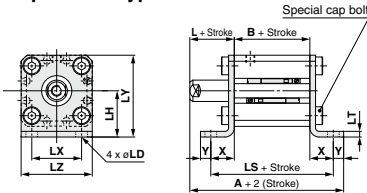
Foot Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|-----|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5, 10 | 35.3 | 17 | 5 | 40.3 | 22 | 10 |
| 16 | | 35.3 | 17 | 5 | 40.3 | 22 | 10 |
| 20 | | 41.2 | 19.5 | 7.5 | 51.2 | 29.5 | 17.5 |
| 25 | | 44.7 | 22.5 | 7.5 | 54.7 | 32.5 | 17.5 |

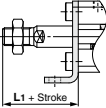
| Bore size (mm) | L | L ₁ | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|-----|----|-----|----|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot type: CQSLC/CDQSLC



Rod end male thread



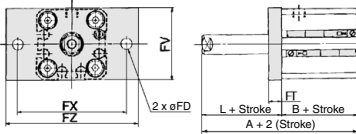
Compact Foot Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5, 10 | 44.3 | 17 | 35.6 | 49.3 | 22 | 40.6 |
| 16 | | 44.8 | 17 | 35.6 | 49.8 | 22 | 40.6 |
| 20 | | 53 | 19.5 | 45.9 | 63 | 29.5 | 55.9 |
| 25 | | 56.5 | 22.5 | 48.9 | 66.5 | 32.5 | 58.9 |

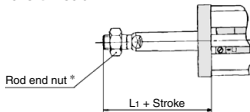
| Bore size (mm) | L | L ₁ | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|----|-----|------|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod side flange type: CQSF/CDQSF



Rod end male thread

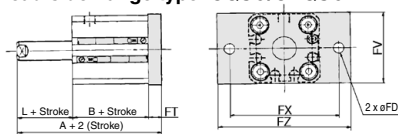


Rod Side Flange Type

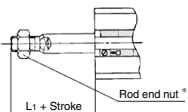
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|------|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5, 10 | 30.5 | 17 | 35.5 | 22 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | | 30.5 | 17 | 35.5 | 22 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | | 34 | 19.5 | 44 | 29.5 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | | 37.5 | 22.5 | 47.5 | 32.5 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head side flange type: CQSG/CDQSG



Rod end male thread



Head Side Flange Type

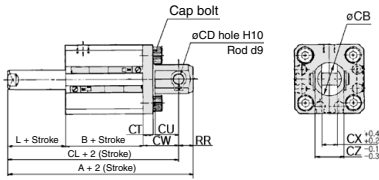
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|-----|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5, 10 | 26 | 17 | 31 | 22 | 4.5 | 5.5 | 25 | 45 | 55 | 3.5 | 14 |
| 16 | | 26 | 17 | 31 | 22 | 4.5 | 5.5 | 30 | 45 | 55 | 3.5 | 15.5 |
| 20 | | 32 | 19.5 | 42 | 29.5 | 6.6 | 8 | 39 | 48 | 60 | 4.5 | 18.5 |
| 25 | | 35.5 | 22.5 | 45.5 | 32.5 | 6.6 | 8 | 42 | 52 | 64 | 5 | 22.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

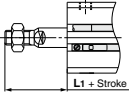
* For details about the rod end nut and accessory brackets, refer to page 796.

Dimensions: $\varnothing 12$ to $\varnothing 25$ /Single Acting, Spring Extend

Double clevis type: CQSD/CDQSD



Rod end male thread



Double Clevis Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | | | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|-----|----------------|----|
| | | A | B | CL | A | B | CL | | | | |
| 12 | 5, 10 | 40.5 | 17 | 34.5 | 45.5 | 22 | 39.5 | | | | |
| 16 | | 41.5 | 17 | 35.5 | 46.5 | 22 | 40.5 | | | | |
| 20 | | 51 | 19.5 | 42 | 61 | 29.5 | 52 | | | | |
| 25 | | 57.5 | 22.5 | 47.5 | 67.5 | 32.5 | 57.5 | | | | |
| Bore size (mm) | | CB | CD | CT | CU | CW | CX | CZ | L | L ₁ | RR |
| 12 | | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 3.5 | 14 | 6 |
| 16 | | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 3.5 | 15.5 | 6 |
| 20 | | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 4.5 | 18.5 | 9 |
| 25 | | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 5 | 22.5 | 10 |

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 796.

CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

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

CQSK Series

ø12, ø16, ø20, ø25

How to Order

CQSK **B** **20** - **30** **D** **□** - **□**

With auto switch **CDQSK** **B** **20** - **30** **D** **□** - **M9BW** **□** - **□**

With auto switch
(Built-in magnet)

Mounting type

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

Bore size

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

Number of auto switches

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

Auto switch

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

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

Body option

| | |
|------------|----------------------------------|
| Nil | Standard (Rod end female thread) |
| M | Rod end male thread |
| F | Boss on head side |

* Combination of body options is available. FM

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) CDQSKL25-30D

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 725.

Cylinder stroke (mm)

Applicable Auto Switches/Refer to pages 1575 to 1701 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 auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ● | ○ | ○ | | | |
| | | | | 2-wire | 12 V | M9BV | M9B | ● | ● | ● | ○ | ○ | | | | |
| | | | | 3-wire (NPN) | | M9NWV | M9NW | ● | ● | ● | ○ | ○ | | | | |
| | Diagnostic indication (2-color indicator) | Grommet | Yes | 3-wire (PNP) | 5 V, 12 V | — | M9PWV | M9PW | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | |
| | | | | 2-wire | | | M9BWV | M9BW | ● | ● | ● | ○ | ○ | | | |
| | | | | 3-wire (NPN) | 5 V, 12 V | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ○ | ○ | ○ | | | | |
| | | | | 3-wire (PNP) | | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ● | ● | ○ | | | | |
| Water resistant (2-color indicator) | Grommet | Yes | 2-wire | 12 V | — | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ● | ● | ○ | — | — | | |
| | | | 3-wire (NPN equivalent) | | | 5 V | A96V | A96 | ● | ● | — | — | | | — | |
| | | | 2-wire | 24 V | 12 V | | A93V ^{*2} | A93 | ● | ● | ● | ● | | | — | — |
| | | | 3-wire (NPN) | | | A90V | A90 | ● | — | ● | — | — | | | — | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
Consult with SMC regarding water resistant types with the above model numbers.

*2 1 m type lead wire is only applicable to 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) M9NZW

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

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

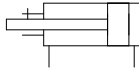
* Auto switches are shipped together (not assembled).

Note) There is the case D-A9□V/M9□V/M9□WV/M9□AV 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: Non-rotating Rod Type Double Acting, Single Rod **CQSK Series**



Symbol
Without cushion



Made to Order:
Individual Specifications
(For details, refer to page 752.)

| Symbol | Specifications |
|--------|--|
| -X1876 | With concave shape end boss on the cylinder tube head side |

Made to Order Specifications
[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of Rod End Shape |
| -XC6 | Piston rod and 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 |

Body Option

| Description | Application |
|---------------------|--|
| Rod end male thread | Available for all non-rotating rod type. |

Mounting Bracket Part No.

| Bore size (mm) | Foot (1) | Compact foot (1) | Flange | Double clevis |
|----------------|-----------|------------------|-----------|---------------|
| 12 | CQSK-L012 | CQSK-LC012 | CQSK-F012 | CQSK-D012 |
| 16 | CQSK-L016 | CQSK-LC016 | CQSK-F016 | CQSK-D016 |
| 20 | CQSK-L020 | CQSK-LC020 | CQSK-F020 | CQSK-D020 |
| 25 | CQSK-L025 | CQSK-LC025 | CQSK-F025 | CQSK-D025 |

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

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

Moisture Control Tube IDK Series



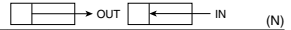
When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to [the IDK series in the Best Pneumatics No. 6.](#)

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 | None | | | |
| Rod end thread | Female thread | | | |
| Stroke length tolerance | +1.0 mm 0 | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable kinetic energy (J) | 0.022 | 0.038 | 0.055 | 0.09 |
| Rod non-rotating accuracy | ±1° | | ±0.7° | |

Theoretical Output



| Bore size (mm) | Rod width across flats (mm) | Action | Piston area (mm ²) | Operating pressure (MPa) | | |
|----------------|-----------------------------|--------|--------------------------------|--------------------------|-----|-----|
| | | | | 0.3 | 0.5 | 0.7 |
| 12 | 5.2 | IN | 90 | 27 | 45 | 63 |
| | | OUT | 113 | 34 | 57 | 79 |
| 16 | 6.2 | IN | 168 | 50 | 84 | 117 |
| | | OUT | 201 | 60 | 101 | 141 |
| 20 | 8.2 | IN | 256 | 77 | 128 | 179 |
| | | OUT | 314 | 94 | 157 | 220 |
| 25 | 10.2 | IN | 401 | 120 | 200 | 281 |
| | | 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 724). | |
| Standard stroke | Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. |
| | | Stroke range |
| | Example | Part no.: CQSKB25-47D CQSKB25-50D with 3 mm width spacer inside. B dimension is 77.5 mm. |

Refer to pages 747 to 749 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQSK Series

Weight/Without Auto Switch

(g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 39 | 46 | 53 | 60 | 67 | 74 | — | — | — | — |
| 16 | 52 | 61 | 69 | 78 | 86 | 95 | — | — | — | — |
| 20 | 89 | 102 | 116 | 129 | 143 | 156 | 170 | 183 | 197 | 211 |
| 25 | 124 | 141 | 157 | 174 | 190 | 207 | 224 | 240 | 257 | 273 |

Calculation: (Example) **CQSKF20-5DM**

- Cylinder weight: CQSKB20-5D..... 89 g
- Additional weight: Rod end male thread..... 10 g
- : Rod side flange type142 g
- 241 g

Weight/With Auto Switch (Built-in magnet)

(g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 47 | 54 | 62 | 69 | 76 | 83 | — | — | — | — |
| 16 | 63 | 71 | 80 | 88 | 97 | 106 | — | — | — | — |
| 20 | 122 | 136 | 149 | 163 | 176 | 190 | 203 | 217 | 230 | 244 |
| 25 | 168 | 185 | 201 | 218 | 235 | 251 | 268 | 284 | 301 | 317 |

Additional Weight

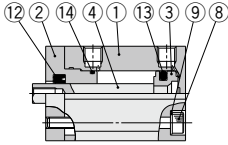
(g)

| Bore size (mm) | | 12 | 16 | 20 | 25 |
|--|-------------|-----|-----|-----|-----|
| Rod end male thread | Male thread | 1.5 | 3 | 6 | 12 |
| | Nut | 1 | 2 | 4 | 8 |
| With boss on head end | | 0.7 | 1.3 | 2 | 3 |
| Foot type (Including mounting bolt) | | 55 | 64 | 158 | 179 |
| Compact foot type (Including mounting bolt) | | 41 | 51 | 121 | 140 |
| Rod side flange type (Including mounting bolt) | | 58 | 69 | 142 | 178 |
| Head side flange type (Including mounting bolt) | | 56 | 66 | 137 | 171 |
| Double clevis type (Including pin, retaining ring, bolt) | | 34 | 40 | 92 | 127 |

Construction

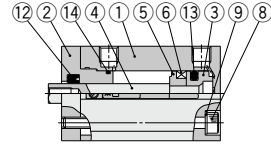
Basic type

ø12

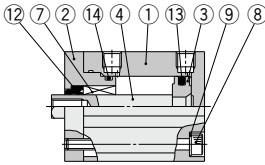


With auto switch (Built-in magnet)

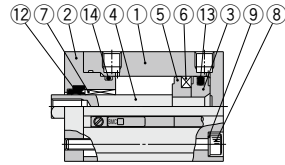
ø12



ø16, ø20, ø25



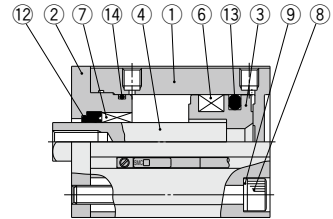
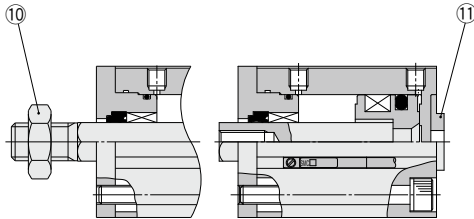
ø16



