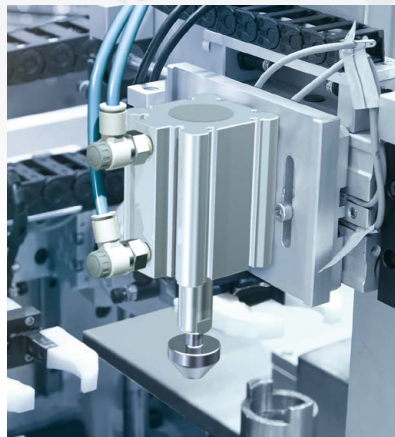
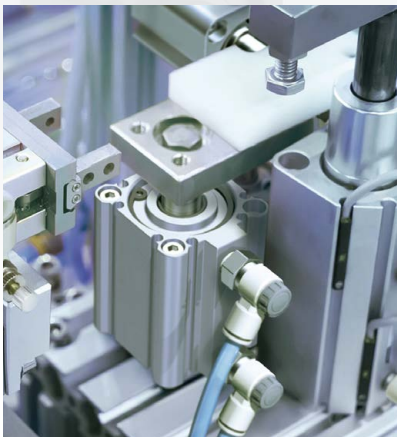


# Compact Cylinder

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100,  
ø125, ø140, ø160, ø180, ø200

## *Equipment Downsizing*

*For more compact jigs and other equipment*












**CQ2 Series**



CAT.ES20-205C

# Compact Cylinder *CQ2 Series*

## Variations

| Series   | Action        | Model                             | Bore size [mm] |           |           |           |           |           |           |           |           |            |            |            |            |            | Standard stroke [mm]   | Page   |           |
|--|---------------|-----------------------------------|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|--|--|-----------|
|  |               |                                   | 12             | 16        | 20        | 25        | 32        | 40        | 50        | 63        | 80        | 100        | 125        | 140        | 160        | 180        |  |  | 200       |
| <b>Standard CQ2</b><br>   | Double acting | Single rod                        | ●              | ●         | ●         | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            |  | ø12, ø16: 5 to 30<br>ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50 to ø100: 10 to 100 | <b>7</b>  |
|  | Double acting | Double rod                        | ●              | ●         | ●         | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            |  | ø12, ø16: 5 to 30<br>ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50 to ø100: 10 to 100 | <b>29</b> |
|  | Single acting | Single rod (Spring return/extend) | ●              | ●         | ●         | ●         | ●         | ●         |           |           |           |            |            |            |            |            |  | ø12 to ø40: 5, 10<br>ø50: 10, 20   | <b>43</b> |
| <b>With stable lubrication function (Lube-retainer) CQ2□M</b><br> | Double acting | Single rod                        |                |           |           | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø32, ø40: 5 to 100<br>ø50 to ø100: 10 to 100   | <b>16</b>  |           |
| <b>Large bore size CQ2</b><br>                                    | Double acting | Single rod                        |                |           |           |           |           |           |           |           | ●         | ●          | ●          | ●          |            |            | 10 to 300  | <b>53</b>  |           |
|  | Double acting | Double rod                        |                |           |           |           |           |           |           |           | ●         | ●          | ●          | ●          |            |            | 10 to 300  | <b>59</b>  |           |
| <b>Anti-lateral load CQ2□S</b><br>                                | Double acting | Single rod                        |                |           |           | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø32 to ø40: 5 to 100<br>ø50 to ø100: 10 to 100   | <b>65</b>  |           |
| <b>Long stroke CQ2</b><br>                                       | Double acting | Single rod                        |                |           |           | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | 125 to 300   | <b>72</b>  |           |
| <b>Non-rotating rod CQ2K</b><br>                                | Double acting | Single rod                        | ●              | ●         | ●         | ●         | ●         | ●         | ●         |           |           |            |            |            |            |            | ø12, ø16: 5 to 30<br>ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50, ø63: 10 to 100    | <b>77</b>  |           |
|  | Double acting | Double rod                        | ●              | ●         | ●         | ●         | ●         | ●         | ●         |           |           |            |            |            |            |            | ø12, ø16: 5 to 30<br>ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50, ø63: 10 to 100    | <b>89</b>  |           |
| <b>Water resistant CQ2□<sup>R</sup><sub>V</sub></b><br>         | Double acting | Single rod                        |                |           | ●         | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50 to ø100: 10 to 100                      | <b>99</b>  |           |
|  | Double acting | Double rod                        |                |           |           | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø40: 5 to 100<br>ø50 to ø100: 10 to 100  | <b>108</b>   |           |
| <b>Axial piping CQP2</b><br>                                    | Double acting | Single rod                        | ●              | ●         | ●         | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø12, ø16: 5 to 30<br>ø20, ø25: 5 to 50<br>ø32, ø40: 5 to 100<br>ø50 to ø100: 10 to 100 | <b>115</b>   |           |
|  | Single acting | Single rod (Spring return/extend) | ●              | ●         | ●         | ●         | ●         | ●         |           |           |           |            |            |            |            |            | ø12 to ø40: 5, 10<br>ø50: 10, 20   | <b>122</b>   |           |
| <b>With end lock CBQ2</b><br>                                   | Double acting | Single rod                        |                |           | ●         | ●         | ●         | ●         | ●         | ●         |           |            |            |            |            |            | ø20 to ø63: 10 to 100<br>ø80, ø100: 25 to 100  | <b>131</b>   |           |
|  |               |                                   | <b>12</b>      | <b>16</b> | <b>20</b> | <b>25</b> | <b>32</b> | <b>40</b> | <b>50</b> | <b>63</b> | <b>80</b> | <b>100</b> | <b>125</b> | <b>140</b> | <b>160</b> | <b>180</b> | <b>200</b>   |  |           |
| Simple specials  |               |                                   |                |           |           |           |           |           |           |           |           |            |            |            |            |            |  | <b>157</b>   |           |
| Made to order common specifications  |               |                                   |                |           |           |           |           |           |           |           |           |            |            |            |            |            |  | <b>161</b>   |           |


Secondary battery compatible  
**25A-CQ2**



Clean series/Low particle generation  
10-/21-**CQ2**  
11-/22-



Smooth Cylinder (Low friction)  
**CQ2Y**



Low-speed Cylinder  
**CQ2X**



Refer to the **Web Catalog**.

\* The axial piping type, end lock cylinders, and low-speed cylinders have the same body shapes as those of the existing products.

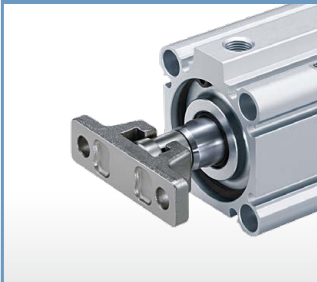
## Various mounting bracket options

- Mounting brackets suitable for various installation conditions
- Improved mounting freedom

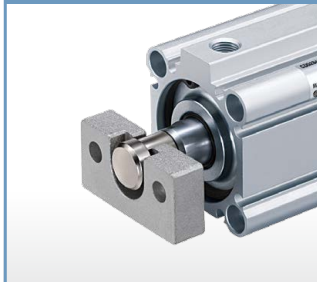
### Rod End Types/Brackets

#### Rod end female thread

Simple joint A

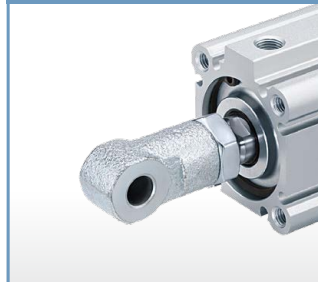


Simple joint B



#### Rod end male thread

Single knuckle joint



Double knuckle joint

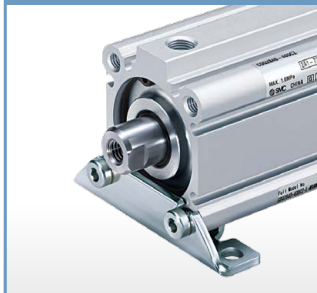


### Mounting Brackets

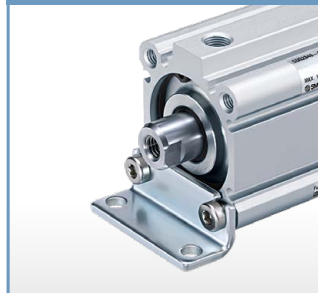
Rod flange



Foot



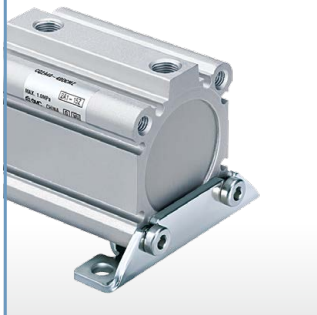
Compact foot



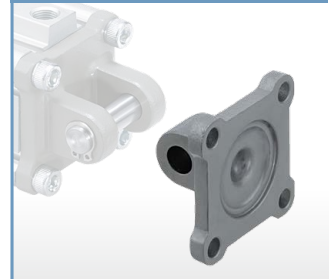
Clevis



Head flange



Double clevis pivot bracket



### Environmentally Resistant Specifications

#### ■ Brackets and cylinders that can be used in environments where contact with water or coolant occurs

- Made of Stainless Steel ..... p. 26, 168
  - Single knuckle joint
  - Double knuckle joint
  - Rod end nut
- XC27 ..... p. 176
  - Double clevis pin/Double knuckle joint pin material: Stainless steel 304
- Water-resistant Cylinder ..... p. 99

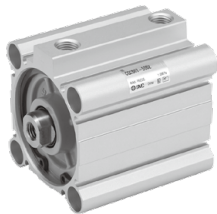
#### ■ Cylinders that can be used in micro-powder environments

- Compact Cylinder with Stable Lubrication Function (Lube-retainer) ..... p. 16
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- Dust-resistant Actuator (-XC92) ..... p. 179
  - For use in environments with airborne micro-powder such as ceramic powder, toner powder, paper powder, and metallic powder
- With Heavy Duty Scraper (-XC4) ..... p. 167
- With Coil Scraper (-XC35) ..... p. 176
  - For use in dusty environments or in environments where die-cast equipment, construction machinery, etc., cause exposure to dirt or sand
- Heat Resistant/Cold Resistant (-XB6, -XB7, -XB14) ..... p. 161, 165



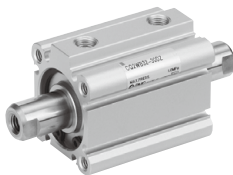
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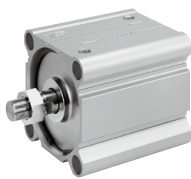
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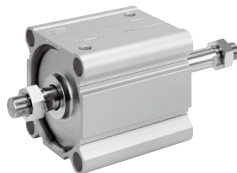
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### ■ Large Bore Size: Double Acting, Double Rod *CQ2W Series*

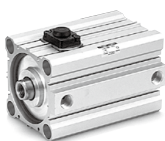
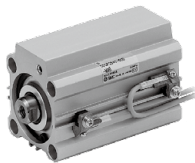
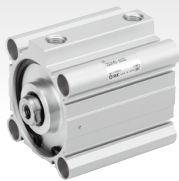
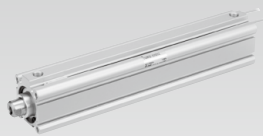
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Axial Piping Double Acting, Single Rod CQP2  
Axial Piping Single Acting, Single Rod CQP2  
With End Lock Double Acting, Single Rod CBQ2  
Auto Switch  
Made to Order

# Combinations of Standard Products and Made to Order

## CQ2 Series

- : Standard
- ⊙: Made to order
- : Special product (Please contact SMC for details.)
- : Not available

| Symbol   | Specifications   | Applicable bore size | Series      |               | CQ2 (Standard) |                              |                              |               | CQ2 (Large bore size) |  |
|----------|--|----------------------|-------------|---------------|----------------|------------------------------|------------------------------|---------------|-----------------------|--|
|          |  |                      | Action/Type | Double acting |                | Single acting                |                              | Double acting |                       |  |
|          |  |                      |             | Single rod    | Double rod     | Single rod/<br>Spring return | Single rod/<br>Spring extend | Single rod    | Double rod            |  |
|          |  |                      | ø12 to ø100 |               | ø12 to ø50     |                              | ø125 to ø200                 |               |                       |  |
| Standard | Standard   | ø12 to ø100          | ●           | ●             | ●              | ●                            | ●                            | ●             |                       |  |
| D        | Built-in magnet  | ø12 to ø100          | ●           | ●             | ●              | ●                            | ●                            | ●             |                       |  |
| CQ2□H    | Air-hydro type*13  | ø20 to ø100          | ●           | ●             | —              | —                            | ○                            | ○             |                       |  |
| 10-, 11- | Clean series/Low particle generation   | ø12 to ø200          | ●           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| 25A      | Copper (Cu) and zinc (Zn)-free*12  |                      | ●           | ●             | ○              | ○                            | ●                            | ○             |                       |  |
| 20-      | Copper*11 and Fluorine-free  |                      | ●           | ●             | ●              | ●                            | ●                            | ●             |                       |  |
| CQ2□M    | Compact cylinder with stable lubrication function (Lube-retainer)*6  | ø32 to ø100          | ●           | ○             | ○              | ○                            | —                            | —             |                       |  |
| XB6      | Heat-resistant cylinder (-10 to 150°C)*14  | ø12 to ø100          | ⊙           | ⊙             | ○              | ○                            | ○                            | ○             |                       |  |
| XB7      | Cold-resistant cylinder (-40 to 70°C)  | ø12 to ø40           | ⊙           | ⊙             | ○              | ○                            | ○                            | ○             |                       |  |
| XB9      | Low-speed cylinder (10 to 50 mm/s)   | ø12 to ø100          | ⊙           | ⊙             | ○              | ○                            | ○                            | ○             |                       |  |
| XB10     | Intermediate stroke (Using exclusive body)   | ø12 to ø200          | ⊙           | ⊙             | ⊙              | ○                            | ⊙                            | ⊙             |                       |  |
| XB10A    | Intermediate stroke (Spacer-installed type)  | ø32 to ø100          | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| XB13     | Low-speed cylinder (5 to 50 mm/s)  | ø12 to ø100          | ⊙           | ⊙             | ○              | ○                            | ○                            | ○             |                       |  |
| XB14     | Cylinder with heat-resistant auto switch*14  | ø16 to ø63           | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| XC2(A)   | Rod end length increased by 10 mm (For foot and flange bracket)  | ø12 to ø100          | ⊙           | ⊙             | ⊙              | ⊙                            | —                            | —             |                       |  |
| XC4      | With heavy duty scraper  | ø20 to ø100          | ⊙           | ⊙*3           | ○              | ○                            | ○                            | ○             |                       |  |
| XC6(A)   | Piston rod/Retaining ring/Rod end nut material: Stainless steel  | ø12 to ø100          | ⊙           | ⊙             | ⊙              | ⊙                            | ○                            | ○             |                       |  |
| XC8      | Adjustable stroke cylinder/Adjustable extension type   |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| XC9      | Adjustable stroke cylinder/Adjustable retraction type  |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| XC10     | Dual stroke cylinder/Double rod type   |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| XC11     | Dual stroke cylinder/Single rod type   |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| XC26     | With split pins for double clevis pin/double knuckle joint pin and flat washers                                    |                      | ⊙           | —             | ⊙              | ⊙                            | ○                            | ○             |                       |  |
| XC26□    | Double clevis width/Double knuckle width 12.5 mm, 16.5 mm, or 19.5 mm: With double clevis and double knuckle joint |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| XC27     | Double clevis pin/Double knuckle joint pin material: Stainless steel 304   |                      | ⊙           | ○             | ⊙              | ⊙                            | ○                            | ○             |                       |  |
| XC35     | With coil scraper  |                      | ø32 to ø100 | ⊙             | ⊙              | ○                            | ○                            | ○             | ○                     |  |
| XC36     | With boss on rod end   |                      | ø12 to ø100 | ⊙             | ⊙              | ⊙                            | ⊙                            | ○             | ○                     |  |
| XC85     | Grease for food processing equipment   | ø12 to ø200          | ⊙           | ⊙             | ⊙              | ⊙                            | ⊙                            | ⊙             |                       |  |
| XC88     | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)                | ø32 to ø100          | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| XC89     | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)                               |                      | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| XC91     | Spatter-resistant coil scraper, Grease for welding (Piston rod: S45C)  |                      | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| XC92     | Dust-resistant actuator  |                      | ⊙           | ○             | ○              | ○                            | ○                            | ○             |                       |  |
| X144     | Special port location  | ø12 to ø25           | ⊙           | ⊙             | ⊙              | ⊙                            | —                            | —             |                       |  |
| X202     | Same full length dimension as the CQ1 series   | ø12 to ø100          | ⊙           | —             | ⊙              | ⊙                            | —                            | —             |                       |  |
| X203     | Same L dimension from the rod cover as the CQ1 series  | ø12 to ø32           | ⊙           | —             | ⊙              | ⊙                            | —                            | —             |                       |  |
| X235     | Special rod end for double rod cylinder  | ø12 to ø200          | —           | ⊙             | —              | —                            | —                            | ⊙             |                       |  |
| X271     | Fluororubber seals*14  | ø12 to ø160          | ⊙           | ⊙             | ⊙              | ⊙                            | ⊙*9                          | ⊙*9           |                       |  |
| X293     | Same full length dimension as the CQ1W series  |                      | —           | ⊙             | —              | —                            | —                            | —             |                       |  |
| X525     | Long stroke for adjustable extension stroke cylinder (-XC8)  | ø12 to ø100          | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| X526     | Long stroke for adjustable retraction stroke cylinder (-XC9)   |                      | ⊙           | —             | ○              | ○                            | ○                            | —             |                       |  |
| X633     | Intermediate stroke for double rod cylinder  | ø12 to ø200          | —           | ⊙             | —              | —                            | —                            | ⊙             |                       |  |
| X636     | Long stroke for dual stroke single rod cylinder  | ø12 to ø100          | ⊙           | —             | ○              | —                            | ○                            | —             |                       |  |
| X1876    | Cylinder tube: With concave boss on head end   | ø20 to ø100          | ⊙           | —             | ⊙              | ⊙                            | —                            | —             |                       |  |

\*1 ø12 to ø32: (○), for ø40 to ø63 only

\*2 ø12: (—)

\*3 ø20 to ø32: (○), for ø40 to ø100 only

\*4 ø20 to ø25: (○), for ø32 to ø100 only

\*5 Rod end lock: (—), for head end lock only

\*6 ø20 to ø32: (○), for ø40 to ø100 only

\*7 Head end lock: (—), for rod end lock only

\*8 With boss on rod end (Standard)

\*9 ø180 to ø200: (○), for ø125 to ø160 only

\*10 The body shape is the same as the existing product.

# Common Specifications

## CQ2 Series

|   | CQ2□S<br>(Anti-lateral load) | CQ2<br>(Long stroke) | CQ2K<br>(Non-rotating rod) |            | CQ2-R/V<br>(Water resistant) |             | CQP2<br>(Axial piping) <sup>*10</sup> |                              |                              | CBQ2<br>(With end lock) <sup>*10</sup> | Symbol   |
|---|------------------------------|----------------------|----------------------------|------------|------------------------------|-------------|---------------------------------------|------------------------------|------------------------------|--|----------|
|   | Double acting                | Double acting        | Double acting              |            | Double acting                |             | Double acting                         | Single acting                |                              | Double acting                          |          |
|   | Single rod                   | Single rod           | Single rod                 | Double rod | Single rod                   | Double rod  | Single rod                            | Single rod/<br>Spring return | Single rod/<br>Spring extend | Single rod                             |          |
|   | ø32 to ø100                  | ø32 to ø100          | ø12 to ø63                 |            | ø20 to ø100                  | ø40 to ø100 | ø12 to ø100                           | ø12 to ø50                   |                              | ø20 to ø100                            |          |
| ● | ●                            | ●                    | ●                          | ●          | ●                            | ●           | ●                                     | ●                            | ●                            | ●                                      | Standard |
| ● | ●                            | ●                    | ●                          | ●          | ●                            | ●           | ●                                     | ●                            | ●                            | ●                                      | D        |
| ○ | ●                            | —                    | —                          | —          | —                            | —           | ●                                     | —                            | —                            | —                                      | CQ2□H    |
| ○ | ●                            | ○                    | ○                          | —          | —                            | ○           | ○                                     | ○                            | ○                            | ○                                      | 10-, 11- |
| ● | ●                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | 25A      |
| ● | ●                            | ●*2                  | ●*2                        | ○          | ○                            | ○           | ●                                     | ●                            | ●                            | ○                                      | 20-      |
| ○ | ○                            | —                    | —                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | CQ2□M    |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB6      |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB7      |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB9      |
| ○ | ○                            | ○*1                  | ○*1                        | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB10     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB10A    |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB13     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XB14     |
| ○ | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC2(A)   |
| ○ | ○                            | —                    | —                          | —          | —                            | ○           | ○*4                                   | ○                            | ○                            | ○                                      | XC4      |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC6(A)   |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC8      |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC9      |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC10     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC11     |
| ○ | ○                            | ○*1                  | —                          | ○          | —                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC26     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC26□    |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC27     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC35     |
| ○ | ○                            | ○*8                  | ○*8                        | ○*8        | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC36     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC85     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC88     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC89     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC91     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | XC92     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X144     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X202     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X203     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X235     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X271     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X293     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X525     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X526     |
| — | —                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X633     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X636     |
| ○ | ○                            | ○                    | ○                          | ○          | ○                            | ○           | ○                                     | ○                            | ○                            | ○                                      | X1876    |

\*11 Copper-free for the externally exposed part  
For details, refer to the [Web Catalog](#).  
\*12 For details, refer to the [Web Catalog](#).

\*13 Without rubber bumper (Standard)  
\*14 Excludes the air-hydro type

|                   |  |          |
|-------------------|--|----------|
| Standard          | Double Acting, Single Rod                | CQ2      |
| Standard          | Double Acting, Double Rod                | CQ2W     |
| Standard          | Single Acting, Spring Return, Single Rod | CQ2      |
| Standard          | Single Acting, Spring Return, Double Rod | CQ2W     |
| Large Bore Size   | Double Acting, Single Rod                | CQ2      |
| Large Bore Size   | Double Acting, Double Rod                | CQ2W     |
| Anti-lateral Load | Double Acting, Single Rod                | CQ2□S    |
| Long Stroke       | Double Acting, Single Rod                | CQ2      |
| Long Stroke       | Double Acting, Double Rod                | CQ2W     |
| Non-rotating Rod  | Double Acting, Single Rod                | CQ2K     |
| Non-rotating Rod  | Double Acting, Double Rod                | CQ2KW    |
| Water Resistant   | Double Acting, Single Rod                | CQ2-R/V  |
| Water Resistant   | Double Acting, Double Rod                | CQ2W-R/V |
| Axial Piping      | Double Acting, Single Rod                | CQP2     |
| Axial Piping      | Single Acting, Spring Return, Single Rod | CQP2     |
| With End Lock     | Double Acting, Single Rod                | CBQ2     |
| With End Lock     | Double Acting, Double Rod                | CBQ2     |
| Auto Switch       |  |          |
| Made to Order     |  |          |



# Compact Cylinder: Standard Double Acting, Single Rod

## CQ2 Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

Without auto switch  
ø12 to ø25

CQ2 B [ ] 20 [ ] - 30 D [ ] - [ ] [ ] - [ ]

Without auto switch  
ø32 to ø100

CQ2 B [ ] 32 [ ] - 30 D [ ] Z - [ ] [ ] - [ ]

With auto switch

CDQ2 B [ ] 32 [ ] - 30 D M Z - L W - M9BW [ ] - [ ]

#### With auto switch magnet

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

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

#### ① Mounting

|    |                  |
|----|------------------|
| B  | Through-hole     |
| A  | Both ends tapped |
| L  | Foot             |
| LC | Compact foot     |
| F  | Rod flange       |
| G  | Head flange      |
| D  | Double clevis    |

- \* Mounting brackets are shipped together with the product but do not come assembled.
- \* Refer to ⑨ for the through-hole type mounting bolt.

#### ② Type

|     |             |
|-----|-------------|
| Nil | Pneumatic   |
| H   | Air-hydro*1 |

\*1 The bore sizes available for the air-hydro type are ø20 to ø100.

#### ③ Bore size

|     |        |
|-----|--------|
| 12  | 12 mm  |
| 16  | 16 mm  |
| 20  | 20 mm  |
| 25  | 25 mm  |
| 32  | 32 mm  |
| 40  | 40 mm  |
| 50  | 50 mm  |
| 63  | 63 mm  |
| 80  | 80 mm  |
| 100 | 100 mm |

#### ④ Port thread type

|     |                               |             |
|-----|-------------------------------|-------------|
| Nil | M thread                      | ø12 to ø25  |
|     | Rc                            |             |
| TN  | NPT                           | ø32 to ø100 |
| TF  | G                             |             |
| F   | Built-in One-touch fittings*1 |             |

- \*1 The bore sizes available with One-touch fittings are ø32 to ø63. However, they cannot be selected for the air-hydro type.
- \* "TF" is not selectable for the air-hydro type.
- \* For cylinders without an auto switch magnet, M threads are compatible only with ø32-5 mm stroke.

#### ⑤ Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145)

| Pneumatic type  |  | [mm] |
|-----------------|--|------|
| Bore size       | Standard stroke                                |      |
| 12, 16          | 5, 10, 15, 20, 25, 30                          |      |
| 20, 25          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |      |
| 32, 40          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |      |
| 50, 63, 80, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |      |

| Air-hydro type  |  | [mm] |
|-----------------|--|------|
| Bore size       | Standard stroke                                |      |
| 20, 25          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |      |
| 32, 40          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |      |
| 50, 63, 80, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |      |

- \* For long strokes exceeding the standard stroke range ⇨ p. 72
- \* For details on the manufacturing of intermediate strokes ⇨ p. 10

#### ⑥ Action

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|

#### ⑦ Body option

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| F   | With boss on head end |
| C   | With rubber bumper*1  |
| M   | Rod end male thread   |

- \*1 The type with a rubber bumper is not selectable for the air-hydro type.
- \* Combined body options, such as "FC," "FM," "FCM," and "CM" can be selected.

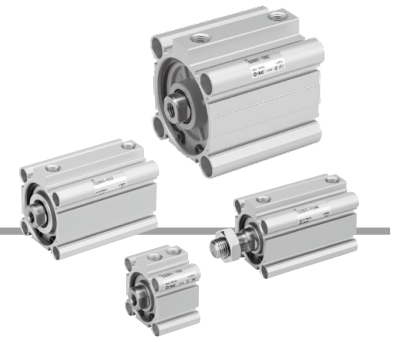
#### ⑧ Auto switch mounting groove

|   |             |            |
|---|-------------|------------|
| Z | ø12 to ø25  | 2 surfaces |
|   | ø32 to ø100 | 4 surfaces |

#### ⑨ Through-hole type mounting bolt

|     |                  |
|-----|------------------|
| Nil | None             |
| L   | Shipped together |

- \* Mounting bolt is shipped together with the product only when the mounting bracket is "B" (Through-hole).
- \* When a made-to-order option is selected for ⑩, the mounting bolt is not shipped together with the product. Please order it separately. For details:  
Without auto switch magnet ⇨ p. 13  
With auto switch magnet ⇨ p. 14



**10 Rod end bracket** (⇒ p. 26, 27)

|            |                             |
|------------|-----------------------------|
| <b>Nil</b> | None                        |
| <b>D</b>   | Simple joint A type + Joint |
| <b>E</b>   | Simple joint B type + Joint |
| <b>V</b>   | Single knuckle joint        |
| <b>W</b>   | Double knuckle joint        |

- \* The single knuckle joint and double knuckle joint cannot be mounted on the rod end female thread type.
  - \* A knuckle joint pin is not provided with the single knuckle joint.
  - \* The simple joint A and B types cannot be mounted on the rod end male thread type.
  - \* The rod end bracket is shipped together with the product.
  - \* The bore sizes available with the simple joint (D and E) are ø32 to ø100.
  - \* When a made-to-order option is selected, the rod end bracket cannot be selected. Please order it separately.
- For details ⇒ p. 26, 27

**11 Auto switch**

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

**13 Made to order common specifications**

For details ⇒ p. 9

**12 Number of auto switches**

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

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

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

**Cylinder Model with Auto Switch Magnet**

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDQ2L32-25DZ

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

| Type                    | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |                 | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |            |   |   |   |            |
|-------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|-----------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|------------|---|---|---|------------|
|                         |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line         | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | Relay, PLC      | Other      |            |            |   |   |   |            |
| Solid state auto switch | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | <b>M9NV</b>     | <b>M9N</b>           | ●     | ●     | ●     | ○        | —                   | ○               | IC circuit | Relay, PLC |            |   |   |   |            |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PV</b>     | <b>M9P</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |   |   |   |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BV</b>     | <b>M9B</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          |   |   |   |            |
|                         |   |                  |                 | 3-wire (NPN)            |              |           |                   | <b>M9NWV</b>    | <b>M9NW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          |   |   |   |            |
|                         | Diagnostic indication (2-color indicator) |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PWV</b>    | <b>M9PW</b>          | ●     | ●     | ●     | ○        | —                   | ○               | —          |            | ○          | — | ○ | — | IC circuit |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9B WV</b>   | <b>M9B W</b>         | ●     | ●     | ●     | ○        | —                   | ○               | —          |            | ○          | — | ○ | — | —          |
|                         | Water resistant (2-color indicator)       |                  |                 | 3-wire (NPN)            |              |           |                   | <b>M9NAV</b> *1 | <b>M9NA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               | —          |            | ○          | — | ○ | — | IC circuit |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PAV</b> *1 | <b>M9PA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               | —          |            | ○          | — | ○ | — | IC circuit |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BAV</b> *1 | <b>M9BA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               | —          |            | ○          | — | ○ | — | —          |
|                         |   |                  |                 | 2-wire (Non-polar)      |              |           |                   | —               | <b>P3DWA</b>         | ●     | —     | ●     | ●        | —                   | ○               | —          |            | ○          | — | ○ | — | —          |
| Reed auto switch        | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V or less     | <b>A96V</b>     | <b>A96</b>           | ●     | —     | ●     | —        | —                   | —               | IC circuit | —          |            |   |   |   |            |
|                         |   |                  |                 | <b>A93V</b> *2          |              |           |                   | <b>A93</b>      | ●                    | ●     | ●     | ●     | —        | —                   | —               | —          | —          | Relay, PLC |   |   |   |            |
|                         |   |                  |                 | <b>A90V</b>             |              |           |                   | <b>A90</b>      | ●                    | —     | ●     | —     | —        | —                   | —               | —          | —          | IC circuit |   |   |   |            |

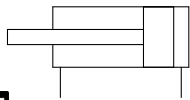
- \*1 Water-resistant type auto switches can be mounted on the models on page 7, but SMC cannot guarantee water resistance. A water-resistant type cylinder (⇒ p. 99) is recommended for use in environments which require water resistance.
  - \*2 The 1 m lead wire is only applicable to the D-A93.
  - \* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ
  - \* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* The D-P3DWA type is only available in sizes ø25 to ø100.
- \* There are applicable auto switches other than those listed above. For details ⇒ p. 152

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Double Acting, Single Rod **CQ2**  
 Anti-lateral Load Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-R/V**  
 Double Acting, Double Rod **CQ2W-R/V**  
 Axial Piping Single Acting, Single Rod **CQP2**  
 Double Acting, Single Rod **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

# CQ2 Series

## Symbol

Without cushion



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

| Symbol  | Specifications   |
|---------|--|
| -XA□    | Change of rod end shape  |
| -XB6    | Heat-resistant cylinder (-10 to 150°C) w/o auto switch only*1  |
| -XB7    | Cold-resistant cylinder (-40 to 70°C) w/o auto switch only   |
| -XB9    | Low-speed cylinder (10 to 50 mm/s)   |
| -XB10   | Intermediate stroke (Using exclusive body)   |
| -XB10A  | Intermediate stroke (Spacer-installed type)  |
| -XB13   | Low-speed cylinder (5 to 50 mm/s)  |
| -XB14   | Cylinder with heat-resistant auto switch*1   |
| -XC2(A) | Rod end length increased by 10 mm (For foot and flange bracket)  |
| -XC4    | With heavy duty scraper  |
| -XC6    | Piston rod/Retaining ring/Rod end nut material: 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   |
| -XC26   | With split pins for double clevis pin/double knuckle joint pin and flat washers                                    |
| -XC26□  | Double clevis width/Double knuckle width 12.5 mm, 16.5 mm, or 19.5 mm: With double clevis and double knuckle joint |
| -XC27   | Double clevis pin/Double knuckle joint pin material: Stainless steel 304   |
| -XC35   | With coil scraper  |
| -XC36   | With boss on rod end   |
| -XC85   | Grease for food processing equipment   |
| -XC88   | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)                |
| -XC89   | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)                               |
| -XC91   | Spatter-resistant coil scraper, Grease for welding (Piston rod: S45C)  |
| -XC92   | Dust-resistant actuator  |
| -X144   | Special port location, with auto switch  |
| -X202   | Same full length dimension as the CQ1 series   |
| -X203   | Same L dimension from the rod cover as the CQ1 series  |
| -X271   | Fluororubber seals*1   |
| -X525   | Long stroke for adjustable extension stroke cylinder (-XC8)  |
| -X526   | Long stroke for adjustable retraction stroke cylinder (-XC9)   |
| -X636   | Long stroke for dual stroke single rod cylinder  |
| -X1876  | Cylinder tube: With concave boss on head end   |

\*1 Excludes the air-hydro type

### Clean Series/Low Particle Generation

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

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

### Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

## ⚠ Precautions

**Refer to page 189 before handling the products.**

## Specifications

### Pneumatic type

| Bore size [mm]                        |   | 12    | 16       | 20    | 25   | 32   | 40   | 50   | 63   | 80   | 100  |
|---------------------------------------|---|-------|----------|-------|------|------|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |       |          |       |      |      |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |       |          |       |      |      |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.07 MPa  |       | 0.05 MPa |       |      |      |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |       |          |       |      |      |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |       |          |       |      |      |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |       |          |       |      |      |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | <b>Standard</b>   | 0.022 | 0.038    | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
|                                       | <b>With rubber bumper</b>   | 0.043 | 0.075    | 0.11  | 0.18 | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| <b>Stroke length tolerance</b>        | +1.0 mm*1<br>0  |       |          |       |      |      |      |      |      |      |      |

\*1 Stroke length tolerance does not include the amount of bumper change.

### Air-hydro type

| Bore size [mm]                        |                           | 20 | 25 | 32      | 40 | 50 | 63 | 80 | 100 |
|---------------------------------------|---------------------------|----|----|---------|----|----|----|----|-----|
| <b>Action</b>                         | Double acting, Single rod |    |    |         |    |    |    |    |     |
| <b>Fluid</b>                          | Turbine oil*1             |    |    |         |    |    |    |    |     |
| <b>Proof pressure</b>                 | 1.5 MPa                   |    |    |         |    |    |    |    |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa                   |    |    |         |    |    |    |    |     |
| <b>Minimum operating pressure</b>     | 0.18 MPa                  |    |    | 0.1 MPa |    |    |    |    |     |
| <b>Ambient and fluid temperatures</b> | 5 to 60°C                 |    |    |         |    |    |    |    |     |
| <b>Piston speed</b>                   | 5 to 50 mm/s              |    |    |         |    |    |    |    |     |
| <b>Cushion</b>                        | None                      |    |    |         |    |    |    |    |     |
| <b>Stroke length tolerance</b>        | +1.0 mm<br>0              |    |    |         |    |    |    |    |     |

\*1 Actuator Precautions 5 ⇨ Refer to the **Web Catalog**.

## Mounting Bracket Part Nos.

| Bore size [mm] |                            | Foot*1  | Compact foot*1 | Flange  | Double clevis | Double clevis pivot bracket |
|----------------|----------------------------|---------|----------------|---------|---------------|-----------------------------|
| 12             | Without auto switch magnet | CQ-L012 | CQ-LC012       | CQ-F012 | CQ-D012       | CQ-C012                     |
|                | With auto switch magnet    | CQ-LZ12 | CQ-LCZ12       |         |               |                             |
| 16             | Without auto switch magnet | CQ-L016 | CQ-LC016       | CQ-F016 | CQ-D016       | CQ-C016                     |
|                | With auto switch magnet    | CQ-LZ16 | CQ-LCZ16       |         |               |                             |
| 20             | Without auto switch magnet | CQ-L020 | CQ-LC020       | CQ-F020 | CQ-D020       | CQ-C020                     |
|                | With auto switch magnet    | CQ-LZ20 | CQ-LCZ20       |         |               |                             |
| 25             | Without auto switch magnet | CQ-L025 | CQ-LC025       | CQ-F025 | CQ-D025       | CQ-C025                     |
|                | With auto switch magnet    | CQ-LZ25 | CQ-LCZ25       |         |               |                             |
| 32             |                            | CQ-L032 | CQ-LC032       | CQ-F032 | CQ-D032       | CQ-C032                     |
| 40             |                            | CQ-L040 | CQ-LC040       | CQ-F040 | CQ-D040       | CQ-C040                     |
| 50             |                            | CQ-L050 | CQ-LC050       | CQ-F050 | CQ-D050       | CQ-C050                     |
| 63             |                            | CQ-L063 | CQ-LC063       | CQ-F063 | CQ-D063       | CQ-C063                     |
| 80             |                            | CQ-L080 | CQ-LC080       | CQ-F080 | CQ-D080       | CQ-C080                     |
| 100            |                            | CQ-L100 | CQ-LC100       | CQ-F100 | CQ-D100       | CQ-C100                     |

\*1 When ordering foot and compact foot brackets, the required quantity will be different depending on the bore size.

ø12 to ø25:

• Without auto switch magnet: Order 2 pieces per cylinder.

• With auto switch magnet: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)

ø32 to ø100:

• Order 2 pieces per cylinder.

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

Foot, Compact foot, Flange: Body mounting bolts

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

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

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



## Manufacturing of Intermediate Strokes (Excludes the air-hydro type)

\* Pay attention to the mounting dimensions since the intermediate strokes ( $\phi 32$  to  $\phi 100$ ) can be manufactured in three types.