Rod end male thread

With boss on head end

ø20, ø25



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------------|--------------------------------|------------------|
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Rod cover | Aluminum alloy | Anodized |
| 3 | Piston | Aluminum alloy | |
| 4 | Piston rod | Stainless steel | |
| 5 | Spacer for switch type | Aluminum alloy | Chromated |
| 6 | Magnet | — | |
| 7 | Non-rotating guide | Oil impregnated sintered alloy | ø16, ø20 and ø25 |
| 8 | Hexagon socket head cap screw | Alloy steel | Nickel plated |
| 9 | Plain washer | Rolled steel | Nickel plated |
| 10 | Rod end nut | Carbon steel | Zinc chromated |
| 11 | Centering location ring | Aluminum alloy | Anodized |
| 12* | Rod seal | NBR | |
| 13* | Piston seal | NBR | |
| 14* | Tube gasket | NBR | |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|----------------------------|
| 12 | CQSKB12-PS | Set of nos. above ⑫, ⑬, ⑭. |
| 16 | CQSKB16-PS | |
| 20 | CQSKB20-PS | |
| 25 | CQSKB25-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)

⚠ Precautions

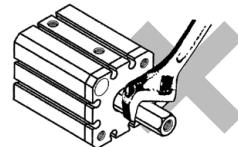
Operating Precautions

⚠ Caution

- Any kind of operation producing rotational torque to piston rod must be considered. The non-rotating guide would be deformed and the accuracy would be compromised. Refer to the table below for rotation torque allowance.

| Allowable rotational torque (N-m) or less | ø12 | ø16 | ø20 | ø25 |
|---|------|------|-----|------|
| | 0.04 | 0.04 | 0.2 | 0.25 |

- Load to piston rod must always be in an 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 by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQSK Series

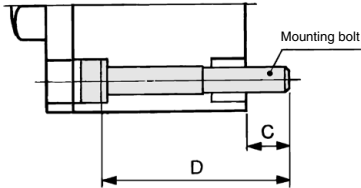
Mounting Bolt for CQSK

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

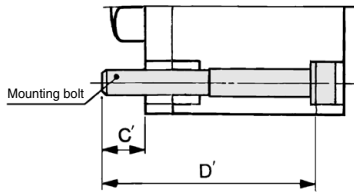
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x25L 2 pcs.

Head side mounting type



Rod side mounting type



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

| Cylinder model | C | D | Mounting bolt part no. | C' | D' | Mounting bolt part no. |
|-------------------|-----|----|------------------------|-----|----|------------------------|
| CQSKB12-5D | 6.5 | 25 | CQ-M3 x 25L | 6.5 | 30 | CQ-M3 x 30L |
| -10D | | 30 | x 35L | | 35 | x 35L |
| -15D | | 35 | x 35L | | 40 | x 40L |
| -20D | | 40 | x 40L | | 45 | x 45L |
| -25D | | 45 | x 45L | | 50 | x 50L |
| -30D | | 50 | x 50L | | 55 | x 55L |
| CQSKB16-5D | 6.5 | 25 | CQ-M3 x 25L | 6.5 | 30 | CQ-M3 x 30L |
| -10D | | 30 | x 30L | | 35 | x 35L |
| -15D | | 35 | x 35L | | 40 | x 40L |
| -20D | | 40 | x 40L | | 45 | x 45L |
| -25D | | 45 | x 45L | | 50 | x 50L |
| -30D | | 50 | x 50L | | 55 | x 55L |
| CQSKB20-5D | 6.5 | 25 | CQ-M5 x 25L | 6.5 | 30 | CQ-M5 x 30L |
| -10D | | 30 | x 30L | | 35 | x 35L |
| -15D | | 35 | x 35L | | 40 | x 40L |
| -20D | | 40 | x 40L | | 45 | x 45L |
| -25D | | 45 | x 45L | | 50 | x 50L |
| -30D | | 50 | x 50L | | 55 | x 55L |
| CQSKB25-5D | 6.5 | 25 | CQ-M5 x 25L | 6.5 | 30 | CQ-M5 x 30L |
| -10D | | 30 | x 30L | | 35 | x 35L |
| -15D | | 35 | x 35L | | 40 | x 40L |
| -20D | | 40 | x 40L | | 45 | x 45L |
| -25D | | 45 | x 45L | | 50 | x 50L |
| -30D | | 50 | x 50L | | 55 | x 55L |
| CQSKB20-5D | 8.5 | 25 | CQ-M5 x 25L | 8.5 | 30 | CQ-M5 x 30L |
| -10D | | 35 | x 35L | | 40 | x 40L |
| -15D | | 40 | x 40L | | 45 | x 45L |
| -20D | | 45 | x 45L | | 50 | x 50L |
| -25D | | 50 | x 50L | | 55 | x 55L |
| -30D | | 55 | x 55L | | 60 | x 60L |
| CQSKB25-5D | 8.5 | 25 | CQ-M5 x 25L | 8.5 | 35 | CQ-M5 x 35L |
| -10D | | 35 | x 35L | | 40 | x 40L |
| -15D | | 40 | x 40L | | 45 | x 45L |
| -20D | | 45 | x 45L | | 50 | x 50L |
| -25D | | 50 | x 50L | | 55 | x 55L |
| -30D | | 55 | x 55L | | 60 | x 60L |
| CQSKB25-5D | 8.5 | 25 | CQ-M5 x 25L | 8.5 | 60 | x 65L |
| -35D | | 60 | x 60L | | 65 | x 65L |
| -40D | | 65 | x 65L | | 70 | x 70L |
| -45D | | 70 | x 70L | | 75 | x 75L |
| -50D | | 75 | x 75L | | 80 | x 80L |
| -50D | | 75 | x 75L | | 80 | x 80L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

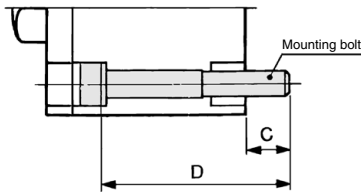
Mounting Bolt for CDQSK

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

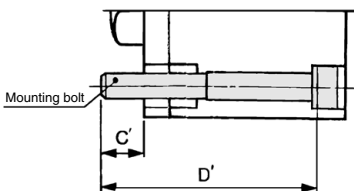
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 2 pcs.

Head side mounting type



Rod side mounting type



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

| Cylinder model | C | D | Mounting bolt part no. | C' | D' | Mounting bolt part no. |
|--------------------|-----|----|------------------------|-----|----|------------------------|
| CDQSKB12-5D | 6.5 | 30 | CQ-M3 x 30L | 6.5 | 35 | CQ-M3 x 35L |
| -10D | | 35 | x 35L | | 40 | x 40L |
| -15D | | 40 | x 40L | | 45 | x 45L |
| -20D | | 45 | x 45L | | 50 | x 50L |
| -25D | | 50 | x 50L | | 55 | x 55L |
| -30D | | 55 | x 55L | | 60 | x 60L |
| CDQSKB16-5D | 6.5 | 30 | CQ-M3 x 30L | 6.5 | 35 | CQ-M3 x 35L |
| -10D | | 35 | x 35L | | 40 | x 40L |
| -15D | | 40 | x 40L | | 45 | x 45L |
| -20D | | 45 | x 45L | | 50 | x 50L |
| -25D | | 50 | x 50L | | 55 | x 55L |
| -30D | | 55 | x 55L | | 60 | x 60L |
| CDQSKB20-5D | 6.5 | 35 | CQ-M5 x 35L | 6.5 | 40 | CQ-M5 x 40L |
| -10D | | 40 | x 40L | | 45 | x 45L |
| -15D | | 45 | x 45L | | 50 | x 50L |
| -20D | | 50 | x 50L | | 55 | x 55L |
| -25D | | 55 | x 55L | | 60 | x 60L |
| -30D | | 60 | x 60L | | 65 | x 65L |
| CDQSKB25-5D | 6.5 | 40 | x 40L | 6.5 | 65 | x 65L |
| -35D | | 65 | x 65L | | 70 | x 70L |
| -40D | | 70 | x 70L | | 75 | x 75L |
| -45D | | 75 | x 75L | | 80 | x 80L |
| -50D | | 80 | x 80L | | 85 | x 85L |
| -50D | | 80 | x 80L | | 85 | x 85L |
| CDQSKB25-5D | 8.5 | 40 | CQ-M5 x 40L | 8.5 | 45 | CQ-M5 x 45L |
| -10D | | 45 | x 45L | | 50 | x 50L |
| -15D | | 50 | x 50L | | 55 | x 55L |
| -20D | | 55 | x 55L | | 60 | x 60L |
| -25D | | 60 | x 60L | | 65 | x 65L |
| -30D | | 65 | x 65L | | 70 | x 70L |
| CDQSKB25-5D | 8.5 | 40 | CQ-M5 x 40L | 8.5 | 70 | x 75L |
| -35D | | 70 | x 70L | | 75 | x 75L |
| -40D | | 75 | x 75L | | 80 | x 80L |
| -45D | | 80 | x 80L | | 85 | x 85L |
| -50D | | 85 | x 85L | | 90 | x 90L |
| -50D | | 85 | x 85L | | 90 | x 90L |

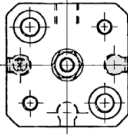
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Dimensions: $\phi 12$ to $\phi 25$

Basic type (Through-hole/Both ends tapped common): CQSK/CDQSK

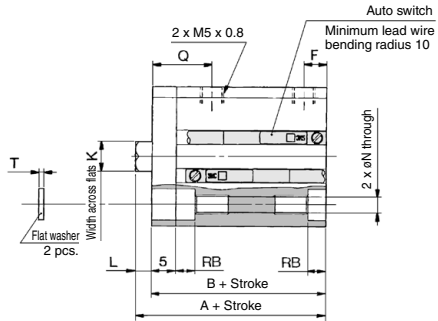
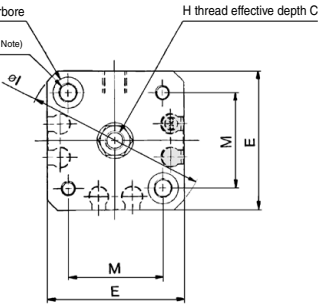
* For the auto switch mounting position and its mounting height, refer to page 748.

$\phi 12$

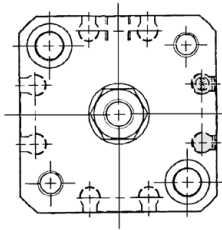


$\phi 16$

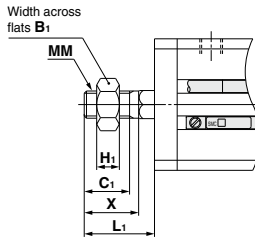
2 x 2 x ϕ OB counterbore
2 x 2 x OA effective depth RA (Note)



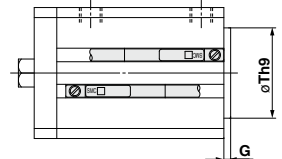
$\phi 20, \phi 25$



Rod end male thread



With boss on head end



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 (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} |

Basic Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | C | E | F | H | I | K | L | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|------|------------------|------|----|----|-----|----------|----|------|-----|------|-----|----------|-----|------|----|----|-----|
| | | A | B | A | B | | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 6 | 25 | 5 | M3 x 0.5 | 32 | 5.2 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 12.5 | 7 | 4 | 0.5 |
| 16 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 8 | 29 | 5 | M4 x 0.7 | 38 | 6.2 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 12.5 | 7 | 4 | 0.5 |
| 20 | 5 to 50 | 29 | 24.5 | 39 | 34.5 | 7 | 36 | 5.5 | M5 x 0.8 | 47 | 8.2 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 13 | 10 | 7 | 1 |
| 25 | 5 to 50 | 32.5 | 27.5 | 42.5 | 37.5 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10.2 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 14 | 10 | 7 | 1 |

Note) For basic type $\phi 12$ and $\phi 16$ with 5 stroke, through-hole is threaded over the entire length.

For basic type $\phi 20$ with 5 to 15 stroke, through-hole is threaded over the entire length.

For basic type $\phi 25$ with 5 and 10 stroke, through-hole is threaded over the entire length.

Note) With auto switch (Built-in magnet): $\phi 20$; 5 stroke

* For details about the rod end nut and accessory brackets, refer to page 796.

- CJ
- CU
- CQS**
- JCQ
- CQ2
- RQ
- CQM
- CQU
- MU

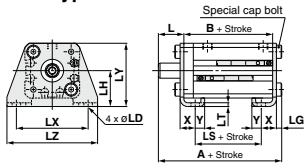
- D-□
- X□

Technical Data

CQSK Series

Dimensions: $\varnothing 12$ to $\varnothing 25$

Foot type: CQSKL/CDQSKL

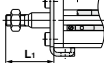


Foot Type

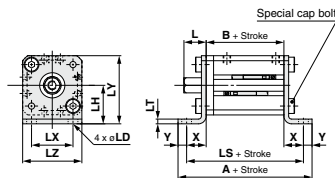
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|------|------|------------------|------|------|------|----------------|-----|-----|----|-----|----|------|----|------|-----|
| | | A | B | LS | A | B | LS | | | | | | | | | | | |
| 12 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 5 to 50 | 46.2 | 24.5 | 12.5 | 56.2 | 34.5 | 22.5 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 5 to 50 | 49.7 | 27.5 | 12.5 | 59.7 | 37.5 | 22.5 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Compact foot type: CQSKLC/CDQSKLC



Compact Foot Type

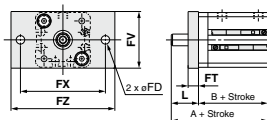
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | L | L ₁ | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|------|------|------------------|------|------|------|----------------|-----|----|-----|------|------|----|------|-----|
| | | A | B | LS | A | B | LS | | | | | | | | | | |
| 12 | 5 to 30 | 49.6 | 22 | 40.6 | 54.6 | 27 | 45.6 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 5 to 30 | 50.6 | 22 | 40.6 | 55.6 | 27 | 45.6 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 5 to 50 | 62.5 | 24.5 | 50.9 | 72.5 | 34.5 | 60.9 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 5 to 50 | 65.5 | 27.5 | 53.9 | 75.5 | 37.5 | 63.9 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod end male thread



Rod side flange type: CQSKF/CDQSKF

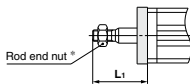


Rod Side Flange Type

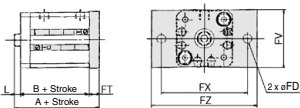
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|------|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5 to 30 | 35.5 | 22 | 40.5 | 27 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | 5 to 30 | 35.5 | 22 | 40.5 | 27 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | 5 to 50 | 39 | 24.5 | 49 | 34.5 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | 5 to 50 | 42.5 | 27.5 | 52.5 | 37.5 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Rod end male thread



Head side flange type: CQSKG/CDQSKG

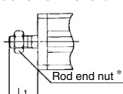


Head Side Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-------------------|---------------------|------|------------------|------|-----|-----|----|----|----|-----|----------------|
| | | A | B | A | B | | | | | | | |
| 12 | 5 to 30 | 31 | 22 | 36 | 27 | 4.5 | 5.5 | 25 | 45 | 55 | 3.5 | 14 |
| 16 | 5 to 30 | 31 | 22 | 36 | 27 | 4.5 | 5.5 | 30 | 45 | 55 | 3.5 | 15.5 |
| 20 | 5 to 50 | 37 | 24.5 | 47 | 34.5 | 6.6 | 8 | 39 | 48 | 60 | 4.5 | 18.5 |
| 25 | 5 to 50 | 40.5 | 27.5 | 50.5 | 37.5 | 6.6 | 8 | 42 | 52 | 64 | 5 | 22.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

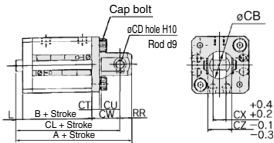
Rod end male thread



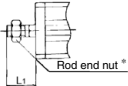
* For details about the rod end nut and accessory brackets, refer to page 796.

Dimensions: $\varnothing 12$ to $\varnothing 25$

**Double clevis type:
 CQSKD/CDQSKD**



Rod end male thread



Double Clevis Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | CB | CD | CT | CU | CW | CX | CZ | L | L ₁ | RR |
|----------------|-------------------|---------------------|------|------|------------------|------|------|----|----|----|----|----|-----|----|-----|----------------|----|
| | | A | B | CL | A | B | CL | | | | | | | | | | |
| 12 | 5 to 30 | 45.5 | 22 | 39.5 | 50.5 | 27 | 44.5 | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 3.5 | 14 | 6 |
| 16 | 5 to 30 | 46.5 | 22 | 40.5 | 51.5 | 27 | 45.5 | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 3.5 | 15.5 | 6 |
| 20 | 5 to 50 | 56 | 24.5 | 47 | 66 | 34.5 | 57 | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 4.5 | 18.5 | 9 |
| 25 | 5 to 50 | 62.5 | 27.5 | 52.5 | 72.5 | 37.5 | 62.5 | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 5 | 22.5 | 10 |

Double clevis bracket material: Carbon steel
 Surface treatment: Nickel plated

- * For details about the double clevis pivot bracket, refer to page 705.
- * For details about the rod end nut and accessory brackets, refer to page 796.

CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

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

CQSKW Series

∅12, ∅16, ∅20, ∅25

How to Order

CQSKW B 20-30 D - [] - []

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

With auto switch
(Built-in magnet)

Mounting type

| | |
|-----------|---|
| B | Through-hole/Both ends tapped common (Standard) |
| L | Foot type |
| LC | Compact foot type |
| F | Flange type |

* Mounting brackets are shipped together (but not assembled).
* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for CQSKW" on page 736.

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 |

Number of auto switches

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

Auto switch

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

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

Body option

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

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) CDQSKWL25-30D

Made to Order
Refer to page 733 for details.

Applicable Auto Switches/Refer to pages 1575 to 1701 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 auto switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | IC circuit | Relay, PLC |
| | | | | 2-wire | | | | M9PV | M9P | ● | ● | ○ | ○ | | |
| | | | | 3-wire (PNP) | M9BV | M9B | ● | ● | ○ | ○ | — | | | | |
| | 3-wire (NPN) | | | M9NVV | M9NW | ● | ● | ○ | ○ | IC circuit | | | | | |
| | 3-wire (PNP) | | | M9PWW | M9PW | ● | ● | ○ | ○ | | | | | | |
| | 2-wire | | | M9BWW | M9BW | ● | ● | ○ | ○ | | | | | | |
| | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ● | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ● | ○ | | |
| | | | | 2-wire | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ○ | ○ | — | | | | |
| Reed auto switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 24 V | 12 V | 100 V 100 V or less | A96V | A96 | ● | — | ● | — | IC circuit | — |
| | | | | 2-wire | | | | A93V ^{*2} | A93 | ● | ● | ● | ● | | |
| | | | No | 2-wire | | | | A90V | A90 | ● | — | ● | — | IC circuit | |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

*2 1 m type lead wire is only applicable to 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) M9NZZ

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

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

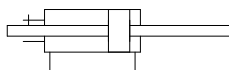
* Auto switches are shipped together (not assembled).

Note) There is the case D-A93□V/M9□V/M9□IWW/M9□IAV 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.



Symbol

Without cushion



Made to Order:
Individual Specifications
(For details, refer to page 751)

| | |
|--------|--|
| Symbol | Specifications |
| -X633 | Intermediate stroke of double rod cylinder |

Made to Order Specifications

[Click here for details](#)

| | |
|--------|---|
| Symbol | Specifications |
| -XA□ | Change of rod end shape |
| -XC6 | Piston rod, retaining ring, rod end nut made of stainless steel |

Body Option

| Description | Application |
|---------------------|--|
| Rod end male thread | Available for all non-rotating rod type. |

Mounting Bracket Part No.

| Bore size (mm) | Foot ⁽¹⁾ | Compact foot ⁽¹⁾ | Flange |
|----------------|---------------------|-----------------------------|-----------|
| 12 | CQSK-L012 | CQSK-LC012 | CQSK-F012 |
| 16 | CQSK-L016 | CQSK-LC016 | CQSK-F016 |
| 20 | CQSK-L020 | CQSK-LC020 | CQSK-F020 |
| 25 | CQSK-L025 | CQSK-LC025 | CQSK-F025 |

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

Note 2) Parts belonging to each bracket are as follows.
Foot, Compact foot, Flange type: Body mounting bolt

Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) 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 IDK series in the Best Pneumatics No. 6.](#)

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 | | | |
| Rod end thread | Female thread | | | |
| Stroke length tolerance | $+1.0 \text{ mm}$ 0 | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable kinetic energy (J) | 0.022 | 0.038 | 0.055 | 0.09 |
| Rod non-rotating accuracy | $\pm 1^\circ$ | | $\pm 0.7^\circ$ | |

Theoretical Output

(N)

| Bore size (mm) | Rod width across flats (mm) | Piston area (mm ²) | Operating pressure (MPa) | | |
|----------------|-----------------------------|--------------------------------|--------------------------|-----|-----|
| | | | 0.3 | 0.5 | 0.7 |
| 12 | 5.2 | 90 | 27 | 45 | 63 |
| 16 | 6.2 | 168 | 50 | 84 | 117 |
| 20 | 8.2 | 256 | 77 | 128 | 179 |
| 25 | 10.2 | 401 | 120 | 200 | 281 |

Manufacture of Intermediate Stroke

| | | |
|--------------|--|--------------|
| Description | Spacer is installed in the standard stroke body. | |
| Part no. | Suffix "-X633" to the end of standard model no. (page 706). | |
| Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. | |
| Stroke range | Bore size | Stroke range |
| | 12, 16 | 6 to 29 |
| | 20, 25 | 6 to 49 |
| Example | Part no.: CQSKW25-47D-X633 CQSKWB25-50D with 3 mm width spacer inside. B dimension is 84 mm. | |

Refer to pages 747 to 749 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQSKW Series

Weight/Without Auto Switch (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 48 | 56 | 65 | 73 | 80 | 88 | — | — | — | — |
| 16 | 64 | 75 | 84 | 95 | 105 | 115 | — | — | — | — |
| 20 | 115 | 131 | 148 | 164 | 191 | 196 | 213 | 229 | 246 | 264 |
| 25 | 160 | 180 | 200 | 221 | 241 | 263 | 285 | 305 | 320 | 347 |

Weight/With Auto Switch (Built-in magnet) (g)

| Bore size (mm) | Cylinder stroke (mm) | | | | | | | | | |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 12 | 56 | 65 | 74 | 82 | 90 | 98 | — | — | — | — |
| 16 | 75 | 85 | 95 | 105 | 116 | 126 | — | — | — | — |
| 20 | 148 | 164 | 180 | 197 | 214 | 231 | 247 | 265 | 280 | 297 |
| 25 | 188 | 209 | 230 | 251 | 273 | 293 | 315 | 335 | 356 | 376 |

Additional Weight (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 type (Including mounting bolt) | | 55 | 64 | 158 | 179 |
| Compact foot type (Including mounting bolt) | | 41 | 51 | 121 | 140 |
| Rod side flange type (Including mounting bolt) | | 58 | 69 | 142 | 178 |

Calculation: (Example) CQSKWF20-5DM

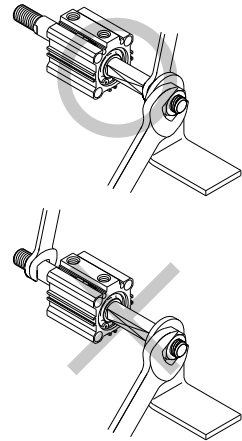
- Cylinder weight: CQSKWB20-5D:.....115 g
 - Additional weight: Rod end male thread:.....10 g
 - : Rod side flange type142 g
- 267 g

⚠ Precautions

Operating Precautions

⚠ Warning

1. Do not apply the 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 a load while the piston rod width across flats are secured. Do not fix the other side of piston rod width across flat and apply the reverse torque.