Ordering example: 57 mm stroke

**CQ2B50-57 DZ** -   

Stroke ●

Stroke suffix ●

|              |   |     |
|--------------|---|-----|
| <b>Nil</b>   | A 18 mm spacer is installed on 75 mm stroke tube. | ⇔ 1 |
| <b>XB10A</b> | A 3 mm spacer is installed on 60 mm stroke tube.  | ⇔ 2 |
| <b>XB10</b>  | Makes 57 mm stroke tube.                          | ⇔ 3 |

### 1. Spacer-installed type 1: Standard model number

- A spacer is installed on the standard strokes (⇔ p. 7).
- Available in 1 mm increments
- A spacer is installed on tubes with a stroke longer than the specified stroke (◆).

◆ : Standard stroke

| Bore size [mm] | Stroke range | Stroke |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|----------------|--------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
|                |              | 5      | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
| 12, 16         | 1 to 29      | ○◆     | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆  |
| 20, 25         | 1 to 49      | ○◆     | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆  |
| 32, 40         | 1 to 99      | ○◆     | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆ | ○◆  |
| 50 to 100      | 1 to 99      | ○      | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○   |

Ordering example:  $\phi 50$ -57 mm stroke, with through-hole and without auto switch magnet

|             |  |  |
|-------------|--|--|
| Part no.    | <b>CQ2B50-57DZ</b>   |  |
| Description | <ul style="list-style-type: none"> <li>• Uses a standard stroke (75 mm) tube.</li> <li>• Makes 57 mm stroke with 18 mm spacer inside.</li> <li>• The B dimension is 115.5 mm.</li> </ul> |  |

### 2. Spacer-installed type 2: Suffix “-XB10A” ( $\phi 32$ to $\phi 100$ : Intermediate strokes of 51 mm or more)

- A spacer is installed on the “3. Exclusive body type (XB10)” inventory tubes for 55, 60, 65, 70, 80, 85, 90 and 95 strokes.
- Available in 1 mm increments
- A spacer is installed on tubes with a stroke longer than the specified stroke (●). ◆ : Standard stroke ● : Stroke in stock

| Bore size [mm] | Stroke range | Stroke |    |    |    |   |    |    |    |    |    |   |     |   |   |   |   |   |   |   |   |
|----------------|--------------|--------|----|----|----|---|----|----|----|----|----|---|-----|---|---|---|---|---|---|---|---|
|                |              | 55     | 60 | 65 | 70 | * | 75 | 80 | 85 | 90 | 95 | * | 100 |   |   |   |   |   |   |   |   |
| 32, 40         | 51 to 94     | ○      | ●  | ○  | ●  | ○ | ●  | ○  | ●  | ○  | ●  | ○ | ●   | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| 50 to 100      | 51 to 94     | ○      | ●  | ○  | ●  | ○ | ●  | ○  | ●  | ○  | ●  | ○ | ●   | ○ | ● | ○ | ● | ○ | ● | ○ | ● |

Ordering example:  $\phi 50$ -57 mm stroke, with through-hole and without auto switch magnet

|             |  |  |
|-------------|--|--|
| Part no.    | <b>CQ2B50-57DZ-XB10A</b>   |  |
| Description | <ul style="list-style-type: none"> <li>• Uses an exclusive tube (60 mm stroke) in “3”.</li> <li>• Makes 57 mm stroke with 3 mm spacer inside.</li> <li>• The B dimension is 100.5 mm.</li> </ul> |  |

\* Specify a spacer-installed type 1 with standard model number for ordering an intermediate stroke with a \* mark. For details ⇔ p. 164

### 3. Exclusive body type: Suffix “-XB10”

- Exclusive tubes can be manufactured for specified strokes upon request.
- Available in 1 mm increments

| Bore size [mm] | Stroke range |
|----------------|--------------|
| 12, 16         | 6 to 29      |
| 20, 25         | 6 to 49      |
| 32, 40         | 6 to 99      |
| 50 to 100      | 11 to 99     |

\* In the case of exclusive body type with  $\phi 32$  to  $\phi 100$  (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension (A/B dimension) will be the same as those with auto switch magnet. For details ⇔ p. 162

Ordering example:  $\phi 50$ -57 mm stroke, with through-hole and without auto switch magnet

|             |   |  |
|-------------|---|--|
| Part no.    | <b>CQ2B50-57DZ-XB10</b>   |  |
| Description | <ul style="list-style-type: none"> <li>• Makes 57 mm stroke tube.</li> <li>• The B dimension is 97.5 mm.</li> </ul> |  |

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Single Rod **CQ2**

Large Bore Size Double Acting, Single Rod **CQ2**

Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2**

Double Acting, Single Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Double Acting, Double Rod **CQ2W**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-RV**

Double Acting, Single Rod **CQ2-RV**

Double Acting, Double Rod **CQ2W-RV**

Double Acting, Double Rod **CQ2W-RV**

Axial Piping Single Acting, Spring Return, Single Rod **CQP2**

Double Acting, Single Rod **CQP2**

Double Acting, Double Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Double Acting, Single Rod **CBQ2**

Auto Switch

Made to Order

# CQ2 Series

## Allowable Kinetic Energy

### Load Mass and Piston Speed [J]

| Bore size [mm]   | 12    | 16    | 20    | 25   | 32   | 40   | 50   | 63   | 80   | 100  |
|--|-------|-------|-------|------|------|------|------|------|------|------|
| Standard/<br>Allowable kinetic<br>energy: Ea           | 0.022 | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| With rubber bumper/<br>Allowable kinetic<br>energy: Eb | 0.043 | 0.075 | 0.110 | 0.18 | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |

$$\text{Kinetic energy } E \text{ [J]} = \frac{(m_1+m_2) V^2}{2}$$

**m1:** Mass of cylinder movable parts [kg]  
**m2:** Load mass [kg]  
**V:** Piston speed [m/s]

### Mass of Cylinder Movable Parts: Without Auto Switch Magnet [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |     |     |     |     |     |     |      |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50  | 75  | 100  |
| 12             | 5                    | 6   | 7   | 8   | 10  | 11  | —   | —   | —   | —   | —   | —    |
| 16             | 9                    | 11  | 13  | 15  | 17  | 19  | —   | —   | —   | —   | —   | —    |
| 20             | 15                   | 18  | 21  | 24  | 27  | 31  | 34  | 37  | 40  | 44  | —   | —    |
| 25             | 24                   | 28  | 33  | 37  | 42  | 46  | 51  | 55  | 60  | 64  | —   | —    |
| 32             | 45                   | 52  | 60  | 68  | 76  | 84  | 92  | 100 | 107 | 115 | 170 | 209  |
| 40             | 64                   | 72  | 80  | 88  | 96  | 104 | 112 | 119 | 127 | 135 | 190 | 229  |
| 50             | —                    | 117 | 129 | 141 | 153 | 166 | 178 | 190 | 202 | 214 | 300 | 361  |
| 63             | —                    | 153 | 165 | 177 | 190 | 202 | 214 | 226 | 239 | 251 | 337 | 398  |
| 80             | —                    | 270 | 289 | 308 | 327 | 347 | 366 | 385 | 404 | 423 | 557 | 653  |
| 100            | —                    | 487 | 515 | 543 | 570 | 598 | 625 | 653 | 681 | 708 | 901 | 1038 |

### Mass of Cylinder Movable Parts: With Auto Switch Magnet [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |     |     |     |     |     |      |      |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50  | 75   | 100  |
| 12             | 8                    | 9   | 10  | 11  | 12  | 13  | —   | —   | —   | —   | —    | —    |
| 16             | 16                   | 18  | 20  | 22  | 24  | 26  | —   | —   | —   | —   | —    | —    |
| 20             | 28                   | 31  | 34  | 37  | 40  | 44  | 47  | 50  | 53  | 56  | —    | —    |
| 25             | 44                   | 48  | 53  | 57  | 62  | 66  | 71  | 75  | 80  | 84  | —    | —    |
| 32             | 78                   | 86  | 93  | 101 | 109 | 117 | 125 | 133 | 140 | 148 | 187  | 227  |
| 40             | 109                  | 117 | 125 | 133 | 140 | 148 | 156 | 164 | 172 | 180 | 219  | 258  |
| 50             | —                    | 187 | 199 | 211 | 223 | 236 | 248 | 260 | 272 | 285 | 346  | 407  |
| 63             | —                    | 254 | 266 | 278 | 290 | 303 | 315 | 327 | 339 | 352 | 413  | 474  |
| 80             | —                    | 433 | 453 | 472 | 491 | 510 | 530 | 549 | 568 | 587 | 683  | 778  |
| 100            | —                    | 741 | 768 | 796 | 823 | 851 | 879 | 906 | 934 | 962 | 1099 | 1236 |

### Additional Mass of Cylinder Movable Parts [g]

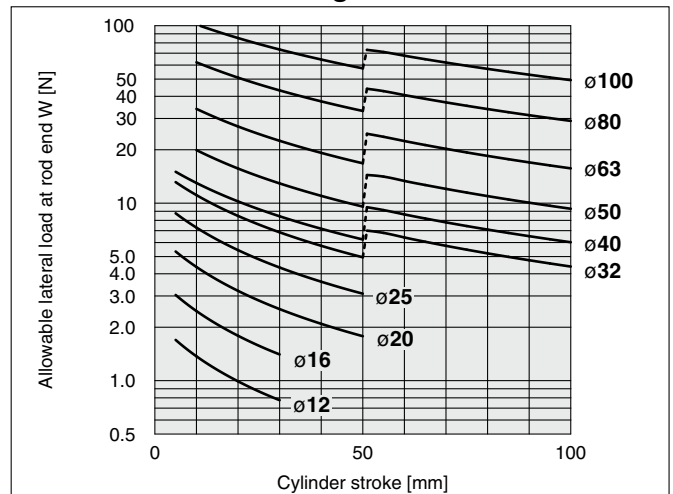
| Bore size [mm]      |             | 12  | 16 | 20 | 25 | 32 | 40 | 50 | 63  | 80  | 100 |
|---------------------|-------------|-----|----|----|----|----|----|----|-----|-----|-----|
| Rod end male thread | Male thread | 1.5 | 3  | 6  | 12 | 26 | 27 | 53 | 53  | 120 | 175 |
|                     | Nut         | 1   | 2  | 4  | 8  | 17 | 17 | 32 | 32  | 49  | 116 |
| With rubber bumper  |             | 0   | 0  | -2 | -3 | -3 | -7 | -9 | -18 | -31 | -56 |

Calculation: (Example) **CDQ2B32-20DCMZ**

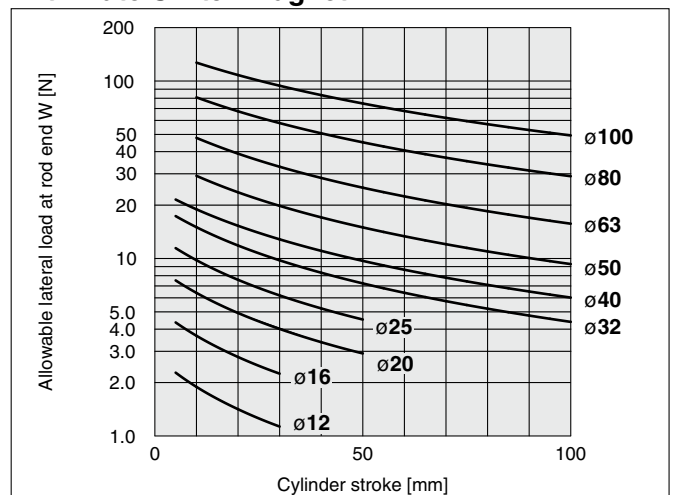
- Basic mass: CDQ2B32-20DZ ..... 101 g
  - Additional mass: Rod end male thread ..... 43 g
  - With rubber bumper ..... -3 g
- 141 g

## Allowable Lateral Load at Rod End

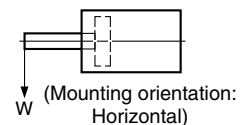
### Without Auto Switch Magnet



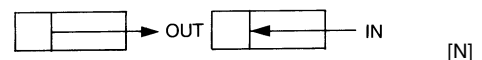
### With Auto Switch Magnet



If an allowable lateral load at rod end is exceeding the value in the graph, we recommend anti-lateral load type cylinder be used.



## Theoretical Output



| Bore size [mm] | Operating direction | Operating pressure [MPa] |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 12             | IN                  | 25                       | 42   | 59   |
|                | OUT                 | 34                       | 57   | 79   |
| 16             | IN                  | 45                       | 75   | 106  |
|                | OUT                 | 60                       | 101  | 141  |
| 20             | IN                  | 71                       | 118  | 165  |
|                | OUT                 | 94                       | 157  | 220  |
| 25             | IN                  | 113                      | 189  | 264  |
|                | OUT                 | 147                      | 245  | 344  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1150 |
|                | OUT                 | 589                      | 982  | 1370 |
| 63             | IN                  | 841                      | 1400 | 1960 |
|                | OUT                 | 935                      | 1560 | 2180 |
| 80             | IN                  | 1360                     | 2270 | 3170 |
|                | OUT                 | 1510                     | 2510 | 3520 |
| 100            | IN                  | 2140                     | 3570 | 5000 |
|                | OUT                 | 2360                     | 3930 | 5500 |

**Weight**

**Without Auto Switch Magnet** [g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 29                   | 35   | 41   | 47   | 54   | 60   | —    | —    | —    | —    | —    | —    |
| 16             | 42                   | 50   | 59   | 67   | 76   | 84   | —    | —    | —    | —    | —    | —    |
| 20             | 63                   | 75   | 88   | 101  | 114  | 127  | 140  | 152  | 165  | 178  | —    | —    |
| 25             | 86                   | 100  | 115  | 129  | 144  | 158  | 173  | 187  | 202  | 216  | —    | —    |
| 32             | 125                  | 145  | 165  | 184  | 204  | 224  | 244  | 263  | 283  | 303  | 448  | 547  |
| 40             | 187                  | 208  | 230  | 251  | 273  | 294  | 315  | 337  | 358  | 380  | 552  | 664  |
| 50             | —                    | 339  | 372  | 405  | 438  | 471  | 504  | 537  | 570  | 603  | 872  | 1043 |
| 63             | —                    | 480  | 518  | 556  | 594  | 632  | 670  | 708  | 746  | 784  | 1112 | 1308 |
| 80             | —                    | 916  | 976  | 1036 | 1097 | 1157 | 1217 | 1277 | 1338 | 1398 | 1917 | 2215 |
| 100            | —                    | 1608 | 1688 | 1768 | 1849 | 1929 | 2010 | 2090 | 2170 | 2251 | 2982 | 3391 |

**With Auto Switch Magnet** [g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 43                   | 49   | 55   | 61   | 67   | 73   | —    | —    | —    | —    | —    | —    |
| 16             | 64                   | 71   | 79   | 87   | 95   | 102  | —    | —    | —    | —    | —    | —    |
| 20             | 94                   | 106  | 118  | 131  | 143  | 155  | 167  | 179  | 191  | 203  | —    | —    |
| 25             | 134                  | 149  | 164  | 180  | 195  | 210  | 226  | 241  | 256  | 272  | —    | —    |
| 32             | 182                  | 202  | 222  | 241  | 261  | 281  | 300  | 320  | 340  | 359  | 459  | 558  |
| 40             | 269                  | 290  | 312  | 333  | 355  | 376  | 398  | 420  | 441  | 463  | 575  | 687  |
| 50             | —                    | 455  | 488  | 521  | 554  | 587  | 620  | 653  | 686  | 719  | 891  | 1062 |
| 63             | —                    | 627  | 665  | 703  | 741  | 779  | 817  | 855  | 893  | 931  | 1129 | 1326 |
| 80             | —                    | 1162 | 1222 | 1282 | 1342 | 1403 | 1463 | 1524 | 1584 | 1644 | 1941 | 2237 |
| 100            | —                    | 1966 | 2047 | 2127 | 2208 | 2288 | 2368 | 2449 | 2529 | 2610 | 3018 | 3426 |

**Additional Weight** [g]

| Bore size [mm]  |             | 12  | 16  | 20  | 25  | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Both ends tapped                                      |             | 2   | 2   | 6   | 6   | 6   | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                                   | Male thread | 1.5 | 3   | 6   | 12  | 26  | 27  | 53  | 53  | 120  | 175  |
|   | Nut         | 1   | 2   | 4   | 8   | 17  | 17  | 32  | 32  | 49   | 116  |
| With boss on head end                                 |             | 0.7 | 1.3 | 2   | 3   | 5   | 7   | 13  | 25  | 45   | 96   |
| With rubber bumper                                    |             | 0   | 0   | -2  | -3  | -3  | -7  | -9  | -18 | -31  | -56  |
| Built-in One-touch fittings                           |             | —   | —   | —   | —   | 12  | 12  | 21  | 21  | —    | —    |
| Foot (Including mounting bolts)                       |             | 50  | 62  | 150 | 175 | 120 | 138 | 219 | 297 | 589  | 968  |
| Compact foot (Including mounting bolts)               |             | 37  | 46  | 115 | 134 | 94  | 109 | 172 | 234 | 492  | 762  |
| Rod flange (Including mounting bolts)                 |             | 57  | 69  | 139 | 161 | 180 | 214 | 373 | 559 | 1056 | 1365 |
| Head flange (Including mounting bolts)                |             | 54  | 65  | 133 | 152 | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining rings, bolts) |             | 32  | 39  | 88  | 123 | 151 | 196 | 393 | 554 | 1109 | 1887 |

Calculation: (Example) **CQ2D32-20DCMZ**

- Basic weight: CQ2B32-20DZ ..... 184 g
  - Additional weight: Both ends tapped ..... 6 g
    - Rod end male thread ..... 43 g
    - With rubber bumper ..... -3 g
    - Double clevis ..... 151 g
- 381 g

**Additional Weight** [g]

| Bore size [mm]  |             | 12  | 16  | 20  | 25  | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Both ends tapped                                      |             | 1   | 1   | 3   | 3   | 6   | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                                   | Male thread | 1.5 | 3   | 6   | 12  | 26  | 27  | 53  | 53  | 120  | 175  |
|   | Nut         | 1   | 2   | 4   | 8   | 17  | 17  | 32  | 32  | 49   | 116  |
| With boss on head end                                 |             | 0.7 | 1.3 | 2   | 3   | 5   | 7   | 13  | 25  | 45   | 96   |
| With rubber bumper                                    |             | 0   | 0   | -2  | -3  | -3  | -7  | -9  | -18 | -31  | -56  |
| Built-in One-touch fittings                           |             | —   | —   | —   | —   | 12  | 12  | 21  | 21  | —    | —    |
| Foot (Including mounting bolts)                       |             | 41  | 53  | 126 | 149 | 120 | 138 | 219 | 297 | 589  | 968  |
| Compact foot (Including mounting bolts)               |             | 30  | 38  | 94  | 113 | 94  | 109 | 172 | 234 | 492  | 762  |
| Rod flange (Including mounting bolts)                 |             | 54  | 67  | 131 | 153 | 180 | 214 | 373 | 559 | 1056 | 1365 |
| Head flange (Including mounting bolts)                |             | 52  | 63  | 124 | 144 | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining rings, bolts) |             | 29  | 35  | 78  | 114 | 151 | 196 | 393 | 554 | 1109 | 1887 |

Calculation: (Example) **CDQ2D32-20DCMZ**

- Basic weight: CQ2B32-20DZ ..... 241 g
  - Additional weight: Both ends tapped ..... 6 g
    - Rod end male thread ..... 43 g
    - With rubber bumper ..... -3 g
    - Double clevis ..... 151 g
- 438 g

Add each weight of auto switches when auto switches are mounted.

|                   |  |  |
|-------------------|--|--|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>   |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>  |
| Standard          | Single Acting, Spring Return, Single Rod | <b>CQ2</b>   |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2W</b>  |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>   |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>  |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2</b> <input type="checkbox"/> <b>S</b>                                   |
| Anti-lateral Load | Double Acting, Double Rod                | <b>CQ2</b> <input type="checkbox"/> <b>W</b> <input type="checkbox"/> <b>S</b> |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>   |
| Long Stroke       | Double Acting, Double Rod                | <b>CQ2W</b>  |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2K</b>  |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2KW</b>   |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-R/V</b>   |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-R/V</b>  |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>  |
| Axial Piping      | Double Acting, Double Rod                | <b>CQP2W</b>   |
| Axial Piping      | Single Acting, Spring Return, Single Rod | <b>CQP2</b>  |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>  |
| Auto Switch       |  | <b>Auto Switch</b>   |
| Made to Order     |  | <b>Made to Order</b>   |

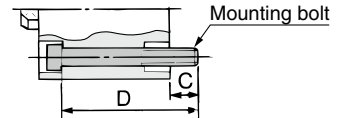


# CQ2 Series

## Through-hole Type Mounting Bolt for the CQ2: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2B is available as an option.  
 Refer to the following for ordering procedures.  
 Order the actual number of bolts that will be used.  
 For models with an auto switch magnet ⇨ p. 14

Type: Hexagon socket head cap screw  
 Material: Chromium molybdenum steel  
 Surface treatment: Zinc chromated



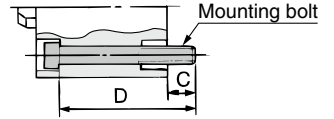
**Example) CQ-M3 x 25L 4 pcs.**

| Cylinder model    | C   | D      | Mounting bolt part no. | Cylinder model     | C      | D           | Mounting bolt part no. | Cylinder model     | C            | D      | Mounting bolt part no. |
|-------------------|-----|--------|------------------------|--------------------|--------|-------------|------------------------|--------------------|--------------|--------|------------------------|
| <b>CQ2B12-5D</b>  | 6.5 | 25     | CQ-M3 x 25L            | <b>CQ2B40-5DZ</b>  | 7.5    | 35          | CQ-M5 x 35L            | <b>CQ2B80-10DZ</b> | 15           | 55     | CQ-M10 x 55L           |
| -10D              |     | 30     | x 30L                  | -10DZ              |        | 40          | x 40L                  | -15DZ              |              | 60     | x 60L                  |
| -15D              |     | 35     | x 35L                  | -15DZ              |        | 45          | x 45L                  | -20DZ              |              | 65     | x 65L                  |
| -20D              |     | 40     | x 40L                  | -20DZ              |        | 50          | x 50L                  | -25DZ              |              | 70     | x 70L                  |
| -25D              |     | 45     | x 45L                  | -25DZ              |        | 55          | x 55L                  | -30DZ              |              | 75     | x 75L                  |
| -30D              |     | 50     | x 50L                  | -30DZ              |        | 60          | x 60L                  | -35DZ              |              | 80     | x 80L                  |
| <b>CQ2B16-5D</b>  | 5   | 25     | CQ-M3 x 25L            | -35DZ              | 65     | x 65L       | -40DZ                  | 85                 |              | x 85L  |                        |
| -10D              |     | 30     | x 30L                  | -40DZ              | 70     | x 70L       | -45DZ                  | 90                 |              | x 90L  |                        |
| -15D              |     | 35     | x 35L                  | -45DZ              | 75     | x 75L       | -50DZ                  | 95                 |              | x 95L  |                        |
| -20D              |     | 40     | x 40L                  | -50DZ              | 80     | x 80L       | -55DZ-XB10             | 110                |              | x 110L |                        |
| -25D              |     | 45     | x 45L                  | -55DZ-XB10         | 95     | x 95L       | -60DZ-XB10             | 115                | x 115L       |        |                        |
| -30D              |     | 50     | x 50L                  | -60DZ-XB10         | 100    | x 100L      | -65DZ-XB10             | 120                | x 120L       |        |                        |
| <b>CQ2B20-5D</b>  | 7.5 | 25     | CQ-M5 x 25L            | -65DZ-XB10         | 105    | x 105L      | -70DZ-XB10             | 125                | x 125L       |        |                        |
| -10D              |     | 30     | x 30L                  | -70DZ-XB10         | 110    | x 110L      | -75DZ                  | 130                | x 130L       |        |                        |
| -15D              |     | 35     | x 35L                  | -75DZ              | 115    | x 115L      | -80DZ-XB10             | 135                | x 135L       |        |                        |
| -20D              |     | 40     | x 40L                  | -80DZ-XB10         | 120    | x 120L      | -85DZ-XB10             | 140                | x 140L       |        |                        |
| -25D              |     | 45     | x 45L                  | -85DZ-XB10         | 125    | x 125L      | -90DZ-XB10             | 145                | x 145L       |        |                        |
| -30D              |     | 50     | x 50L                  | -90DZ-XB10         | 130    | x 130L      | -95DZ-XB10             | 150                | x 150L       |        |                        |
| -35D              |     | 55     | x 55L                  | -95DZ-XB10         | 135    | x 135L      | -100DZ                 | 155                | x 155L       |        |                        |
| -40D              |     | 60     | x 60L                  | -100DZ             | 140    | x 140L      | <b>CQ2B100-10DZ</b>    | 65                 | CQ-M10 x 65L |        |                        |
| -45D              |     | 65     | x 65L                  | <b>CQ2B50-10DZ</b> | 45     | CQ-M6 x 45L | -15DZ                  | 70                 | x 70L        |        |                        |
| -50D              |     | 70     | x 70L                  | -15DZ              | 50     | x 50L       | -20DZ                  | 75                 | x 75L        |        |                        |
| <b>CQ2B25-5D</b>  | 9.5 | 30     | CQ-M5 x 30L            | -20DZ              | 55     | x 55L       | -25DZ                  | 80                 | x 80L        |        |                        |
| -10D              |     | 35     | x 35L                  | -25DZ              | 60     | x 60L       | -30DZ                  | 85                 | x 85L        |        |                        |
| -15D              |     | 40     | x 40L                  | -30DZ              | 65     | x 65L       | -35DZ                  | 90                 | x 90L        |        |                        |
| -20D              |     | 45     | x 45L                  | -35DZ              | 70     | x 70L       | -40DZ                  | 95                 | x 95L        |        |                        |
| -25D              |     | 50     | x 50L                  | -40DZ              | 75     | x 75L       | -45DZ                  | 100                | x 100L       |        |                        |
| -30D              |     | 55     | x 55L                  | -45DZ              | 80     | x 80L       | -50DZ                  | 105                | x 105L       |        |                        |
| -35D              |     | 60     | x 60L                  | -50DZ              | 85     | x 85L       | -55DZ-XB10             | 120                | x 120L       |        |                        |
| -40D              |     | 65     | x 65L                  | -55DZ-XB10         | 100    | x 100L      | -60DZ-XB10             | 125                | x 125L       |        |                        |
| -45D              |     | 70     | x 70L                  | -60DZ-XB10         | 105    | x 105L      | -65DZ-XB10             | 130                | x 130L       |        |                        |
| -50D              |     | 75     | x 75L                  | -65DZ-XB10         | 110    | x 110L      | -70DZ-XB10             | 135                | x 135L       |        |                        |
| <b>CQ2B32-5DZ</b> | 9   | 30     | CQ-M5 x 30L            | -70DZ-XB10         | 115    | x 115L      | -75DZ                  | 140                | x 140L       |        |                        |
| -10DZ             |     | 35     | x 35L                  | -75DZ              | 120    | x 120L      | -80DZ-XB10             | 145                | x 145L       |        |                        |
| -15DZ             |     | 40     | x 40L                  | -80DZ-XB10         | 125    | x 125L      | -85DZ-XB10             | 150                | x 150L       |        |                        |
| -20DZ             |     | 45     | x 45L                  | -85DZ-XB10         | 130    | x 130L      | -90DZ-XB10             | 155                | x 155L       |        |                        |
| -25DZ             |     | 50     | x 50L                  | -90DZ-XB10         | 135    | x 135L      | -95DZ-XB10             | 160                | x 160L       |        |                        |
| -30DZ             |     | 55     | x 55L                  | -95DZ-XB10         | 140    | x 140L      | -100DZ                 | 165                | x 165L       |        |                        |
| -35DZ             |     | 60     | x 60L                  | -100DZ             | 145    | x 145L      |                        |                    |              |        |                        |
| -40DZ             |     | 65     | x 65L                  | <b>CQ2B63-10DZ</b> | 50     | CQ-M8 x 50L |                        |                    |              |        |                        |
| -45DZ             |     | 70     | x 70L                  | -15DZ              | 55     | x 55L       |                        |                    |              |        |                        |
| -50DZ             |     | 75     | x 75L                  | -20DZ              | 60     | x 60L       |                        |                    |              |        |                        |
| -55DZ-XB10        |     | 90     | x 90L                  | -25DZ              | 65     | x 65L       |                        |                    |              |        |                        |
| -60DZ-XB10        |     | 95     | x 95L                  | -30DZ              | 70     | x 70L       |                        |                    |              |        |                        |
| -65DZ-XB10        |     | 100    | x 100L                 | -35DZ              | 75     | x 75L       |                        |                    |              |        |                        |
| -70DZ-XB10        |     | 105    | x 105L                 | -40DZ              | 80     | x 80L       |                        |                    |              |        |                        |
| -75DZ             |     | 110    | x 110L                 | -45DZ              | 85     | x 85L       |                        |                    |              |        |                        |
| -80DZ-XB10        |     | 115    | x 115L                 | -50DZ              | 90     | x 90L       |                        |                    |              |        |                        |
| -85DZ-XB10        | 120 | x 120L | -55DZ-XB10             | 105                | x 105L |             |                        |                    |              |        |                        |
| -90DZ-XB10        | 125 | x 125L | -60DZ-XB10             | 110                | x 110L |             |                        |                    |              |        |                        |
| -95DZ-XB10        | 130 | x 130L | -65DZ-XB10             | 115                | x 115L |             |                        |                    |              |        |                        |
| -100DZ            | 135 | x 135L | -70DZ-XB10             | 120                | x 120L |             |                        |                    |              |        |                        |
|                   |     |        | -75DZ                  | 125                | x 125L |             |                        |                    |              |        |                        |
|                   |     |        | -80DZ-XB10             | 130                | x 130L |             |                        |                    |              |        |                        |
|                   |     |        | -85DZ-XB10             | 135                | x 135L |             |                        |                    |              |        |                        |
|                   |     |        | -90DZ-XB10             | 140                | x 140L |             |                        |                    |              |        |                        |
|                   |     |        | -95DZ-XB10             | 145                | x 145L |             |                        |                    |              |        |                        |
|                   |     |        | -100DZ                 | 150                | x 150L |             |                        |                    |              |        |                        |

## Through-hole Type Mounting Bolt for the CDQ2: With Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CDQ2B is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.  
For models without an auto switch magnet ⇨ p. 13

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



**Example) CQ-M3 x 35L 2 pcs.**

| Cylinder model | C    | D      | Mounting bolt part no. | Cylinder model | C      | D           | Mounting bolt part no. | Cylinder model | C            | D      | Mounting bolt part no. |
|----------------|------|--------|------------------------|----------------|--------|-------------|------------------------|----------------|--------------|--------|------------------------|
| CDQ2B12-5DZ    | 5.5  | 35     | CQ-M3 x 35L            | CDQ2B40-5DZ    | 7.5    | 45          | CQ-M5 x 45L            | CDQ2B80-10DZ   | 15           | 65     | CQ-M10 x 65L           |
| -10DZ          |      | 40     | x 40L                  | -10DZ          |        | 50          | x 50L                  | -15DZ          |              | 70     | x 70L                  |
| -15DZ          |      | 45     | x 45L                  | -15DZ          |        | 55          | x 55L                  | -20DZ          |              | 75     | x 75L                  |
| -20DZ          |      | 50     | x 50L                  | -20DZ          |        | 60          | x 60L                  | -25DZ          |              | 80     | x 80L                  |
| -25DZ          |      | 55     | x 55L                  | -25DZ          |        | 65          | x 65L                  | -30DZ          |              | 85     | x 85L                  |
| -30DZ          |      | 65     | x 60L                  | -30DZ          |        | 70          | x 70L                  | -35DZ          |              | 90     | x 90L                  |
| CDQ2B16-5DZ    | 8    | 40     | CQ-M3 x 40L            | -35DZ          | 75     | x 75L       | -40DZ                  | 95             |              | x 95L  |                        |
| -10DZ          |      | 45     | x 45L                  | -40DZ          | 80     | x 80L       | -45DZ                  | 100            |              | x 100L |                        |
| -15DZ          |      | 50     | x 50L                  | -45DZ          | 85     | x 85L       | -50DZ                  | 105            |              | x 105L |                        |
| -20DZ          |      | 55     | x 55L                  | -50DZ          | 90     | x 90L       | -55DZ-XB10             | 110            |              | x 110L |                        |
| -25DZ          |      | 60     | x 60L                  | -55DZ-XB10     | 95     | x 95L       | -60DZ-XB10             | 115            | x 115L       |        |                        |
| -30DZ          |      | 65     | x 65L                  | -60DZ-XB10     | 100    | x 100L      | -65DZ-XB10             | 120            | x 120L       |        |                        |
| CDQ2B20-5DZ    | 10.5 | 40     | CQ-M5 x 40L            | -65DZ-XB10     | 105    | x 105L      | -70DZ-XB10             | 125            | x 125L       |        |                        |
| -10DZ          |      | 45     | x 45L                  | -70DZ-XB10     | 110    | x 110L      | -75DZ                  | 130            | x 130L       |        |                        |
| -15DZ          |      | 50     | x 50L                  | -75DZ          | 115    | x 115L      | -80DZ-XB10             | 135            | x 135L       |        |                        |
| -20DZ          |      | 55     | x 55L                  | -80DZ-XB10     | 120    | x 120L      | -85DZ-XB10             | 140            | x 140L       |        |                        |
| -25DZ          |      | 60     | x 60L                  | -85DZ-XB10     | 125    | x 125L      | -90DZ-XB10             | 145            | x 145L       |        |                        |
| -30DZ          |      | 65     | x 65L                  | -90DZ-XB10     | 130    | x 130L      | -95DZ-XB10             | 150            | x 150L       |        |                        |
| -35DZ          |      | 70     | x 70L                  | -95DZ-XB10     | 135    | x 135L      | -100DZ                 | 155            | x 155L       |        |                        |
| -40DZ          |      | 75     | x 75L                  | -100DZ         | 140    | x 140L      | CDQ2B100-10DZ          | 75             | CQ-M10 x 75L |        |                        |
| -45DZ          |      | 80     | x 80L                  | CDQ2B50-10DZ   | 55     | CQ-M6 x 55L | -15DZ                  | 80             | x 80L        |        |                        |
| -50DZ          |      | 85     | x 85L                  | -15DZ          | 60     | x 60L       | -20DZ                  | 85             | x 85L        |        |                        |
| CDQ2B25-5DZ    | 9.5  | 40     | CQ-M5 x 40L            | -20DZ          | 65     | x 65L       | -25DZ                  | 90             | x 90L        |        |                        |
| -10DZ          |      | 45     | x 45L                  | -25DZ          | 70     | x 70L       | -30DZ                  | 95             | x 95L        |        |                        |
| -15DZ          |      | 50     | x 50L                  | -30DZ          | 75     | x 75L       | -35DZ                  | 100            | x 100L       |        |                        |
| -20DZ          |      | 55     | x 55L                  | -35DZ          | 80     | x 80L       | -40DZ                  | 105            | x 105L       |        |                        |
| -25DZ          |      | 60     | x 60L                  | -40DZ          | 85     | x 85L       | -45DZ                  | 110            | x 110L       |        |                        |
| -30DZ          |      | 65     | x 65L                  | -45DZ          | 90     | x 90L       | -50DZ                  | 115            | x 115L       |        |                        |
| -35DZ          |      | 70     | x 70L                  | -50DZ          | 95     | x 95L       | -55DZ-XB10             | 120            | x 120L       |        |                        |
| -40DZ          |      | 75     | x 75L                  | -55DZ-XB10     | 100    | x 100L      | -60DZ-XB10             | 125            | x 125L       |        |                        |
| -45DZ          |      | 80     | x 80L                  | -60DZ-XB10     | 105    | x 105L      | -65DZ-XB10             | 130            | x 130L       |        |                        |
| -50DZ          |      | 85     | x 85L                  | -65DZ-XB10     | 110    | x 110L      | -70DZ-XB10             | 135            | x 135L       |        |                        |
| CDQ2B32-5DZ    | 9    | 40     | CQ-M5 x 40L            | -70DZ-XB10     | 115    | x 115L      | -75DZ                  | 140            | x 140L       |        |                        |
| -10DZ          |      | 45     | x 45L                  | -75DZ          | 120    | x 120L      | -80DZ-XB10             | 145            | x 145L       |        |                        |
| -15DZ          |      | 50     | x 50L                  | -80DZ-XB10     | 125    | x 125L      | -85DZ-XB10             | 150            | x 150L       |        |                        |
| -20DZ          |      | 55     | x 55L                  | -85DZ-XB10     | 130    | x 130L      | -90DZ-XB10             | 155            | x 155L       |        |                        |
| -25DZ          |      | 60     | x 60L                  | -90DZ-XB10     | 135    | x 135L      | -95DZ-XB10             | 160            | x 160L       |        |                        |
| -30DZ          |      | 65     | x 65L                  | -95DZ-XB10     | 140    | x 140L      | -100DZ                 | 165            | x 165L       |        |                        |
| -35DZ          |      | 70     | x 70L                  | -100DZ         | 145    | x 145L      |                        |                |              |        |                        |
| -40DZ          |      | 75     | x 75L                  | CDQ2B63-10DZ   | 60     | CQ-M8 x 60L |                        |                |              |        |                        |
| -45DZ          |      | 80     | x 80L                  | -15DZ          | 65     | x 65L       |                        |                |              |        |                        |
| -50DZ          |      | 85     | x 85L                  | -20DZ          | 70     | x 70L       |                        |                |              |        |                        |
| -55DZ-XB10     |      | 90     | x 90L                  | -25DZ          | 75     | x 75L       |                        |                |              |        |                        |
| -60DZ-XB10     |      | 95     | x 95L                  | -30DZ          | 80     | x 80L       |                        |                |              |        |                        |
| -65DZ-XB10     |      | 100    | x 100L                 | -35DZ          | 85     | x 85L       |                        |                |              |        |                        |
| -70DZ-XB10     |      | 105    | x 105L                 | -40DZ          | 90     | x 90L       |                        |                |              |        |                        |
| -75DZ          | 110  | x 110L | -45DZ                  | 95             | x 95L  |             |                        |                |              |        |                        |
| -80DZ-XB10     | 115  | x 115L | -50DZ                  | 100            | x 100L |             |                        |                |              |        |                        |
| -85DZ-XB10     | 120  | x 120L | -55DZ-XB10             | 105            | x 105L |             |                        |                |              |        |                        |
| -90DZ-XB10     | 125  | x 125L | -60DZ-XB10             | 110            | x 110L |             |                        |                |              |        |                        |
| -95DZ-XB10     | 130  | x 130L | -65DZ-XB10             | 115            | x 115L |             |                        |                |              |        |                        |
| -100DZ         | 135  | x 135L | -70DZ-XB10             | 120            | x 120L |             |                        |                |              |        |                        |
|                |      |        | -75DZ                  | 125            | x 125L |             |                        |                |              |        |                        |
|                |      |        | -80DZ-XB10             | 130            | x 130L |             |                        |                |              |        |                        |
|                |      |        | -85DZ-XB10             | 135            | x 135L |             |                        |                |              |        |                        |
|                |      |        | -90DZ-XB10             | 140            | x 140L |             |                        |                |              |        |                        |
|                |      |        | -95DZ-XB10             | 145            | x 145L |             |                        |                |              |        |                        |
|                |      |        | -100DZ                 | 150            | x 150L |             |                        |                |              |        |                        |