⚠ Caution

1. Any kind of operation producing rotational torque to piston rod must be considered. The non-rotating guide would be deformed and the accuracy would be compromised. Refer to the table below for rotation torque allowance.

| Allowable rotational torque (N·m) or less | φ12 | φ16 | φ20 | φ25 |
|---|------|------|-----|------|
| | 0.04 | 0.04 | 0.2 | 0.25 |

2. Load to piston rod must always be in an axial direction.

Retaining Ring Installation/Removal

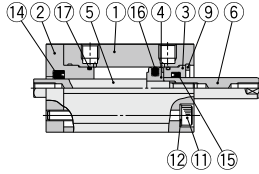
⚠ Caution

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 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.

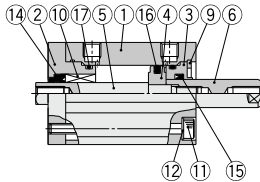
Construction

Basic type

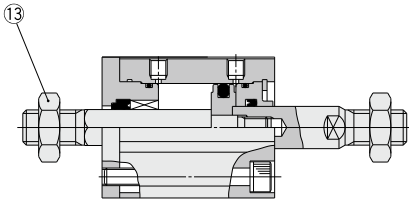
ø12



ø16, ø20, ø25

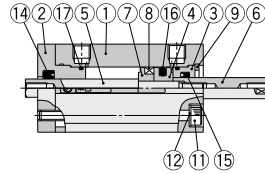


Rod end male thread

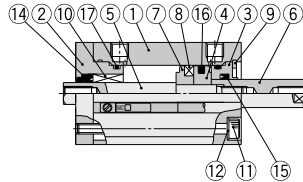


With auto switch (Built-in magnet)

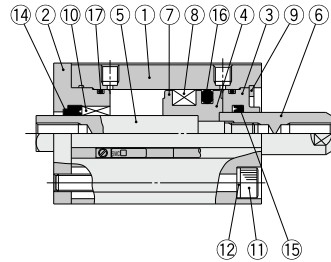
ø12



ø16



ø20, ø25



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------------|--------------------------------|------------------|
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Rod cover | Aluminum alloy | Anodized |
| 3 | Collar | Aluminum alloy | Anodized |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston rod A | Stainless steel | |
| 6 | Piston rod B | Stainless steel | |
| 7 | Spacer for switch type | Aluminum alloy | Chromated |
| 8 | Magnet | — | |
| 9 | Retaining ring | Carbon tool steel | Phosphate coated |
| 10 | Non-rotating guide | Oil impregnated sintered alloy | ø16, ø20 and ø25 |
| 11 | Hexagon socket head cap screw | Alloy steel | Nickel plated |
| 12 | Plain washer | Rolled steel | Nickel plated |
| 13 | Rod end nut | Carbon steel | Zinc chromated |
| 14* | Rod seal for non-rotating | NBR | |
| 15* | Rod seal | NBR | |
| 16* | Piston seal | NBR | |
| 17* | Tube gasket | NBR | |

Replacement Parts/Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|-------------|-----------------------------------|
| 12 | CQSKWB12-PS | Set of nos. above 14, 15, 16, 17. |
| 16 | CQSKWB16-PS | |
| 20 | CQSKWB20-PS | |
| 25 | CQSKWB25-PS | |

* Seal kit includes 14, 15, 16, 17. 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)

CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

CQSKW Series

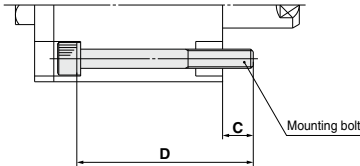
Mounting Bolt for CQSKW

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

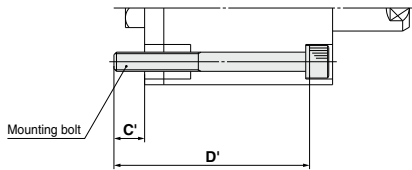
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x30L 2 pcs.

Round rod side mounting



Non-rotating rod side mounting



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

| Cylinder model | C | D | Mounting bolt part no. | C' | D' | Mounting bolt part no. |
|--------------------|-----|----|------------------------|-----|----|------------------------|
| CQSKWB12-5D | | 25 | CQ-M3 x 30L | | 30 | CQ-M3 x 35L |
| -10D | 6.5 | 30 | x 35L | 6.5 | 35 | x 40L |
| -15D | | 35 | x 40L | | 40 | x 45L |
| -20D | | 40 | x 45L | | 45 | x 50L |
| -25D | | 45 | x 50L | | 50 | x 55L |
| -30D | | 50 | x 55L | | 55 | x 60L |
| CQSKWB16-5D | | 25 | CQ-M3 x 30L | | 30 | CQ-M3 x 35L |
| -10D | 6.5 | 30 | x 35L | 6.5 | 35 | x 40L |
| -15D | | 35 | x 40L | | 40 | x 45L |
| -20D | | 40 | x 45L | | 45 | x 50L |
| -25D | | 45 | x 50L | | 50 | x 55L |
| -30D | | 50 | x 55L | | 55 | x 60L |
| CQSKWB20-5D | | 25 | CQ-M5 x 35L | | 30 | CQ-M5 x 40L |
| -10D | 6.5 | 30 | x 40L | 6.5 | 35 | x 45L |
| -15D | | 35 | x 45L | | 40 | x 50L |
| -20D | | 40 | x 50L | | 45 | x 55L |
| -25D | | 45 | x 55L | | 50 | x 60L |
| -30D | | 50 | x 60L | | 55 | x 65L |
| CQSKWB25-5D | | 25 | CQ-M5 x 35L | | 30 | CQ-M5 x 40L |
| -10D | 10 | 30 | x 40L | 10 | 35 | x 45L |
| -15D | | 35 | x 45L | | 40 | x 50L |
| -20D | | 40 | x 50L | | 45 | x 55L |
| -25D | | 45 | x 55L | | 50 | x 60L |
| -30D | | 50 | x 60L | | 55 | x 65L |
| -35D | | 55 | x 65L | | 60 | x 70L |
| -40D | | 60 | x 70L | | 65 | x 75L |
| -45D | | 65 | x 75L | | 70 | x 80L |
| -50D | | 70 | x 80L | | 75 | x 85L |
| CQSKWB25-5D | | 30 | CQ-M5 x 40L | | 35 | CQ-M5 x 45L |
| -10D | 7 | 35 | x 45L | 7 | 40 | x 50L |
| -15D | | 40 | x 45L | | 45 | x 50L |
| -20D | | 45 | x 50L | | 50 | x 55L |
| -25D | | 50 | x 55L | | 55 | x 60L |
| -30D | | 55 | x 60L | | 60 | x 65L |
| -35D | | 60 | x 65L | | 65 | x 70L |
| -40D | | 65 | x 70L | | 70 | x 75L |
| -45D | | 70 | x 75L | | 75 | x 80L |
| -50D | | 75 | x 80L | | 80 | x 85L |

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

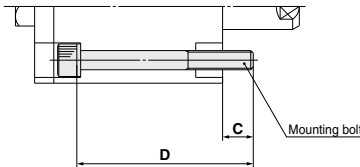
Mounting Bolt for CDQSKW

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

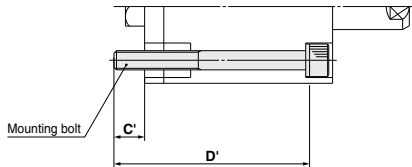
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M3x35L 2 pcs.

Round rod side mounting



Non-rotating rod side mounting



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

| Cylinder model | C | D | Mounting bolt part no. | C' | D' | Mounting bolt part no. |
|---------------------|-----|----|------------------------|-----|----|------------------------|
| CDQSKWB12-5D | | 30 | CQ-M3 x 35L | | 35 | CQ-M3 x 40L |
| -10D | 6.5 | 35 | x 40L | 6.5 | 40 | x 45L |
| -15D | | 40 | x 45L | | 45 | x 50L |
| -20D | | 45 | x 50L | | 50 | x 55L |
| -25D | | 50 | x 55L | | 55 | x 60L |
| -30D | | 55 | x 60L | | 60 | x 65L |
| CDQSKWB16-5D | | 30 | CQ-M3 x 35L | | 35 | CQ-M3 x 40L |
| -10D | 6.5 | 35 | x 40L | 6.5 | 40 | x 45L |
| -15D | | 40 | x 45L | | 45 | x 50L |
| -20D | | 45 | x 50L | | 50 | x 55L |
| -25D | | 50 | x 55L | | 55 | x 60L |
| -30D | | 55 | x 60L | | 60 | x 65L |
| CDQSKWB20-5D | | 35 | CQ-M5 x 45L | | 40 | x 50L |
| -10D | 10 | 40 | x 50L | 10 | 45 | x 55L |
| -15D | | 45 | x 55L | | 50 | x 60L |
| -20D | | 50 | x 60L | | 55 | x 65L |
| -25D | | 55 | x 65L | | 60 | x 70L |
| -30D | | 60 | x 70L | | 65 | x 75L |
| -35D | | 65 | x 75L | | 70 | x 80L |
| -40D | | 70 | x 80L | | 75 | x 85L |
| -45D | | 75 | x 85L | | 80 | x 90L |
| -50D | | 80 | x 90L | | 85 | x 95L |
| CDQSKWB25-5D | | 40 | CQ-M5 x 45L | | 45 | CQ-M5 x 50L |
| -10D | 7 | 45 | x 50L | 7 | 50 | x 55L |
| -15D | | 50 | x 55L | | 55 | x 60L |
| -20D | | 55 | x 60L | | 60 | x 65L |
| -25D | | 60 | x 65L | | 65 | x 70L |
| -30D | | 65 | x 70L | | 70 | x 75L |
| -35D | | 70 | x 75L | | 75 | x 80L |
| -40D | | 75 | x 80L | | 80 | x 85L |
| -45D | | 80 | x 85L | | 85 | x 90L |
| -50D | | 85 | x 90L | | 90 | x 95L |

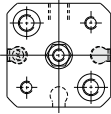
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Dimensions: $\phi 12$ to $\phi 25$

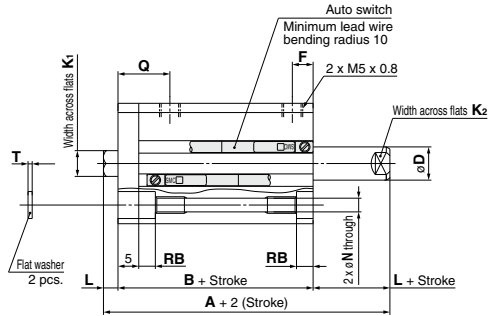
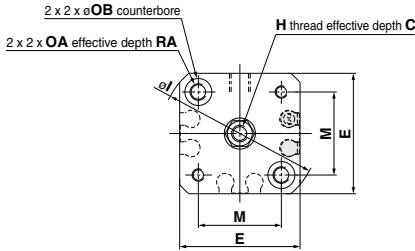
Basic type (Through-hole/Both ends tapped common): CQSKW/CDQSKW

* For the auto switch mounting position and its mounting height, refer to page 748.

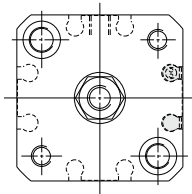
$\phi 12$



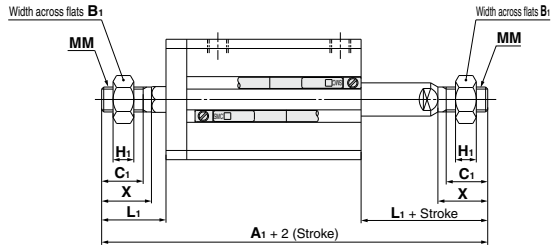
$\phi 16$



$\phi 20, \phi 25$



Rod end male thread



Rod End Male Thread

| Bore size (mm) | Without auto switch | | With auto switch | | B ₁ | C ₁ | H ₁ | L ₁ | MM | X |
|----------------|---------------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|----|---|
| | A ₁ | A ₁ | A ₁ | A ₁ | | | | | | |
| 12 | 55 | 60 | 8 | 9 | 4 | 14 | M5 x 0.8 | 10.5 | | |
| 16 | 58 | 63 | 10 | 10 | 5 | 15.5 | M6 x 1.0 | 12 | | |
| 20 | 68 | 78 | 13 | 12 | 5 | 18.5 | M8 x 1.25 | 14 | | |
| 25 | 79 | 89 | 17 | 15 | 6 | 22.5 | M10 x 1.25 | 17.5 | | |

Basic Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | C | D | E | F | H | I | K ₁ | K ₂ | L | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|----|----|----|------------------|----|----|-----|----------|----|------|----|-----|------|----------------|----------------|-----|------|----|----|-----|---|----|----|---|
| | | A | B | A | B | A | B | | | | | | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 34 | 27 | 39 | 32 | 6 | 6 | 25 | 7.5 | M3 x 0.5 | 32 | 5.2 | 5 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 12.5 | 7 | 4 | 0.5 | | | | |
| 16 | 5 to 30 | 34 | 27 | 39 | 32 | 8 | 8 | 29 | 7.5 | M4 x 0.7 | 38 | 6.2 | 6 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 12.5 | 7 | 4 | 0.5 | | | | |
| 20 | 5 to 50 | 40 | 31 | 50 | 41 | 7 | 10 | 36 | 8 | M5 x 0.8 | 47 | 8.2 | 8 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 13 | 10 | 7 | 1 | | | | |
| 25 | 5 to 50 | 44 | 34 | 54 | 44 | 12 | 12 | 40 | 9 | M6 x 1.0 | 52 | 10.2 | 10 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 14 | 10 | 7 | 1 | | | | |

Note 1) For basic type $\phi 20$ and $\phi 25$ with 5 stroke, through-hole is threaded over the entire length.

Note 2) The positions of width across flats (K₂) on both sides are not the same.

* For details about the rod end nut and accessory brackets, refer to page 796.

- CUJ
- CU
- CQS
- JCQ
- CQ2
- RQ
- CQM
- CQU
- MU

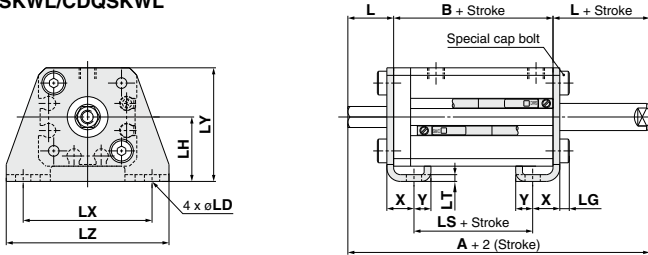
- D-
- X

Technical Data

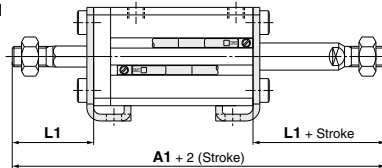
CQSKW Series

Dimensions: $\varnothing 12$ to $\varnothing 25$

Foot type: CQSKWL/CDQSKWL



Rod end male thread

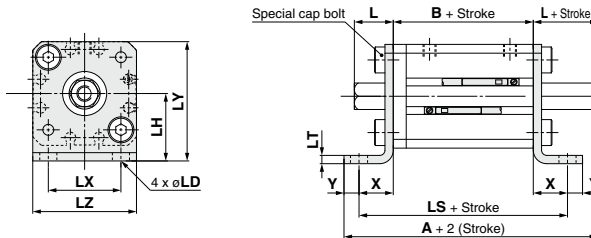


Foot Type

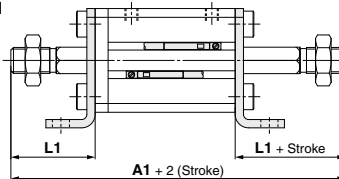
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | L | L1 | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|----|----|----|------------------|-----|----|----|------|------|-----|-----|----|-----|----|------|----|------|-----|
| | | A | A1 | B | LS | A | A1 | B | LS | | | | | | | | | | | |
| 12 | 5 to 30 | 54 | 75 | 27 | 15 | 59 | 80 | 32 | 20 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 5 to 30 | 54 | 78 | 27 | 15 | 59 | 83 | 32 | 20 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 5 to 50 | 60 | 88 | 31 | 19 | 70 | 98 | 41 | 29 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 5 to 50 | 64 | 99 | 34 | 19 | 74 | 109 | 44 | 29 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact foot type CQSKWLC/CDQSKWLC



Rod end male thread



Compact Foot Type

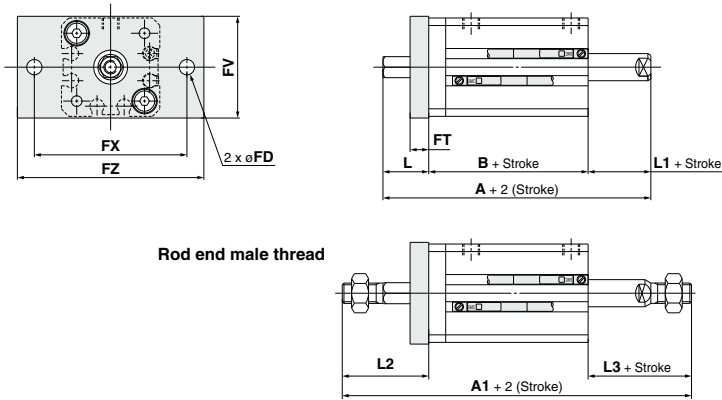
| Bore size (mm) | Stroke range (mm) | Without auto switch | | | | With auto switch | | | | L | L1 | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|-------------------|---------------------|----|----|------|------------------|-----|----|------|------|------|-----|----|-----|------|------|----|------|-----|
| | | A | A1 | B | LS | A | A1 | B | LS | | | | | | | | | | |
| 12 | 5 to 30 | 54.3 | 75 | 27 | 45.6 | 59.3 | 80 | 32 | 50.6 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 5 to 30 | 54.8 | 78 | 27 | 45.6 | 59.8 | 83 | 32 | 50.6 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 5 to 50 | 64.5 | 88 | 31 | 57.4 | 74.5 | 98 | 41 | 67.4 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 5 to 50 | 68 | 99 | 34 | 60.4 | 78 | 109 | 44 | 70.4 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

* For details about the rod end nut and accessory brackets, refer to page 796.

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Dimensions: $\varnothing 12$ to $\varnothing 25$

Flange type: CQSKWF/CDQSKWF



Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | | FD | FT | FV | FX | FZ | L | L1 | L2 | L3 |
|----------------|-------------------|---------------------|----|----|------------------|----|----|-----|-----|----|----|----|------|-----|------|------|
| | | A | A1 | B | A | A1 | B | | | | | | | | | |
| 12 | 5 to 30 | 44 | 65 | 27 | 49 | 70 | 32 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 3.5 | 24 | 14 |
| 16 | 5 to 30 | 44 | 68 | 27 | 49 | 73 | 32 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 3.5 | 25.5 | 15.5 |
| 20 | 5 to 50 | 50 | 78 | 31 | 60 | 88 | 41 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 4.5 | 28.5 | 18.5 |
| 25 | 5 to 50 | 54 | 89 | 34 | 64 | 99 | 44 | 6.6 | 8 | 42 | 52 | 64 | 15 | 5 | 32.5 | 22.5 |

* For details about the rod end nut and accessory brackets, refer to page 796.

Note 1) The positions of piston rod width across flats (right side) are not constant.

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

Compact Cylinder: Anti-lateral Load Type

CQS□S Series

∅12, ∅16, ∅20, ∅25

How to Order

With auto switch C D Q S B S 20 - 30 D C - M9BW

With auto switch
(Built-in magnet)

Mounting type

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

Cushion
S Anti-lateral load type

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 741.

Made to Order
Refer to page 741 for details.

Number of auto switches

| | |
|-----|----------|
| NII | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------|
| NII | Without auto switch |
|-----|---------------------|

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

Body option 2

| | |
|-----|----------------------------------|
| NII | Standard (Rod end female thread) |
| M | Rod end male thread |

Cushion

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

Body option 1

| | |
|-----|-----------------------|
| NII | Standard |
| F | With boss on head end |

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) CDQSL12-25D

Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

| Type | Special function | Electrical entry | Indicating light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length (m) | | | | Pre-wired connector | Applicable load | | |
|-------------------------------------|------------------|------------------|------------------|-------------------------|---------------------|---------------------|--------------------|--------------------|----------------------|-------|-------|------------|---------------------|-----------------|------------|------------|
| | | | | | DC | AC | Perpendicular | In-line | 0.5 (NII) | 1 (M) | 3 (L) | 5 (Z) | | | | |
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | M9PV | M9P | ● | ● | ○ | ○ | | | | |
| | 2-wire | | | M9BV | M9B | | ● | ● | ● | ○ | ○ | — | | | | |
| | 3-wire (NPN) | | | M9NWW | M9NW | | ● | ● | ● | ○ | ○ | IC circuit | | | | |
| | 3-wire (PNP) | | | M9PWW | M9PW | | ● | ● | ● | ○ | ○ | — | | | | |
| | 2-wire | | | M9BWW | M9BW | | ● | ● | ● | ○ | ○ | — | | | | |
| Water resistant (2-color indicator) | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | M9NAV ^{*1} | M9NA ^{*1} | ○ | ○ | ○ | ○ | ○ | IC circuit | | | |
| | | | | 3-wire (PNP) | | M9PAV ^{*1} | M9PA ^{*1} | ○ | ○ | ○ | ○ | | | | | |
| | | | | 2-wire | M9BAV ^{*1} | M9BA ^{*1} | ○ | ○ | ○ | ○ | ○ | — | | | | |
| | | | | 3-wire (NPN equivalent) | — | 5 V | A96V | A96 | ● | ● | ● | — | — | IC circuit | — | |
| | | | | 2-wire | 24 V | 12 V | 100 V | A93V ^{*2} | A93 | ● | ● | ● | — | — | — | Relay, PLC |
| | | | | | | | 100 V or less | A90V | A90 | ● | ● | ● | — | — | — | IC circuit |

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

*2 Consult with SMC regarding water resistant types with the above model numbers.

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

* Lead wire length symbols: 0.5 m..... NII (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NZ

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

* Since there are other applicable auto switches than listed, refer to page 749 for details.

* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.

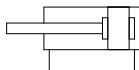
* Auto switches are shipped together (not assembled).

Note) There is the case D-A93□V/M9□V/M9□WV/M9□AV 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.



Symbol

Rubber bumper



Made to Order:
Individual Specifications
(For details, refer to pages 750 and 752.)

| Symbol | Specifications |
|--------|--|
| -X271 | Fluororubber seals |
| -X1876 | With concave shape end boss on the cylinder tube head side |

Made to Order Specifications

[Click here for details](#)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of Rod End Shape |
| -XB10 | Intermediate stroke (Using exclusive body) |
| -XC6 | Piston rod, retaining ring, rod end nut made of stainless steel |
| -XC85 | Grease for food processing equipment |

Body Option

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

Mounting Bracket Part No.

| Bore size (mm) | Foot (1) | Compact foot (1) | Flange | Double clevis |
|----------------|----------|------------------|----------|---------------|
| 12 | CQS-L012 | CQS-LC012 | CQS-F012 | CQS-D012 |
| 16 | CQS-L016 | CQS-LC016 | CQS-F016 | CQS-D016 |
| 20 | CQS-L020 | CQS-LC020 | CQS-F020 | CQS-D020 |
| 25 | CQS-L025 | CQS-LC025 | CQS-F025 | CQS-D025 |

Note1) When ordering foot and compact foot brackets, order 2 pieces per cylinder.

Note2) Parts belonging to each bracket are as follows.

Foot, Compact foot, Flange type: Body mounting bolt
Double clevis type: Clevis pin, type C retaining ring for axis, Body mounting bolt

Moisture Control Tube IDK Series



When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions.