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-RV**

Double Acting, Double Rod **CQ2W-RV**

Axial Piping Double Acting, Single Rod **CQP2**

Single Acting, Spring Return, Single Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

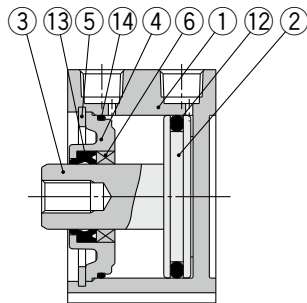
Auto Switch

Made to Order

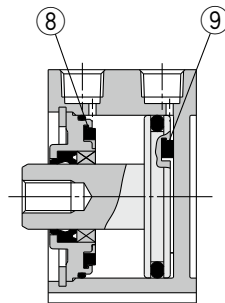
# CQ2 Series

## Construction

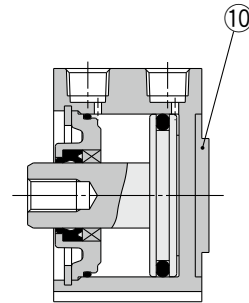
Without auto switch magnet



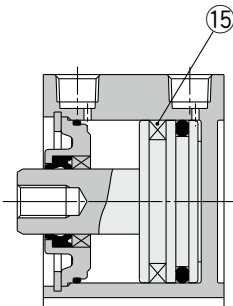
With rubber bumper



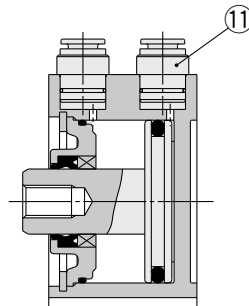
With boss on head end



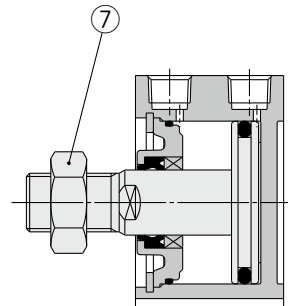
With auto switch magnet



Built-in One-touch fittings



Rod end male thread



### Component Parts

| No. | Description    | Material              | Note                             |
|-----|----------------|-----------------------|----------------------------------|
| 1   | Cylinder tube  | Aluminum alloy        | Hard anodized                    |
| 2   | Piston         | Aluminum alloy        |                                  |
| 3   | Piston rod     | Stainless steel       | ø12 to ø25                       |
|     |                | Carbon steel          | ø32 to ø100, Hard chrome plating |
| 4   | Collar         | Aluminum alloy        | ø12 to ø40, Anodized             |
|     |                | Aluminum alloy casted | ø50 to ø100, Chromated, Painted  |
| 5   | Retaining ring | Carbon tool steel     | Phosphate coated                 |
| 6   | Bushing        | Bearing alloy         | For ø50 or more only             |
| 7   | Rod end nut    | Carbon steel          | Zinc chromated                   |
| 8   | Bumper A       | Urethane              | Pneumatic type only              |

| No. | Description             | Material       | Note                       |
|-----|-------------------------|----------------|----------------------------|
| 9   | Bumper B                | Urethane       | Pneumatic type only        |
| 10  | Centering location ring | Aluminum alloy | ø20 to ø100, Hard anodized |
| 11  | One-touch fitting       | —              | ø32 to ø63                 |
| 12  | Piston seal             | NBR            |                            |
| 13  | Rod seal                | NBR            |                            |
| 14  | Gasket                  | NBR            |                            |
| 15  | Magnet                  | —              |                            |

### Replacement Parts/Seal Kit Pneumatic Type

| Bore size [mm] | Kit no.    | Contents               |
|----------------|------------|------------------------|
| 12             | CQ2B12-PS  | Set of nos. 12, 13, 14 |
| 16             | CQ2B16-PS  |                        |
| 20             | CQ2B20-PS  |                        |
| 25             | CQ2B25-PS  |                        |
| 32             | CQ2B32-PS  |                        |
| 40             | CQ2B40-PS  |                        |
| 50             | CQ2B50-PS  |                        |
| 63             | CQ2B63-PS  |                        |
| 80             | CQ2B80-PS  |                        |
| 100            | CQ2B100-PS |                        |

\* Seal kit includes 12, 13, 14. Order the seal kit based on each bore size.  
 \* The seal kit does not include a grease pack. Order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

### Air-hydro Type

| Bore size [mm] | Kit no.     | Contents               |
|----------------|-------------|------------------------|
| 20             | CQ2BH20-PS  | Set of nos. 12, 13, 14 |
| 25             | CQ2BH25-PS  |                        |
| 32             | CQ2BH32-PS  |                        |
| 40             | CQ2BH40-PS  |                        |
| 50             | CQ2BH50-PS  |                        |
| 63             | CQ2BH63-PS  |                        |
| 80             | CQ2BH80-PS  |                        |
| 100            | CQ2BH100-PS |                        |

\* Seal kit includes 12, 13, 14. Order the seal kit based on each bore size.  
 \* The seal kit does not include a grease pack. Order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**



**Compact Cylinder with Stable Lubrication Function (Lube-retainer)**

**CDQ2** Mounting type Bore size **M** — Stroke **D** Body option **Z** Mounting bolt Rod end thread — Auto switch

• With auto switch magnet
• With stable lubrication function (Lube-retainer)
\* Available only for models with an auto switch magnet

**Specifications**

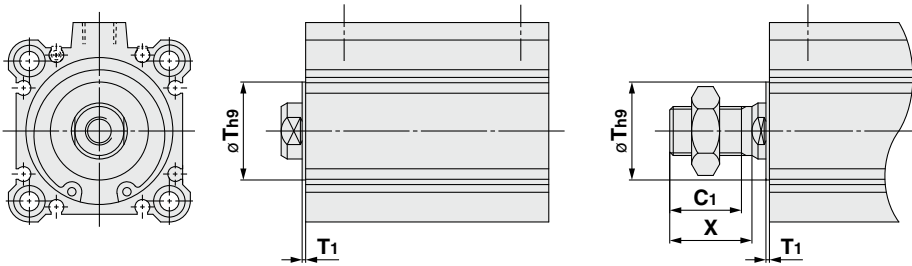
|                         |                                |
|-------------------------|--------------------------------|
| Bore size [mm]          | <b>32, 40, 50, 63, 80, 100</b> |
| Action                  | Double acting, Single rod      |
| Min. operating pressure | 0.1 MPa                        |
| 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 those of the standard model.)

ø32 to ø100



| Bore size  | T  | T1 | C1   | X    |
|------------|----|----|------|------|
| <b>32</b>  | 22 | 1  | 20.5 | 23.5 |
| <b>40</b>  | 28 | 1  | 20.5 | 23.5 |
| <b>50</b>  | 35 | 2  | 24   | 26.5 |
| <b>63</b>  | 35 | 2  | 24   | 26.5 |
| <b>80</b>  | —  | —  | 32.5 | 35.5 |
| <b>100</b> | —  | —  | 32.5 | 35.5 |

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

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

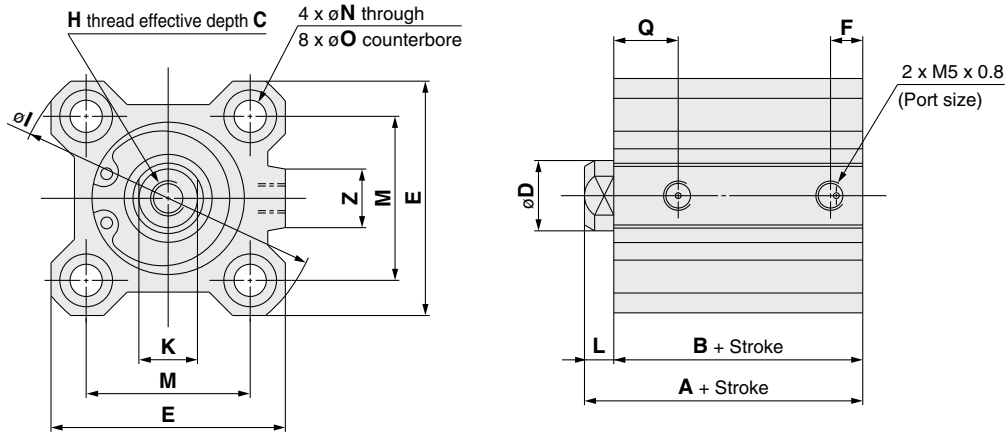
|                                     |                           |                      |
|-------------------------------------|---------------------------|----------------------|
| Standard                            | Double Acting, Single Rod | <b>CQ2</b>           |
| Standard                            | Double Acting, Double Rod | <b>CQ2W</b>          |
| Single Acting, Spring Return-Extend | Single Rod                | <b>CQ2</b>           |
| Large Bore Size                     | Double Acting, Double Rod | <b>CQ2W</b>          |
| Large Bore Size                     | Double Acting, Single Rod | <b>CQ2</b>           |
| Anti-lateral Load                   | Double Acting, Single Rod | <b>CQ2□S</b>         |
| Long Stroke                         | Double Acting, Single Rod | <b>CQ2</b>           |
| Non-rotating Rod                    | Double Acting, Double Rod | <b>CQ2KW</b>         |
| Non-rotating Rod                    | Double Acting, Single Rod | <b>CQ2K</b>          |
| Water Resistant                     | Double Acting, Double Rod | <b>CQ2W-RV</b>       |
| Water Resistant                     | Double Acting, Single Rod | <b>CQ2-RV</b>        |
| Axial Piping                        | Double Acting, Double Rod | <b>CQ2</b>           |
| Axial Piping                        | Double Acting, Single Rod | <b>CQP2</b>          |
| With End Lock                       | Double Acting, Single Rod | <b>CBQ2</b>          |
| Auto Switch                         |                           | <b>Auto Switch</b>   |
| Made to Order                       |                           | <b>Made to Order</b> |

# CQ2 Series

Bore Size

## Ø12 to Ø25 Without Auto Switch Magnet

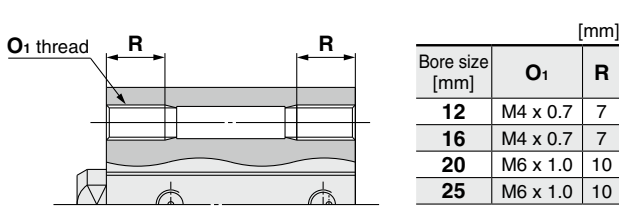
Through-hole: CQ2B



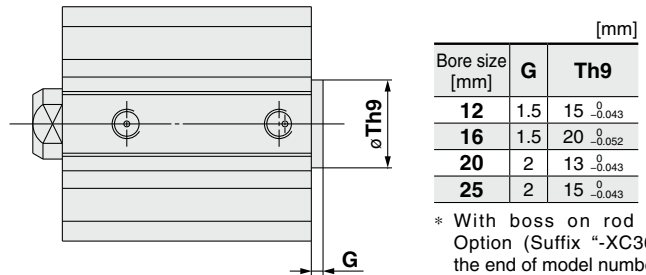
|                |                   | [mm] |      |    |    |    |     |          |    |    |     |      |     |               |     |    |  |
|----------------|-------------------|------|------|----|----|----|-----|----------|----|----|-----|------|-----|---------------|-----|----|--|
| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | F   | H        | I  | K  | L   | M    | N   | O             | Q   | Z  |  |
| 12             | 5 to 30           | 20.5 | 17   | 6  | 6  | 25 | 5   | M3 x 0.5 | 32 | 5  | 3.5 | 15.5 | 3.5 | 6.5 depth 3.5 | 7.5 | —  |  |
| 16             | 5 to 30           | 22   | 18.5 | 8  | 8  | 29 | 5.5 | M4 x 0.7 | 38 | 6  | 3.5 | 20   | 3.5 | 6.5 depth 3.5 | 8   | 10 |  |
| 20             | 5 to 50           | 24   | 19.5 | 7  | 10 | 36 | 5.5 | M5 x 0.8 | 47 | 8  | 4.5 | 25.5 | 5.5 | 9 depth 7     | 8   | 10 |  |
| 25             | 5 to 50           | 27.5 | 22.5 | 12 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10 | 5   | 28   | 5.5 | 9 depth 7     | 9   | 10 |  |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 10

### Both ends tapped

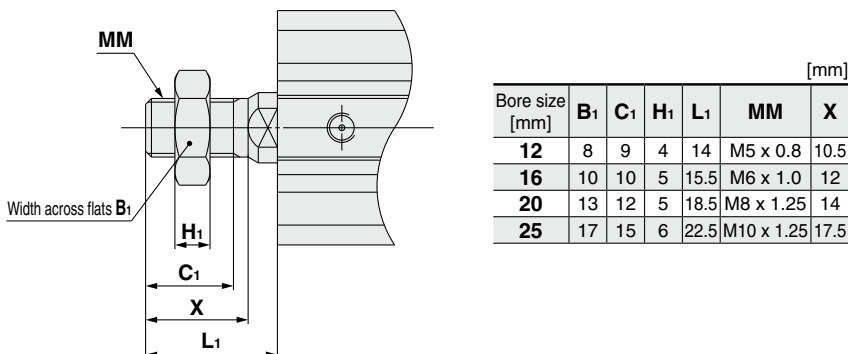


### With boss on head end



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

### Rod end male thread



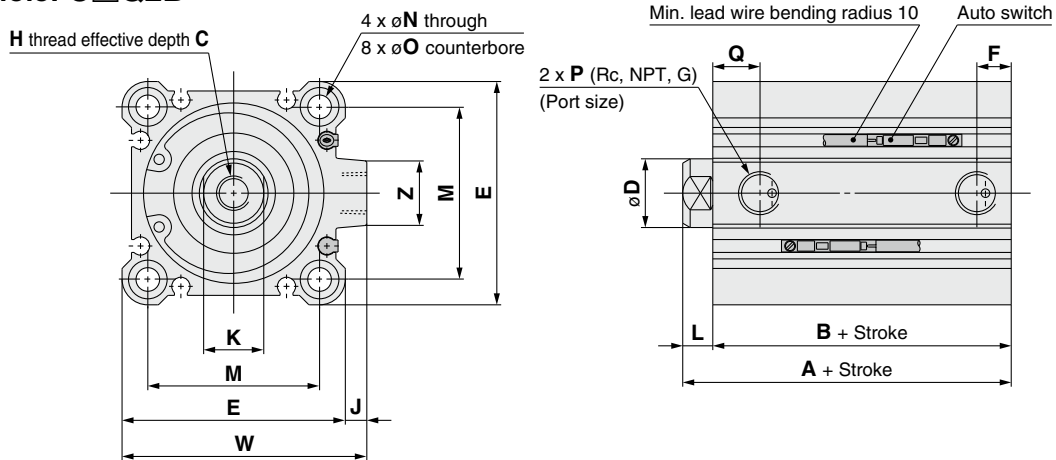


# CQ2 Series

Bore Size

## ø32 to ø50 With/Without Auto Switch Magnet

Through-hole: C□Q2B

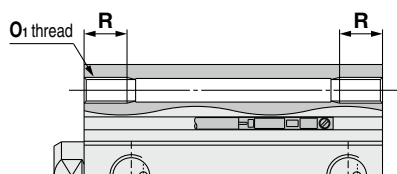


| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      |      |          | With auto switch magnet |      |      |     | [mm] |    |    |           |     |    |   |    |     |
|----------------|-------------------|----------------------------|------|------|----------|-------------------------|------|------|-----|------|----|----|-----------|-----|----|---|----|-----|
|                |                   | A                          | B    | F    | P        | A                       | B    | F    | P   | C    | D  | E  | H         | J   | K  | L | M  | N   |
| 32             | 5                 | 30                         | 23   | 5.5  | M5 x 0.8 | 40                      | 33   | 7.5  | 1/8 | 13   | 16 | 45 | M8 x 1.25 | 4.5 | 14 | 7 | 34 | 5.5 |
|                | 10 to 50          | 40                         | 33   | 7.5  | 1/8      |                         |      |      |     |      |    |    |           |     |    |   |    |     |
|                | 75, 100           | 46.5                       | 39.5 | 10.5 | 1/4      |                         |      |      |     |      |    |    |           |     |    |   |    |     |
| 40             | 5 to 50           | 36.5                       | 29.5 | 7.5  | 1/8      | 46.5                    | 39.5 | 7.5  | 1/8 | 13   | 16 | 52 | M8 x 1.25 | 5   | 14 | 7 | 40 | 5.5 |
|                | 75, 100           | 46.5                       | 39.5 | 10.5 | 1/4      |                         |      |      |     |      |    |    |           |     |    |   |    |     |
|                | 10 to 50          | 38.5                       | 30.5 | 10.5 | 1/4      |                         |      |      |     |      |    |    |           |     |    |   |    |     |
| 50             | 10 to 50          | 38.5                       | 30.5 | 10.5 | 1/4      | 48.5                    | 40.5 | 10.5 | 1/4 | 15   | 20 | 64 | M10 x 1.5 | 7   | 17 | 8 | 50 | 6.6 |
|                | 75, 100           | 48.5                       | 40.5 | 10.5 | 1/4      |                         |      |      |     |      |    |    |           |     |    |   |    |     |

| Bore size [mm] | O          | Q    | W    | Z  |
|----------------|------------|------|------|----|
| 32             | 9 depth 7  | 10   | 49.5 | 14 |
| 40             | 9 depth 7  | 12.5 | 57   | 15 |
| 50             | 11 depth 8 | 10.5 | 71   | 19 |

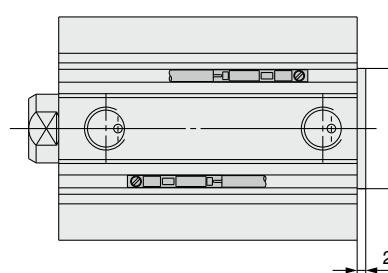
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 10
- The spacer-installed type (Standard, -XB10A) and the exclusive body type (-XB10) are available.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 32             | M6 x 1.0       | 10 |
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |

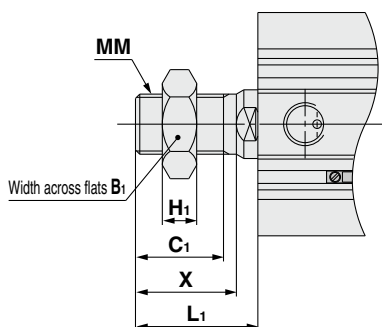
### With boss on head end



| Bore size [mm] | Th <sub>9</sub>                   |
|----------------|-----------------------------------|
| 32             | 21 <sup>0</sup> <sub>-0.052</sub> |
| 40             | 28 <sup>0</sup> <sub>-0.052</sub> |
| 50             | 35 <sup>0</sup> <sub>-0.062</sub> |

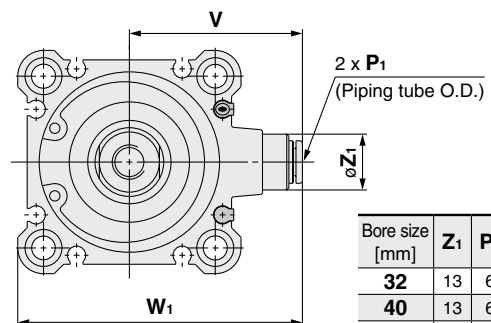
- \* With boss on rod end: Option (Suffix "-XC36" to the end of model number.)

### Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 32             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |

### Built-in One-touch fittings



| Bore size [mm] | Z <sub>1</sub> | P <sub>1</sub> | V    | W <sub>1</sub> |
|----------------|----------------|----------------|------|----------------|
| 32             | 13             | 6              | 36.5 | 59             |
| 40             | 13             | 6              | 40.5 | 66             |
| 50             | 16             | 8              | 50   | 82             |

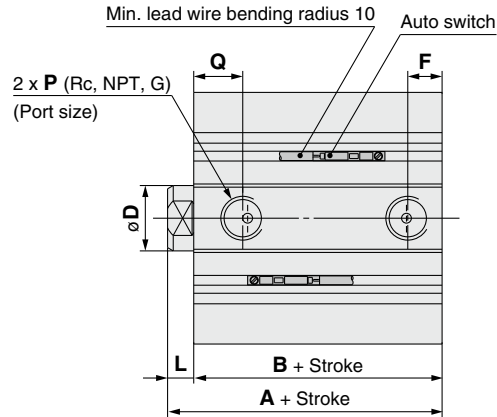
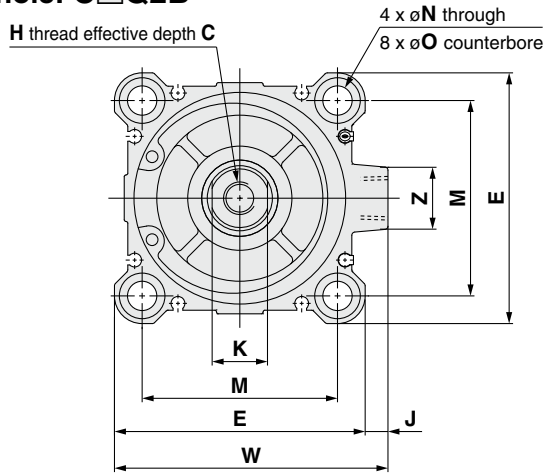
- \* The dimensions of the ø32-5 mm stroke with built-in One-touch fittings (without magnet) are the same as those of the 10 mm stroke cylinder tube.



Bore Size

**∅63 to ∅100** With/Without Auto Switch Magnet

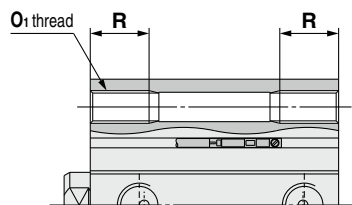
Through-hole: **C□Q2B**



| Bore size [mm] | Stroke range [mm]   | Without auto switch magnet |                     | With auto switch magnet |            | C  | D  | E   | F    | H         | J   | K  | L  | M  | N  | O          | P    | Q   | W  | Z     |            |
|----------------|---------------------|----------------------------|---------------------|-------------------------|------------|----|----|-----|------|-----------|-----|----|----|----|----|------------|------|-----|----|-------|------------|
|                |                     | A                          | B                   | A                       | B          |    |    |     |      |           |     |    |    |    |    |            |      |     |    |       |            |
|                |                     | <b>63</b>                  | 10 to 50<br>75, 100 | 44<br>54                | 36<br>46   |    |    |     |      |           |     |    |    |    |    |            |      |     |    |       | 54<br>63.5 |
| <b>80</b>      | 10 to 50<br>75, 100 | 53.5<br>63.5               | 43.5<br>53.5        | 63.5<br>75              | 53.5<br>63 | 21 | 25 | 98  | 12.5 | M16 x 2.0 | 6   | 22 | 10 | 77 | 11 | 17.5 depth | 13.5 | 3/8 | 16 | 104   | 25         |
| <b>100</b>     | 10 to 50<br>75, 100 | 65<br>75                   | 53<br>63            | 75                      | 63         | 27 | 30 | 117 | 13   | M20 x 2.5 | 6.5 | 27 | 12 | 94 | 11 | 17.5 depth | 13.5 | 3/8 | 23 | 123.5 | 25         |

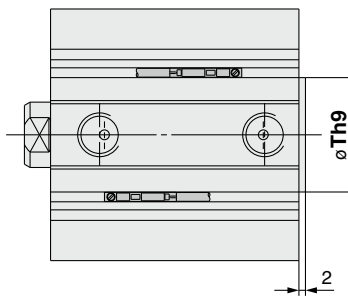
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 10
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| <b>63</b>      | M10 x 1.5      | 18 |
| <b>80</b>      | M12 x 1.75     | 22 |
| <b>100</b>     | M12 x 1.75     | 22 |

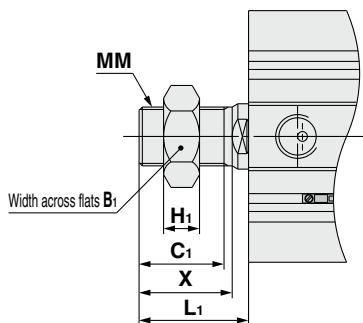
With boss on head end



| Bore size [mm] | Th9                               |
|----------------|-----------------------------------|
| <b>63</b>      | 35 <sup>0</sup> <sub>-0.062</sub> |
| <b>80</b>      | 43 <sup>0</sup> <sub>-0.062</sub> |
| <b>100</b>     | 59 <sup>0</sup> <sub>-0.074</sub> |

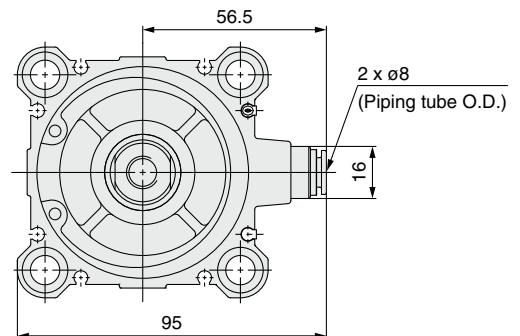
\* With boss on rod end: Option (Suffix "XC36" to the end of model number.)

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| <b>63</b>      | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
| <b>80</b>      | 32             | 32.5           | 13             | 43.5           | M22 x 1.5 | 35.5 |
| <b>100</b>     | 41             | 32.5           | 16             | 43.5           | M26 x 1.5 | 35.5 |

Built-in One-touch fittings: ∅63



|                                     |   |
|-------------------------------------|---|
| Double Acting, Single Rod           | <b>CQ2</b>                                  |
| Standard                            | Double Acting, Double Rod<br><b>CQ2W</b>    |
| Single Acting, Spring Return-Extend | <b>CQ2</b>                                  |
| Large Bore Size                     | Double Acting, Single Rod<br><b>CQ2</b>     |
| Double Acting, Double Rod           | <b>CQ2W</b>                                 |
| Anti-lateral Load                   | Double Acting, Single Rod<br><b>CQ2□S</b>   |
| Long Stroke                         | Double Acting, Single Rod<br><b>CQ2</b>     |
| Non-rotating Rod                    | Double Acting, Single Rod<br><b>CQ2K</b>    |
| Water Resistant                     | Double Acting, Double Rod<br><b>CQ2W-RV</b> |
| Double Acting, Single Rod           | <b>CQ2-RV</b>                               |
| Double Acting, Double Rod           | <b>CQ2W-RV</b>                              |
| Axial Piping                        | Double Acting, Single Rod<br><b>CQP2</b>    |
| Single Acting, Spring Return-Extend | <b>CQP2</b>                                 |
| With End Lock                       | Double Acting, Single Rod<br><b>CBQ2</b>    |
| Auto Switch                         | <b>Auto Switch</b>                          |
| Made to Order                       | <b>Made to Order</b>                        |

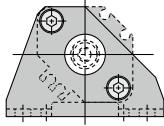
# CQ2 Series Accessory Brackets

## Mounting Brackets

### Foot

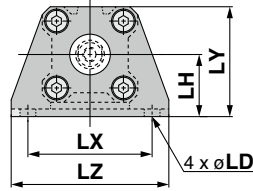
ø12 to ø25 With auto switch magnet

CQ-LZ□□

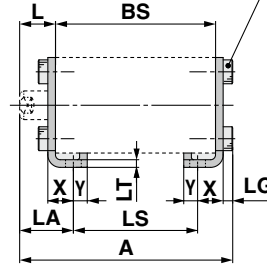


Without auto switch magnet

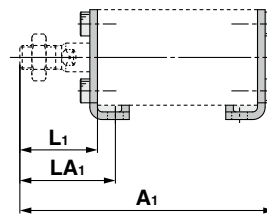
CQ-L0□□



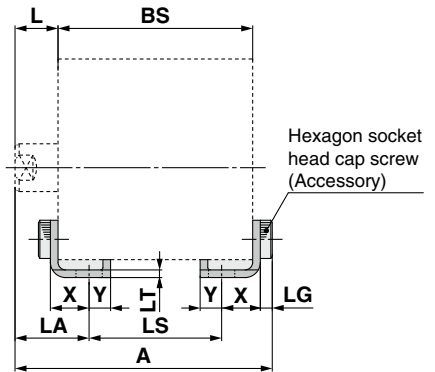
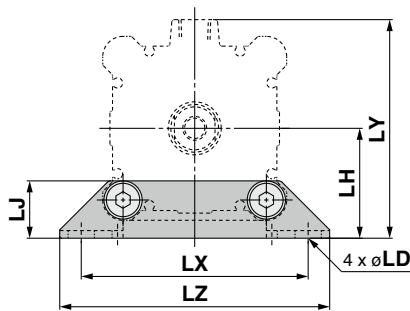
Hexagon socket head cap screw (Accessory)



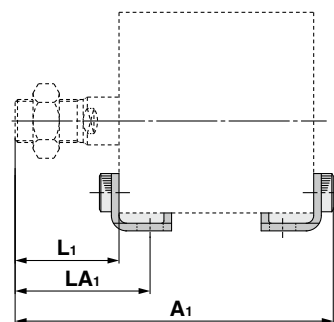
Rod end male thread



ø32 to ø100



Rod end male thread



\* The foot bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

| Bore size [mm] | Part no. | A         | A <sub>1</sub> | L    | L <sub>1</sub> | LA   | LA <sub>1</sub> | LD  | LG  | LH | LJ   | LS    | LT  | LX  | LY   | LZ  | X    | Y    |
|----------------|----------|-----------|----------------|------|----------------|------|-----------------|-----|-----|----|------|-------|-----|-----|------|-----|------|------|
| 12             | CQ-L012  | BS + 18.3 | BS + 28.8      | 13.5 | 24             | 19.5 | 30              | 4.5 | 2.8 | 17 | —    | BS-12 | 2   | 34  | 29.5 | 44  | 8    | 4.5  |
|                | CQ-LZ12  |           |                |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 16             | CQ-L016  | BS + 18.3 | BS + 30.3      | 13.5 | 25.5           | 19.5 | 31.5            | 4.5 | 2.8 | 19 | —    | BS-12 | 2   | 38  | 33.5 | 48  | 8    | 5    |
|                | CQ-LZ16  |           |                |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 20             | CQ-L020  | BS + 21.7 | BS + 35.7      | 14.5 | 28.5           | 20.5 | 34.5            | 6.6 | 4   | 24 | —    | BS-12 | 3.2 | 48  | 42   | 62  | 9.2  | 5.8  |
|                | CQ-LZ20  |           |                |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 25             | CQ-L025  | BS + 22.2 | BS + 39.7      | 15   | 32.5           | 22.5 | 40              | 6.6 | 4   | 26 | —    | BS-15 | 3.2 | 52  | 46   | 66  | 10.7 | 5.8  |
|                | CQ-LZ25  |           |                |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 32             | CQ-L032  | BS + 24.2 | BS + 45.7      | 17   | 38.5           | 25   | 46.5            | 6.6 | 4   | 30 | 18.5 | BS-16 | 3.2 | 57  | 57   | 71  | 11.2 | 5.8  |
| 40             | CQ-L040  | BS + 24.2 | BS + 45.7      | 17   | 38.5           | 25   | 46.5            | 6.6 | 4   | 33 | 18.5 | BS-16 | 3.2 | 64  | 64   | 78  | 11.2 | 7    |
| 50             | CQ-L050  | BS + 26.2 | BS + 51.7      | 18   | 43.5           | 29.5 | 55              | 9   | 5   | 39 | 21   | BS-23 | 3.2 | 79  | 78   | 95  | 14.7 | 8    |
| 63             | CQ-L063  | BS + 26.2 | BS + 51.7      | 18   | 43.5           | 31   | 56.5            | 11  | 5   | 46 | 24   | BS-26 | 3.2 | 95  | 91.5 | 113 | 16.2 | 9    |
| 80             | CQ-L080  | BS + 31.5 | BS + 65        | 20   | 53.5           | 35   | 68.5            | 13  | 7   | 59 | 31   | BS-30 | 4.5 | 118 | 114  | 140 | 19.5 | 11   |
| 100            | CQ-L100  | BS + 35   | BS + 66.5      | 22   | 53.5           | 39   | 70.5            | 13  | 7   | 71 | 36   | BS-34 | 6   | 137 | 136  | 162 | 23   | 12.5 |

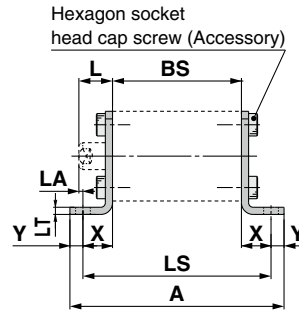
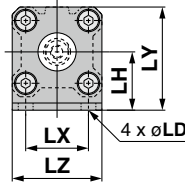
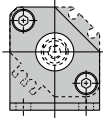
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

**Mounting Brackets**

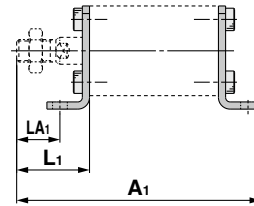
**Compact foot**

ø12 to ø25

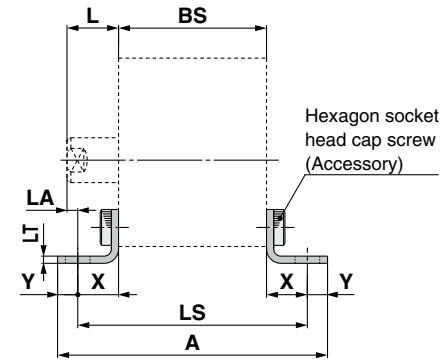
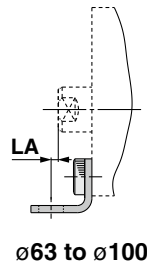
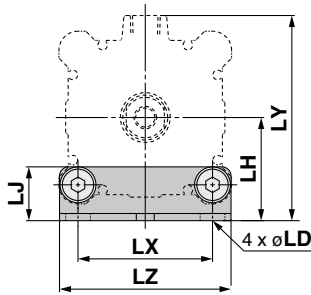
With auto switch magnet **CQ-LCZ** □ □ □ □  
 Without auto switch magnet **CQ-LC0** □ □ □ □