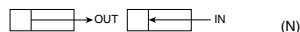
Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to [the IDK series in the Best Pneumatics No. 6.](#)

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 | | | |
| 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 740). | |
| Standard stroke | Description | Intermediate strokes in 1 mm increments are available by using spacers with standard stroke cylinders. |
| | Stroke range | Bore size |
| | | Stroke range |
| Example | Part no.: CQSBS25-47D CQSBS25-50D with 3 mm width spacer inside. B dimension is 77.5 mm. | |

Refer to pages 747 to 749 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data

Weight/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) CQDS20-20DCM

- Cylinder weight: CQBS20-20DC 114 g
- Additional weight: Rod end male thread 10 g
- : Double clevis type 92 g
- 216 g

Weight/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 Weight (g)

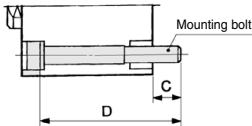
| Bore size (mm) | | 12 | 16 | 20 | 25 |
|--|-------------|-----|-----|-----|-----|
| Rod end male thread | Male thread | 1.5 | 3 | 6 | 12 |
| | Nut | 1 | 2 | 4 | 8 |
| With boss on head end | | 0.7 | 1.3 | 2 | 3 |
| Foot type (Including mounting bolt) | | 55 | 65 | 159 | 181 |
| Compact foot type (Including mounting bolt) | | 41 | 51 | 121 | 140 |
| Rod side flange type (Including mounting bolt) | | 58 | 70 | 143 | 180 |
| Head side flange type (Including mounting bolt) | | 56 | 66 | 137 | 171 |
| Double clevis type (Including pin, retaining ring, bolt) | | 34 | 40 | 92 | 127 |

Mounting Bolt for CQSBS

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

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example CQ-M3x30L 4 pcs.



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

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CQSBS12-5DC | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| CQSBS16-5DC | 6.5 | 30 | CQ-M3 x 30L |
| | | 35 | x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| CQSBS20-5DC | 6.5 | 30 | CQ-M5 x 30L |
| | | 35 | x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CQSBS20-25DC | 6.5 | 50 | CQ-M5 x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| | | 65 | x 65L |
| | | 70 | x 70L |
| | | 75 | x 75L |
| CQSBS25-5DC | 8.5 | 35 | CQ-M5 x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| | 8.5 | 65 | x 65L |
| | | 70 | x 70L |
| | | 75 | x 75L |
| | | 80 | x 80L |
| | | 85 | x 85L |
| | | 90 | x 90L |

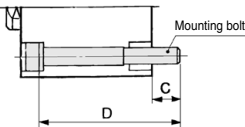
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Mounting Bolt for CDQSBS with Auto Switch

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

Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example CQ-M3x35L 4 pcs.



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

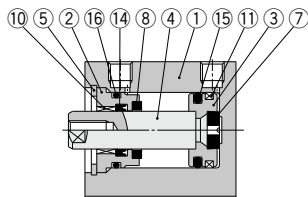
| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CDQBS12-5DC | 6.5 | 35 | CQ-M3 x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| CDQBS16-5DC | 6.5 | 35 | CQ-M3 x 35L |
| | | 40 | x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| CDQBS20-5DC | 6.5 | 40 | CQ-M5 x 40L |
| | | 45 | x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| | | 65 | x 65L |

| Cylinder model | C | D | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CDQBS20-25DC | 6.5 | 60 | CQ-M5 x 60L |
| | | 65 | x 65L |
| | | 70 | x 70L |
| | | 75 | x 75L |
| | | 80 | x 80L |
| | | 85 | x 85L |
| CDQBS25-5DC | 8.5 | 45 | CQ-M5 x 45L |
| | | 50 | x 50L |
| | | 55 | x 55L |
| | | 60 | x 60L |
| | | 65 | x 65L |
| | | 70 | x 70L |
| | 8.5 | 75 | x 75L |
| | | 80 | x 80L |
| | | 85 | x 85L |
| | | 90 | x 90L |

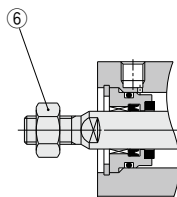
Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

Construction

Basic type

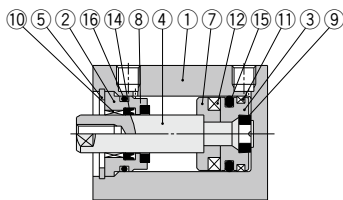


Rod end male thread

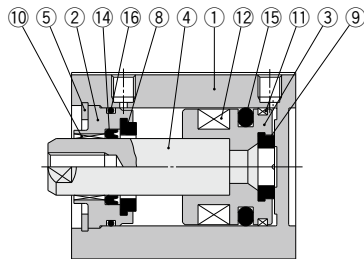


With auto switch (Built-in magnet)

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 | |
| 4 | Piston rod | Stainless steel | |
| 5 | Retaining ring | Carbon tool steel | Phosphate coated |
| 6 | Rod end nut | Carbon steel | Zinc chromated |
| 7 | Spacer for switch type | Aluminum alloy | Chromated |
| 8 | Bumper A | Urethane | |
| 9 | Bumper B | Urethane | |
| 10 | Bushing | Oil-impregnated sintered alloy | |
| 11 | Wear ring | Resin | |
| 12 | Magnet | — | |
| 13 | Centering location ring | Aluminum alloy | Anodized |
| 14* | Rod seal | NBR | |
| 15* | Piston seal | NBR | |
| 16* | Tube gasket | NBR | |

Replacement Parts/Seal Kit

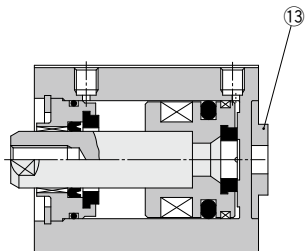
| Bore size (mm) | Kit no. | Contents |
|----------------|-----------|-------------------------------|
| 12 | CQSB12-PS | Set of nos. above 14, 15, 16. |
| 16 | CQSB16-PS | |
| 20 | CQSB20-PS | |
| 25 | CQSB25-PS | |

* 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)

With boss on head end



CJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

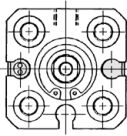
-X□

Technical
Data

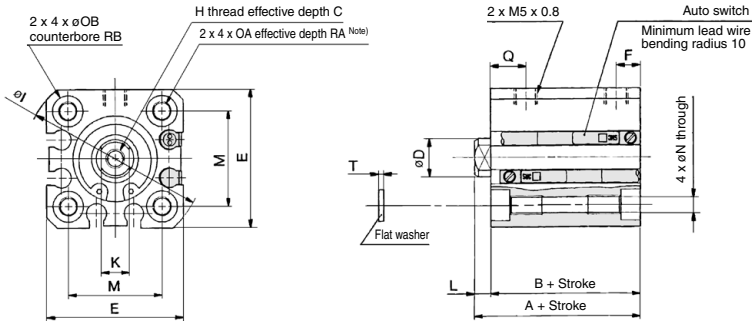
Dimensions: $\phi 12$ to $\phi 25$

Basic type (Through-hole/Both ends tapped common): CQSBS/CDQSBS

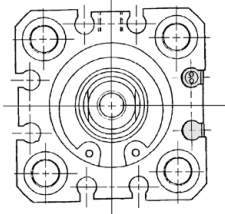
$\phi 12$



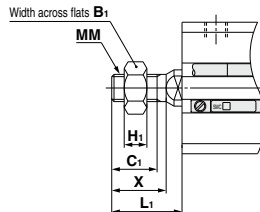
$\phi 16$



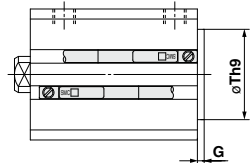
$\phi 20, \phi 25$



Rod end male thread



With boss on head end



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

Note that only bore sizes $\phi 12$ and $\phi 16$ are applicable to the long stroke.

Basic Type

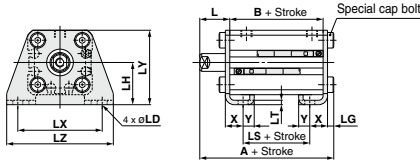
| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | | C | D | E | F | H | I | K | L | M | N | OA | OB | Q | RA | RB | T |
|----------------|-------------------|---------------------|------|------------------|------|----|----|----|-----|----------|----|----|-----|------|-----|----------|-----|-----|----|----|-----|
| | | A | B | A | B | | | | | | | | | | | | | | | | |
| 12 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 6 | 6 | 25 | 5 | M3 x 0.5 | 32 | 5 | 3.5 | 15.5 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 16 | 5 to 30 | 25.5 | 22 | 30.5 | 27 | 8 | 8 | 29 | 5 | M4 x 0.7 | 38 | 6 | 3.5 | 20 | 3.5 | M4 x 0.7 | 6.5 | 7.5 | 7 | 4 | 0.5 |
| 20 | 5 to 50 | 29 | 24.5 | 39 | 34.5 | 7 | 10 | 36 | 5.5 | M5 x 0.8 | 47 | 8 | 4.5 | 25.5 | 5.4 | M6 x 1.0 | 9 | 8 | 10 | 7 | 1 |
| 25 | 5 to 50 | 32.5 | 27.5 | 42.5 | 37.5 | 12 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10 | 5 | 28 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 | 1 |

Note) For basic type 5 to 10 stroke with $\phi 20$ and 5 stroke with $\phi 25$, through-hole is threaded over the entire length.

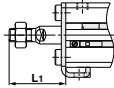
* For details about the rod end nut and accessory brackets, refer to page 796.

Dimensions: $\varnothing 12$ to $\varnothing 25$

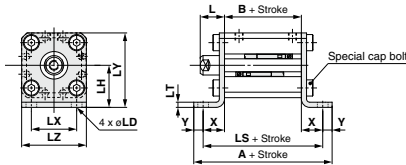
Foot type: CQSLs/CDQSLs



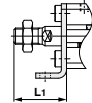
Rod end male thread



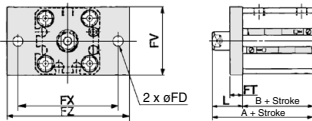
Compact foot type: CQSLCS/CDQSLCS



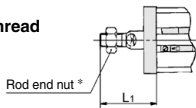
Rod end male thread



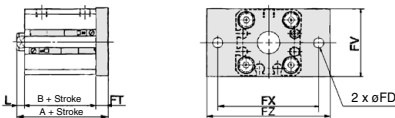
Rod side flange type: CQSFS/CDQSFS



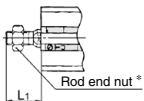
Rod end male thread



Head side flange type: CQSGS/CDQSGS



Rod end male thread



Foot Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 |
| 16 | 5 to 30 | 40.3 | 22 | 10 | 45.3 | 27 | 15 |
| 20 | 5 to 50 | 46.2 | 24.5 | 12.5 | 56.2 | 34.5 | 22.5 |
| 25 | 5 to 50 | 49.7 | 27.5 | 12.5 | 59.7 | 37.5 | 22.5 |

| Bore size (mm) | L | L ₁ | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|-----|----|-----|----|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 2.8 | 17 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 2.8 | 19 | 2 | 38 | 33.5 | 48 | 8 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 4 | 24 | 3.2 | 48 | 42 | 62 | 9.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 4 | 26 | 3.2 | 52 | 46 | 66 | 10.7 | 5.8 |

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Compact Foot Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | LS | A | B | LS |
| 12 | 5 to 30 | 49.6 | 22 | 40.6 | 54.6 | 27 | 45.6 |
| 16 | 5 to 30 | 50.6 | 22 | 40.6 | 55.6 | 27 | 45.6 |
| 20 | 5 to 50 | 62.5 | 24.5 | 50.9 | 72.5 | 34.5 | 60.9 |
| 25 | 5 to 50 | 65.5 | 27.5 | 53.9 | 75.5 | 37.5 | 63.9 |

| Bore size (mm) | L | L ₁ | LD | LH | LT | LX | LY | LZ | X | Y |
|----------------|------|----------------|-----|----|-----|------|------|----|------|-----|
| 12 | 13.5 | 24 | 4.5 | 17 | 2 | 15.5 | 29.5 | 25 | 9.3 | 4.5 |
| 16 | 13.5 | 25.5 | 4.5 | 19 | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
| 20 | 14.5 | 28.5 | 6.6 | 24 | 3.2 | 25.5 | 42 | 36 | 13.2 | 5.8 |
| 25 | 15 | 32.5 | 6.6 | 26 | 3.2 | 28 | 46 | 40 | 13.2 | 5.8 |

Compact foot bracket material: Carbon steel
Surface treatment: Zinc chromated

Rod Side Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | |
|----------------|-------------------|---------------------|------|------------------|------|
| | | A | B | A | B |
| 12 | 5 to 30 | 35.5 | 22 | 40.5 | 27 |
| 16 | 5 to 30 | 35.5 | 22 | 40.5 | 27 |
| 20 | 5 to 50 | 39 | 24.5 | 49 | 34.5 |
| 25 | 5 to 50 | 42.5 | 27.5 | 52.5 | 37.5 |

| Bore size (mm) | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-----|-----|----|----|----|------|----------------|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 |
| 20 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 |
| 25 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head Side Flange Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | With auto switch | |
|----------------|-------------------|---------------------|------|------------------|------|
| | | A | B | A | B |
| 12 | 5 to 30 | 31 | 22 | 36 | 27 |
| 16 | 5 to 30 | 31 | 22 | 36 | 27 |
| 20 | 5 to 50 | 37 | 24.5 | 47 | 34.5 |
| 25 | 5 to 50 | 40.5 | 27.5 | 50.5 | 37.5 |

| Bore size (mm) | FD | FT | FV | FX | FZ | L | L ₁ |
|----------------|-----|-----|----|----|----|-----|----------------|
| 12 | 4.5 | 5.5 | 25 | 45 | 55 | 3.5 | 14 |
| 16 | 4.5 | 5.5 | 30 | 45 | 55 | 3.5 | 15.5 |
| 20 | 6.6 | 8 | 39 | 48 | 60 | 4.5 | 18.5 |
| 25 | 6.6 | 8 | 42 | 52 | 64 | 5 | 22.5 |

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the rod end nut and accessory brackets, refer to page 796.

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

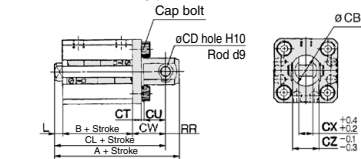
D-□

-X□

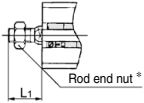
Technical Data

Dimensions: $\varnothing 12$ to $\varnothing 25$

Double clevis type: CQS \square SDS/CDQS \square SDS



Rod end male thread



Double Clevis Type

| Bore size (mm) | Stroke range (mm) | Without auto switch | | | With auto switch | | |
|----------------|-------------------|---------------------|------|------|------------------|------|------|
| | | A | B | CL | A | B | CL |
| 12 | 5 to 30 | 45.5 | 22 | 39.5 | 50.5 | 27 | 44.5 |
| 16 | 5 to 30 | 46.5 | 22 | 40.5 | 51.5 | 27 | 45.5 |
| 20 | 5 to 50 | 56 | 24.5 | 47 | 66 | 34.5 | 57 |
| 25 | 5 to 50 | 62.5 | 27.5 | 52.5 | 72.5 | 37.5 | 62.5 |

| Bore size (mm) | CB | CD | CT | CU | CW | CX | CZ | L | L ₁ | RR |
|----------------|----|----|----|----|----|-----|----|-----|----------------|----|
| 12 | 12 | 5 | 4 | 7 | 14 | 5 | 10 | 3.5 | 14 | 6 |
| 16 | 14 | 5 | 4 | 10 | 15 | 6.5 | 12 | 3.5 | 15.5 | 6 |
| 20 | 20 | 8 | 5 | 12 | 18 | 8 | 16 | 4.5 | 18.5 | 9 |
| 25 | 24 | 10 | 5 | 14 | 20 | 10 | 20 | 5 | 22.5 | 10 |

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

* For details about the double clevis pivot bracket, refer to page 705.

* For details about the rod end nut and accessory brackets, refer to page 796.

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

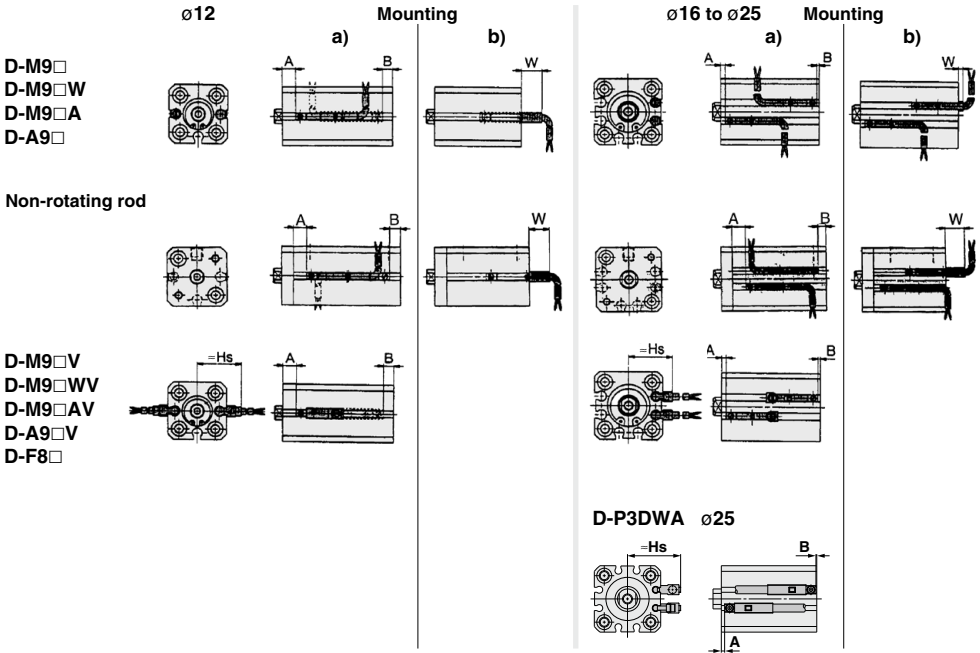
-X□

Technical
Data

Auto Switch Mounting

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Basic type, Single acting (Spring return/Spring extend), Long stroke type, Anti-lateral load type



Proper Auto Switch Mounting Position (Detection at stroke end)

Proper Auto Switch Mounting Position

| Auto switch model | D-M9□/M9□W | | | D-M9□V/M9□WV/M9□AV | | | D-M9□A | | | D-A9□ | | | D-A9□V | | | D-F8□ | | | D-P3DWA | | |
|-------------------|------------|---|---|--------------------|---|----|--------|---|---|-------|---|---|--------|---|----|-------|---|----|---------|---|----|
| | A | B | W | A | B | Hs | A | B | W | A | B | W | A | B | Hs | A | B | Hs | A | B | Hs |

Single rod: Basic type, Single acting (Spring return/Spring extend), Non-rotating rod []: Denotes the values of D-A93. (): Denotes the values of type T.

| | | | | | | | | | | | | | | | | | | | | | |
|----|-----------|-----------|-----------|-----------|-----------|------|-----------|-----------|-----------|-----------|-----|-------------------|-----------|-----|------|-----|-----|------|-----|---|----|
| 12 | 5.5 (6.5) | 3.5 (4.5) | 5.5 (6.5) | 5.5 (6.5) | 4.5 (3.5) | 19.5 | 5.5 (6.5) | 4.5 (3.5) | 7.5 (8.5) | 1.5 (2.5) | 0 | 1.5 [4] (2.5 [5]) | 1.5 (2.5) | 0 | 17 | 3.5 | 2.5 | 27 | — | — | — |
| 16 | 6 | 4 | 6 | 6 | 4 | 21.5 | 6 | 4 | 8 | 2 | 0 | 2 [4.5] | 2 | 0 | 19 | 4 | 2 | 29 | — | — | — |
| 20 | 10 | 7.5 | 2.5 | 10 | 7.5 | 25 | 10 | 7.5 | 4.5 | 6 | 3.5 | -1.5 [1] | 6 | 3.5 | 22.5 | 8.5 | 5 | 32.5 | — | — | — |
| 25 | 11 | 9.5 | 0.5 | 11 | 9.5 | 27 | 11 | 9.5 | 2.5 | 7 | 5.5 | -3.5 [-1] | 7 | 5.5 | 24.5 | 9 | 7.5 | 34.5 | 6.5 | 5 | 33 |

Long stroke

| | | | | | | | | | | | | | | | | | | | | | |
|----|-----|------|------|-----|------|------|-----|------|-----|-----|----|------------|-----|----|------|-----|-----|------|-----|------|----|
| 12 | 9 | 11 | -1 | 9 | 11 | 19.5 | 9 | 11 | 1 | 5 | 7 | -5 [2.5] | 5 | 7 | 17 | 7 | 9 | 27 | — | — | — |
| 16 | 9.5 | 10.5 | -0.5 | 9.5 | 10.5 | 21.5 | 9.5 | 10.5 | 1.5 | 5.5 | 6 | -4.5 [-2] | 5.5 | 6 | 19 | 7.5 | 8.5 | 29 | — | — | — |
| 20 | 13 | 16 | -6 | 13 | 16 | 25 | 13 | 16 | -4 | 9 | 12 | -10 [-7.5] | 9 | 12 | 22.5 | 11 | 14 | 32.5 | — | — | — |
| 25 | 14 | 18 | -8 | 14 | 18 | 27 | 14 | 18 | -6 | 10 | 14 | -12 [-9.5] | 10 | 14 | 24.5 | 12 | 16 | 34.5 | 9.5 | 13.5 | 33 |

Anti-lateral load type

| | | | | | | | | | | | | | | | | | | | | | |
|----|-----|------|------|-----|------|------|-----|------|-----|-----|-----|-----------|-----|-----|------|-----|-----|------|-----|---|----|
| 12 | 10 | 5 | 5 | 10 | 5 | 19.5 | 10 | 5 | 7 | 6 | 1 | 1 [3.5] | 6 | 1 | 17 | 8 | 3 | 27 | — | — | — |
| 16 | 9.5 | 5.5 | 4.5 | 9.5 | 5.5 | 21.5 | 9.5 | 5.5 | 6.5 | 5.5 | 1.5 | 0.5 [3] | 5.5 | 1.5 | 19 | 7.5 | 3.5 | 29 | — | — | — |
| 20 | 13 | 9.5 | 0.5 | 13 | 9.5 | 25 | 13 | 9.5 | 2.5 | 9 | 5.5 | -3.5 [-1] | 9 | 5.5 | 22.5 | 11 | 7.5 | 32.5 | — | — | — |
| 25 | 14 | 11.5 | -1.5 | 14 | 11.5 | 27 | 14 | 11.5 | 0.5 | 10 | 7.5 | -5.5 [-3] | 10 | 7.5 | 24.5 | 12 | 9.5 | 34.5 | 9.5 | 7 | 33 |

Double acting: Basic type, Non-rotating rod

| | | | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------------|-----|-----|------|-----|-----|------|-----|------|----|
| 12 | 5.5 | 9.5 | 0.5 | 5.5 | 9.5 | 19.5 | 5.5 | 9.5 | 2.5 | 1.5 | 5.5 | -3.5 [1] | 1.5 | 5.5 | 17 | 3.5 | 7.5 | 27 | — | — | — |
| 16 | 6 | 9 | 1 | 6 | 9 | 21.5 | 6 | 9 | 3 | 2 | 5 | -3 [-0.5] | 2 | 5 | 19 | 4 | 7 | 29 | — | — | — |
| 20 | 10 | 14 | -4 | 10 | 14 | 25 | 10 | 14 | -2 | 6 | 10 | -8 [-5.5] | 6 | 10 | 22.5 | 8 | 12 | 32.5 | — | — | — |
| 25 | 11 | 16 | -6 | 11 | 16 | 27 | 11 | 16 | -4 | 7 | 12 | -10 [-7.5] | 7 | 12 | 24.5 | 9 | 14 | 34.5 | 6.5 | 11.5 | 33 |

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.

Note 2) The D-M9□/M9□W and M9□A cannot be installed on the single acting; single rod type.

Note 3) Adjust the auto switch after confirming the operating conditions in the actual setting.

Note 4) The D-P3DWA□ is available only for $\phi 25$.

Operating Range

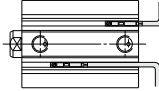
| Auto switch model | Bore size (mm) | | | |
|--|----------------|-----|-----|-----|
| | 12 | 16 | 20 | 25 |
| D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV | 3 | 4 | 5.5 | 5.5 |
| D-A9□/A9□V | 6 | 7.5 | 10 | 10 |
| D-F8□ | 2.5 | 3 | 4 | 4 |
| D-P3DWA | — | — | — | 6 |

* Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately ±30% dispersion.) There may be the case it will vary substantially depending on an ambient environment.