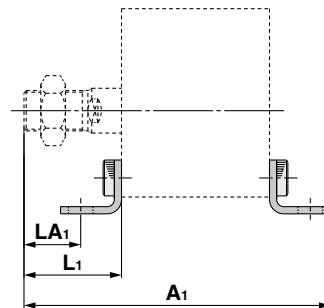
**Rod end male thread**



ø32 to ø100



**Rod end male thread**



\* The compact foot bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

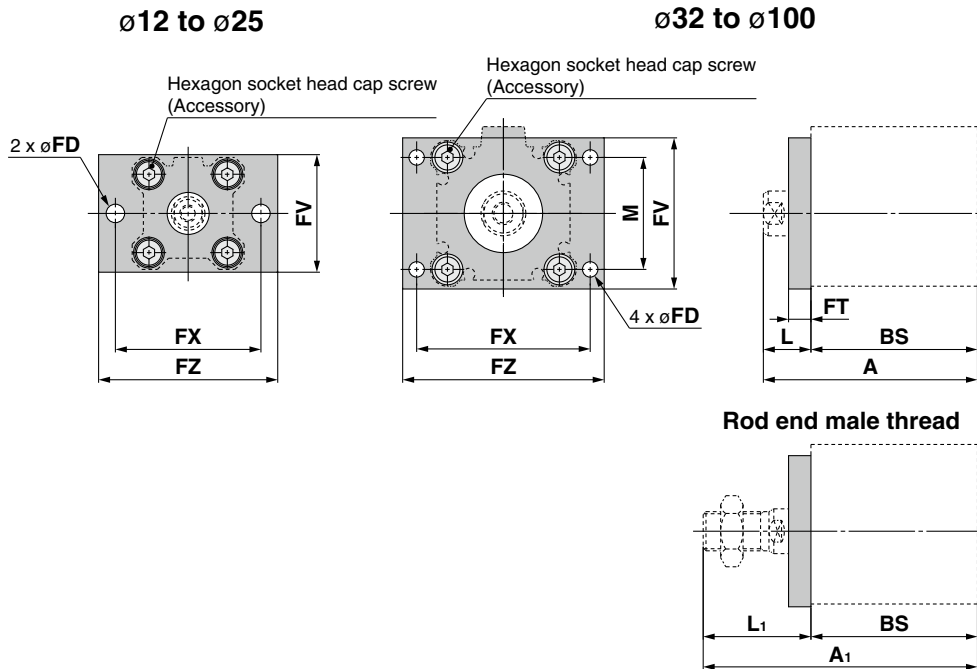
| Bore size [mm] | Part no. | A         | A <sub>1</sub> | L    | L <sub>1</sub> | LA  | LA <sub>1</sub> | LD  | LH | LJ   | LS        | LT  | LX   | LY   | LZ  | X    | Y    |
|----------------|----------|-----------|----------------|------|----------------|-----|-----------------|-----|----|------|-----------|-----|------|------|-----|------|------|
| 12             | CQ-LC012 | BS + 27.6 | BS + 37.8      | 13.5 | 24             | 4.2 | 14.7            | 4.5 | 17 | —    | BS + 18.6 | 2   | 15.5 | 29.5 | 25  | 9.3  | 4.5  |
|                | CQ-LCZ12 |           |                |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 16             | CQ-LC016 | BS + 28.6 | BS + 39.8      | 13.5 | 25.5           | 4.2 | 16.2            | 4.5 | 19 | —    | BS + 18.6 | 2   | 20   | 33.5 | 29  | 9.3  | 5    |
|                | CQ-LCZ16 |           |                |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 20             | CQ-LC020 | BS + 38   | BS + 47.5      | 14.5 | 28.5           | 1.3 | 15.3            | 6.6 | 24 | —    | BS + 26.4 | 3.2 | 25.5 | 42   | 36  | 13.2 | 5.8  |
|                | CQ-LCZ20 |           |                |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 25             | CQ-LC025 | BS + 38   | BS + 51.5      | 15   | 32.5           | 1.8 | 19.3            | 6.6 | 26 | —    | BS + 26.4 | 3.2 | 28   | 46   | 40  | 13.2 | 5.8  |
|                | CQ-LCZ25 |           |                |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 32             | CQ-LC032 | BS + 39   | BS + 58        | 17   | 38.5           | 3.3 | 24.8            | 6.6 | 30 | 18.5 | BS + 27.4 | 3.2 | 34   | 57   | 45  | 13.7 | 5.8  |
| 40             | CQ-LC040 | BS + 41.4 | BS + 59.2      | 17   | 38.5           | 3.3 | 24.8            | 6.6 | 33 | 18.5 | BS + 27.4 | 3.2 | 40   | 64   | 52  | 13.7 | 7    |
| 50             | CQ-LC050 | BS + 49.4 | BS + 68.2      | 18   | 43.5           | 1.3 | 26.8            | 9   | 39 | 21   | BS + 33.4 | 3.2 | 50   | 78   | 64  | 16.7 | 8    |
| 63             | CQ-LC063 | BS + 54.4 | BS + 70.7      | 18   | 43.5           | 0.2 | 25.3            | 11  | 46 | 24   | BS + 36.4 | 3.2 | 60   | 91.5 | 77  | 18.2 | 9    |
| 80             | CQ-LC080 | BS + 67   | BS + 87        | 20   | 53.5           | 2.5 | 31              | 13  | 59 | 31   | BS + 45   | 4.5 | 77   | 114  | 98  | 22.5 | 11   |
| 100            | CQ-LC100 | BS + 73   | BS + 90        | 22   | 53.5           | 2   | 29.5            | 13  | 71 | 36   | BS + 48   | 6   | 94   | 136  | 117 | 24   | 12.5 |

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

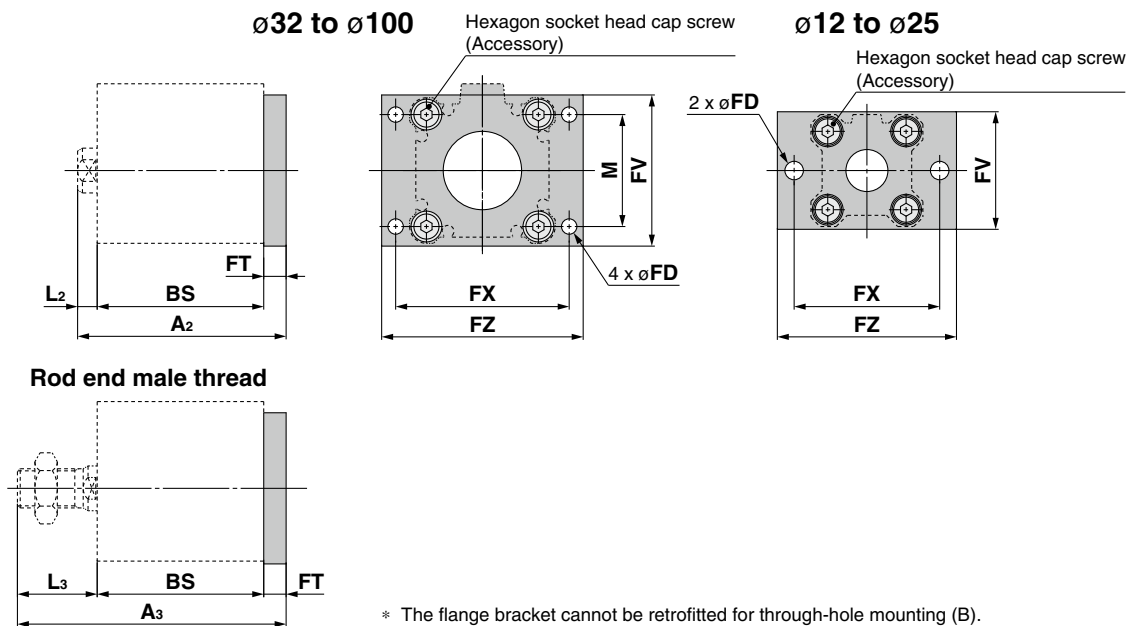
|                   |  |                  |
|-------------------|--|------------------|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>       |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>      |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2</b>       |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>       |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>      |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2</b> □ □ S |
| Anti-lateral Load | Double Acting, Double Rod                | <b>CQ2</b> □ □ S |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>       |
| Long Stroke       | Double Acting, Double Rod                | <b>CQ2W</b>      |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2K</b>      |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2KW</b>     |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-RV</b>    |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-RV</b>   |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>      |
| Axial Piping      | Double Acting, Double Rod                | <b>CQP2</b>      |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>      |
| With End Lock     | Double Acting, Double Rod                | <b>CBQ2</b>      |
| Auto Switch       | Double Acting, Single Rod                | <b>CQ2</b>       |
| Made to Order     | Double Acting, Single Rod                | <b>CQ2</b>       |

## Mounting Brackets

### Rod flange



### Head flange



\* The flange bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

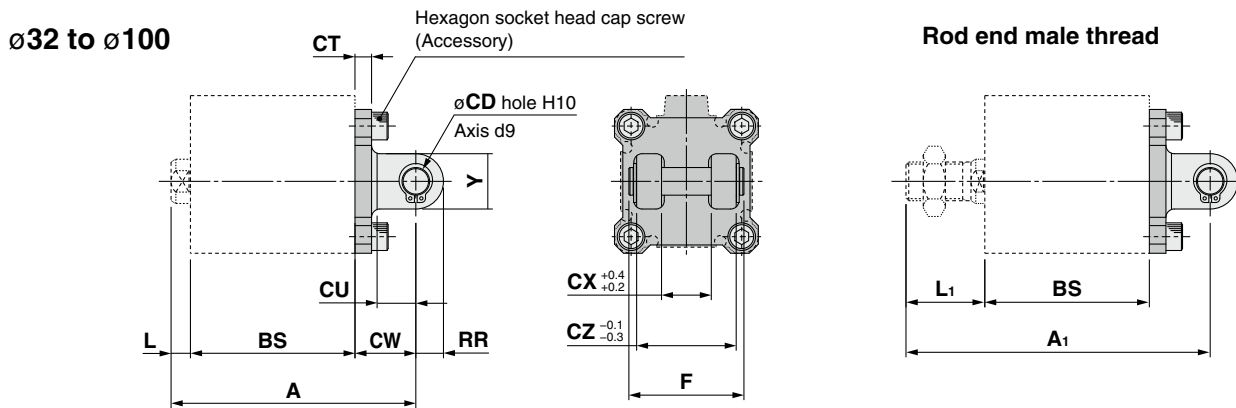
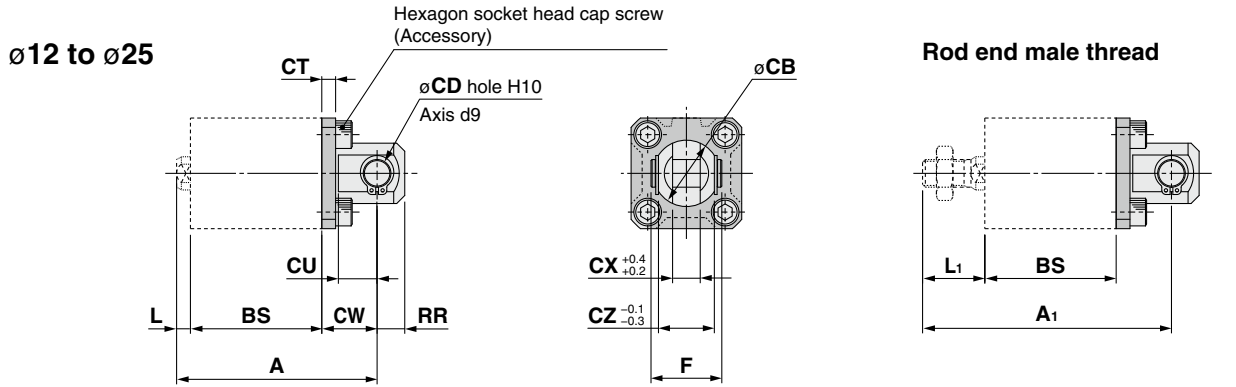
| Bore size [mm] | Part no. | A         | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | FD  | FT  | FV  | FX  | FZ  | L    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | M  |
|----------------|----------|-----------|----------------|----------------|----------------|-----|-----|-----|-----|-----|------|----------------|----------------|----------------|----|
| 12             | CQ-F012  | BS + 13.5 | BS + 24        | BS + 9         | BS + 19.5      | 4.5 | 5.5 | 25  | 45  | 55  | 13.5 | 24             | 3.5            | 14             | —  |
| 16             | CQ-F016  | BS + 13.5 | BS + 25.5      | BS + 9         | BS + 21        | 4.5 | 5.5 | 30  | 45  | 55  | 13.5 | 25.5           | 3.5            | 15.5           | —  |
| 20             | CQ-F020  | BS + 14.5 | BS + 28.5      | BS + 12.5      | BS + 26.5      | 6.6 | 8   | 39  | 48  | 60  | 14.5 | 28.5           | 4.5            | 18.5           | —  |
| 25             | CQ-F025  | BS + 15   | BS + 32.5      | BS + 13        | BS + 30.5      | 6.6 | 8   | 42  | 52  | 64  | 15   | 32.5           | 5              | 22.5           | —  |
| 32             | CQ-F032  | BS + 17   | BS + 38.5      | BS + 15        | BS + 36.5      | 5.5 | 8   | 48  | 56  | 65  | 17   | 38.5           | 7              | 28.5           | 34 |
| 40             | CQ-F040  | BS + 17   | BS + 38.5      | BS + 15        | BS + 36.5      | 5.5 | 8   | 54  | 62  | 72  | 17   | 38.5           | 7              | 28.5           | 40 |
| 50             | CQ-F050  | BS + 18   | BS + 43.5      | BS + 17        | BS + 42.5      | 6.6 | 9   | 67  | 76  | 89  | 18   | 43.5           | 8              | 33.5           | 50 |
| 63             | CQ-F063  | BS + 18   | BS + 43.5      | BS + 17        | BS + 42.5      | 9   | 9   | 80  | 92  | 108 | 18   | 43.5           | 8              | 33.5           | 60 |
| 80             | CQ-F080  | BS + 20   | BS + 53.5      | BS + 21        | BS + 54.5      | 11  | 11  | 99  | 116 | 134 | 20   | 53.5           | 10             | 43.5           | 77 |
| 100            | CQ-F100  | BS + 22   | BS + 53.5      | BS + 23        | BS + 54.5      | 11  | 11  | 117 | 136 | 154 | 22   | 53.5           | 12             | 43.5           | 94 |

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



## Mounting Brackets

### Double clevis



\* The double clevis bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

|                |          | [mm]      |                |    |    |    |    |    |     |    |      |     |                |    |    |  |
|----------------|----------|-----------|----------------|----|----|----|----|----|-----|----|------|-----|----------------|----|----|--|
| Bore size [mm] | Part no. | A         | A <sub>1</sub> | CB | CD | CT | CU | CW | CX  | CZ | F    | L   | L <sub>1</sub> | RR | Y  |  |
| 12             | CQ-D012  | BS + 17.5 | BS + 28        | 12 | 5  | 4  | 7  | 14 | 5   | 10 | 14.6 | 3.5 | 14             | 6  | —  |  |
| 16             | CQ-D016  | BS + 18.5 | BS + 30.5      | 14 | 5  | 4  | 10 | 15 | 6.5 | 12 | 16.6 | 3.5 | 15.5           | 6  | —  |  |
| 20             | CQ-D020  | BS + 22.5 | BS + 36.5      | 20 | 8  | 5  | 12 | 18 | 8   | 16 | 21   | 4.5 | 18.5           | 9  | —  |  |
| 25             | CQ-D025  | BS + 25   | BS + 42.5      | 24 | 10 | 5  | 14 | 20 | 10  | 20 | 25.6 | 5   | 22.5           | 10 | —  |  |
| 32             | CQ-D032  | BS + 27   | BS + 48.5      | —  | 10 | 5  | 14 | 20 | 18  | 36 | 41.6 | 7   | 28.5           | 10 | 20 |  |
| 40             | CQ-D040  | BS + 29   | BS + 50.5      | —  | 10 | 6  | 14 | 22 | 18  | 36 | 41.6 | 7   | 28.5           | 10 | 20 |  |
| 50             | CQ-D050  | BS + 36   | BS + 61.5      | —  | 14 | 7  | 20 | 28 | 22  | 44 | 50.6 | 8   | 33.5           | 14 | 28 |  |
| 63             | CQ-D063  | BS + 38   | BS + 63.5      | —  | 14 | 8  | 20 | 30 | 22  | 44 | 50.6 | 8   | 33.5           | 14 | 28 |  |
| 80             | CQ-D080  | BS + 48   | BS + 81.5      | —  | 18 | 10 | 27 | 38 | 28  | 56 | 64   | 10  | 43.5           | 18 | 36 |  |
| 100            | CQ-D100  | BS + 57   | BS + 88.5      | —  | 22 | 13 | 31 | 45 | 32  | 64 | 72   | 12  | 43.5           | 22 | 44 |  |

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

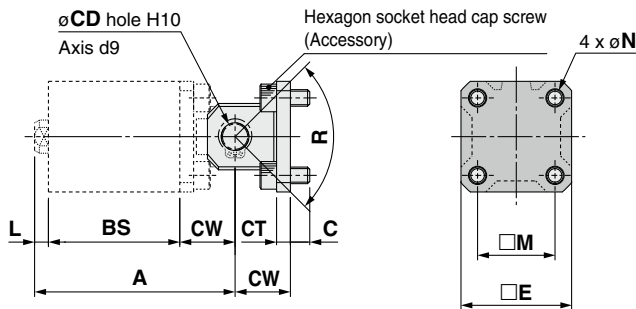
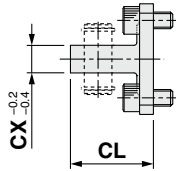
|                                   |                      |
|-----------------------------------|----------------------|
| Double Acting, Single Rod         | <b>CQ2</b>           |
| Double Acting, Double Rod         | <b>CQ2W</b>          |
| Single Acting, Spring Return, End | <b>CQ2</b>           |
| Double Acting, Single Rod         | <b>CQ2</b>           |
| Double Acting, Double Rod         | <b>CQ2W</b>          |
| Anti-lateral Load                 | <b>CQ2□S</b>         |
| Long Stroke                       | <b>CQ2</b>           |
| Non-rotating Rod                  | <b>CQ2KW</b>         |
| Water Resistant                   | <b>CQ2-RV</b>        |
| Water Resistant                   | <b>CQ2W-RV</b>       |
| Axial Piping                      | <b>CQP2</b>          |
| With End Lock                     | <b>CBQ2</b>          |
| Auto Switch                       | <b>Auto Switch</b>   |
| Made to Order                     | <b>Made to Order</b> |

# CQ2 Series

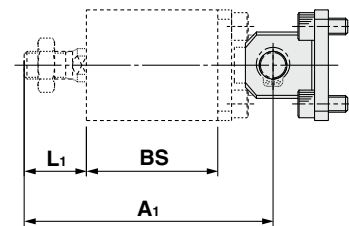
## Mounting Brackets

### Double clevis pivot bracket

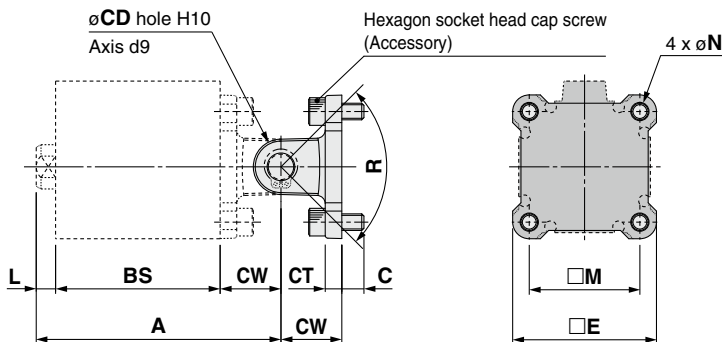
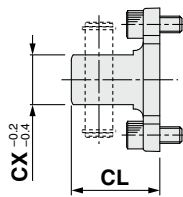
∅12 to ∅25



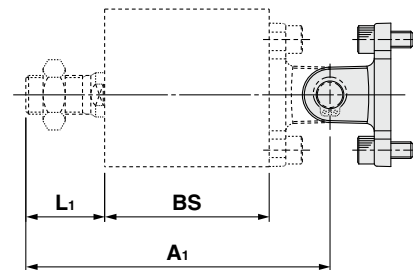
Rod end male thread



∅32 to ∅100



Rod end male thread



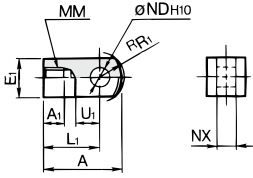
\* BS indicates the overall length of the cylinder tube to be used.

| Bore size [mm] | Part no. | A         | A <sub>1</sub> | C  | CD | CL | CT | CW | CX  | □E  | L   | L <sub>1</sub> | □M   | N    | R    | Hexagon socket head cap screw size | Weight [g] |
|----------------|----------|-----------|----------------|----|----|----|----|----|-----|-----|-----|----------------|------|------|------|------------------------------------|------------|
| 12             | CQ-C012  | BS + 17.5 | BS + 28        | 6  | 5  | 19 | 4  | 14 | 5   | 25  | 3.5 | 14             | 15.5 | 4.5  | 100° | M4 x 10 L                          | 30         |
| 16             | CQ-C016  | BS + 18.5 | BS + 30.5      | 6  | 5  | 21 | 4  | 15 | 6.5 | 28  | 3.5 | 15.5           | 20   | 4.5  | 100° | M4 x 10 L                          | 40         |
| 20             | CQ-C020  | BS + 22.5 | BS + 36.5      | 7  | 8  | 27 | 5  | 18 | 8   | 35  | 4.5 | 18.5           | 25.5 | 6.6  | 80°  | M6 x 12 L                          | 86         |
| 25             | CQ-C025  | BS + 25   | BS + 42.5      | 7  | 10 | 30 | 5  | 20 | 10  | 40  | 5   | 22.5           | 28   | 6.6  | 90°  | M6 x 12 L                          | 115        |
| 32             | CQ-C032  | BS + 27   | BS + 48.5      | 7  | 10 | 30 | 5  | 20 | 18  | 45  | 7   | 28.5           | 34   | 6.6  | 80°  | M6 x 12 L                          | 112        |
| 40             | CQ-C040  | BS + 29   | BS + 50.5      | 8  | 10 | 32 | 6  | 22 | 18  | 52  | 7   | 28.5           | 40   | 6.6  | 80°  | M6 x 14 L                          | 147        |
| 50             | CQ-C050  | BS + 36   | BS + 61.5      | 9  | 14 | 42 | 7  | 28 | 22  | 64  | 8   | 33.5           | 50   | 9    | 80°  | M8 x 16 L                          | 294        |
| 63             | CQ-C063  | BS + 38   | BS + 63.5      | 12 | 14 | 44 | 8  | 30 | 22  | 77  | 8   | 33.5           | 60   | 11   | 60°  | M10 x 20 L                         | 448        |
| 80             | CQ-C080  | BS + 48   | BS + 81.5      | 15 | 18 | 56 | 10 | 38 | 28  | 98  | 10  | 43.5           | 77   | 13.5 | 70°  | M12 x 25 L                         | 884        |
| 100            | CQ-C100  | BS + 57   | BS + 88.5      | 17 | 22 | 67 | 13 | 45 | 32  | 117 | 12  | 43.5           | 94   | 13.5 | 70°  | M12 x 30 L                         | 1516       |

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

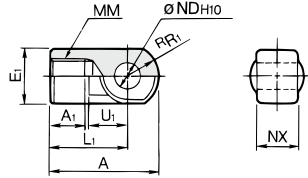
### Single Knuckle Joint

I-G012, I-Z015A  
I-G02, I-G03



Material: Carbon steel  
Surface treatment: Nickel plating

I-G04, I-G05  
I-G08, I-G10

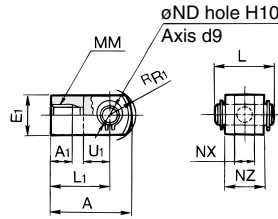


Material: Cast iron  
Surface treatment: Zinc chromated

| Bore size [mm] | Part no. | A    | A <sub>1</sub> | E <sub>1</sub> | L <sub>1</sub> | MM         | R <sub>R1</sub> | U <sub>1</sub> | ND <sub>H10</sub>                 | NX                                  | Weight [g] |
|----------------|----------|------|----------------|----------------|----------------|------------|-----------------|----------------|-----------------------------------|-------------------------------------|------------|
| 12             | I-G012   | 21.5 | 6              | □10            | 16             | M5 x 0.8   | 6.3             | 7              | 5 <sup>+0.048</sup> <sub>0</sub>  | 5 <sup>-0.2</sup> <sub>-0.4</sub>   | 9          |
| 16             | I-Z015A  | 32   | 8              | □12            | 25             | M6 x 1     | 8.1             | 14             | 5 <sup>+0.048</sup> <sub>0</sub>  | 6.4 <sup>-0.1</sup> <sub>-0.3</sub> | 9          |
| 20             | I-G02    | 34   | 8.5            | □16            | 25             | M8 x 1.25  | 10.3            | 11.5           | 8 <sup>+0.058</sup> <sub>0</sub>  | 8 <sup>-0.2</sup> <sub>-0.4</sub>   | 38         |
| 25             | I-G03    | 41   | 10.5           | □20            | 30             | M10 x 1.25 | 12.8            | 14             | 10 <sup>+0.058</sup> <sub>0</sub> | 10 <sup>-0.2</sup> <sub>-0.4</sub>  | 70         |
| 32, 40         | I-G04    | 42   | 14             | ∅22            | 30             | M14 x 1.5  | 12              | 14             | 10 <sup>+0.058</sup> <sub>0</sub> | 18 <sup>-0.3</sup> <sub>-0.5</sub>  | 75         |
| 50, 63         | I-G05    | 56   | 18             | ∅28            | 40             | M18 x 1.5  | 16              | 20             | 14 <sup>+0.070</sup> <sub>0</sub> | 22 <sup>-0.3</sup> <sub>-0.5</sub>  | 163        |
| 80             | I-G08    | 71   | 21             | ∅38            | 50             | M22 x 1.5  | 21              | 27             | 18 <sup>+0.070</sup> <sub>0</sub> | 28 <sup>-0.3</sup> <sub>-0.5</sub>  | 370        |
| 100            | I-G10    | 79   | 21             | ∅44            | 55             | M26 x 1.5  | 24              | 31             | 22 <sup>+0.084</sup> <sub>0</sub> | 32 <sup>-0.3</sup> <sub>-0.5</sub>  | 544        |

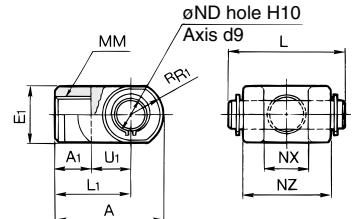
### Double Knuckle Joint

Y-G012, Y-Z015A  
Y-G02, Y-G03



Material: Carbon steel  
Surface treatment: Nickel plating

Y-G04, Y-G05  
Y-G08, Y-G10

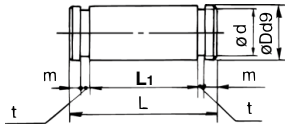


Material: Cast iron  
Surface treatment: Zinc chromated

| Bore size [mm] | Part no. | A    | A <sub>1</sub> | E <sub>1</sub> | L <sub>1</sub> | MM         | R <sub>R1</sub> | U <sub>1</sub> | ND <sub>H10</sub>                 | NX                                  | NZ | L    | Applicable pin part no. | Weight [g] |
|----------------|----------|------|----------------|----------------|----------------|------------|-----------------|----------------|-----------------------------------|-------------------------------------|----|------|-------------------------|------------|
| 12             | Y-G012   | 21.5 | 6              | □10            | 16             | M5 x 0.8   | 6.3             | 7              | 5 <sup>+0.048</sup> <sub>0</sub>  | 5 <sup>-0.4</sup> <sub>-0.2</sub>   | 10 | 14.6 | IY-G012                 | 11         |
| 16             | Y-Z015A  | 28   | 11             | □12            | 21             | M6 x 1     | 8.1             | 10             | 5 <sup>+0.048</sup> <sub>0</sub>  | 6.5 <sup>-0.2</sup> <sub>-0.3</sub> | 12 | 16.6 | IY-J015                 | 11         |
| 20             | Y-G02    | 34   | 8.5            | □16            | 25             | M8 x 1.25  | 10.3            | 11.5           | 8 <sup>+0.058</sup> <sub>0</sub>  | 8 <sup>-0.4</sup> <sub>-0.2</sub>   | 16 | 21   | IY-G02                  | 45         |
| 25             | Y-G03    | 41   | 10.5           | □20            | 30             | M10 x 1.25 | 12.8            | 14             | 10 <sup>+0.058</sup> <sub>0</sub> | 10 <sup>-0.4</sup> <sub>-0.2</sub>  | 20 | 25.6 | IY-G03                  | 86         |
| 32, 40         | Y-G04    | 42   | 16             | ∅22            | 30             | M14 x 1.5  | 12              | 14             | 10 <sup>+0.058</sup> <sub>0</sub> | 18 <sup>-0.5</sup> <sub>-0.3</sub>  | 36 | 41.6 | IY-G04                  | 121        |
| 50, 63         | Y-G05    | 56   | 20             | ∅28            | 40             | M18 x 1.5  | 16              | 20             | 14 <sup>+0.070</sup> <sub>0</sub> | 22 <sup>-0.5</sup> <sub>-0.3</sub>  | 44 | 50.6 | IY-G05                  | 253        |
| 80             | Y-G08    | 71   | 23             | ∅38            | 50             | M22 x 1.5  | 21              | 27             | 18 <sup>+0.070</sup> <sub>0</sub> | 28 <sup>-0.5</sup> <sub>-0.3</sub>  | 56 | 64   | IY-G08                  | 568        |
| 100            | Y-G10    | 79   | 24             | ∅44            | 55             | M26 x 1.5  | 24              | 31             | 22 <sup>+0.084</sup> <sub>0</sub> | 32 <sup>-0.5</sup> <sub>-0.3</sub>  | 64 | 72   | IY-G10                  | 838        |

\* Knuckle pin and retaining rings are included.

### Knuckle Pin (Common with double clevis pin)

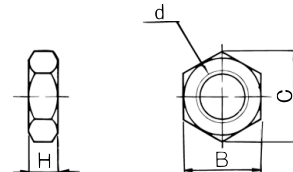


Material: Carbon steel

| Bore size [mm] | Part no. | Dd9                                    | L    | d    | L <sub>1</sub> | m    | t    | Applicable retaining ring | Weight [g] |
|----------------|----------|--|------|------|----------------|------|------|---------------------------|------------|
| 12             | IY-G012  | 5 <sup>-0.030</sup> <sub>-0.060</sub>  | 14.6 | 4.8  | 10.2           | 1.5  | 0.7  | Type C5 for axis          | 2          |
| 16             | IY-J015  | 5 <sup>-0.030</sup> <sub>-0.060</sub>  | 16.6 | 4.8  | 12.2           | 1.5  | 0.7  | Type C5 for axis          | 3          |
| 20             | IY-G02   | 8 <sup>-0.040</sup> <sub>-0.076</sub>  | 21   | 7.6  | 16.2           | 1.5  | 0.9  | Type C8 for axis          | 8          |
| 25             | IY-G03   | 10 <sup>-0.040</sup> <sub>-0.076</sub> | 25.6 | 9.6  | 20.2           | 1.55 | 1.15 | Type C10 for axis         | 16         |
| 32, 40         | IY-G04   | 10 <sup>-0.040</sup> <sub>-0.076</sub> | 41.6 | 9.6  | 36.2           | 1.55 | 1.15 | Type C10 for axis         | 25         |
| 50, 63         | IY-G05   | 14 <sup>-0.050</sup> <sub>-0.093</sub> | 50.6 | 13.4 | 44.2           | 2.05 | 1.15 | Type C14 for axis         | 60         |
| 80             | IY-G08   | 18 <sup>-0.050</sup> <sub>-0.093</sub> | 64   | 17   | 56.2           | 2.55 | 1.35 | Type C18 for axis         | 126        |
| 100            | IY-G10   | 22 <sup>-0.065</sup> <sub>-0.117</sub> | 72   | 21   | 64.2           | 2.55 | 1.35 | Type C22 for axis         | 212        |

\* Type C retaining rings for axis are included.

### Rod End Nut



Material: Carbon steel  
Surface treatment: Zinc chromated (∅12 to ∅100)  
Nickel plating (∅125 to ∅200)

| Bore size [mm] | Part no. | d          | H  | B  | C    | Weight [g] |
|----------------|----------|------------|----|----|------|------------|
| 12             | NTJ-015A | M5 x 0.8   | 4  | 8  | 9.2  | 1          |
| 16             | NT-015A  | M6 x 1     | 5  | 10 | 11.5 | 2          |
| 20             | NT-02    | M8 x 1.25  | 5  | 13 | 15.0 | 4          |
| 25             | NT-03    | M10 x 1.25 | 6  | 17 | 19.6 | 8          |
| 32, 40         | NT-04    | M14 x 1.5  | 8  | 22 | 25.4 | 17         |
| 50, 63         | NT-05    | M18 x 1.5  | 11 | 27 | 31.2 | 32         |
| 80             | NT-08    | M22 x 1.5  | 13 | 32 | 37.0 | 49         |
| 100            | NT-10    | M26 x 1.5  | 16 | 41 | 47.3 | 116        |
| 125, 140       | NT-12    | M30 x 1.5  | 18 | 46 | 53.1 | 160        |
| 160, 180, 200  | NT-16    | M36 x 1.5  | 21 | 55 | 63.5 | 230        |

### Rod End Bracket, Rod End Nut Material: Stainless Steel

Part Nos. (Dimensions: Same as the standard type)

| Bore size [mm] | Single knuckle joint | Double knuckle joint*1 | Knuckle joint pin | Rod end nut |
|----------------|----------------------|------------------------|-------------------|-------------|
| 20             | I-G02SUS             | Y-G02SUS               | IY-G02SUS         | NT-02SUS    |
| 25             | I-G03SUS             | Y-G03SUS               | IY-G03SUS         | NT-03SUS    |
| 32, 40         | I-G04SUS             | Y-G04SUS               | IY-G04SUS         | NT-G04SUS   |
| 50, 63         | I-G05SUS             | Y-G05SUS               | IY-G05SUS         | NT-05SUS    |
| 80             | I-G08SUS             | Y-G08SUS               | IY-G08SUS         | NT-08SUS    |
| 100            | I-G10SUS             | Y-G10SUS               | IY-G10SUS         | NT-10SUS    |

\*1 A knuckle pin and retaining rings are included with the double knuckle joint. Retaining rings are included with the knuckle joint pin.

Standard Double Acting, Single Rod CQ2

Single Acting, Spring Return, Double Rod CQ2

Double Acting, Double Rod CQ2

Large Bore Size Double Acting, Double Rod CQ2W

Anti-lateral Load Double Acting, Single Rod CQ2S

Long Stroke Double Acting, Single Rod CQ2

Non-rotating Rod Double Acting, Single Rod CQ2K

Water Resistant Double Acting, Double Rod CQ2W-RV

Water Resistant Double Acting, Single Rod CQ2-RV

Axial Piping Single Acting, Spring Return, Double Rod CQP2

With End Lock Double Acting, Single Rod CQBQ2

Auto Switch

Made to Order

# CQ2 Series

## Simple Joint (CQ2): $\phi 32$ to $\phi 100$

### Joint/Mounting Bracket (Type A/B) Part Nos.

| Bore size [mm] | Joint | Type A mounting bracket | Type B mounting bracket |
|----------------|-------|-------------------------|-------------------------|
| 32, 40         | YU-03 | YA-03                   | YB-03                   |
| 50, 63         | YU-05 | YA-05                   | YB-05                   |
| 80             | YU-08 | YA-08                   | YB-08                   |
| 100            | YU-10 | YA-10                   | YB-10                   |

<Ordering>

Joints are not included with type A or B mounting brackets.

Order them separately.

(Example)

Bore size  $\phi 40$

Part no.

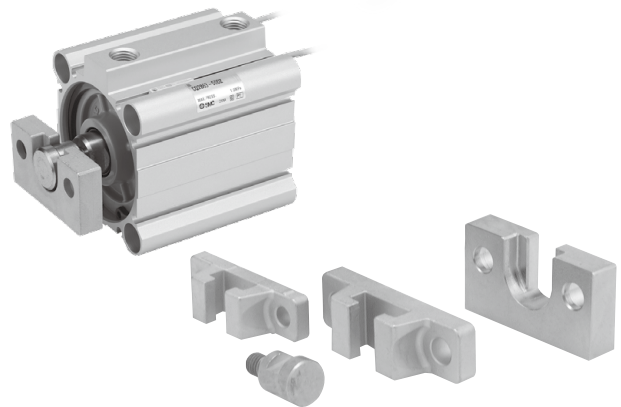
• Type A mounting bracket .....YA-03

• Joint.....YU-03

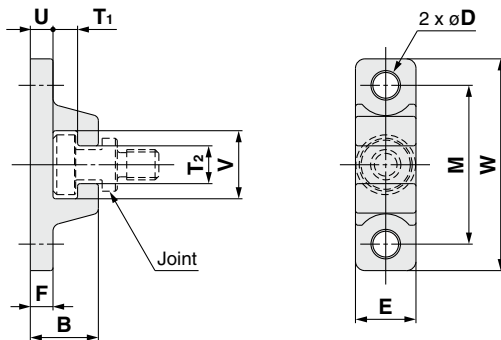
### Allowable Eccentricity

[mm]

| Bore size [mm]         | 32  | 40 | 50 | 63   | 80 | 100 |
|------------------------|-----|----|----|------|----|-----|
| Eccentricity tolerance | ±1  |    |    | ±1.5 |    | ±2  |
| Backlash               | 0.5 |    |    |      |    |     |



### Type A Mounting Bracket

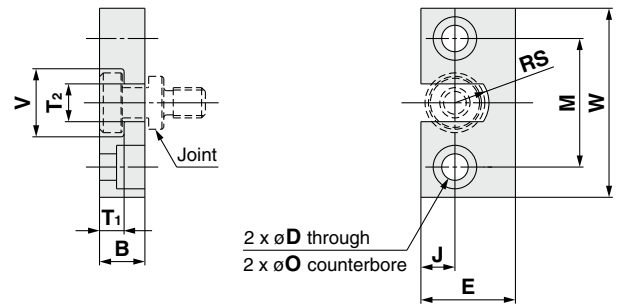


Material: Chromium molybdenum steel (Nickel plating)  
[mm]

| Bore size [mm] | Part no. | B  | D   | E  | F  | M  | T <sub>1</sub> | T <sub>2</sub> |
|----------------|----------|----|-----|----|----|----|----------------|----------------|
| 32, 40         | YA-03    | 18 | 6.8 | 16 | 6  | 42 | 6.5            | 10             |
| 50, 63         | YA-05    | 20 | 9   | 20 | 8  | 50 | 6.5            | 12             |
| 80             | YA-08    | 26 | 11  | 25 | 10 | 62 | 8.5            | 16             |
| 100            | YA-10    | 31 | 14  | 30 | 12 | 76 | 10.5           | 18             |

| Bore size [mm] | Part no. | U  | V  | W   | Weight [g] |
|----------------|----------|----|----|-----|------------|
| 32, 40         | YA-03    | 6  | 18 | 56  | 55         |
| 50, 63         | YA-05    | 8  | 22 | 67  | 100        |
| 80             | YA-08    | 10 | 28 | 83  | 195        |
| 100            | YA-10    | 12 | 36 | 100 | 340        |

### Type B Mounting Bracket

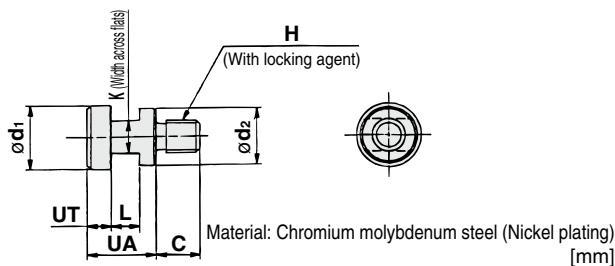


Material: Stainless steel  
[mm]

| Bore size [mm] | Part no. | B  | D  | E  | J  | M  | O              |
|----------------|----------|----|----|----|----|----|----------------|
| 32, 40         | YB-03    | 12 | 7  | 25 | 9  | 34 | 11.5 depth 7.5 |
| 50, 63         | YB-05    | 12 | 9  | 32 | 11 | 42 | 14.5 depth 8.5 |
| 80             | YB-08    | 16 | 11 | 38 | 13 | 52 | 18 depth 12    |
| 100            | YB-10    | 19 | 14 | 50 | 17 | 62 | 21 depth 14    |

| Bore size [mm] | Part no. | T <sub>1</sub> | T <sub>2</sub> | V  | W  | RS | Weight [g] |
|----------------|----------|----------------|----------------|----|----|----|------------|
| 32, 40         | YB-03    | 6.5            | 10             | 18 | 50 | 9  | 80         |
| 50, 63         | YB-05    | 6.5            | 12             | 22 | 60 | 11 | 120        |
| 80             | YB-08    | 8.5            | 16             | 28 | 75 | 14 | 230        |
| 100            | YB-10    | 10.5           | 18             | 36 | 90 | 18 | 455        |

### Joint



Material: Chromium molybdenum steel (Nickel plating)  
[mm]

| Bore size [mm] | Part no. | UA | C  | d <sub>1</sub> | d <sub>2</sub> | H         | K  | L  | UT | Weight [g] |
|----------------|----------|----|----|----------------|----------------|-----------|----|----|----|------------|
| 32, 40         | YU-03    | 17 | 11 | 15.8           | 14             | M8 x 1.25 | 8  | 7  | 6  | 25         |
| 50, 63         | YU-05    | 17 | 13 | 19.8           | 18             | M10 x 1.5 | 10 | 7  | 6  | 40         |
| 80             | YU-08    | 22 | 20 | 24.8           | 23             | M16 x 2   | 13 | 9  | 8  | 90         |
| 100            | YU-10    | 26 | 26 | 29.8           | 28             | M20 x 2.5 | 14 | 11 | 10 | 160        |

# Compact Cylinder: Standard Double Acting, Double Rod

## CQ2W Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

Without auto switch  
ø12 to ø25

CQ2W B □ 20 □ - 30 D □ - □

Without auto switch  
ø32 to ø100

CQ2W B □ 32 □ - 30 D □ Z - □

With auto switch

CDQ2W B □ 32 □ - 30 D M Z - M9BW □ - □

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

#### 1 Mounting

|           |                  |
|-----------|------------------|
| <b>B</b>  | Through-hole     |
| <b>A</b>  | Both ends tapped |
| <b>L</b>  | Foot             |
| <b>LC</b> | Compact foot     |
| <b>F</b>  | Flange           |

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

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 34

#### 2 Type

|            |             |
|------------|-------------|
| <b>Nil</b> | Pneumatic   |
| <b>H</b>   | Air-hydro*1 |

\*1 The bore sizes available for the air-hydro type are ø20 to ø100.

#### 3 Bore size

|            |        |
|------------|--------|
| <b>12</b>  | 12 mm  |
| <b>16</b>  | 16 mm  |
| <b>20</b>  | 20 mm  |
| <b>25</b>  | 25 mm  |
| <b>32</b>  | 32 mm  |
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

#### 4 Port thread type

|            |                               |             |
|------------|-------------------------------|-------------|
| <b>Nil</b> | M thread                      | ø12 to ø25  |
|            | Rc                            |             |
| <b>TN</b>  | NPT                           | ø32 to ø100 |
| <b>TF</b>  | G                             |             |
| <b>F</b>   | Built-in One-touch fittings*1 |             |

\*1 The bore sizes available with One-touch fittings are ø32 to ø63. However, they cannot be selected for the air-hydro type.

\* "TF" is not selectable for the air-hydro type.

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

#### 5 Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145)

##### Pneumatic type (Non-lube) [mm]

| Bore size              | Standard stroke                                |
|------------------------|--|
| <b>12, 16</b>          | 5, 10, 15, 20, 25, 30                          |
| <b>20, 25</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |
| <b>32, 40</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| <b>50, 63, 80, 100</b> | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 31

##### Air-hydro type [mm]

| Bore size              | Standard stroke                                |
|------------------------|--|
| <b>20, 25</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |
| <b>32, 40</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| <b>50, 63, 80, 100</b> | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

#### 6 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### 7 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>C</b>   | With rubber bumper*1  |
| <b>M</b>   | Rod end male thread   |

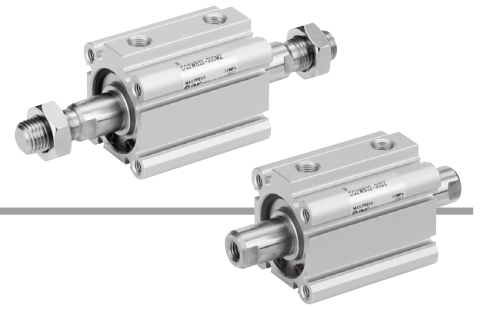
\*1 The type with a rubber bumper is not selectable for the air-hydro type.

\* Combined body options "CM" can be selected.

#### 8 Auto switch mounting groove

|          |             |            |
|----------|-------------|------------|
| <b>Z</b> | ø12 to ø25  | 2 surfaces |
|          | ø32 to ø100 | 4 surfaces |





**9 Auto switch**

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

**10 Number of auto switches**

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

**11 Made to order common specifications**

For details ⇨ p. 31

**Cylinder Model with Auto Switch Magnet**

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) CDQ2WL32-25DZ

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

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

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

| Type   | Special function                          | Electrical entry | Indicator light         | Wiring (Output)    | Load voltage |               | Auto switch model |                 | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |
|--|---|------------------|-------------------------|--------------------|--------------|---------------|-------------------|-----------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|
|  |   |                  |                         |                    | DC           | AC            | Perpendicular     | In-line         | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | IC circuit      | Relay, PLC |
| Solid state auto switch                      | Diagnostic indication (2-color indicator) | Grommet          | Yes                     | 3-wire (NPN)       | 24 V         | 5 V, 12 V     | —                 | <b>M9NV</b>     | <b>M9N</b>           | ●     | ●     | ●     | ○        | —                   |                 |            |
|  |   |                  |                         | 3-wire (PNP)       |              |               |                   | <b>M9PV</b>     | <b>M9P</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 2-wire             |              |               |                   | <b>M9BV</b>     | <b>M9B</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 3-wire (NPN)       |              |               |                   | <b>M9NVV</b>    | <b>M9NV</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 3-wire (PNP)       |              |               |                   | <b>M9PVV</b>    | <b>M9PV</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 2-wire             |              |               |                   | <b>M9BVV</b>    | <b>M9BV</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |
|  | Water resistant (2-color indicator)       | Grommet          | Yes                     | 3-wire (NPN)       | 24 V         | 5 V, 12 V     | —                 | <b>M9NAV</b> *1 | <b>M9NA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               | Relay, PLC |
|  |   |                  |                         | 3-wire (PNP)       |              |               |                   | <b>M9PAV</b> *1 | <b>M9PA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 2-wire             |              |               |                   | <b>M9BAV</b> *1 | <b>M9BA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |
|  |   |                  |                         | 2-wire (Non-polar) |              |               |                   | —               | <b>P3DWA</b>         | ●     | —     | ●     | ●        | —                   | ○               |            |
| Magnetic field resistant (2-color indicator) | Grommet                                   | Yes              | 3-wire (NPN equivalent) | 24 V               | 5 V, 12 V    | 100 V or less | <b>A96V</b>       | <b>A96</b>      | ●                    | —     | ●     | —     | —        | —                   | Relay, PLC      |            |
|  |   |                  | 2-wire                  |                    |              |               | <b>A93V</b> *2    | <b>A93</b>      | ●                    | ●     | ●     | ●     | —        | —                   |                 |            |
|  |   |                  | 2-wire                  |                    |              |               | <b>A90V</b>       | <b>A90</b>      | ●                    | —     | ●     | —     | —        | —                   |                 |            |
| Reed auto switch                             | —   | Grommet          | No                      | 2-wire             | 24 V         | 5 V, 12 V     | 100 V or less     | <b>A90V</b>     | <b>A90</b>           | ●     | —     | ●     | —        | —                   | IC circuit      | Relay, PLC |

\*1 Water-resistant type auto switches can be mounted on the models on page 29, but SMC cannot guarantee water resistance.

Please contact SMC regarding water-resistant types with the model numbers on page 29.

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

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

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
 \* The D-P3DWA□ type is only available in sizes ø25 to ø100.

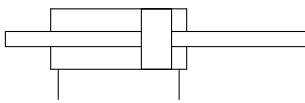
\* There are applicable auto switches other than those listed above. For details ⇨ p. 152

|                   |  |                |
|-------------------|--|----------------|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>     |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>    |
| Standard          | Single Acting, Spring Return, Single Rod | <b>CQ2</b>     |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2W</b>    |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>     |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>    |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2□S</b>   |
| Anti-lateral Load | Double Acting, Double Rod                | <b>CQ2W□S</b>  |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>     |
| Long Stroke       | Double Acting, Double Rod                | <b>CQ2W</b>    |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2K</b>    |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2KW</b>   |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-RV</b>  |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-RV</b> |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>    |
| Axial Piping      | Double Acting, Double Rod                | <b>CQP2W</b>   |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>    |
| With End Lock     | Double Acting, Double Rod                | <b>CBQ2W</b>   |
| Auto Switch       |  |                |
| Made to Order     |  |                |

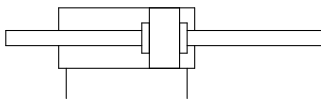
# CQ2W Series

## Symbol

Without cushion



Rubber bumper



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

| Symbol  | Specifications   |
|---------|--|
| -XA□    | Change of rod end shape  |
| -XB6    | Heat-resistant cylinder (-10 to 150°C)<br>w/o auto switch only*1   |
| -XB7    | Cold-resistant cylinder (-40 to 70°C)<br>w/o auto switch only      |
| -XB9    | Low-speed cylinder (10 to 50 mm/s)                                 |
| -XB10   | Intermediate stroke (Using exclusive body)                         |
| -XB13   | Low-speed cylinder (5 to 50 mm/s)                                  |
| -XC2(A) | Rod end length increased by 10 mm (For foot and flange bracket)    |
| -XC4    | With heavy duty scraper  |
| -XC6    | Piston rod/Retaining ring/Rod end nut<br>material: Stainless steel |
| -XC35   | With coil scraper  |
| -XC36   | With boss on rod end   |
| -XC85   | Grease for food processing equipment                               |
| -X144   | Special port location, with auto switch                            |
| -X235   | Special rod end for double rod cylinder                            |
| -X271   | Fluororubber seals*1   |
| -X293   | Same full length dimension as the CQ1W series                      |
| -X633   | Intermediate stroke for double rod cylinder                        |

\*1 Excludes the air-hydro type

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

### Moisture Control Tube IDK Series



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

## ⚠ Precautions

**Refer to page 189 before handling the products.**

## Specifications

### Pneumatic type

| Bore size [mm]                        |   | 12    | 16       | 20    | 25   | 32   | 40   | 50   | 63   | 80   | 100  |
|---------------------------------------|---|-------|----------|-------|------|------|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Double rod   |       |          |       |      |      |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |       |          |       |      |      |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.07 MPa  |       | 0.05 MPa |       |      |      |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |       |          |       |      |      |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |       |          |       |      |      |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |       |          |       |      |      |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | <b>Standard</b>   | 0.022 | 0.038    | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
|                                       | <b>With rubber bumper</b>   | 0.043 | 0.075    | 0.11  | 0.18 | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| <b>Stroke length tolerance</b>        | +1.0 mm <sup>*1</sup><br>0  |       |          |       |      |      |      |      |      |      |      |

\*1 Stroke length tolerance does not include the amount of bumper change.

### Air-hydro type

| Bore size [mm]                        |                           | 20 | 25 | 32      | 40 | 50 | 63 | 80 | 100 |
|---------------------------------------|---------------------------|----|----|---------|----|----|----|----|-----|
| <b>Action</b>                         | Double acting, Double rod |    |    |         |    |    |    |    |     |
| <b>Fluid</b>                          | Turbine oil*1             |    |    |         |    |    |    |    |     |
| <b>Proof pressure</b>                 | 1.5 MPa                   |    |    |         |    |    |    |    |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa                   |    |    |         |    |    |    |    |     |
| <b>Minimum operating pressure</b>     | 0.18 MPa                  |    |    | 0.1 MPa |    |    |    |    |     |
| <b>Ambient and fluid temperatures</b> | 5 to 60°C                 |    |    |         |    |    |    |    |     |
| <b>Piston speed</b>                   | 5 to 50 mm/s              |    |    |         |    |    |    |    |     |
| <b>Cushion</b>                        | None                      |    |    |         |    |    |    |    |     |
| <b>Stroke length tolerance</b>        | +1.0 mm<br>0              |    |    |         |    |    |    |    |     |

\*1 Actuator Precautions 5 ⇨ Refer to the **Web Catalog**.

## Manufacturing of Intermediate Strokes

| Type                | A spacer is installed in the standard stroke body.<br>(5 mm increments)                               | A spacer is installed in the standard stroke body.<br>(1 mm increments)                                   | Exclusive body (-XB10)   |              |           |              |
|---------------------|---|---|--|--------------|-----------|--------------|
| <b>Part no.</b>     | Refer to "How to Order" for the standard model number. (⇨ p. 29)                                      | Suffix "-X633" (p. 186) to the end of standard model number. (⇨ p. 29)                                    | Suffix "-XB10" to the end of standard model number. (⇨ p. 29)                                  |              |           |              |
| <b>Description</b>  | Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.      | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.          | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |              |           |              |
| <b>Stroke range</b> | Bore size   | Stroke range  | Bore size  | Stroke range | Bore size | Stroke range |
|                     | —   | —   | 12, 16   | 6 to 29      | 12, 16    | 6 to 29      |
|                     |   |   | 20, 25   | 6 to 49      | 20, 25    | 6 to 49      |
|                     | 32 to 100   | 55 to 95  | 32, 40   | 6 to 99      | 32, 40    | 6 to 99      |
|                     |   |   | 50 to 100  | 11 to 99     | 50 to 100 | 11 to 99     |
| <b>Example</b>      | Part no.: CQ2WB50-65DZ<br>CQ2WB50-75DZ with 10 mm width spacer inside<br>The B dimension is 125.5 mm. | Part no.: CQ2WB50-72DZ-X633<br>CQ2WB50-75DZ with 3 mm width spacer inside<br>The B dimension is 125.5 mm. | Part no.: CQ2WB50-65DZ-XB10<br>Makes 65 mm stroke tube.<br>The B dimension is 115.5 mm.        |              |           |              |

- Excludes the air-hydro type
- In the case of spacer type, intermediate strokes with bumper for ø40 to ø100, "-X633" is not available.
- In the case of exclusive body type with ø32 to ø100 (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension will be changed. Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.

## Mounting Bracket Part Nos.

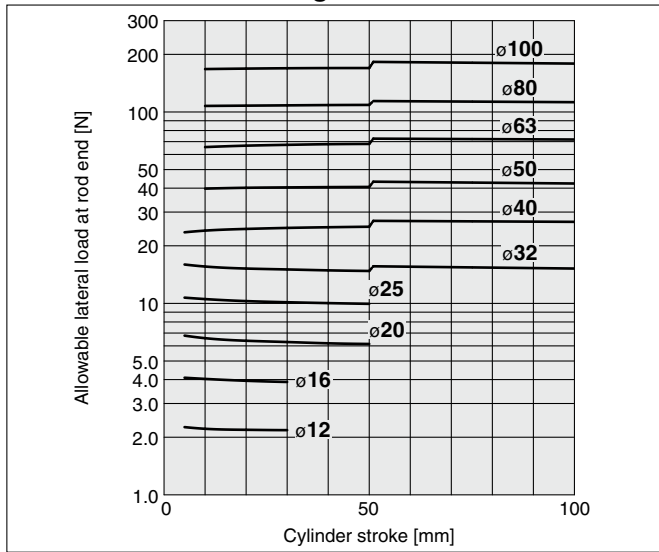
| Bore size [mm] |                            | Foot*1  | Compact foot*1 | Flange  |
|----------------|----------------------------|---------|----------------|---------|
| 12             | Without auto switch magnet | CQ-L012 | CQ-LC012       | CQ-F012 |
|                | With auto switch magnet    | CQ-LZ12 | CQ-LCZ12       |         |
| 16             | Without auto switch magnet | CQ-L016 | CQ-LC016       | CQ-F016 |
|                | With auto switch magnet    | CQ-LZ16 | CQ-LCZ16       |         |
| 20             | Without auto switch magnet | CQ-L020 | CQ-LC020       | CQ-F020 |
|                | With auto switch magnet    | CQ-LZ20 | CQ-LCZ20       |         |
| 25             | Without auto switch magnet | CQ-L025 | CQ-LC025       | CQ-F025 |
|                | With auto switch magnet    | CQ-LZ25 | CQ-LCZ25       |         |
| 32             |                            | CQ-L032 | CQ-LC032       | CQ-F032 |
| 40             |                            | CQ-L040 | CQ-LC040       | CQ-F040 |
| 50             |                            | CQ-L050 | CQ-LC050       | CQ-F050 |
| 63             |                            | CQ-L063 | CQ-LC063       | CQ-F063 |
| 80             |                            | CQ-L080 | CQ-LC080       | CQ-F080 |
| 100            |                            | CQ-L100 | CQ-LC100       | CQ-F100 |

\*1 When ordering foot and compact foot brackets, the required quantity will be different depending on the bore size.  
 ø12 to ø25:  
 · Without auto switch magnet: Order 2 pieces per cylinder.  
 · With auto switch magnet: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)  
 ø32 to ø100:  
 · Order 2 pieces per cylinder.

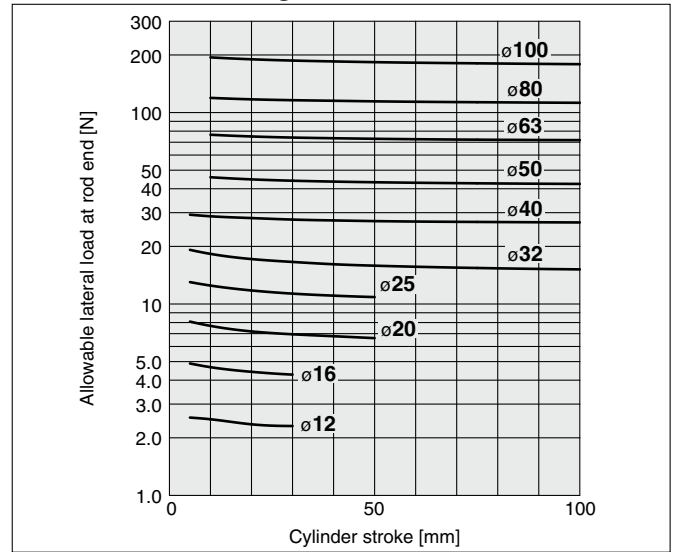
\* Parts included with each type of bracket are as follows.  
 Foot, Compact foot, Flange: Body mounting bolts  
 \* For details on accessory brackets (Options) ⇨ p. 21 to 27  
 \* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).

## Allowable Lateral Load at Rod End

### Without Auto Switch Magnet



### With Auto Switch Magnet



## Theoretical Output

| Bore size [mm] | Operating pressure [MPa] |      |      |
|----------------|--------------------------|------|------|
|                | 0.3                      | 0.5  | 0.7  |
| 12             | 25                       | 42   | 59   |
| 16             | 45                       | 75   | 106  |
| 20             | 71                       | 118  | 165  |
| 25             | 113                      | 189  | 264  |
| 32             | 181                      | 302  | 422  |
| 40             | 317                      | 528  | 739  |
| 50             | 495                      | 825  | 1150 |
| 63             | 841                      | 1400 | 1960 |
| 80             | 1360                     | 2270 | 3170 |
| 100            | 2140                     | 3570 | 5000 |

Standard  
Double Acting, Double Rod  
**CQ2W**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2□S**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch

Made to Order

# CQ2W Series

## Weight

### Without Auto Switch Magnet

[g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 42                   | 49   | 56   | 63   | 70   | 77   | —    | —    | —    | —    | —    | —    |
| 16             | 59                   | 68   | 77   | 86   | 95   | 104  | —    | —    | —    | —    | —    | —    |
| 20             | 89                   | 104  | 119  | 134  | 149  | 164  | 179  | 194  | 209  | 224  | —    | —    |
| 25             | 119                  | 136  | 153  | 170  | 187  | 204  | 221  | 238  | 255  | 272  | —    | —    |
| 32             | 185                  | 212  | 235  | 257  | 280  | 303  | 326  | 349  | 372  | 395  | 555  | 670  |
| 40             | 279                  | 308  | 337  | 367  | 396  | 426  | 455  | 484  | 514  | 543  | 749  | 896  |
| 50             | —                    | 497  | 538  | 580  | 622  | 664  | 705  | 747  | 789  | 830  | 1122 | 1331 |
| 63             | —                    | 646  | 682  | 718  | 754  | 790  | 826  | 862  | 899  | 935  | 1187 | 1368 |
| 80             | —                    | 1149 | 1225 | 1302 | 1378 | 1455 | 1531 | 1608 | 1684 | 1760 | 2296 | 2678 |
| 100            | —                    | 1960 | 2068 | 2177 | 2286 | 2394 | 2503 | 2612 | 2720 | 2829 | 3589 | 4132 |

### With Auto Switch Magnet

[g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 50                   | 58   | 65   | 73   | 80   | 87   | —    | —    | —    | —    | —    | —    |
| 16             | 77                   | 87   | 96   | 106  | 115  | 125  | —    | —    | —    | —    | —    | —    |
| 20             | 120                  | 136  | 151  | 166  | 182  | 197  | 212  | 228  | 243  | 258  | —    | —    |
| 25             | 170                  | 185  | 201  | 216  | 232  | 247  | 263  | 279  | 294  | 310  | —    | —    |
| 32             | 238                  | 260  | 283  | 306  | 329  | 352  | 375  | 398  | 421  | 444  | 558  | 673  |
| 40             | 353                  | 383  | 412  | 442  | 471  | 500  | 530  | 559  | 589  | 618  | 765  | 912  |
| 50             | —                    | 609  | 645  | 681  | 716  | 752  | 788  | 823  | 859  | 895  | 1073 | 1252 |
| 63             | —                    | 798  | 840  | 882  | 924  | 966  | 1008 | 1051 | 1093 | 1135 | 1346 | 1556 |
| 80             | —                    | 1393 | 1469 | 1546 | 1622 | 1699 | 1775 | 1851 | 1928 | 2004 | 2387 | 2769 |
| 100            | —                    | 2334 | 2443 | 2551 | 2660 | 2769 | 2877 | 2986 | 3094 | 3203 | 3746 | 4289 |

### Additional Weight

[g]

| Bore size [mm]                          |             | 12 | 16 | 20  | 25  | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|----|----|-----|-----|-----|-----|-----|-----|------|------|
| Both ends tapped                        |             | 2  | 2  | 6   | 6   | 6   | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                     | Male thread | 3  | 6  | 12  | 24  | 52  | 54  | 106 | 106 | 240  | 350  |
|   | Nut         | 2  | 4  | 8   | 16  | 34  | 34  | 64  | 64  | 98   | 232  |
| With rubber bumper                      |             | 0  | 0  | -2  | -2  | -3  | -7  | -12 | -20 | -34  | -57  |
| Built-in One-touch fittings             |             | —  | —  | —   | —   | 12  | 12  | 21  | 21  | —    | —    |
| Foot (Including mounting bolts)         |             | 52 | 66 | 156 | 184 | 136 | 154 | 243 | 321 | 627  | 1023 |
| Compact foot (Including mounting bolts) |             | 39 | 50 | 122 | 143 | 110 | 124 | 197 | 259 | 531  | 818  |
| Flange (Including mounting bolts)       |             | 57 | 69 | 139 | 161 | 180 | 214 | 373 | 559 | 1056 | 1365 |

Calculation: (Example) **CQ2WF32-20DCMZ**

- Basic weight: CQ2WB32-20DZ ..... 257 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 86 g
  - With rubber bumper ..... -3 g
  - Flange ..... 180 g
- 526 g

### Additional Weight

[g]

| Bore size [mm]                          |             | 12 | 16 | 20  | 25  | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|----|----|-----|-----|-----|-----|-----|-----|------|------|
| Both ends tapped                        |             | 1  | 1  | 3   | 3   | 6   | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                     | Male thread | 3  | 6  | 12  | 24  | 52  | 54  | 106 | 106 | 240  | 350  |
|   | Nut         | 2  | 4  | 8   | 16  | 34  | 34  | 64  | 64  | 98   | 232  |
| With rubber bumper                      |             | 0  | 0  | -2  | -2  | -3  | -7  | -12 | -19 | -34  | -54  |
| Built-in One-touch fittings             |             | —  | —  | —   | —   | 12  | 12  | 21  | 21  | —    | —    |
| Foot (Including mounting bolts)         |             | 43 | 57 | 132 | 158 | 136 | 154 | 243 | 321 | 627  | 1023 |
| Compact foot (Including mounting bolts) |             | 32 | 42 | 100 | 122 | 110 | 124 | 197 | 259 | 531  | 818  |
| Flange (Including mounting bolts)       |             | 54 | 67 | 131 | 153 | 180 | 214 | 373 | 559 | 1056 | 1365 |

Calculation: (Example) **CDQ2WF32-20DCMZ**

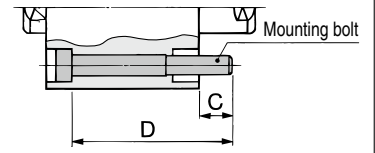
- Basic weight: CDQ2WB32-20DZ ..... 306 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 86 g
  - With rubber bumper ..... -3 g
  - Rod flange ..... 180 g
- 575 g
- Add each weight of auto switches when auto switches are mounted.

### Through-hole Type Mounting Bolt for the CQ2W: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2WB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

**Example) CQ-M3 x 35L 4 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model | C   | D  | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CQ2WB12-5D     | 8.3 | 35 | CQ-M3 x 35L            |
| -10D           |     | 40 | x 40L                  |
| -15D           |     | 45 | x 45L                  |
| -20D           |     | 50 | x 50L                  |
| -25D           |     | 55 | x 55L                  |
| -30D           |     | 60 | x 60L                  |
| CQ2WB16-5D     | 7.5 | 35 | CQ-M3 x 35L            |
| -10D           |     | 40 | x 40L                  |
| -15D           |     | 45 | x 45L                  |
| -20D           |     | 50 | x 50L                  |
| -25D           |     | 55 | x 55L                  |
| -30D           |     | 60 | x 60L                  |
| CQ2WB20-5D     | 6   | 30 | CQ-M5 x 30L            |
| -10D           |     | 35 | x 35L                  |
| -15D           |     | 40 | x 40L                  |
| -20D           |     | 45 | x 45L                  |
| -25D           |     | 50 | x 50L                  |
| -30D           |     | 55 | x 55L                  |
| -35D           |     | 60 | x 60L                  |
| -40D           |     | 65 | x 65L                  |
| -45D           |     | 70 | x 70L                  |
| -50D           |     | 75 | x 75L                  |
| CQ2WB25-5D     | 8   | 35 | CQ-M5 x 35L            |
| -10D           |     | 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                  |

| Cylinder model | C    | D      | Mounting bolt part no. |
|----------------|------|--------|------------------------|
| CQ2WB32-5DZ    | 6.5  | 35     | CQ-M5 x 35L            |
| -10DZ          |      | 40     | x 40L                  |
| -15DZ          |      | 45     | x 45L                  |
| -20DZ          |      | 50     | x 50L                  |
| -25DZ          |      | 55     | x 55L                  |
| -30DZ          |      | 60     | x 60L                  |
| -35DZ          |      | 65     | x 65L                  |
| -40DZ          |      | 70     | x 70L                  |
| -45DZ          |      | 75     | x 75L                  |
| -50DZ          |      | 80     | x 80L                  |
| -75DZ          | 115  | x 115L |                        |
| -100DZ         | 140  | x 140L |                        |
| CQ2WB40-5DZ    | 7    | 45     | CQ-M5 x 45L            |
| -10DZ          |      | 50     | x 50L                  |
| -15DZ          |      | 55     | x 55L                  |
| -20DZ          |      | 60     | x 60L                  |
| -25DZ          |      | 65     | x 65L                  |
| -30DZ          |      | 70     | x 70L                  |
| -35DZ          |      | 75     | x 75L                  |
| -40DZ          |      | 80     | x 80L                  |
| -45DZ          |      | 85     | x 85L                  |
| -50DZ          |      | 90     | x 90L                  |
| -75DZ          | 125  | x 125L |                        |
| -100DZ         | 150  | x 150L |                        |
| CQ2WB50-10DZ   | 12.5 | 55     | CQ-M6 x 55L            |
| -15DZ          |      | 60     | x 60L                  |
| -20DZ          |      | 65     | x 65L                  |
| -25DZ          |      | 70     | x 70L                  |
| -30DZ          |      | 75     | x 75L                  |
| -35DZ          |      | 80     | x 80L                  |
| -40DZ          |      | 85     | x 85L                  |
| -45DZ          |      | 90     | x 90L                  |
| -50DZ          |      | 95     | x 95L                  |
| -75DZ          |      | 130    | x 130L                 |
| -100DZ         | 155  | x 155L |                        |

| Cylinder model | C    | D      | Mounting bolt part no. |
|----------------|------|--------|------------------------|
| CQ2WB63-10DZ   | 13.5 | 55     | CQ-M8 x 55L            |
| -15DZ          |      | 60     | x 60L                  |
| -20DZ          |      | 65     | x 65L                  |
| -25DZ          |      | 70     | x 70L                  |
| -30DZ          |      | 75     | x 75L                  |
| -35DZ          |      | 80     | x 80L                  |
| -40DZ          |      | 85     | x 85L                  |
| -45DZ          |      | 90     | x 90L                  |
| -50DZ          |      | 95     | x 95L                  |
| -75DZ          |      | 130    | x 130L                 |
| -100DZ         | 155  | x 155L |                        |
| CQ2WB80-10DZ   | 12.5 | 60     | CQ-M10 x 60L           |
| -15DZ          |      | 65     | x 65L                  |
| -20DZ          |      | 70     | x 70L                  |
| -25DZ          |      | 75     | x 75L                  |
| -30DZ          |      | 80     | x 80L                  |
| -35DZ          |      | 85     | x 85L                  |
| -40DZ          |      | 90     | x 90L                  |
| -45DZ          |      | 95     | x 95L                  |
| -50DZ          |      | 100    | x 100L                 |
| -75DZ          |      | 135    | x 135L                 |
| -100DZ         | 160  | x 160L |                        |
| CQ2WB100-10DZ  | 13   | 70     | CQ-M10 x 70L           |
| -15DZ          |      | 75     | x 75L                  |
| -20DZ          |      | 80     | x 80L                  |
| -25DZ          |      | 85     | x 85L                  |
| -30DZ          |      | 90     | x 90L                  |
| -35DZ          |      | 95     | x 95L                  |
| -40DZ          |      | 100    | x 100L                 |
| -45DZ          |      | 105    | x 105L                 |
| -50DZ          |      | 110    | x 110L                 |
| -75DZ          |      | 145    | x 145L                 |
| -100DZ         | 170  | x 170L |                        |

### Through-hole Type Mounting Bolt for the CDQ2W: With Auto Switch Magnet

| Cylinder model | C   | D  | Mounting bolt part no. |
|----------------|-----|----|------------------------|
| CDQ2WB12-5DZ   | 6.1 | 40 | CQ-M3 x 40L            |
| -10DZ          |     | 45 | x 45L                  |
| -15DZ          |     | 50 | x 50L                  |
| -20DZ          |     | 55 | x 55L                  |
| -25DZ          |     | 60 | x 60L                  |
| -30DZ          |     | 65 | x 65L                  |
| CDQ2WB16-5DZ   | 7.5 | 45 | CQ-M3 x 45L            |
| -10DZ          |     | 50 | x 50L                  |
| -15DZ          |     | 55 | x 55L                  |
| -20DZ          |     | 60 | x 60L                  |
| -25DZ          |     | 65 | x 65L                  |
| -30DZ          |     | 70 | x 70L                  |
| CDQ2WB20-5DZ   | 9   | 45 | CQ-M5 x 45L            |
| -10DZ          |     | 50 | x 50L                  |
| -15DZ          |     | 55 | x 55L                  |
| -20DZ          |     | 60 | x 60L                  |
| -25DZ          |     | 65 | x 65L                  |
| -30DZ          |     | 70 | x 70L                  |
| -35DZ          |     | 75 | x 75L                  |
| -40DZ          |     | 80 | x 80L                  |
| -45DZ          |     | 85 | x 85L                  |
| -50DZ          |     | 90 | x 90L                  |
| CDQ2WB25-5DZ   | 8   | 45 | CQ-M5 x 45L            |
| -10DZ          |     | 50 | x 50L                  |
| -15DZ          |     | 55 | x 55L                  |
| -20DZ          |     | 60 | x 60L                  |
| -25DZ          |     | 65 | x 65L                  |
| -30DZ          |     | 70 | x 70L                  |
| -35DZ          |     | 75 | x 75L                  |
| -40DZ          |     | 80 | x 80L                  |
| -45DZ          |     | 85 | x 85L                  |
| -50DZ          |     | 90 | x 90L                  |

| Cylinder model | C    | D      | Mounting bolt part no. |
|----------------|------|--------|------------------------|
| CDQ2WB32-5DZ   | 6.5  | 45     | CQ-M5 x 45L            |
| -10DZ          |      | 50     | x 50L                  |
| -15DZ          |      | 55     | x 55L                  |
| -20DZ          |      | 60     | x 60L                  |
| -25DZ          |      | 65     | x 65L                  |
| -30DZ          |      | 70     | x 70L                  |
| -35DZ          |      | 75     | x 75L                  |
| -40DZ          |      | 80     | x 80L                  |
| -45DZ          |      | 85     | x 85L                  |
| -50DZ          |      | 90     | x 90L                  |
| -75DZ          | 115  | x 115L |                        |
| -100DZ         | 140  | x 140L |                        |
| CDQ2WB40-5DZ   | 7    | 55     | CQ-M5 x 55L            |
| -10DZ          |      | 60     | x 60L                  |
| -15DZ          |      | 65     | x 65L                  |
| -20DZ          |      | 70     | x 70L                  |
| -25DZ          |      | 75     | x 75L                  |
| -30DZ          |      | 80     | x 80L                  |
| -35DZ          |      | 85     | x 85L                  |
| -40DZ          |      | 90     | x 90L                  |
| -45DZ          |      | 95     | x 95L                  |
| -50DZ          |      | 100    | x 100L                 |
| -75DZ          | 125  | x 125L |                        |
| -100DZ         | 150  | x 150L |                        |
| CDQ2WB50-10DZ  | 12.5 | 65     | CQ-M6 x 65L            |
| -15DZ          |      | 70     | x 70L                  |
| -20DZ          |      | 75     | x 75L                  |
| -25DZ          |      | 80     | x 80L                  |
| -30DZ          |      | 85     | x 85L                  |
| -35DZ          |      | 90     | x 90L                  |
| -40DZ          |      | 95     | x 95L                  |
| -45DZ          |      | 100    | x 100L                 |
| -50DZ          |      | 105    | x 105L                 |
| -75DZ          |      | 130    | x 130L                 |
| -100DZ         | 155  | x 155L |                        |

| Cylinder model | C    | D      | Mounting bolt part no. |
|----------------|------|--------|------------------------|
| CDQ2WB63-10DZ  | 13.5 | 65     | CQ-M8 x 65L            |
| -15DZ          |      | 70     | x 70L                  |
| -20DZ          |      | 75     | x 75L                  |
| -25DZ          |      | 80     | x 80L                  |
| -30DZ          |      | 85     | x 85L                  |
| -35DZ          |      | 90     | x 90L                  |
| -40DZ          |      | 95     | x 95L                  |
| -45DZ          |      | 100    | x 100L                 |
| -50DZ          |      | 105    | x 105L                 |
| -75DZ          |      | 130    | x 130L                 |
| -100DZ         | 155  | x 155L |                        |
| CDQ2WB80-10DZ  | 12.5 | 70     | CQ-M10 x 70L           |
| -15DZ          |      | 75     | x 75L                  |
| -20DZ          |      | 80     | x 80L                  |
| -25DZ          |      | 85     | x 85L                  |
| -30DZ          |      | 90     | x 90L                  |
| -35DZ          |      | 95     | x 95L                  |
| -40DZ          |      | 100    | x 100L                 |
| -45DZ          |      | 105    | x 105L                 |
| -50DZ          |      | 110    | x 110L                 |
| -75DZ          |      | 135    | x 135L                 |
| -100DZ         | 160  | x 160L |                        |
| CDQ2WB100-10DZ | 13   | 80     | CQ-M10 x 80L           |
| -15DZ          |      | 85     | x 85L                  |
| -20DZ          |      | 90     | x 90L                  |
| -25DZ          |      | 95     | x 95L                  |
| -30DZ          |      | 100    | x 100L                 |
| -35DZ          |      | 105    | x 105L                 |
| -40DZ          |      | 110    | x 110L                 |
| -45DZ          |      | 115    | x 115L                 |
| -50DZ          |      | 120    | x 120L                 |
| -75DZ          |      | 145    | x 145L                 |
| -100DZ         | 170  | x 170L |                        |

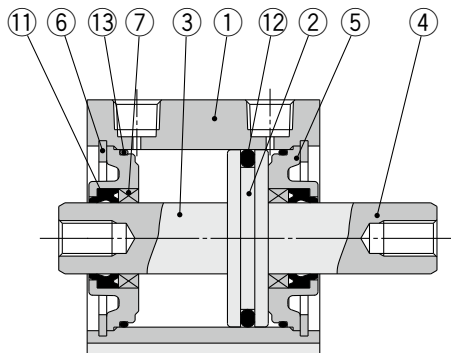
Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, End **CQ2**  
 Large Bore Size Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2K**  
 Non-rotating Rod Double Acting, Single Rod **CQ2KW**  
 Double Acting, Single Rod **CQ2-RV**  
 Water Resistant Double Acting, Double Rod **CQ2W-RV**  
 Double Acting, Single Rod **CQ2**  
 Axial Piping Single Acting, Spring Return, Lateral **CQ2**  
 Double Acting, Single Rod **CQ2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch **Auto Switch**  
 Made to Order



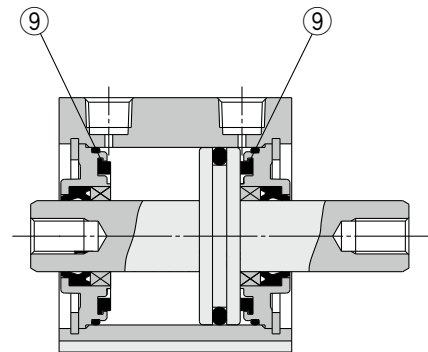
# CQ2W Series

## Construction

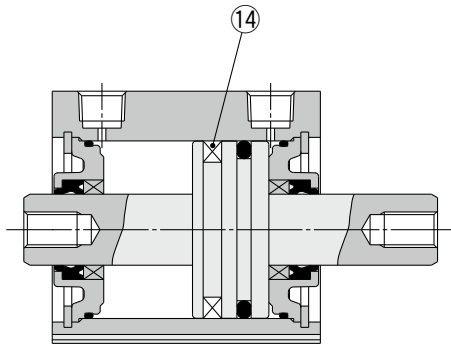
Without auto switch magnet



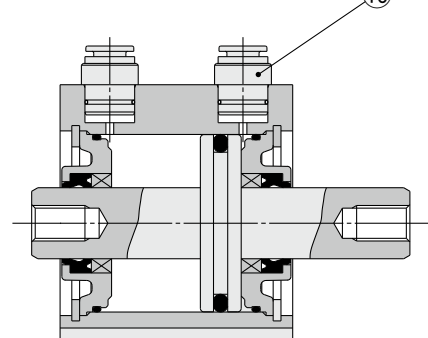
With rubber bumper



With auto switch magnet



Built-in One-touch fittings



### Component Parts

| No. | Description       | Material              | Note                             |
|-----|-------------------|-----------------------|----------------------------------|
| 1   | Cylinder tube     | Aluminum alloy        | Hard anodized                    |
| 2   | Piston            | Aluminum alloy        |                                  |
| 3   | Piston rod A      | Stainless steel       | ø12 to ø25                       |
|     |                   | Carbon steel          | ø32 to ø100, Hard chrome plating |
| 4   | Piston rod B      | Stainless steel       | ø12 to ø25                       |
|     |                   | Carbon steel          | ø32 to ø100, Hard chrome plating |
| 5   | Collar            | Aluminum alloy        | ø12 to ø40, Anodized             |
|     |                   | Aluminum alloy casted | ø50 to ø100, Chromated, Painted  |
| 6   | Retaining ring    | Carbon tool steel     | Phosphate coated                 |
| 7   | Bushing           | Bearing alloy         | For ø50 or more only             |
| 8   | Rod end nut       | Carbon steel          | Zinc chromated                   |
| 9   | Bumper            | Urethane              | Pneumatic type only              |
| 10  | One-touch fitting | —                     | ø32 to ø63                       |
| 11  | Rod seal          | NBR                   |                                  |
| 12  | Piston seal       | NBR                   |                                  |
| 13  | Tube gasket       | NBR                   |                                  |
| 14  | Magnet            | —                     |                                  |

### Replacement Parts/Seal Kit

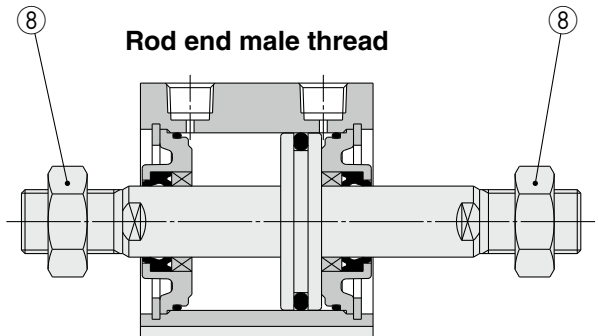
#### Pneumatic Type

| Bore size [mm] | Kit no.     | Contents            |
|----------------|-------------|---------------------|
| 12             | CQ2WB12-PS  | Set of nos. ①, ②, ⑬ |
| 16             | CQ2WB16-PS  |                     |
| 20             | CQ2WB20-PS  |                     |
| 25             | CQ2WB25-PS  |                     |
| 32             | CQ2WB32-PS  |                     |
| 40             | CQ2WB40-PS  |                     |
| 50             | CQ2WB50-PS  |                     |
| 63             | CQ2WB63-PS  |                     |
| 80             | CQ2WB80-PS  |                     |
| 100            | CQ2WB100-PS |                     |

\* Seal kit includes ①, ②, ⑬. Order the seal kit based on each bore size.