Minimum Auto Switch Mounting Stroke

| No. of auto switch mounted | (mm) | | | | | | | |
|----------------------------|--------|--------------------|--------|--------|--------|------------------|-------|----------------------------|
| | D-M9□V | D-M9□WV D-M9□AV | D-A9□ | D-A9□V | D-M9□ | D-M9□W D-M9□A | D-F8□ | D-P3DWA ^{Note 2)} |
| 1 pc. | 5 | 10 | 10 (5) | 5 | 15 (5) | 15 (10) | 5 | 15 |
| 2 pcs. | 5 | 10 | 10 | 10 | 15 (5) | 15 (10) | 5 | 15 |

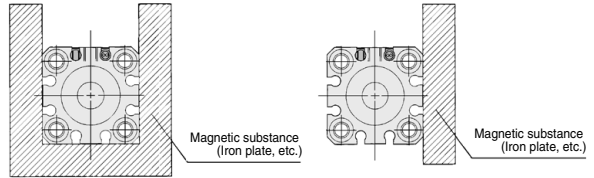
Note 1) The D-M9□/M9□W/M9□A and P3DWA□ cannot be installed on the single acting: single rod type.
 Note 2) Available only for ø25.
 Note 3) As the dimension stated in () shows the minimum mountable stroke when the auto switch does not project from the end face of the cylinder body and the lead wire bending space is not hindered, the auto switch needs to be ordered separately. (Refer to the figure below.)



⚠️ Precautions

- Be sure to read this before handling the products.
- Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

• If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the graph on the right (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, please check with SMC for this type of application.



- Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.
 - * Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) and solid state auto switch D-F8 are also available. For details, refer to pages 1592 and 1592-1.
 - * For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1648 and 1649 for details.

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data



1 Special Piston Rod End for Double Rod Type Cylinder

Symbol
-X235

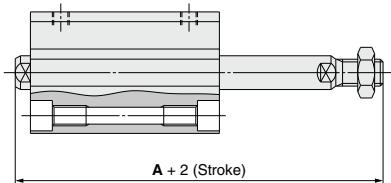
Male thread is used at one piston rod end of double rod type cylinder and female thread is used at the other end.

C□QSW **Mounting** **Bore size** — **Stroke** **D** — **X235**

* Specifications: Same as standard type.
Note) Please contact SMC for mounting bracket.

“D” in the case of “-235”

Piston rod end
Male thread, Female thread



| Symbol | Bore size | 12 | 16 | 20 | 25 |
|-------------------|-----------|-------------|---------|---------|-------------|
| A | | 39.5 (44.5) | 41 (46) | 49 (59) | 56.5 (66.5) |
| Applicable stroke | | 5 to 30 | | 5 to 50 | |

Note 1) Applicable stroke is available in 5 mm increments.
Note 2) (): Denotes the dimensions with auto switch.

2 Fluororubber for Seals

Symbol
-X271

Material for seals is changed to fluororubber.

C□QS **Standard model no.** — **X271**

All series variations except non-rotating piston rod type of the CQS series is available. Specifications are the same as for each variation of CQS.

Fluororubber for seals

3 Long Stroke of Adjustable Extension Stroke Cylinder (-XC8)

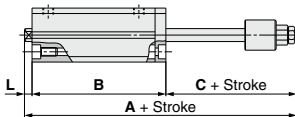
Symbol
-X525

C□QS **Mounting** **Bore size** — **Stroke** **D(M)** — **X525**

Long stroke
of XC8

Specifications are the same as for -XC8 of the CQ2/CQS series. Refer to "Made to Order Common Specifications".
Note) For the tap mounting type (ø12 to ø25—without switch) and mounting bracket, please contact SMC.

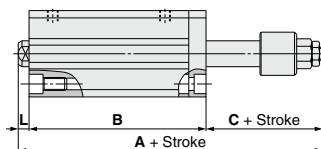
ø12, ø16



ø12, ø16

| Symbol Stroke | A | | | | B | | | C | L | Applicable stroke | |
|------------------|----------------|-----------------|------------------|------------------|------------|------------|------------|------------|------|-------------------|----------------|
| | 35st | 40st | 45st | 50st | 35st | 40st | 45st | | | | 50st |
| Bore (mm) | | | | | | | | | | | |
| 12 | 91.1 (96.1) | 96.1 (101.1) | 101.1 (106.1) | 106.1 (111.1) | 62 (67) | 67 (72) | 72 (77) | 77 (82) | 25.6 | 3.5 | 35, 40, 45, 50 |
| 16 | 91.5 (96.5) | 96.5 (101.5) | 101.5 (106.5) | 106.5 (111.5) | 62 (67) | 67 (72) | 72 (77) | 77 (82) | 26 | 3.5 | |

ø20, ø25



ø20, ø25

| Symbol Stroke | A | | B | | C | L | Applicable stroke |
|------------------|------------------|------------------|---------------|----------------|----|-----|-------------------|
| | 55 to 75st | 80 to 100st | 55 to 75st | 80 to 100st | | | |
| Bore (mm) | | | | | | | |
| 20 | 142.5 (152.5) | 167.5 (177.5) | 109 (119) | 134 (144) | 29 | 4.5 | 55 to 100 |
| 25 | 146 (156) | 171 (181) | 112 (122) | 137 (147) | 29 | 5 | |

Note 1) (): Denotes dimensions with auto switch.
Note 2) Applicable stroke is available in 5 mm increments.

4 Long Stroke of Adjustable Retraction Stroke Cylinder (-XC9)

Symbol
-X526

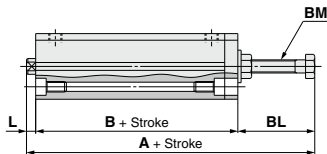
C□QS Mounting Bore size — Stroke D (M) — X526

Long stroke of XC9

Specifications are the same as for -XC9 of the CQS series.
Refer to "Made to Order Common Specifications".
Note) Please contact SMC for bracket type.

Dimensions

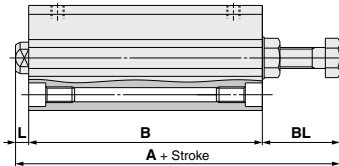
ø12, ø16



| Symbol | A | B | L | BL | BM | Applicable stroke |
|--------------|------|----|-----|------|-----------|---------------------------------------|
| Bore (mm) 12 | 69.8 | 37 | 3.5 | 29.3 | M5 x 0.8 | 35, 40, 45, 50, 75, 100 |
| 16 | 69.5 | 37 | 3.5 | 29 | M6 x 1.0 | 75, 100, 125, 150, 175, 200 |
| 20 | 76 | 41 | 4.5 | 30.5 | M8 x 1.25 | 75, 100, 125, 150, 175, 200, 250, 300 |
| 25 | 78.5 | 44 | 5 | 29.5 | M8 x 1.25 | 75, 100, 125, 150, 175, 200, 250, 300 |

Note 1) Intermediate stroke type (available in 5 mm increments) is for spacer so that dimensions are the same as for each type of 75, 100, 125, 150, 175, 200, 250, 300 stroke.

ø20, ø25



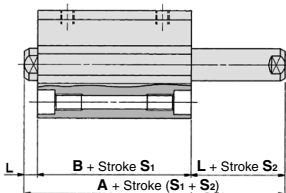
5 Intermediate Stroke of Double Rod Type

Symbol
-X633

C□QSW Standard model no. — X633
C□QSKW

* Specifications: Same as standard type.
Note) Please contact SMC for bracket type.

Dimensions



| Symbol | C(D)QSW | | C(D)QSKW | | L | Stroke S ₁ | Stroke S ₂ |
|--------------|---------|---------|----------|---------|-----|--|--|
| | A | B | A | B | | | |
| Bore (mm) 12 | 29 (34) | 22 (27) | 34 (39) | 27 (32) | 3.5 | In the case of 5 to 30 stroke 5 mm intervals | In the case of 6 to 29 stroke 1 mm intervals |
| 16 | 29 (34) | 22 (27) | 34 (39) | 27 (32) | 3.5 | In the case of 5 to 30 stroke 5 mm intervals | In the case of 6 to 29 stroke 1 mm intervals |
| 20 | 35 (45) | 26 (36) | 40 (50) | 31 (41) | 4.5 | In the case of 5 to 50 stroke 5 mm intervals | In the case of 6 to 49 stroke 1 mm intervals |
| 25 | 39 (49) | 29 (39) | 44 (54) | 34 (44) | 5 | In the case of 5 to 50 stroke 5 mm intervals | In the case of 6 to 49 stroke 1 mm intervals |

Note 1) (): Denotes the dimensions with auto switch.

Note 2) Installing a spacer inside the standard cylinder tube, stroke S₁ has 5 mm intervals for controlling intermediate strokes in 1 mm increments.

Example) In the case of CDQ2WB40-18D, stroke S₁ is 20 mm and stroke S₂ is 18 mm.

CUJ

CU

CQS

JCQ

CQ2

RQ

CQM

CQU

MU

D-□

-X□

Technical Data



6 Long Stroke of Dual Stroke Single Rod Type

Symbol

-X636

C□QSB **Bore size** - **Stroke S₁** + **Stroke S₂-S₁** DC (M) - X636
 Long stroke of XC11

Applicable stroke

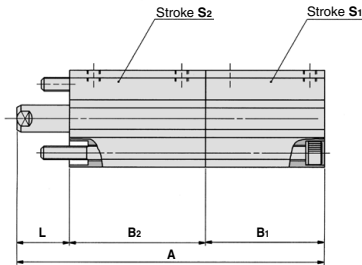
mm

| Bore size | Stroke |
|-----------|---|
| ø12, ø16 | Max. stroke S ₂ : up to 50 mm |
| ø20, ø25 | Max. stroke S ₂ : up to 100 mm |

Specifications are the same as for -XC11 of the CQS series.

Refer to "Made to Order Common Specifications".

Note) Please contact SMC for tap mounting type and bracket mounting type.



Bore size: ø12, ø16

mm

| Symbol | A | B ₁ | B ₂ | L | Stroke range | |
|----------|--|------------------------------------|-------------------------------|------|----------------|----------------|
| | | | | | S ₁ | S ₂ |
| Bore ø12 | 62.5 (67.5) + Stroke (S ₁ + S ₂) | 17 (22) + Stroke S ₁ | 32 + Stroke S ₂ | 13.5 | 5 to 30 | 35 to 50 |
| ø16 | 62.5 (67.5) + Stroke (S ₁ + S ₂) | 17 (22) + Stroke S ₁ | 32 + Stroke S ₂ | 13.5 | 5 to 30 | 35 to 50 |

Bore size: ø20, ø25

mm

| Symbol | A | | B ₁ | B ₂ | | L | Stroke range | |
|----------|--|--|--|-----------------------|-----------|------|----------------|----------------|
| | Stroke S ₂ | | | Stroke S ₂ | | | S ₁ | S ₂ |
| | 55 to 75 | 80 to 100 | | 55 to 75 | 80 to 100 | | | |
| Bore ø20 | 150 (160) + Stroke S ₁ | 175 (185) + Stroke S ₁ | 19.5 (29.5) + Stroke S ₁ | 116 | 141 | 14.5 | 5 to 50 | 55 to 100 |
| ø25 | 156.5 (166.5) + Stroke S ₁ | 181.5 (191.5) + Stroke S ₁ | 22.5 (32.5) + Stroke S ₁ | 119 | 144 | 15 | 5 to 50 | 55 to 100 |

Note 1) (): Denotes the dimensions with auto switch.

Note 2) Applicable stroke is available in 5 mm increments.

7 Cylinder Tube: With Concave Boss on Head End

Symbol

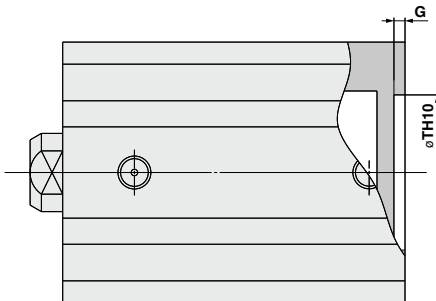
-X1876

C□QS **Mounting** **Bore size** - **Stroke** D (C) (M)
S (M) - X1876
T (M)

With concave boss on head end

Specifications are the same as CQS.

Note) CQS: Excluding ø12 and ø16.



| Series | CQS | |
|----------------|--|-----|
| Bore size (mm) | TH10 | G |
| 20 | 19.3 + ^{0.084} / ₀ | 1.4 |
| 25 | 23.8 + ^{0.084} / ₀ | 1.4 |