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

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



#### Air-hydro Type

| Bore size [mm] | Kit no.      | Contents            |
|----------------|--------------|---------------------|
| 20             | CQ2WBH20-PS  | Set of nos. ①, ②, ⑬ |
| 25             | CQ2WBH25-PS  |                     |
| 32             | CQ2WBH32-PS  |                     |
| 40             | CQ2WBH40-PS  |                     |
| 50             | CQ2WBH50-PS  |                     |
| 63             | CQ2WBH63-PS  |                     |
| 80             | CQ2WBH80-PS  |                     |
| 100            | CQ2WBH100-PS |                     |

\* Seal kit includes ①, ②, ⑬. Order the seal kit based on each bore size.

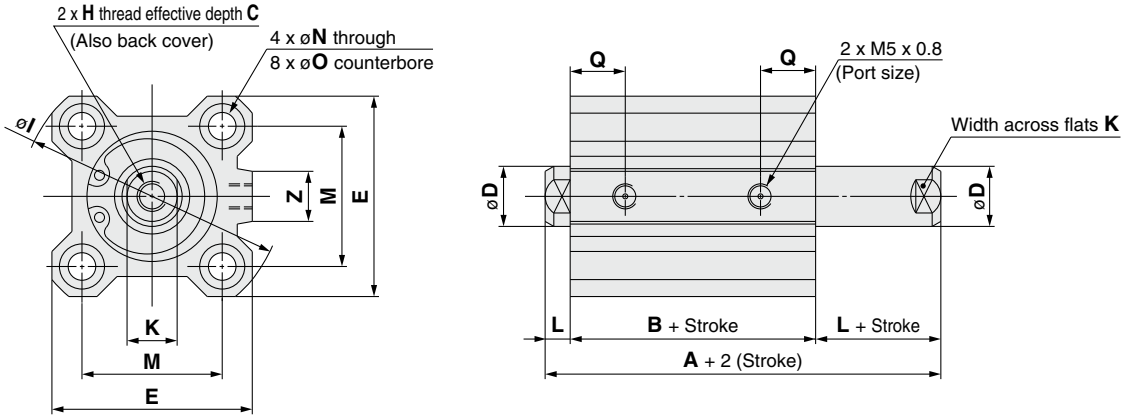
\* The seal kit does not include a grease pack. Order it separately.

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

Bore Size

**∅12 to ∅25** Without Auto Switch Magnet

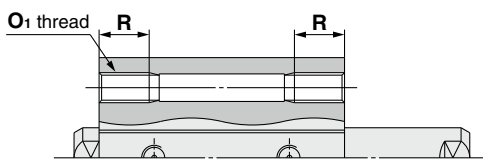
Through-hole: CQ2WB



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | H        | I  | K  | L   | M    | N   | O             | Q  | Z  |
|----------------|-------------------|------|------|----|----|----|----------|----|----|-----|------|-----|---------------|----|----|
| 12             | 5 to 30           | 32.2 | 25.2 | 6  | 6  | 25 | M3 x 0.5 | 32 | 5  | 3.5 | 15.5 | 3.5 | 6.5 depth 3.5 | 10 | —  |
| 16             | 5 to 30           | 33   | 26   | 8  | 8  | 29 | M4 x 0.7 | 38 | 6  | 3.5 | 20   | 3.5 | 6.5 depth 3.5 | 10 | 10 |
| 20             | 5 to 50           | 35   | 26   | 7  | 10 | 36 | M5 x 0.8 | 47 | 8  | 4.5 | 25.5 | 5.5 | 9 depth 7     | 8  | 10 |
| 25             | 5 to 50           | 39   | 29   | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 5   | 28   | 5.5 | 9 depth 7     | 9  | 10 |

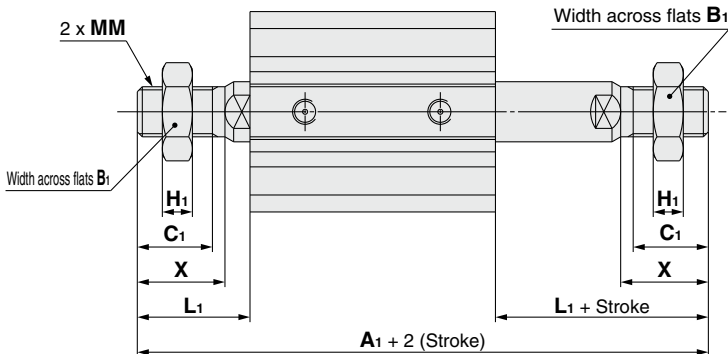
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of left and right width across flats are not constant.
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.

Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 12             | M4 x 0.7       | 7  |
| 16             | M4 x 0.7       | 7  |
| 20             | M6 x 1.0       | 10 |
| 25             | M6 x 1.0       | 10 |

Rod end male thread



| Bore size [mm] | A <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 53.2           | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 57             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 63             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 74             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Double Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2□S**

Long Stroke Double Acting, Single Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Axial Piping Single Acting, Single Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

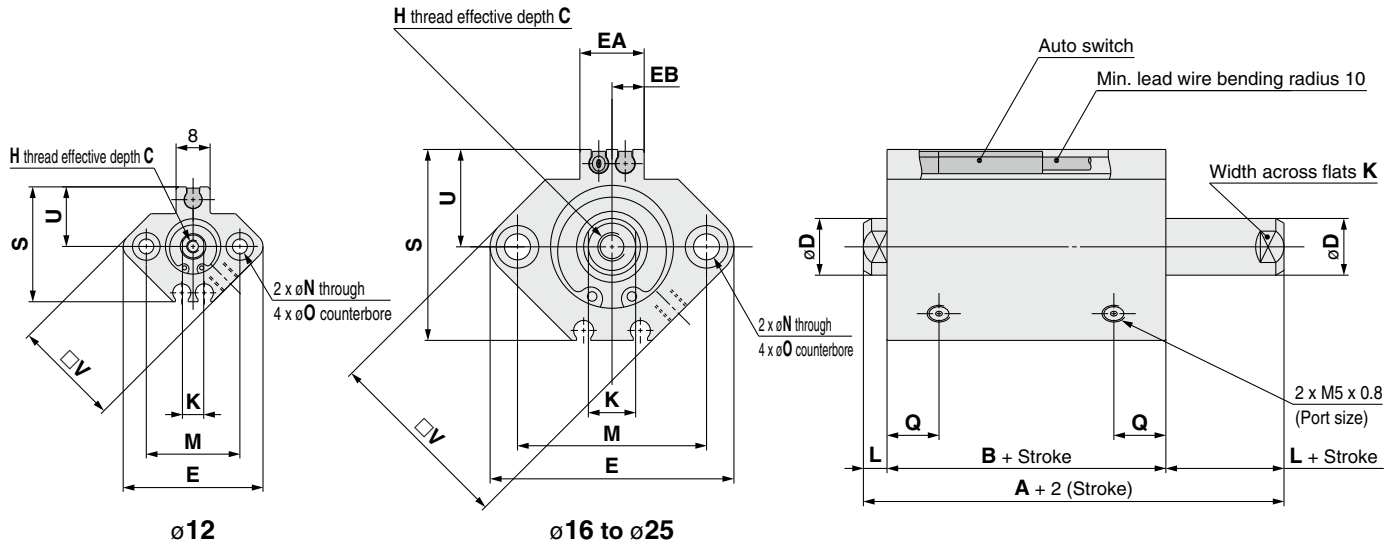
Made to Order

# CQ2W Series

Bore Size

## Ø12 to Ø25 With Auto Switch Magnet

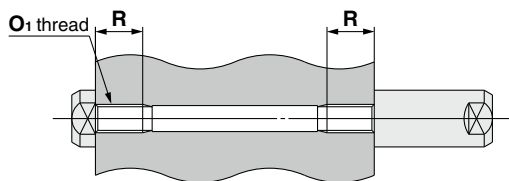
Through-hole: CDQ2WB



| Bore Size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | EA   | EB  | H        | K  | L   | M  | N   | O             | Q    | S    | U  | V  |
|----------------|-------------------|------|------|----|----|----|------|-----|----------|----|-----|----|-----|---------------|------|------|----|----|
| 12             | 5 to 30           | 39.4 | 32.4 | 6  | 6  | 33 | —    | —   | M3 x 0.5 | 5  | 3.5 | 22 | 3.5 | 6.5 depth 3.5 | 10.5 | 27.5 | 14 | 25 |
| 16             | 5 to 30           | 43   | 36   | 8  | 8  | 37 | 13.2 | 6.6 | M4 x 0.7 | 6  | 3.5 | 28 | 3.5 | 6.5 depth 3.5 | 10   | 29.5 | 15 | 29 |
| 20             | 5 to 50           | 47   | 38   | 7  | 10 | 47 | 13.6 | 6.8 | M5 x 0.8 | 8  | 4.5 | 36 | 5.5 | 9 depth 7     | 8    | 35.5 | 18 | 36 |
| 25             | 5 to 50           | 49   | 39   | 12 | 12 | 52 | 13.6 | 6.8 | M6 x 1.0 | 10 | 5   | 40 | 5.5 | 9 depth 7     | 9    | 40.5 | 21 | 40 |

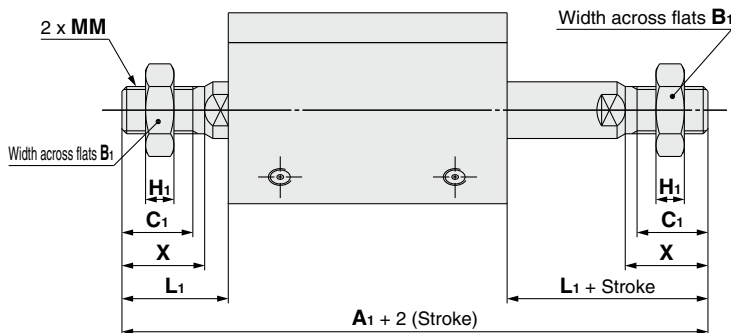
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of left and right width across flats are not constant.
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Both ends tapped



| Bore Size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 12             | M4 x 0.7       | 7  |
| 16             | M4 x 0.7       | 7  |
| 20             | M6 x 1.0       | 10 |
| 25             | M6 x 1.0       | 10 |

### Rod end male thread

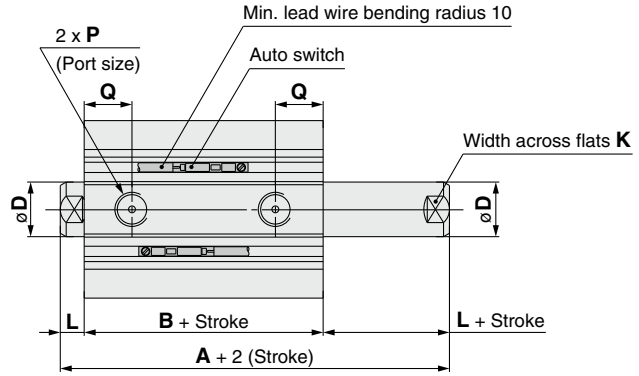
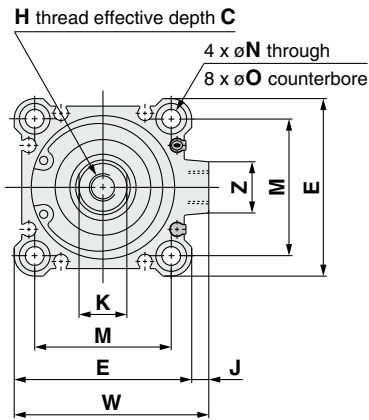


| Bore Size [mm] | A <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 60.4           | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 67             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 75             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 84             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |

Bore Size

**∅32 to ∅50** With/Without Auto Switch Magnet

Through-hole: **C□Q2WB**

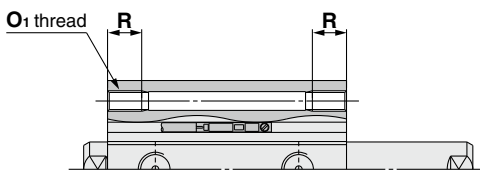


| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      |     | With auto switch magnet |      |     |
|----------------|-------------------|----------------------------|------|-----|-------------------------|------|-----|
|                |                   | A                          | B    | P   | A                       | B    | P   |
| 32             | 5                 | 44.5                       | 30.5 | M5  | 54.5                    | 40.5 | 1/8 |
|                | 10 to 50          |                            |      | 1/8 |                         |      |     |
|                | 75,100            | 54.5                       | 40.5 | 1/8 |                         |      |     |
| 40             | 5 to 50           | 54                         | 40   | 1/8 | 64                      | 50   | 1/8 |
|                | 75,100            | 64                         | 50   | 1/8 | 64                      | 50   | 1/8 |
| 50             | 10 to 50          | 56.5                       | 40.5 | 1/4 | 66.5                    | 50.5 | 1/4 |
|                | 75,100            | 66.5                       | 50.5 |     |                         |      |     |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of left and right width across flats are not constant.
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

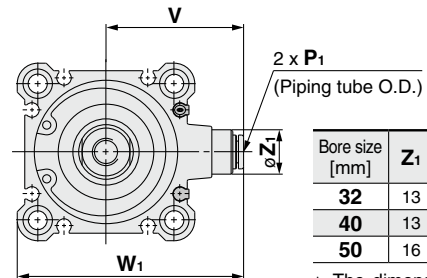
| Bore size [mm] | C  | D  | E  | H         | J   | K  | L | M  | N   | O          | Q    | W    | Z  |
|----------------|----|----|----|-----------|-----|----|---|----|-----|------------|------|------|----|
| 32             | 13 | 16 | 45 | M8 x 1.25 | 4.5 | 14 | 7 | 34 | 5.5 | 9 depth 7  | 10   | 49.5 | 14 |
| 40             | 13 | 16 | 52 | M8 x 1.25 | 5   | 14 | 7 | 40 | 5.5 | 9 depth 7  | 12.5 | 57   | 15 |
| 50             | 15 | 20 | 64 | M10 x 1.5 | 7   | 17 | 8 | 50 | 6.6 | 11 depth 8 | 14   | 71   | 19 |

**Both ends tapped**



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 32             | M6 x 1.0       | 10 |
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |

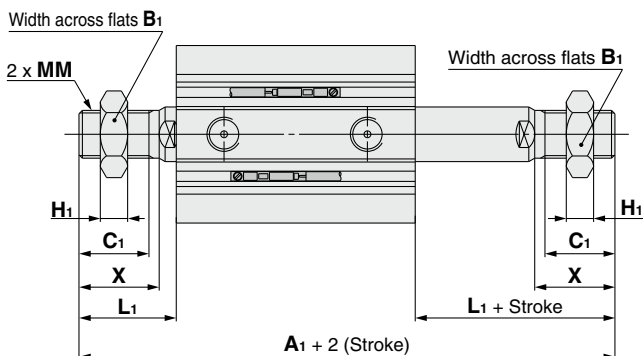
**Built-in One-touch fittings**



| Bore size [mm] | Z <sub>1</sub> | P <sub>1</sub> | V    | W <sub>1</sub> |
|----------------|----------------|----------------|------|----------------|
| 32             | 13             | 6              | 36.5 | 59             |
| 40             | 13             | 6              | 40.5 | 66             |
| 50             | 16             | 8              | 50   | 82             |

\* The dimensions of the ∅32-5 mm stroke with built-in One-touch fittings (without magnet) are the same as those of the 10 mm stroke cylinder tube.

**Rod end male thread**



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |  | With auto switch magnet |  |
|----------------|-------------------|----------------------------|--|-------------------------|--|
|                |                   | A <sub>1</sub>             |  | A <sub>1</sub>          |  |
| 32             | 5 to 50           | 87.5                       |  | 97.5                    |  |
|                | 75,100            | 97.5                       |  | 97.5                    |  |
| 40             | 5 to 50           | 97                         |  | 107                     |  |
|                | 75,100            | 107                        |  | 107                     |  |
| 50             | 10 to 50          | 107.5                      |  | 117.5                   |  |
|                | 75,100            | 117.5                      |  | 117.5                   |  |

| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 32             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Single Rod **CQ2**

Single Acting, Spring Return, Double Rod **CQ2W**

Large Bore Size Double Acting, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2□S**

Long Stroke Double Acting, Single Rod **CQ2**

Long Stroke Double Acting, Double Rod **CQ2W**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Single Acting, Single Rod **CQP2**

Axial Piping Single Acting, Double Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

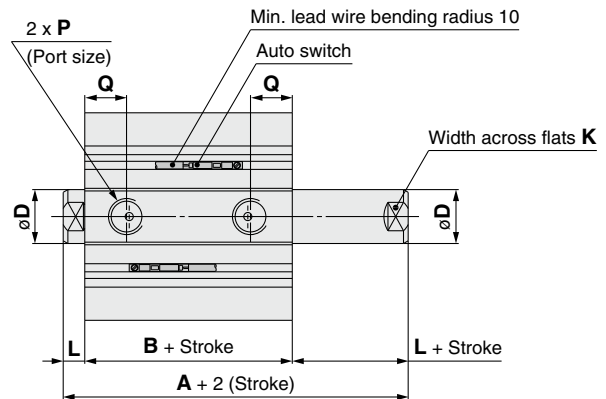
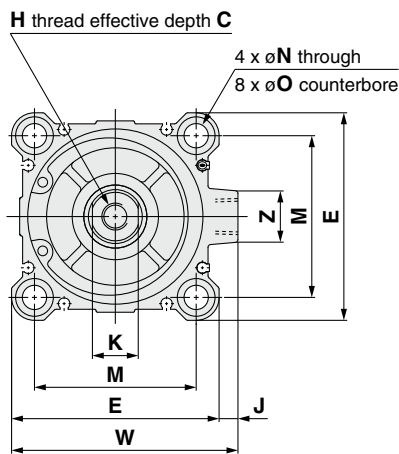
Made to Order

# CQ2W Series

Bore Size

## Ø63 to Ø100 With/Without Auto Switch Magnet

Through-hole: C□Q2WB



[mm]

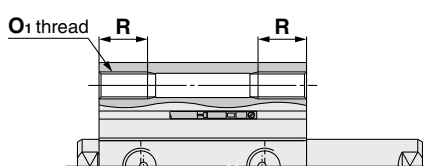
| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      |
|----------------|-------------------|----------------------------|------|-------------------------|------|
|                |                   | A                          | B    | A                       | B    |
| 63             | 10 to 50          | 58                         | 42   | 68                      | 52   |
|                | 75,100            | 68                         | 52   |                         |      |
| 80             | 10 to 50          | 71                         | 51   | 81                      | 61   |
|                | 75,100            | 81                         | 61   |                         |      |
| 100            | 10 to 50          | 84.5                       | 60.5 | 94.5                    | 70.5 |
|                | 75,100            | 94.5                       | 70.5 |                         |      |

| Bore size [mm] | C  | D  | E   | H         | J   | K  | L  | M  | N  | O               | P   | Q    | W     | Z  |
|----------------|----|----|-----|-----------|-----|----|----|----|----|-----------------|-----|------|-------|----|
| 63             | 15 | 20 | 77  | M10 x 1.5 | 7   | 17 | 8  | 60 | 9  | 14 depth 10.5   | 1/4 | 15.5 | 84    | 19 |
| 80             | 21 | 25 | 98  | M16 x 2.0 | 6   | 22 | 10 | 77 | 11 | 17.5 depth 13.5 | 3/8 | 18   | 104   | 25 |
| 100            | 27 | 30 | 117 | M20 x 2.5 | 6.5 | 27 | 12 | 94 | 11 | 17.5 depth 13.5 | 3/8 | 22   | 123.5 | 25 |

[mm]

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of left and right width across flats are not constant.
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

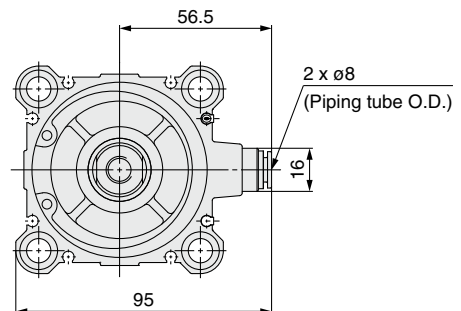
### Both ends tapped



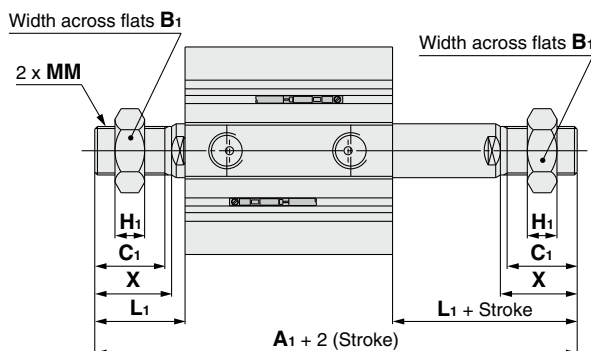
| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 63             | M10 x 1.5      | 18 |
| 80             | M12 x 1.75     | 22 |
| 100            | M12 x 1.75     | 22 |

[mm]

### Built-in One-touch fittings: Ø63



### Rod end male thread



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |                | With auto switch magnet |                |
|----------------|-------------------|----------------------------|----------------|-------------------------|----------------|
|                |                   | A <sub>1</sub>             | A <sub>1</sub> | A <sub>1</sub>          | A <sub>1</sub> |
| 63             | 10 to 50          | 109                        |                | 119                     |                |
|                | 75,100            | 119                        |                |                         |                |
| 80             | 10 to 50          | 138                        |                | 148                     |                |
|                | 75,100            | 148                        |                |                         |                |
| 100            | 10 to 50          | 147.5                      |                | 157.5                   |                |
|                | 75,100            | 157.5                      |                |                         |                |

[mm]

| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 63             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
| 80             | 32             | 32.5           | 13             | 43.5           | M22 x 1.5 | 35.5 |
| 100            | 41             | 32.5           | 16             | 43.5           | M26 x 1.5 | 35.5 |

[mm]

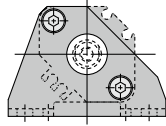


# CQ2 Series Accessory Brackets

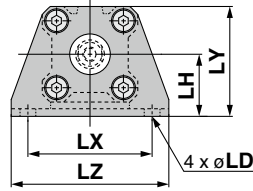
## Mounting Brackets

### Foot

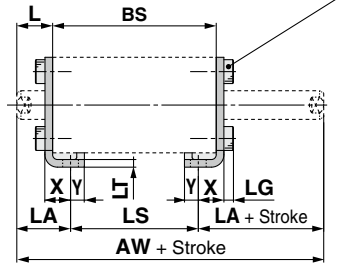
∅12 to ∅25 With auto switch magnet  
CQ-LZ□□



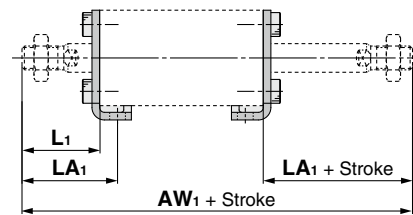
Without auto switch magnet  
CQ-L0□□



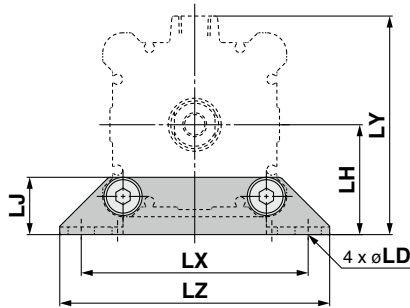
Hexagon socket head cap screw (Accessory)



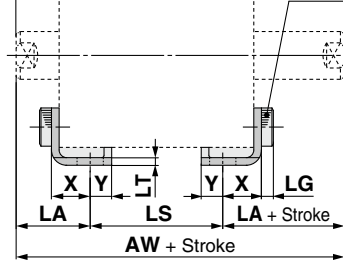
Rod end male thread



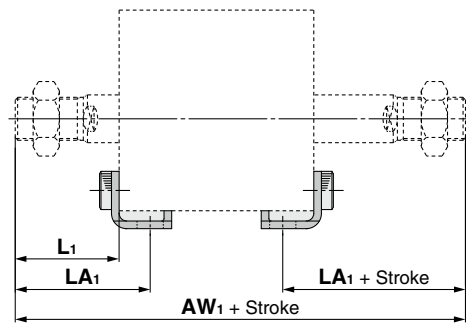
∅32 to ∅100



Hexagon socket head cap screw (Accessory)



Rod end male thread



\* The foot bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

| Bore size [mm] | Part no. | AW      | AW <sub>1</sub> | L    | L <sub>1</sub> | LA   | LA <sub>1</sub> | LD  | LG  | LH | LJ   | LS    | LT  | LX  | LY   | LZ  | X    | Y    |
|----------------|----------|---------|-----------------|------|----------------|------|-----------------|-----|-----|----|------|-------|-----|-----|------|-----|------|------|
| 12             | CQ-L012  | BS + 27 | BS + 48         | 13.5 | 24             | 19.5 | 30              | 4.5 | 2.8 | 17 | —    | BS-12 | 2   | 34  | 29.5 | 44  | 8    | 4.5  |
|                | CQ-LZ12  |         |                 |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 16             | CQ-L016  | BS + 27 | BS + 51         | 13.5 | 25.5           | 19.5 | 31.5            | 4.5 | 2.8 | 19 | —    | BS-12 | 2   | 38  | 33.5 | 48  | 8    | 5    |
|                | CQ-LZ16  |         |                 |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 20             | CQ-L020  | BS + 29 | BS + 57         | 14.5 | 28.5           | 20.5 | 34.5            | 6.6 | 4   | 24 | —    | BS-12 | 3.2 | 48  | 42   | 62  | 9.2  | 5.8  |
|                | CQ-LZ20  |         |                 |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 25             | CQ-L025  | BS + 30 | BS + 65         | 15   | 32.5           | 22.5 | 40              | 6.6 | 4   | 26 | —    | BS-15 | 3.2 | 52  | 46   | 66  | 10.7 | 5.8  |
|                | CQ-LZ25  |         |                 |      |                |      |                 |     |     |    |      |       |     |     |      |     |      |      |
| 32             | CQ-L032  | BS + 34 | BS + 77         | 17   | 38.5           | 25   | 46.5            | 6.6 | 4   | 30 | 18.5 | BS-16 | 3.2 | 57  | 57   | 71  | 11.2 | 5.8  |
| 40             | CQ-L040  | BS + 34 | BS + 77         | 17   | 38.5           | 25   | 46.5            | 6.6 | 4   | 33 | 18.5 | BS-16 | 3.2 | 64  | 64   | 78  | 11.2 | 7    |
| 50             | CQ-L050  | BS + 36 | BS + 87         | 18   | 43.5           | 29.5 | 55              | 9   | 5   | 39 | 21   | BS-23 | 3.2 | 79  | 78   | 95  | 14.7 | 8    |
| 63             | CQ-L063  | BS + 36 | BS + 87         | 18   | 43.5           | 31   | 56.5            | 11  | 5   | 46 | 24   | BS-26 | 3.2 | 95  | 91.5 | 113 | 16.2 | 9    |
| 80             | CQ-L080  | BS + 40 | BS + 107        | 20   | 53.5           | 35   | 68.5            | 13  | 7   | 59 | 31   | BS-30 | 4.5 | 118 | 114  | 140 | 19.5 | 11   |
| 100            | CQ-L100  | BS + 44 | BS + 107        | 22   | 53.5           | 39   | 70.5            | 13  | 7   | 71 | 36   | BS-34 | 6   | 137 | 136  | 162 | 23   | 12.5 |

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

|                   |                                     |         |
|-------------------|-------------------------------------|---------|
| Standard          | Double Acting, Single Rod           | CQ2     |
| Standard          | Double Acting, Double Rod           | CQ2W    |
| Standard          | Single Acting, Spring Return-Extend | CQ2     |
| Large Bore Size   | Double Acting, Single Rod           | CQ2     |
| Large Bore Size   | Double Acting, Double Rod           | CQ2W    |
| Anti-lateral Load | Double Acting, Single Rod           | CQ2□S   |
| Long Stroke       | Double Acting, Single Rod           | CQ2     |
| Non-rotating Rod  | Double Acting, Single Rod           | CQ2K    |
| Non-rotating Rod  | Double Acting, Double Rod           | CQ2KW   |
| Water Resistant   | Double Acting, Single Rod           | CQ2-RV  |
| Water Resistant   | Double Acting, Double Rod           | CQ2W-RV |
| Axial Piping      | Double Acting, Single Rod           | CQP2    |
| Axial Piping      | Single Acting, Spring Return-Extend | CQP2    |
| With End Lock     | Double Acting, Single Rod           | CBQ2    |
| Auto Switch       |                                     |         |
| Made to Order     |                                     |         |

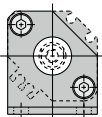
# CQ2 Series

## Mounting Brackets

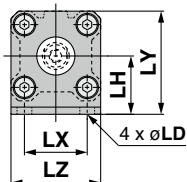
### Compact foot

ø12 to ø25

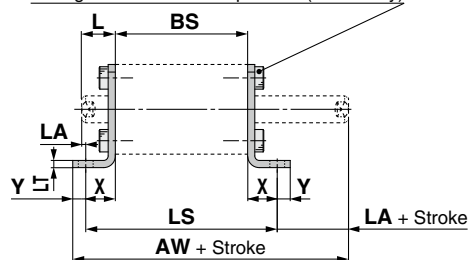
With auto switch magnet  
CQ-LCZ□□



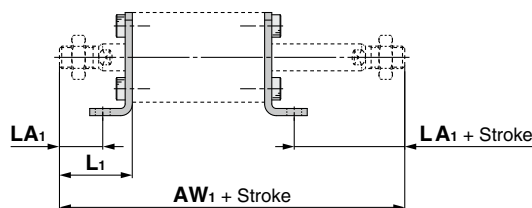
Without auto switch magnet  
CQ-LC0□□



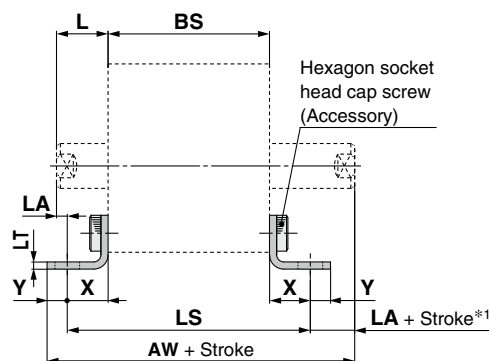
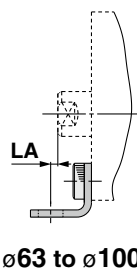
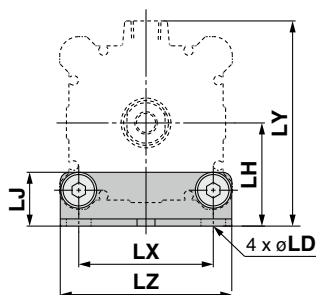
Hexagon socket head cap screw (Accessory)



### Rod end male thread

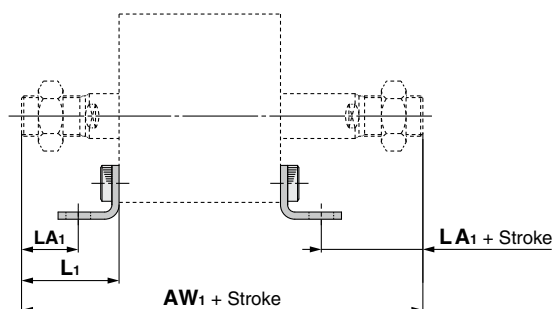


ø32 to ø100



\*1 For ø63 to ø100: Stroke - LA

### Rod end male thread



\* The compact foot bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

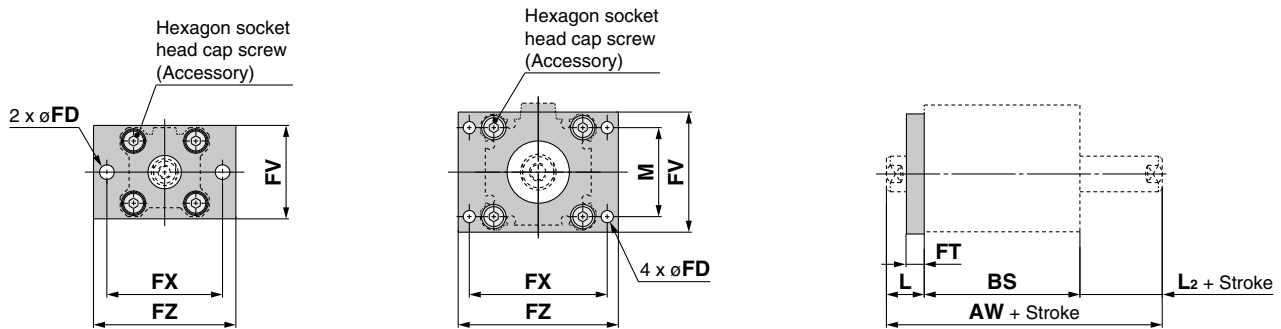
| Bore size [mm] | Part no. | AW          | AW <sub>1</sub> | L    | L <sub>1</sub> | LA  | LA <sub>1</sub> | LD  | LH | LJ   | LS        | LT  | LX   | LY   | LZ  | X    | Y    |
|----------------|----------|-------------|-----------------|------|----------------|-----|-----------------|-----|----|------|-----------|-----|------|------|-----|------|------|
| 12             | CQ-LC012 | BS + 27.3   | BS + 48         | 13.5 | 24             | 4.2 | 14.7            | 4.5 | 17 | —    | BS + 18.6 | 2   | 15.5 | 29.5 | 25  | 9.3  | 4.5  |
|                | CQ-LCZ12 |             |                 |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 16             | CQ-LC016 | BS + 27.8   | BS + 51         | 13.5 | 25.5           | 4.2 | 16.2            | 4.5 | 19 | —    | BS + 18.6 | 2   | 20   | 33.5 | 29  | 9.3  | 5    |
|                | CQ-LCZ16 |             |                 |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 20             | CQ-LC020 | BS + 33.5   | BS + 57         | 14.5 | 28.5           | 1.3 | 15.3            | 6.6 | 24 | —    | BS + 26.4 | 3.2 | 25.5 | 42   | 36  | 13.2 | 5.8  |
|                | CQ-LCZ20 |             |                 |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 25             | CQ-LC025 | BS + 34     | BS + 65         | 15   | 32.5           | 1.8 | 19.3            | 6.6 | 26 | —    | BS + 26.4 | 3.2 | 28   | 46   | 40  | 13.2 | 5.8  |
|                | CQ-LCZ25 |             |                 |      |                |     |                 |     |    |      |           |     |      |      |     |      |      |
| 32             | CQ-LC032 | BS + 36.5   | BS + 77         | 17   | 38.5           | 3.3 | 24.8            | 6.6 | 30 | 18.5 | BS + 27.4 | 3.2 | 34   | 57   | 45  | 13.7 | 5.8  |
| 40             | CQ-LC040 | BS + 37.7   | BS + 77         | 17   | 38.5           | 3.3 | 24.8            | 6.6 | 33 | 18.5 | BS + 27.4 | 3.2 | 40   | 64   | 52  | 13.7 | 7    |
| 50             | CQ-LC050 | BS + 42.7   | BS + 87         | 18   | 43.5           | 1.3 | 26.8            | 9   | 39 | 21   | BS + 33.4 | 3.2 | 50   | 78   | 64  | 16.7 | 8    |
| 63             | CQ-LC063 | BS + 45.2   | BS + 87         | 18   | 43.5           | 0.2 | 25.3            | 11  | 46 | 24   | BS + 36.4 | 3.2 | 60   | 91.5 | 77  | 18.2 | 9    |
| 80             | CQ-LC080 | BS + 53.5*1 | BS + 107        | 20   | 53.5           | 2.5 | 31              | 13  | 59 | 31   | BS + 45   | 4.5 | 77   | 114  | 98  | 22.5 | 11   |
| 100            | CQ-LC100 | BS + 58.5*1 | BS + 107        | 22   | 53.5           | 2   | 29.5            | 13  | 71 | 36   | BS + 48   | 6   | 94   | 136  | 117 | 24   | 12.5 |

\*1 For ø80 and ø100 sizes with a stroke of 10 mm or less, the dimensions of "AW + Stroke" are BS + 67 and BS + 73 respectively.

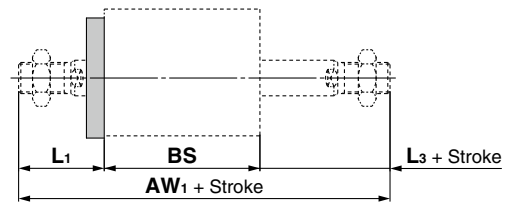
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

## Mounting Brackets

### Flange



### Rod end male thread



\* The flange bracket cannot be retrofitted for through-hole mounting (B).

\* BS indicates the overall length of the cylinder tube to be used.

| [mm]           |          |         |                 |     |     |     |     |     |      |                |                |                |    |
|----------------|----------|---------|-----------------|-----|-----|-----|-----|-----|------|----------------|----------------|----------------|----|
| Bore size [mm] | Part no. | AW      | AW <sub>1</sub> | FD  | FT  | FV  | FX  | FZ  | L    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | M  |
| 12             | CQ-F012  | BS + 17 | BS + 38         | 4.5 | 5.5 | 25  | 45  | 55  | 13.5 | 24             | 3.5            | 14             | —  |
| 16             | CQ-F016  | BS + 17 | BS + 41         | 4.5 | 5.5 | 30  | 45  | 55  | 13.5 | 25.5           | 3.5            | 15.5           | —  |
| 20             | CQ-F020  | BS + 19 | BS + 47         | 6.6 | 8   | 39  | 48  | 60  | 14.5 | 28.5           | 4.5            | 18.5           | —  |
| 25             | CQ-F025  | BS + 20 | BS + 55         | 6.6 | 8   | 42  | 52  | 64  | 15   | 32.5           | 5              | 22.5           | —  |
| 32             | CQ-F032  | BS + 24 | BS + 67         | 5.5 | 8   | 48  | 56  | 65  | 17   | 38.5           | 7              | 28.5           | 34 |
| 40             | CQ-F040  | BS + 24 | BS + 67         | 5.5 | 8   | 54  | 62  | 72  | 17   | 38.5           | 7              | 28.5           | 40 |
| 50             | CQ-F050  | BS + 26 | BS + 77         | 6.6 | 9   | 67  | 76  | 89  | 18   | 43.5           | 8              | 33.5           | 50 |
| 63             | CQ-F063  | BS + 26 | BS + 77         | 9   | 9   | 80  | 92  | 108 | 18   | 43.5           | 8              | 33.5           | 60 |
| 80             | CQ-F080  | BS + 30 | BS + 97         | 11  | 11  | 99  | 116 | 134 | 20   | 53.5           | 10             | 43.5           | 77 |
| 100            | CQ-F100  | BS + 34 | BS + 97         | 11  | 11  | 117 | 136 | 154 | 22   | 53.5           | 12             | 43.5           | 94 |

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

|                   |                                   |                      |
|-------------------|-----------------------------------|----------------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2□S</b>         |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>           |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-RV</b>        |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-RV</b>       |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>          |
| Auto Switch       |                                   | <b>Auto Switch</b>   |
| Made to Order     |                                   | <b>Made to Order</b> |

# Compact Cylinder: Standard Single Acting, Single Rod

## CQ2 Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50

### How to Order

Without auto switch  
ø12 to ø25

CQ2 B 20 □ - 10 S □ - □ □ - □ □

Without auto switch  
ø32 to ø50

CQ2 B 32 □ - 10 S □ Z - □ □ - □ □

With auto switch

CDQ2 B 32 □ - 10 S M Z - L W - M9BW □ - □ □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

#### With auto switch magnet

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

#### ① Mounting

|    |                  |
|----|------------------|
| B  | Through-hole     |
| A  | Both ends tapped |
| L  | Foot             |
| LC | Compact foot     |
| F  | Rod flange       |
| G  | Head flange      |
| D  | Double clevis    |

- \* Mounting brackets are shipped together with the product but do not come assembled.
- \* Refer to ⑧ for the through-hole type mounting bolt.

#### ④ Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size              | Standard stroke |
|------------------------|-----------------|
| 12, 16, 20, 25, 32, 40 | 5, 10           |
| 50                     | 10, 20          |

- \* For the manufacturing of intermediate strokes ⇨ p. 45

#### ② Bore size

|    |       |
|----|-------|
| 12 | 12 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |
| 50 | 50 mm |

#### ⑤ Action

|   |                              |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

#### ③ Port thread type

|     |                               |            |
|-----|-------------------------------|------------|
| Nil | M thread                      | ø12 to ø25 |
|     | Rc                            | ø32 to ø50 |
| TN  | NPT                           |            |
| TF  | G                             |            |
| F   | Built-in One-touch fittings*1 |            |

- \*1 The bore sizes available with One-touch fittings are ø32 to ø50.

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

#### ⑥ Body option

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| F   | With boss on head end |
| M   | Rod end male thread   |

- \* Combined body options "FM" can be selected.

#### ⑦ Auto switch mounting groove

|   |            |            |
|---|------------|------------|
| Z | ø12 to ø25 | 2 surfaces |
|   | ø32 to ø50 | 4 surfaces |

#### ⑧ Through-hole type mounting bolt

|     |                  |
|-----|------------------|
| Nil | None             |
| L   | Shipped together |

- \* Mounting bolt is shipped together with the product only when the mounting bracket is "B" (Through-hole).

- \* When a made-to-order option is selected for ⑫, the mounting bolt is not shipped together with the product. Please order it separately. For details ⇨ p. 48

#### ⑨ Rod end bracket (⇨ p. 26, 27)

|     |                             |
|-----|-----------------------------|
| Nil | None                        |
| D   | Simple joint A type + Joint |
| E   | Simple joint B type + Joint |
| V   | Single knuckle joint        |
| W   | Double knuckle joint        |

- \* The single knuckle joint and double knuckle joint cannot be mounted on the rod end female thread type.

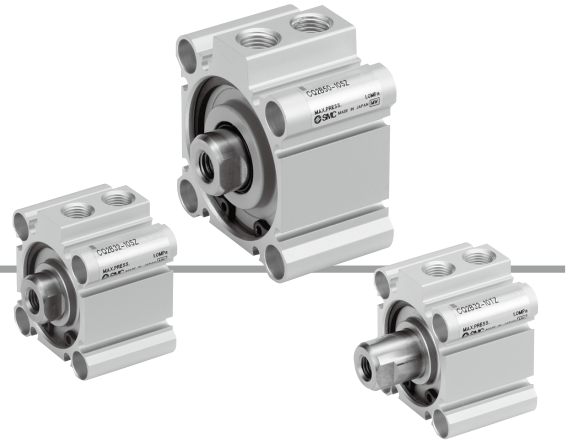
- \* A knuckle joint pin is not provided with the single knuckle joint.

- \* The simple joint A and B types cannot be mounted on the rod end male thread type.

- \* The rod end bracket is shipped together with the product.

- \* The bore sizes available with the simple joint (D and E) are ø32 to ø50.

- \* When a made-to-order option is selected, the rod end bracket cannot be selected. Please order it separately. For details ⇨ p. 26, 27



**10 Auto switch**

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

**11 Number of auto switches**

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

**12 Made to order common specifications**

For details ⇨ p. 45

**Cylinder Model with Auto Switch Magnet**

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDQ2L32-10SZ

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

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

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

| Type                    | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |                 | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |            |
|-------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|-----------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|------------|
|                         |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line         | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | Relay, PLC      | —          |            |            |
| Solid state auto switch | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | <b>M9NV</b>     | <b>M9N</b>           | ●     | ●     | ●     | ○        | —                   |                 |            | ○          | IC circuit |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PV</b>     | <b>M9P</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BV</b>     | <b>M9B</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|                         | Diagnostic indication (2-color indicator) |                  |                 | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | <b>M9NWV</b>    | <b>M9NW</b>          | ●     | ●     | ●     | ○        | —                   | ○               | ○          | IC circuit | Relay, PLC |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PWV</b>    | <b>M9PW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9B WV</b>   | <b>M9BW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|                         | Water resistant (2-color indicator)       |                  |                 | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | <b>M9NAV</b> *1 | <b>M9NA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               | ○          | IC circuit | —          |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PAV</b> *1 | <b>M9PA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |            |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BAV</b> *1 | <b>M9BA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |            |            |
| Reed auto switch        | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V             | <b>A96V</b>     | <b>A96</b>           | ●     | ●     | ●     | —        | —                   | ○               | IC circuit | Relay, PLC |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | <b>A93V</b> *2  | <b>A93</b>           | ●     | ●     | ●     | —        | —                   | —               | —          |            | —          |
|                         |   |                  | No              | 2-wire                  | 24 V         | 5 V, 12 V | 100 V or less     | <b>A90V</b>     | <b>A90</b>           | ●     | —     | ●     | —        | —                   | —               | —          | IC circuit |            |

\*1 Water-resistant type auto switches can be mounted on the models on page 43, but SMC cannot guarantee water resistance. Please contact SMC regarding water-resistant types with the model numbers on page 43.

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
 1 m ..... M (Example) M9NW  
 3 m ..... L (Example) M9NL  
 5 m ..... Z (Example) M9NZ

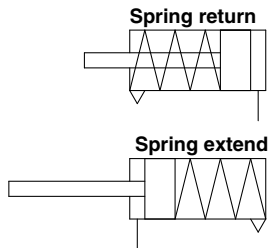
\* Solid state auto switches marked with "○" are produced upon receipt of order.

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

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, End **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Double Acting, Single Rod **CQ2**  
 Anti-lateral Load Double Acting, Single Rod **CQ2S**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2K**  
 Water Resistant Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, End **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

# CQ2 Series

## Symbol



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

| Symbol  | Specifications   |
|---------|--|
| -XA□    | Change of rod end shape, spring return type only                                 |
| -XB10   | Intermediate stroke (Using exclusive body), Spring return type only              |
| -XC2(A) | Rod end length increased by 10 mm (For foot and flange bracket)                  |
| -XC6    | Piston rod/Retaining ring/Rod end nut material: Stainless steel                  |
| -XC26   | With split pins for double clevis pin/ double knuckle joint pin and flat washers |
| -XC27   | Double clevis pin/Double knuckle joint pin material: Stainless steel 304         |
| -XC36   | With boss on rod end   |
| -XC85   | Grease for food processing equipment   |
| -X144   | Special port location, with auto switch  |
| -X202   | Same full length dimension as the CQ1 series                                     |
| -X203   | Same L dimension from the rod cover as the CQ1 series                            |
| -X271   | Fluororubber seals   |
| -X1876  | Cylinder tube: With concave boss on head end                                     |

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

### Moisture Control Tube IDK Series



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

## ⚠ Precautions

**Refer to page 189 before handling the products.**

## Specifications

| Bore size [mm]                          | 12  | 16    | 20    | 25   | 32   | 40   | 50   |
|---|---|-------|-------|------|------|------|------|
| <b>Action</b>                           | Single acting, Single rod   |       |       |      |      |      |      |
| <b>Fluid</b>                            | Air   |       |       |      |      |      |      |
| <b>Proof pressure</b>                   | 1.5 MPa   |       |       |      |      |      |      |
| <b>Maximum operating pressure</b>       | 1.0 MPa   |       |       |      |      |      |      |
| <b>Minimum operating pressure [MPa]</b> | 0.25  | 0.25  | 0.18  | 0.18 | 0.17 | 0.15 | 0.13 |
| <b>Ambient and fluid temperatures</b>   | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |       |       |      |      |      |      |
| <b>Lubrication</b>                      | Not required (Non-lube)   |       |       |      |      |      |      |
| <b>Piston speed</b>                     | 50 to 500 mm/s  |       |       |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>     | 0.022   | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 |
| <b>Stroke length tolerance</b>          | +1.0 mm<br>0  |       |       |      |      |      |      |

## Manufacturing of Intermediate Strokes (Except single acting, spring return type)

| Type         | A spacer is installed in the standard stroke body.   |              |
|--------------|--|--------------|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 43)                                 |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder. |              |
| Stroke range | Bore size  | Stroke range |
|              | 12 to 40   | 1 to 9       |
|              | 50   | 1 to 19      |
| Example      | Part no.: CQ2B20-3T<br>CQ2B20-5T with 2 mm width spacer inside<br>The B dimension is 24.5 mm.    |              |

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1                     | Compact foot*1 | Flange   | Double clevis | Double clevis pivot bracket |         |
|----------------|----------------------------|----------------|----------|---------------|-----------------------------|---------|
| 12             | Without auto switch magnet | CQ-L012        | CQ-LC012 | CQ-F012       | CQ-D012                     | CQ-C012 |
|                | With auto switch magnet    | CQ-LZ12        | CQ-LCZ12 |               |                             |         |
| 16             | Without auto switch magnet | CQ-L016        | CQ-LC016 | CQ-F016       | CQ-D016                     | CQ-C016 |
|                | With auto switch magnet    | CQ-LZ16        | CQ-LCZ16 |               |                             |         |
| 20             | Without auto switch magnet | CQ-L020        | CQ-LC020 | CQ-F020       | CQ-D020                     | CQ-C020 |
|                | With auto switch magnet    | CQ-LZ20        | CQ-LCZ20 |               |                             |         |
| 25             | Without auto switch magnet | CQ-L025        | CQ-LC025 | CQ-F025       | CQ-D025                     | CQ-C025 |
|                | With auto switch magnet    | CQ-LZ25        | CQ-LCZ25 |               |                             |         |
| 32             | CQ-L032                    | CQ-LC032       | CQ-F032  | CQ-D032       | CQ-C032                     |         |
| 40             | CQ-L040                    | CQ-LC040       | CQ-F040  | CQ-D040       | CQ-C040                     |         |
| 50             | CQ-L050                    | CQ-LC050       | CQ-F050  | CQ-D050       | CQ-C050                     |         |

- \*1 When ordering foot and compact foot brackets, the required quantity will be different depending on the bore size.  
 ø12 to ø25:  
 · Without auto switch magnet: Order 2 pieces per cylinder.  
 · With auto switch magnet: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)  
 ø32 to ø50:  
 · Order 2 pieces per cylinder.
- \* Parts included with each type of bracket are as follows.  
 Foot, Compact foot, Flange: Body mounting bolts  
 Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts
- \* For details on accessory brackets (Options) ⇨ p. 21 to 27
- \* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).

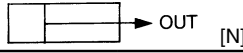
## Dimensions of Each Mounting Bracket

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



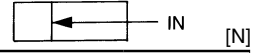
## Theoretical Output

### Single Acting, Spring Return



| Bore size [mm] | Operating direction | Operating pressure [MPa] |     |      |
|----------------|---------------------|--------------------------|-----|------|
|                |                     | 0.3                      | 0.5 | 0.7  |
| 12             | OUT                 | 21                       | 44  | 66   |
| 16             |                     | 45                       | 86  | 126  |
| 20             |                     | 79                       | 142 | 205  |
| 25             |                     | 126                      | 224 | 323  |
| 32             |                     | 211                      | 372 | 533  |
| 40             |                     | 338                      | 589 | 841  |
| 50             |                     | 535                      | 928 | 1316 |

### Single Acting, Spring Extend



| Bore size [mm] | Operating direction | Operating pressure [MPa] |     |      |
|----------------|---------------------|--------------------------|-----|------|
|                |                     | 0.3                      | 0.5 | 0.7  |
| 12             | IN                  | 14                       | 31  | 48   |
| 16             |                     | 24                       | 54  | 85   |
| 20             |                     | 44                       | 91  | 138  |
| 25             |                     | 84                       | 160 | 235  |
| 32             |                     | 152                      | 273 | 393  |
| 40             |                     | 288                      | 499 | 710  |
| 50             |                     | 412                      | 742 | 1072 |

## Spring Force

### Single Acting, Spring Return

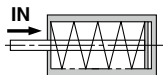
| Bore size [mm] | Stroke [mm] | Spring reaction force [N] |       |
|----------------|-------------|---------------------------|-------|
|                |             | Second                    | First |
| 12             | 5           | 13                        | 8.6   |
|                | 10          | 13                        | 3.9   |
| 16             | 5           | 15                        | 10.3  |
|                | 10          | 15                        | 5.9   |
| 20             | 5           | 15                        | 10    |
|                | 10          | 15                        | 5.9   |
| 25             | 5           | 20                        | 16    |
|                | 10          | 20                        | 11    |
| 32             | 5           | 30                        | 23    |
|                | 10          | 30                        | 16    |
| 40             | 5           | 30                        | 13    |
|                | 10          | 39                        | 21    |
| 50             | 10          | 50                        | 30    |
|                | 20          | 54                        | 24    |

### Single Acting, Spring Extend

| Bore size [mm] | Stroke [mm] | Spring reaction force [N] |       |
|----------------|-------------|---------------------------|-------|
|                |             | Second                    | First |
| 12             | 5           | 11                        | 2.9   |
|                | 10          | 9.7                       | 2.8   |
| 16             | 5           | 20                        | 3.9   |
|                | 10          | 20                        | 3.9   |
| 20             | 5           | 27                        | 5.3   |
|                | 10          | 27                        | 5.9   |
| 25             | 5           | 29                        | 9.8   |
|                | 10          | 29                        | 9.8   |
| 32             | 5           | 29                        | 20    |
|                | 10          | 29                        | 20    |
| 40             | 5           | 29                        | 20    |
|                | 10          | 29                        | 20    |
| 50             | 10          | 83                        | 24    |
|                | 20          | 83                        | 24    |

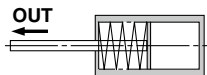
### Single acting, Spring return

- First spring state



When spring is set in cylinder

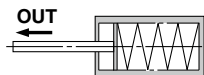
- Second spring state



When spring is compressed with air

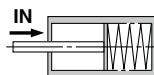
### Single acting, Spring extend

- First spring state



When spring is set in cylinder

- Second spring state



When spring is compressed with air

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Single Rod **CQ2**

Large Bore Size Double Acting, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2**

Anti-lateral Load Double Acting, Double Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Long Stroke Double Acting, Double Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Double Acting, Single Rod **CQP2**

Axial Piping Double Acting, Double Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

Made to Order

# CQ2 Series

## Weight

### Without Auto Switch Magnet

#### Spring Return

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 29                   | 35  | —   |
| 16             | 42                   | 51  | —   |
| 20             | 63                   | 76  | —   |
| 25             | 87                   | 101 | —   |
| 32             | 125                  | 145 | —   |
| 40             | 196                  | 217 | —   |
| 50             | —                    | 357 | 426 |

#### Spring Extend

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 29                   | 35  | —   |
| 16             | 43                   | 50  | —   |
| 20             | 67                   | 78  | —   |
| 25             | 92                   | 104 | —   |
| 32             | 135                  | 151 | —   |
| 40             | 206                  | 223 | —   |
| 50             | —                    | 374 | 429 |

### Additional Weight

[g]

| Bore size [mm]  |             | 12  | 16  | 20  | 25  | 32  | 40  | 50   |
|---|-------------|-----|-----|-----|-----|-----|-----|------|
| Both ends tapped                                      |             | 2   | 2   | 6   | 6   | 6   | 6   | 6    |
| Rod end male thread                                   | Male thread | 1.5 | 3   | 6   | 12  | 26  | 27  | 53   |
|   | Nut         | 1   | 2   | 4   | 8   | 17  | 17  | 32   |
| With boss on head end                                 |             | 0.7 | 1.3 | 2   | 3   | 5   | 7   | 13   |
| Built-in One-touch fittings                           |             | —   | —   | —   | —   | 6   | 6   | 10.5 |
| Foot (Including mounting bolts)                       |             | 50  | 62  | 150 | 175 | 120 | 138 | 219  |
| Compact foot (Including mounting bolts)               |             | 37  | 46  | 115 | 134 | 94  | 109 | 172  |
| Rod flange (Including mounting bolts)                 |             | 57  | 69  | 139 | 161 | 180 | 214 | 373  |
| Head flange (Including mounting bolts)                |             | 54  | 65  | 133 | 152 | 165 | 198 | 348  |
| Double clevis (Including pin, retaining rings, bolts) |             | 32  | 39  | 88  | 123 | 151 | 196 | 393  |

Calculation: (Example) **CQ2D32-10SMZ**

- Basic weight: CQ2B32-10SZ ..... 145 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 345 g

### With Auto Switch Magnet

#### Spring Return

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 44                   | 49  | —   |
| 16             | 64                   | 72  | —   |
| 20             | 97                   | 109 | —   |
| 25             | 135                  | 150 | —   |
| 32             | 182                  | 202 | —   |
| 40             | 269                  | 290 | —   |
| 50             | —                    | 456 | 521 |

#### Spring Extend

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 49                   | 65  | —   |
| 16             | 63                   | 71  | —   |
| 20             | 110                  | 119 | —   |
| 25             | 149                  | 163 | —   |
| 32             | 192                  | 208 | —   |
| 40             | 279                  | 296 | —   |
| 50             | —                    | 486 | 540 |

### Additional Weight

[g]

| Bore size [mm]  |             | 12  | 16  | 20  | 25  | 32  | 40  | 50   |
|---|-------------|-----|-----|-----|-----|-----|-----|------|
| Both ends tapped                                      |             | 1   | 1   | 3   | 3   | 6   | 6   | 6    |
| Rod end male thread                                   | Male thread | 1.5 | 3   | 6   | 12  | 26  | 27  | 53   |
|   | Nut         | 1   | 2   | 4   | 8   | 17  | 17  | 32   |
| With boss on head end                                 |             | 0.7 | 1.3 | 2   | 3   | 5   | 7   | 13   |
| Built-in One-touch fittings                           |             | —   | —   | —   | —   | 6   | 6   | 10.5 |
| Foot (Including mounting bolts)                       |             | 41  | 53  | 126 | 149 | 120 | 138 | 219  |
| Compact foot (Including mounting bolts)               |             | 30  | 38  | 94  | 113 | 94  | 109 | 172  |
| Rod flange (Including mounting bolts)                 |             | 54  | 67  | 131 | 153 | 180 | 214 | 373  |
| Head flange (Including mounting bolts)                |             | 52  | 63  | 124 | 144 | 165 | 198 | 348  |
| Double clevis (Including pin, retaining rings, bolts) |             | 29  | 35  | 78  | 114 | 151 | 196 | 393  |

Calculation: (Example) **CDQ2D32-10SMZ**

- Basic weight: CDQ2B32-10SZ ..... 202 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 43 g
  - Double clevis ..... 151 g
- 402 g

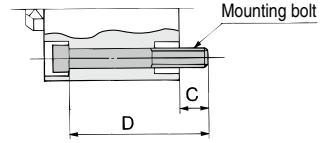
Add each weight of auto switches when auto switches are mounted.

### Through-hole Type Mounting Bolt for the CQ2: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2B is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

**Example) CQ-M3 x 25L 4 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



#### Spring Return

| Cylinder model     | C    | D  | Mounting bolt part no. |
|--------------------|------|----|------------------------|
| <b>CQ2B12-5S</b>   | 6.5  | 25 | CQ-M3 x 25L            |
| <b>-10S</b>        |      | 30 | x 30L                  |
| <b>CQ2B16-5S</b>   | 5    | 25 | CQ-M3 x 25L            |
| <b>-10S</b>        |      | 30 | x 30L                  |
| <b>CQ2B20-5S</b>   | 7.5  | 25 | CQ-M5 x 25L            |
| <b>-10S</b>        |      | 30 | x 30L                  |
| <b>CQ2B25-5S</b>   | 9.5  | 30 | CQ-M5 x 30L            |
| <b>-10S</b>        |      | 35 | x 35L                  |
| <b>CQ2B32-5SZ</b>  | 9    | 30 | CQ-M5 x 30L            |
| <b>-10SZ</b>       |      | 35 | x 35L                  |
| <b>CQ2B40-5SZ</b>  | 7.5  | 35 | CQ-M5 x 35L            |
| <b>-10SZ</b>       |      | 40 | x 40L                  |
| <b>CQ2B50-10SZ</b> | 12.5 | 45 | CQ-M6 x 45L            |
| <b>-20SZ</b>       |      | 55 | x 55L                  |

#### Spring Extend

| Cylinder model     | C    | D  | Mounting bolt part no. |
|--------------------|------|----|------------------------|
| <b>CQ2B12-5T</b>   | 6.5  | 25 | CQ-M3 x 25L            |
| <b>-10T</b>        |      | 30 | x 30L                  |
| <b>CQ2B16-5T</b>   | 5    | 25 | CQ-M3 x 25L            |
| <b>-10T</b>        |      | 30 | x 30L                  |
| <b>CQ2B20-5T</b>   | 7.5  | 25 | CQ-M5 x 25L            |
| <b>-10T</b>        |      | 30 | x 30L                  |
| <b>CQ2B25-5T</b>   | 9.5  | 30 | CQ-M5 x 30L            |
| <b>-10T</b>        |      | 35 | x 35L                  |
| <b>CQ2B32-5TZ</b>  | 9    | 30 | CQ-M5 x 30L            |
| <b>-10TZ</b>       |      | 35 | x 35L                  |
| <b>CQ2B40-5TZ</b>  | 7.5  | 35 | CQ-M5 x 35L            |
| <b>-10TZ</b>       |      | 40 | x 40L                  |
| <b>CQ2B50-10TZ</b> | 12.5 | 45 | CQ-M6 x 45L            |
| <b>-20TZ</b>       |      | 55 | x 55L                  |

### Through-hole Type Mounting Bolt for the CDQ2: With Auto Switch Magnet

#### Spring Return

| Cylinder model      | C    | D  | Mounting bolt part no. |
|---------------------|------|----|------------------------|
| <b>CDQ2B12-5SZ</b>  | 5.5  | 35 | CQ-M3 x 35L            |
| <b>-10SZ</b>        |      | 40 | x 40L                  |
| <b>CDQ2B16-5SZ</b>  | 8    | 40 | CQ-M3 x 40L            |
| <b>-10SZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B20-5SZ</b>  | 10.5 | 40 | CQ-M5 x 40L            |
| <b>-10SZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B25-5SZ</b>  | 9.5  | 40 | CQ-M5 x 40L            |
| <b>-10SZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B32-5SZ</b>  | 9    | 40 | CQ-M5 x 40L            |
| <b>-10SZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B40-5SZ</b>  | 7.5  | 45 | CQ-M5 x 45L            |
| <b>-10SZ</b>        |      | 50 | x 50L                  |
| <b>CDQ2B50-10SZ</b> | 12.5 | 55 | CQ-M6 x 55L            |
| <b>-20SZ</b>        |      | 65 | x 65L                  |

#### Spring Extend

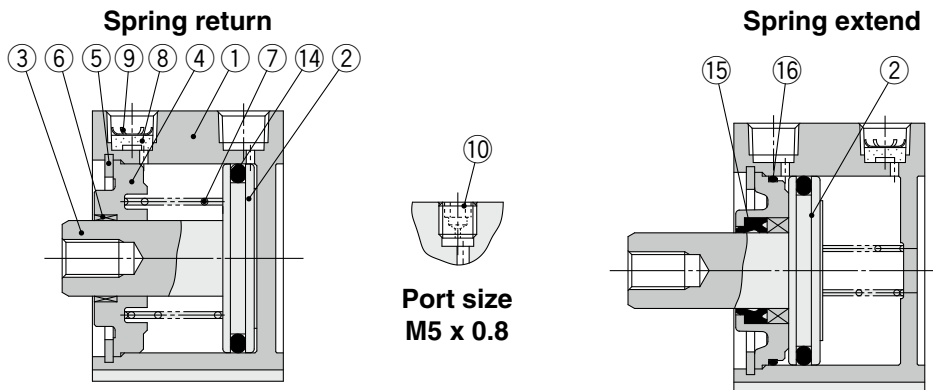
| Cylinder model      | C    | D  | Mounting bolt part no. |
|---------------------|------|----|------------------------|
| <b>CDQ2B12-5TZ</b>  | 6.1  | 40 | CQ-M3 x 40L            |
| <b>-10TZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B16-5TZ</b>  | 8    | 40 | CQ-M3 x 40L            |
| <b>-10TZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B20-5TZ</b>  | 10.5 | 40 | CQ-M5 x 40L            |
| <b>-10TZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B25-5TZ</b>  | 9.5  | 40 | CQ-M5 x 40L            |
| <b>-10TZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B32-5TZ</b>  | 9    | 40 | CQ-M5 x 40L            |
| <b>-10TZ</b>        |      | 45 | x 45L                  |
| <b>CDQ2B40-5TZ</b>  | 7.5  | 45 | CQ-M5 x 45L            |
| <b>-10TZ</b>        |      | 50 | x 50L                  |
| <b>CDQ2B50-10TZ</b> | 12.5 | 55 | CQ-M6 x 55L            |
| <b>-20TZ</b>        |      | 65 | x 65L                  |

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Spring Return, Single Acting, Single Rod **CQ2**  
 Spring Return, Double Acting, Single Rod **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Long Stroke Double Acting, Single Rod **CQ2K**  
 Double Acting, Single Rod **CQ2K**  
 Non-rotating Rod Double Acting, Double Rod **CQ2KW**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, Single Rod **CQP2**  
 Single Acting, Spring Return, Double Rod **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

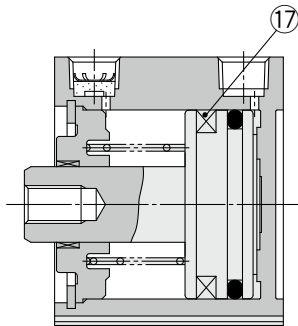
# CQ2 Series

## Construction

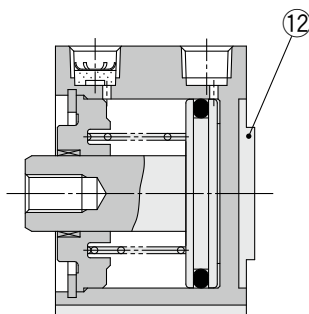
### Without auto switch magnet



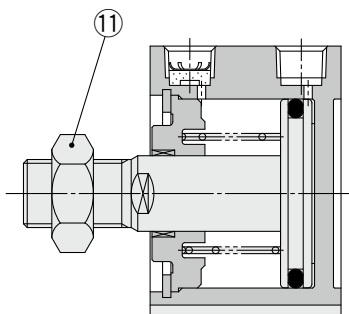
### With auto switch magnet



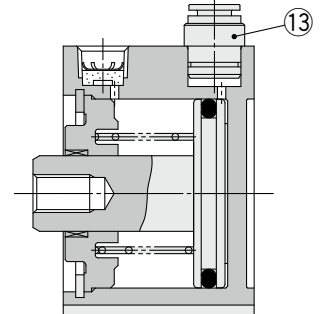
### With boss on head end



### Rod end male thread



### Built-in One-touch fittings



## Component Parts

| No. | Description             | Material              | Note                            |
|-----|-------------------------|-----------------------|---------------------------------|
| 1   | Cylinder tube           | Aluminum alloy        | Hard anodized                   |
| 2*1 | Piston                  | Aluminum alloy        |                                 |
| 3   | Piston rod              | Stainless steel       | ø12 to ø25                      |
|     |                         | Carbon steel          | ø32 to ø50, Hard chrome plating |
| 4   | Collar                  | Aluminum alloy        | ø12 to ø40, Anodized            |
|     |                         | Aluminum alloy casted | ø50, Chromated, Painted         |
| 5   | Retaining ring          | Carbon tool steel     | Phosphate coated                |
| 6   | Bushing                 | Bearing alloy         | ø50                             |
| 7   | Return spring           | Piano wire            | Zinc chromated                  |
| 8   | Bronze element          | Sintered metallic BC  | Port size Rc1/8, 1/4            |
| 9   | Retaining ring          | Carbon tool steel     |                                 |
| 10  | Plug with fixed orifice | Alloy steel           | Port size M5 x 0.8              |
| 11  | Rod end nut             | Carbon steel          | Zinc chromated                  |
| 12  | Centering location ring | Aluminum alloy        | ø20 to ø50, Anodized            |
| 13  | One-touch fitting       | —                     | ø32 to ø50                      |
| 14  | Piston seal             | NBR                   |                                 |
| 15  | Rod seal                | NBR                   |                                 |
| 16  | Gasket                  | NBR                   |                                 |
| 17  | Magnet                  | —                     |                                 |

\*1 For the spring extend type (Type T), the piston and piston rod are integrated (stainless steel). (Except ø12 and ø16 of built-in magnet type)

## Replacement Parts/Seal Kit

| Bore size [mm] | Single acting, Spring return | Single acting, Spring extend |
|----------------|------------------------------|------------------------------|
| 12             | CQ2B12-S-PS                  | CQ2B12-T-PS                  |
| 16             | CQ2B16-S-PS                  | CQ2B16-T-PS                  |
| 20             | CQ2B20-S-PS                  | CQ2B20-T-PS                  |
| 25             | CQ2B25-S-PS                  | CQ2B25-T-PS                  |
| 32             | CQ2B32-S-PS                  | CQ2B32-T-PS                  |
| 40             | CQ2B40-S-PS                  | CQ2B40-T-PS                  |
| 50             | CQ2B50-S-PS                  | CQ2B50-T-PS                  |
| Contents       | ⑭ only                       | Set of nos. ⑭, ⑮, ⑯          |

\* Order the seal kit based on each bore size.

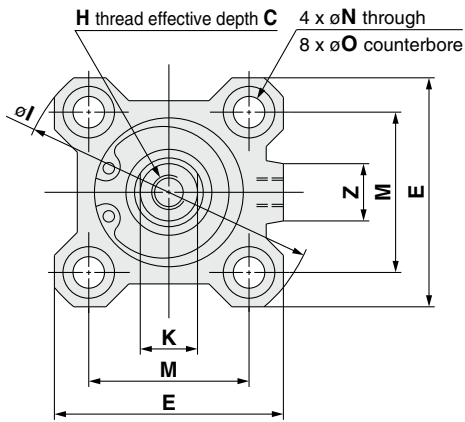
\* The seal kit does not include a grease pack. Order it separately.

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

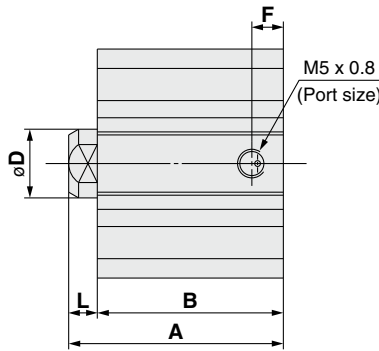
Bore Size

**∅12 to ∅25** Spring Return/Extend: Without Auto Switch Magnet

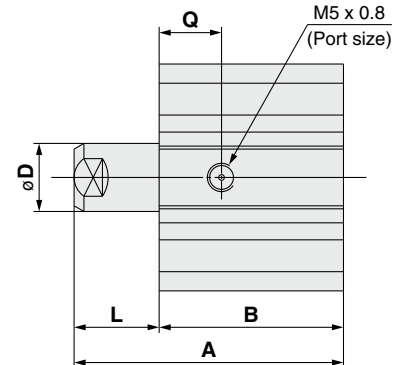
Through-hole: CQ2B□S/T



Spring return



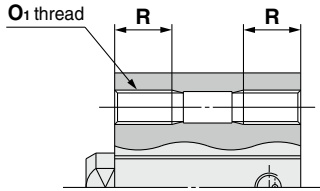
Spring extend



| Bore size [mm] | Stroke [mm] | A             |               | B    | C  | D  | E  | F   | H        | I  | K  | L             |               | M    | N   | O             | Q   | Z  |
|----------------|-------------|---------------|---------------|------|----|----|----|-----|----------|----|----|---------------|---------------|------|-----|---------------|-----|----|
|                |             | Spring return | Spring extend |      |    |    |    |     |          |    |    | Spring return | Spring extend |      |     |               |     |    |
| 12             | 5           | 25.5          | 30.5          | 22   | 6  | 6  | 25 | 5   | M3 x 0.5 | 32 | 5  | 3.5           | 8.5           | 15.5 | 3.5 | 6.5 depth 3.5 | 7.5 | —  |
|                | 10          | 30.5          | 40.5          | 27   |    |    |    |     |          |    |    |               | 13.5          |      |     |               |     |    |
| 16             | 5           | 27            | 32            | 23.5 | 8  | 8  | 29 | 5.5 | M4 x 0.7 | 38 | 6  | 3.5           | 8.5           | 20   | 3.5 | 6.5 depth 3.5 | 8   | 10 |
|                | 10          | 32            | 42            | 28.5 |    |    |    |     |          |    |    |               | 13.5          |      |     |               |     |    |
| 20             | 5           | 29            | 34            | 24.5 | 7  | 10 | 36 | 5.5 | M5 x 0.8 | 47 | 8  | 4.5           | 9.5           | 25.5 | 5.5 | 9 depth 7     | 8   | 10 |
|                | 10          | 34            | 44            | 29.5 |    |    |    |     |          |    |    |               | 14.5          |      |     |               |     |    |
| 25             | 5           | 32.5          | 37.5          | 27.5 | 12 | 12 | 40 | 5.5 | M6 x 1.0 | 52 | 10 | 5             | 10            | 28   | 5.5 | 9 depth 7     | 9   | 10 |
|                | 10          | 37.5          | 47.5          | 32.5 |    |    |    |     |          |    |    |               | 15            |      |     |               |     |    |

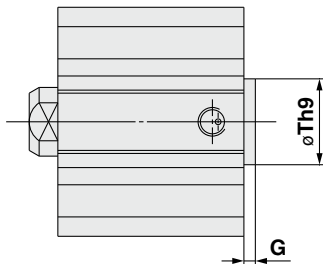
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

Both ends tapped



| Bore size [mm] | O1       | R  |
|----------------|----------|----|
| 12             | M4 x 0.7 | 7  |
| 16             | M4 x 0.7 | 7  |
| 20             | M6 x 1.0 | 10 |
| 25             | M6 x 1.0 | 10 |

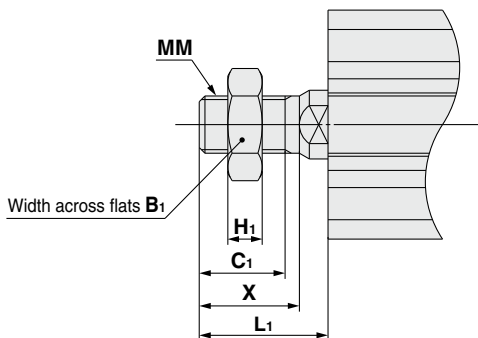
With boss on head end



| Bore size [mm] | G   | Th9                               |
|----------------|-----|-----------------------------------|
| 12             | 1.5 | 15 <sup>0</sup> <sub>-0.043</sub> |
| 16             | 1.5 | 20 <sup>0</sup> <sub>-0.052</sub> |
| 20             | 2   | 13 <sup>0</sup> <sub>-0.043</sub> |
| 25             | 2   | 15 <sup>0</sup> <sub>-0.043</sub> |

\* With boss on rod end: Option (Suffix "XC36" to the end of model number.)

Rod end male thread



| Bore size [mm] | B1 | C1 | H1 | L1            |                    |                     | MM         | X    |
|----------------|----|----|----|---------------|--------------------|---------------------|------------|------|
|                |    |    |    | Spring return | Spring extend 5 st | Spring extend 10 st |            |      |
| 12             | 8  | 9  | 4  | 14            | 19                 | 24                  | M5 x 0.8   | 10.5 |
| 16             | 10 | 10 | 5  | 15.5          | 20.5               | 25.5                | M6 x 1.0   | 12   |
| 20             | 13 | 12 | 5  | 18.5          | 23.5               | 28.5                | M8 x 1.25  | 14   |
| 25             | 17 | 15 | 6  | 22.5          | 27.5               | 32.5                | M10 x 1.25 | 17.5 |

Dimensions of Each Mounting Bracket

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

Standard  
Double Acting, Single Rod  
**CQ2**

Standard  
Double Acting, Double Rod  
**CQ2W**

Single Acting, Spring Return/Extend  
Double Acting, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Double Acting, Single Rod  
Double Acting, Single Rod  
**CQ2**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-RV**

Double Acting, Double Rod  
**CQ2W-RV**

Axial Piping  
Single Acting, Single Rod  
**CQP2**

Double Acting, Single Rod  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch

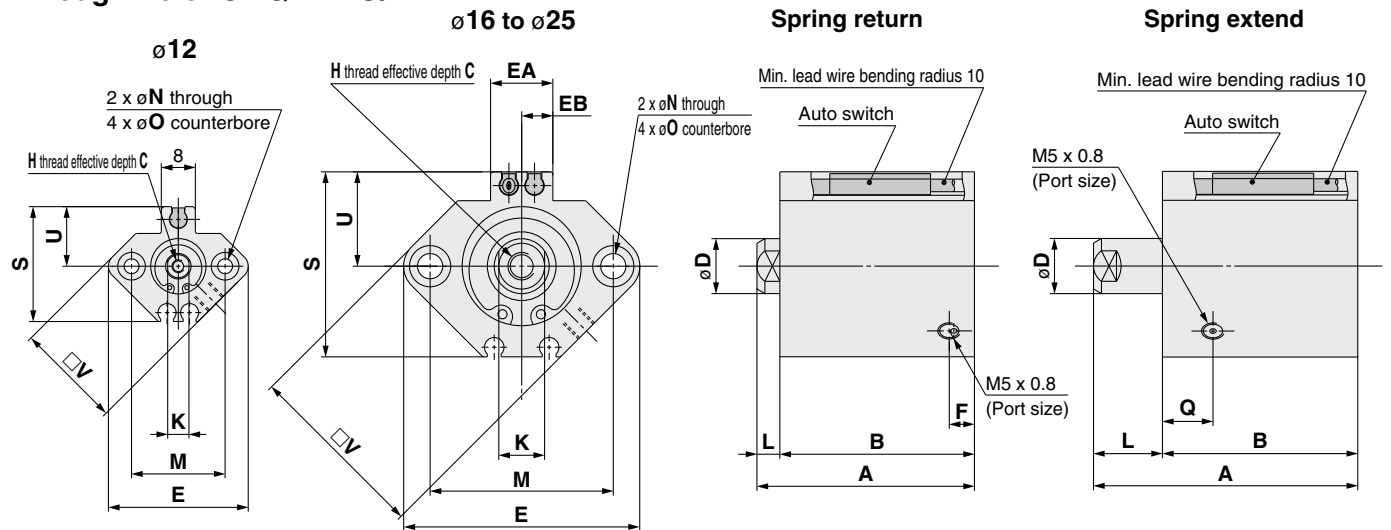
Made to Order

# CQ2 Series

Bore Size

## ø12 to ø25 Spring Return/Extend: With Auto Switch Magnet

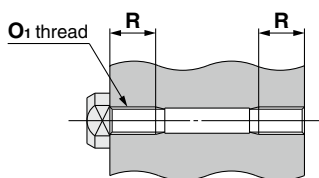
Through-hole: CDQ2B□S/T



| Bore size [mm] | Stroke [mm] | A             |               | B             |               | C  | D  | E  | EA   | EB  | F   | H        | K  | L             |               | M  | N   | O             | Q  | S    | U  | V  |
|----------------|-------------|---------------|---------------|---------------|---------------|----|----|----|------|-----|-----|----------|----|---------------|---------------|----|-----|---------------|----|------|----|----|
|                |             | Spring return | Spring extend | Spring return | Spring extend |    |    |    |      |     |     |          |    | Spring return | Spring extend |    |     |               |    |      |    |    |
| 12             | 5           | 36.5          | 45.9          | 33            | 37.4          | 6  | 6  | 33 | —    | —   | 6.5 | M3 x 0.5 | 5  | 3.5           | 8.5           | 22 | 3.5 | 6.5 depth 3.5 | 11 | 27.5 | 14 | 25 |
|                | 10          | 41.5          | 55.9          | 38            | 42.4          |    |    |    |      |     |     |          |    |               | 13.5          |    |     |               |    |      |    |    |
| 16             | 5           | 39            | 44            | 35.5          | 35.5          | 8  | 8  | 37 | 13.2 | 6.6 | 5.5 | M4 x 0.7 | 6  | 3.5           | 8.5           | 28 | 3.5 | 6.5 depth 3.5 | 10 | 29.5 | 15 | 29 |
|                | 10          | 44            | 54            | 40.5          | 40.5          |    |    |    |      |     |     |          |    |               | 13.5          |    |     |               |    |      |    |    |
| 20             | 5           | 41            | 46            | 36.5          | 36.5          | 7  | 10 | 47 | 13.6 | 6.8 | 5.5 | M5 x 0.8 | 8  | 4.5           | 9.5           | 36 | 5.5 | 9 depth 7     | 8  | 35.5 | 18 | 36 |
|                | 10          | 46            | 56            | 41.5          | 41.5          |    |    |    |      |     |     |          |    |               | 14.5          |    |     |               |    |      |    |    |
| 25             | 5           | 42.5          | 47.5          | 37.5          | 37.5          | 12 | 12 | 52 | 13.6 | 6.8 | 5.5 | M6 x 1.0 | 10 | 5             | 10            | 40 | 5.5 | 9 depth 7     | 9  | 40.5 | 21 | 40 |
|                | 10          | 47.5          | 57.5          | 42.5          | 42.5          |    |    |    |      |     |     |          |    |               | 15            |    |     |               |    |      |    |    |

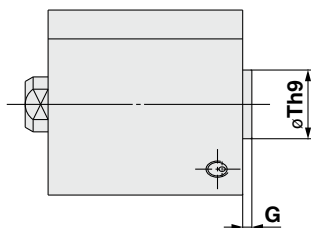
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
 \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Both ends tapped



| [mm]           |                |    |
|----------------|----------------|----|
| Bore size [mm] | O <sub>1</sub> | R  |
| 12             | M4 x 0.7       | 7  |
| 16             | M4 x 0.7       | 7  |
| 20             | M6 x 1.0       | 10 |
| 25             | M6 x 1.0       | 10 |

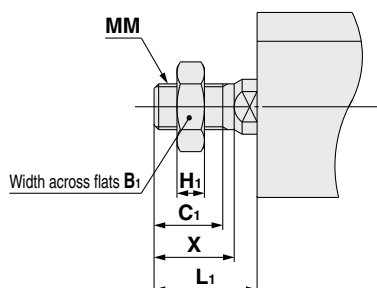
### With boss on head end



| [mm]           |     |                                   |
|----------------|-----|-----------------------------------|
| Bore size [mm] | G   | Th9                               |
| 12             | 1.5 | 15 <sup>0</sup> <sub>-0.043</sub> |
| 16             | 1.5 | 20 <sup>0</sup> <sub>-0.052</sub> |
| 20             | 2   | 13 <sup>0</sup> <sub>-0.043</sub> |
| 25             | 2   | 15 <sup>0</sup> <sub>-0.043</sub> |

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

### Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> |               | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|---------------|------------|------|
|                |                |                |                | Spring return  | Spring extend |            |      |
| 12             | 8              | 9              | 4              | 14             | 24            | M5 x 0.8   | 10.5 |
| 16             | 10             | 10             | 5              | 19.5           | 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 |

### Dimensions of Each Mounting Bracket

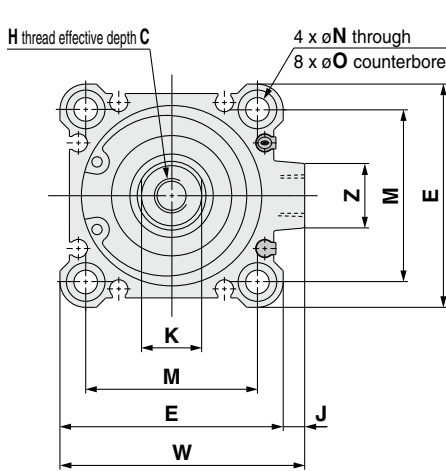
The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.



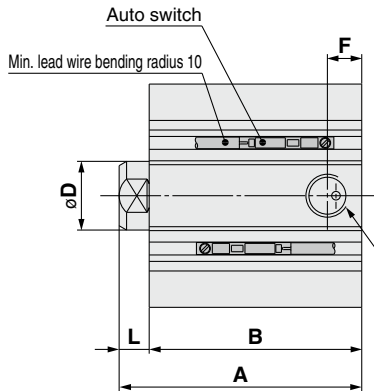
Bore Size

**ø32 to ø50 Spring Return/Extend: With/Without Auto Switch Magnet**

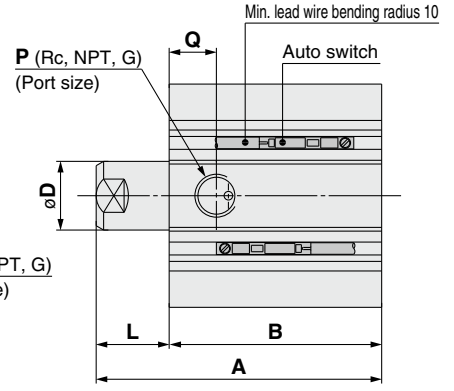
Through-hole: C□Q2B□S/T



Spring return



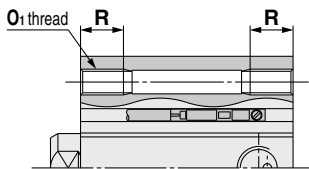
Spring extend



| Bore size [mm] | Stroke [mm] | Without auto switch magnet |               |      |      |          | With auto switch magnet |               |      |      |     |    |    |    |           |     |    |               |               |    |     |            |      |      |    |
|----------------|-------------|----------------------------|---------------|------|------|----------|-------------------------|---------------|------|------|-----|----|----|----|-----------|-----|----|---------------|---------------|----|-----|------------|------|------|----|
|                |             | A                          |               | B    | F    | P        | A                       |               | B    | F    | P   | C  | D  | E  | H         | J   | K  | L             |               | M  | N   | O          | Q    | W    | Z  |
|                |             | Spring return              | Spring extend |      |      |          | Spring return           | Spring extend |      |      |     |    |    |    |           |     |    | Spring return | Spring extend |    |     |            |      |      |    |
| 32             | 5           | 35                         | 40            | 28   | 5.5  | M5 x 0.8 | 45                      | 50            | 38   | 7.5  | 1/8 | 13 | 16 | 45 | M8 x 1.25 | 4.5 | 14 | 7             | 12            | 34 | 5.5 | 9 depth 7  | 10   | 49.5 | 14 |
|                | 10          | 40                         | 50            | 33   | 7.5  | 1/8      | 50                      | 60            | 43   | 7.5  | 1/8 | 13 | 16 | 52 | M8 x 1.25 | 5   | 14 | 7             | 17            | 40 | 5.5 | 9 depth 7  | 12.5 | 57   | 15 |
| 40             | 5           | 41.5                       | 46.5          | 34.5 | 7.5  | 1/8      | 51.5                    | 56.5          | 44.5 | 7.5  | 1/8 | 13 | 16 | 52 | M8 x 1.25 | 5   | 14 | 7             | 12            | 40 | 5.5 | 9 depth 7  | 12.5 | 57   | 15 |
|                | 10          | 46.5                       | 56.5          | 39.5 |      |          | 56.5                    | 66.5          | 49.5 |      |     |    |    |    |           |     |    |               | 17            |    |     |            |      |      |    |
| 50             | 10          | 48.5                       | 58.5          | 40.5 | 10.5 | 1/4      | 58.5                    | 68.5          | 50.5 | 10.5 | 1/4 | 15 | 20 | 64 | M10 x 1.5 | 7   | 17 | 8             | 18            | 50 | 6.6 | 11 depth 8 | 10.5 | 71   | 19 |
|                | 20          | 58.5                       | 78.5          | 50.5 |      |          | 68.5                    | 88.5          | 60.5 |      |     |    |    |    |           |     |    |               | 28            |    |     |            |      |      |    |

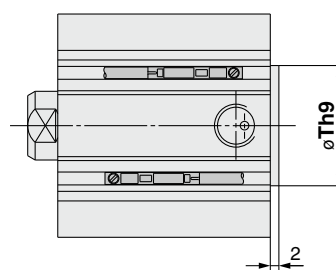
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The A, B dimensions of the ø32-5 mm stroke with built-in One-touch fittings without auto switch magnet are the same as those of the ø32-10 mm stroke without auto switch magnet.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 32             | M6 x 1.0       | 10 |
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |

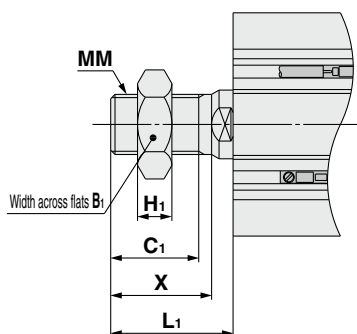
With boss on head end



| Bore size [mm] | Th9                  |
|----------------|----------------------|
| 32             | 21 <sup>+0.052</sup> |
| 40             | 28 <sup>+0.052</sup> |
| 50             | 35 <sup>+0.062</sup> |

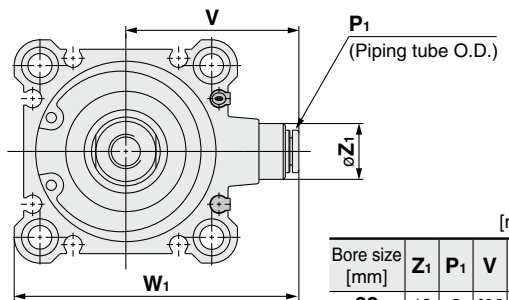
\* With boss on rod end: Option (Suffix "XC36" to the end of model number.)

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> |               |      | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|---------------|------|-----------|------|
|                |                |                |                | Spring return  | Spring extend | 5 st |           |      |
| 32             | 22             | 20.5           | 8              | 28.5           | 33.5          | 38.5 | M14 x 1.5 | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | 33.5          | 38.5 | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | —             | 43.5 | M18 x 1.5 | 28.5 |

Built-in One-touch fittings



| Bore size [mm] | Z <sub>1</sub> | P <sub>1</sub> | V    | W <sub>1</sub> |
|----------------|----------------|----------------|------|----------------|
| 32             | 13             | 6              | 36.5 | 59             |
| 40             | 13             | 6              | 40.5 | 66.5           |
| 50             | 16             | 8              | 50   | 82             |

Dimensions of Each Mounting Bracket

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

Standard  
Double Acting, Single Rod  
**CQ2**

Standard  
Double Acting, Double Rod  
**CQ2W**

Standard  
Single Acting, Spring Return, Extend  
**CQ2**

Large Bore Size  
Double Acting, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2S**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Single Rod  
**CQ2K**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-RV**

Water Resistant  
Double Acting, Double Rod  
**CQ2W-RV**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Axial Piping  
Single Acting, Spring Return, Extend  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch

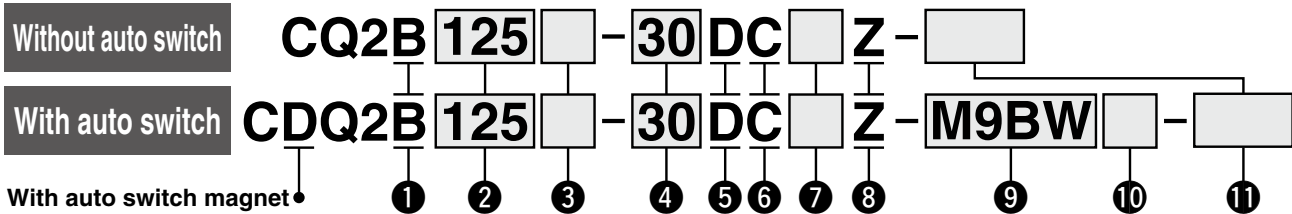
Made to Order

# Compact Cylinder: Large Bore Size Double Acting, Single Rod

## CQ2 Series

∅125, ∅140, ∅160, ∅180, ∅200

### How to Order



#### 1 Mounting

|          |              |
|----------|--------------|
| <b>B</b> | Through-hole |
|----------|--------------|

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 56

#### 2 Bore size

|            |        |
|------------|--------|
| <b>125</b> | 125 mm |
| <b>140</b> | 140 mm |
| <b>160</b> | 160 mm |
| <b>180</b> | 180 mm |
| <b>200</b> | 200 mm |

#### 3 Port thread type

|            |     |
|------------|-----|
| <b>Nil</b> | Rc  |
| <b>TN</b>  | NPT |
| <b>TF</b>  | G   |

#### 4 Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size            | Standard stroke        |
|----------------------|------------------------|
| <b>125, 140, 160</b> | 10, 20, 30, 40, 50, 75 |
| <b>180, 200</b>      | 100, 125, 150, 175     |
|                      | 200, 250, 300          |

\* For the manufacturing of intermediate strokes ⇨ p. 54

#### 5 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### 6 Cushion

|          |               |
|----------|---------------|
| <b>C</b> | Rubber bumper |
|----------|---------------|

#### 7 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>M</b>   | Rod end male thread   |

#### 8 Auto switch mounting groove

|          |            |
|----------|------------|
| <b>Z</b> | 4 surfaces |
|----------|------------|

#### 9 Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

#### 10 Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

#### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2B140-30DCZ

#### 11 Made to order common specifications

For details ⇨ p. 54

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

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

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

| Type                                | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |                 | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |   |            |   |   |   |
|-------------------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|-----------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|---|------------|---|---|---|
|                                     |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line         | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     |                 |            |            |   |            |   |   |   |
| Solid state auto switch             | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | <b>M9NV</b>     | <b>M9N</b>           | ●     | ●     | ●     | ○        | —                   | ○               | IC circuit | Relay, PLC |   |            |   |   |   |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PV</b>     | <b>M9P</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            |   |            |   |   |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BV</b>     | <b>M9B</b>           | ●     | ●     | ●     | ○        | —                   | ○               |            |            |   |            |   |   |   |
|                                     |   |                  |                 | 3-wire (NPN)            |              |           |                   | <b>M9NWV</b>    | <b>M9NW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            |   |            |   |   |   |
|                                     | Diagnostic indication (2-color indicator) |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PWV</b>    | <b>M9PW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            | ○ | —          | ○ | — | ○ |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | <b>M9BWV</b>    | <b>M9BW</b>          | ●     | ●     | ●     | ○        | —                   | ○               |            |            | ○ | —          | ○ | — | ○ |
|                                     |   |                  |                 | 3-wire (NPN)            |              |           |                   | <b>M9NAV</b> *1 | <b>M9NA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |            | ○ | —          | ○ | — | ○ |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                   | <b>M9PAV</b> *1 | <b>M9PA</b> *1       | ○     | ○     | ●     | ○        | —                   | ○               |            |            | ○ | —          | ○ | — | ○ |
| Water resistant (2-color indicator) | 2-wire                                    | <b>M9BAV</b> *1  | <b>M9BA</b> *1  | ○                       | ○            | ●         | ○                 | —               | ○                    | ○     | —     | ○     | —        | ○                   |                 |            |            |   |            |   |   |   |
|                                     | 2-wire (Non-polar)                        | —                | <b>P3DWA</b>    | ●                       | —            | ●         | —                 | —               | —                    | —     | —     | —     | —        | ○                   |                 |            |            |   |            |   |   |   |
| Reed auto switch                    | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V or less     | <b>A96V</b>     | <b>A96</b>           | ●     | —     | ●     | —        | —                   | —               | IC circuit | —          |   |            |   |   |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | <b>A93V</b> *2  | <b>A93</b>           | ●     | ●     | ●     | ●        | —                   | —               | —          | —          | — | Relay, PLC |   |   |   |
|                                     |   |                  |                 | —                       |              |           |                   | <b>A90V</b>     | <b>A90</b>           | ●     | —     | ●     | —        | —                   | —               | —          | —          | — | IC circuit |   |   |   |

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

Please contact SMC regarding water-resistant types with the above model numbers.

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

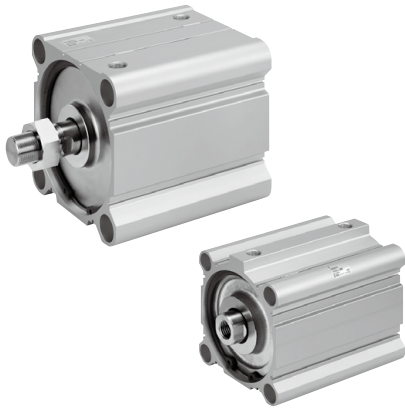
\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWZ

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

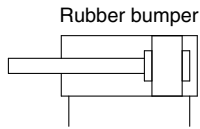
\* There are applicable auto switches other than those listed above. For details ⇨ p. 152

# Compact Cylinder: Large Bore Size Double Acting, Single Rod **CQ2 Series**

## Specifications



### Symbol



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

| Symbol | Specifications                             |
|--------|--|
| -XA□   | Change of rod end shape                    |
| -XB10  | Intermediate stroke (Using exclusive body) |
| -XC85  | Grease for food processing equipment       |
| -X271  | Fluororubber seals, ø125 to ø160 only      |

| Bore size [mm]                        | 125   | 140 | 160  | 180            | 200 |
|---------------------------------------|---|-----|------|----------------|-----|
| <b>Action</b>                         | Double acting, Single rod   |     |      |                |     |
| <b>Fluid</b>                          | Air   |     |      |                |     |
| <b>Proof pressure</b>                 | 1.5 MPa   |     |      | 1.05 MPa       |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |     |      | 0.7 MPa        |     |
| <b>Minimum operating pressure</b>     | 0.05 MPa  |     |      |                |     |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |     |      |                |     |
| <b>Lubrication</b>                    | Not required (Non-lube)   |     |      |                |     |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |     |      | 20 to 400 mm/s |     |
| <b>Allowable kinetic energy [J]</b>   | 7.4   | 9.8 | 12.4 |                |     |
| <b>Stroke length tolerance</b>        | +1.4 mm <sup>*1</sup><br>0  |     |      |                |     |

\*1 Stroke length tolerance does not include the amount of bumper change.

## Manufacturing of Intermediate Strokes

| Type                | A spacer is installed in the standard stroke body.  | Exclusive body (-XB10)   |
|---------------------|---|--|
| <b>Part no.</b>     | Refer to "How to Order" for the standard model number. (⇨ p. 53)  | Suffix "-XB10" to the end of standard model number. (⇨ p. 53)                                  |
| <b>Description</b>  | Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.        | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |
| <b>Stroke range</b> | 5 to 295  | 11 to 299  |
| <b>Example</b>      | Part no.: CQ2B160-165DCZ<br>CQ2B160-175DCZ with 10 mm width spacer inside<br>The B dimension is 266 mm. | Part no.: CQ2B160-165DCZ-XB10<br>Makes 165 mm stroke tube.<br>The B dimension is 256 mm.       |

## ⚠ Precautions

Refer to page 189 before handling the products.

|                   |                                   |         |
|-------------------|-----------------------------------|---------|
| Standard          | Double Acting, Double Rod         | CQ2W    |
| Standard          | Double Acting, Single Rod         | CQ2     |
| Standard          | Single Acting, Spring Return, End | CQ2     |
| Large Bore Size   | Double Acting, Single Rod         | CQ2     |
| Large Bore Size   | Double Acting, Double Rod         | CQ2W    |
| Anti-lateral Load | Double Acting, Single Rod         | CQ2□S   |
| Long Stroke       | Double Acting, Single Rod         | CQ2     |
| Non-rotating Rod  | Double Acting, Double Rod         | CQ2KW   |
| Water Resistant   | Double Acting, Single Rod         | CQ2-RV  |
| Water Resistant   | Double Acting, Double Rod         | CQ2W-RV |
| Axial Piping      | Double Acting, Single Rod         | CQP2    |
| Axial Piping      | Double Acting, Double Rod         | CQP2    |
| With End Lock     | Double Acting, Single Rod         | CBQ2    |
| Auto Switch       |                                   |         |
| Made to Order     |                                   |         |

# CQ2 Series

## Allowable Kinetic Energy

### Load Mass and Piston Speed

[J]

| Bore size [mm]                                   | 125 | 140 | 160  | 180 | 200 |
|--|-----|-----|------|-----|-----|
| Standard/<br>Allowable kinetic energy: <b>Ea</b> | 7.4 | 9.8 | 12.4 |     |     |

$$\text{Kinetic energy } E \text{ [J]} = \frac{(m1 + m2) V^2}{2}$$

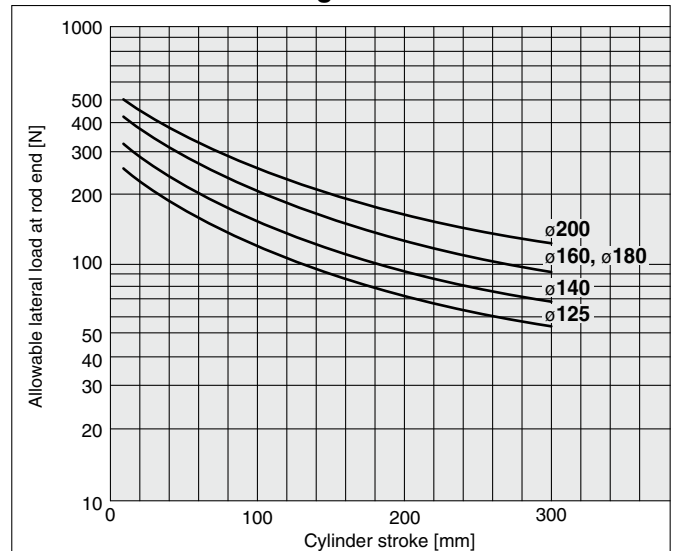
**m1**: Mass of cylinder movable parts [kg]

**m2**: Load mass [kg]

**V**: Piston speed [m/s]

## Allowable Lateral Load at Rod End

### Without Auto Switch Magnet



### Mass of Cylinder Movable Parts: Without Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |  |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                | 10                   | 20   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  |  |
| <b>125</b>     | 1.25                 | 1.34 | 1.42 | 1.5  | 1.58 | 1.77 | 1.97 | 2.17 | 2.37 | 2.57 | 2.77 | 3.17 | 3.57 |  |
| <b>140</b>     | 1.49                 | 1.57 | 1.65 | 1.73 | 1.81 | 2.01 | 2.21 | 2.41 | 2.61 | 2.81 | 3.01 | 3.41 | 3.81 |  |
| <b>160</b>     | 1.98                 | 2.08 | 2.18 | 2.27 | 2.37 | 2.61 | 2.86 | 3.1  | 3.34 | 3.59 | 3.83 | 4.31 | 4.8  |  |
| <b>180</b>     | 2.85                 | 2.95 | 3.05 | 3.15 | 3.25 | 3.49 | 3.74 | 3.99 | 4.24 | 4.48 | 4.73 | 5.22 | 5.72 |  |
| <b>200</b>     | 3.31                 | 3.41 | 3.51 | 3.61 | 3.71 | 3.96 | 4.2  | 4.45 | 4.7  | 4.94 | 5.19 | 5.69 | 6.18 |  |

### Mass of Cylinder Movable Parts: With Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |  |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                | 10                   | 20   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  |  |
| <b>125</b>     | 1.31                 | 1.39 | 1.47 | 1.55 | 1.63 | 1.83 | 2.03 | 2.23 | 2.43 | 2.63 | 2.83 | 3.23 | 3.63 |  |
| <b>140</b>     | 1.56                 | 1.64 | 1.72 | 1.8  | 1.88 | 2.08 | 2.28 | 2.48 | 2.68 | 2.88 | 3.08 | 3.48 | 3.88 |  |
| <b>160</b>     | 2.06                 | 2.16 | 2.26 | 2.35 | 2.45 | 2.69 | 2.94 | 3.18 | 3.42 | 3.66 | 3.91 | 4.39 | 4.88 |  |
| <b>180</b>     | 2.93                 | 3.03 | 3.13 | 3.23 | 3.33 | 3.57 | 3.82 | 4.07 | 4.32 | 4.56 | 4.81 | 5.3  | 5.8  |  |
| <b>200</b>     | 3.4                  | 3.5  | 3.6  | 3.7  | 3.8  | 4.05 | 4.29 | 4.54 | 4.79 | 5.03 | 5.28 | 5.78 | 6.27 |  |

### Additional Mass of Cylinder Movable Parts

[kg]

| Bore size [mm] | 125                 |             |      | 140  |      | 160, 180, 200 |  |
|----------------|---------------------|-------------|------|------|------|---------------|--|
|                | Rod end male thread | Male thread | 0.3  | 0.3  | 0.48 |               |  |
|                | Nut                 | 0.16        | 0.16 | 0.26 |      |               |  |

Calculation: (Example) **CDQ2B125-100DCMZ**

• Basic mass : CDQ2B125-100DCZ ..... 2.03 kg

• Additional mass : Rod end male thread ..... 0.46 kg

2.49 kg

## Theoretical Output



[N]

| Bore size [mm] | Operating direction | Operating pressure [MPa] |       |       |
|----------------|---------------------|--------------------------|-------|-------|
|                |                     | 0.3                      | 0.5   | 0.7   |
| <b>125</b>     | IN                  | 3376                     | 5627  | 7878  |
|                | OUT                 | 3682                     | 6136  | 8590  |
| <b>140</b>     | IN                  | 4313                     | 7188  | 10063 |
|                | OUT                 | 4618                     | 7697  | 10776 |
| <b>160</b>     | IN                  | 5655                     | 9425  | 13195 |
|                | OUT                 | 6032                     | 10053 | 14074 |
| <b>180</b>     | IN                  | 7257                     | 12095 | 16933 |
|                | OUT                 | 7634                     | 12724 | 17813 |
| <b>200</b>     | IN                  | 9048                     | 15080 | 21112 |
|                | OUT                 | 9425                     | 15708 | 21991 |

## Weight

### Without Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.24                 | 5.48  | 5.71  | 5.94  | 6.18  | 6.76  | 7.35  | 7.93  | 8.52  | 9.10  | 9.69  | 10.86 | 12.03 |
| 140            | 6.19                 | 6.44  | 6.71  | 6.98  | 7.25  | 7.90  | 8.57  | 9.23  | 9.90  | 10.56 | 11.23 | 12.55 | 13.88 |
| 160            | 8.57                 | 8.88  | 9.20  | 9.52  | 9.84  | 10.64 | 11.44 | 12.25 | 13.05 | 13.85 | 14.65 | 16.26 | 17.85 |
| 180            | 11.54                | 11.92 | 12.31 | 12.70 | 13.09 | 14.05 | 15.03 | 16.00 | 16.97 | 17.93 | 18.90 | 20.84 | 22.78 |
| 200            | 14.56                | 15.07 | 15.49 | 15.92 | 16.34 | 17.41 | 18.47 | 19.54 | 20.60 | 21.67 | 22.82 | 24.85 | 26.99 |

### With Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.30                 | 5.54  | 5.77  | 6.01  | 6.24  | 6.83  | 7.40  | 7.99  | 8.58  | 9.16  | 9.75  | 10.92 | 12.09 |
| 140            | 6.26                 | 6.51  | 6.78  | 7.05  | 7.32  | 7.97  | 8.64  | 9.30  | 9.97  | 10.63 | 11.30 | 12.62 | 13.95 |
| 160            | 8.65                 | 8.96  | 9.28  | 9.60  | 9.92  | 10.72 | 11.52 | 12.33 | 13.13 | 13.93 | 14.73 | 16.34 | 17.93 |
| 180            | 11.62                | 12.00 | 12.39 | 12.78 | 13.17 | 14.13 | 15.11 | 16.08 | 17.05 | 18.01 | 18.98 | 20.92 | 22.86 |
| 200            | 14.64                | 15.15 | 15.57 | 16.00 | 16.42 | 17.49 | 18.55 | 19.62 | 20.68 | 21.75 | 22.90 | 24.93 | 27.07 |

### Additional Weight

[kg]

| Bore size [mm]      | 125         | 140  | 160  |      |
|---------------------|-------------|------|------|------|
|                     | 180         |      |      | 200  |
| Rod end male thread | Male thread | 0.31 | 0.31 | 0.48 |
|                     | Nut         | 0.16 | 0.16 | 0.26 |

Calculation: (Example) **CDQ2B125-30DCMZ**

- Basic weight: CDQ2B125-30DCZ..... 5.77 kg
  - Additional weight: Rod end male thread... 0.47 kg
- 6.24 kg

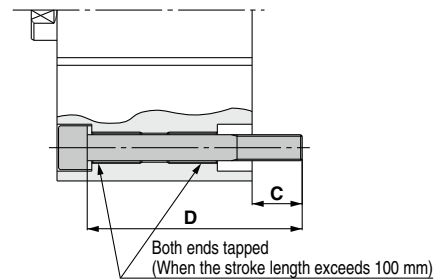
## Through-hole Type Mounting Bolt for the C(D)Q2

Mounting bolt for the through-hole mounting of the C(D)Q2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

**Example) CQ-M12 x 100L 4 pcs.**

- \* To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.
- \* Mounting bolts for stroke lengths exceeding 100 mm are not available. Secure the cylinder with both ends of the cylinder tube tapped or prepare mounting bolts separately.

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model            | C    | D   | Mounting bolt part no. |
|---------------------------|------|-----|------------------------|
| <b>CDQ2B125/140-10DCZ</b> | 22.9 | 100 | CQ-M12 x 100L          |
| <b>-20DCZ</b>             |      | 110 | x 110L                 |
| <b>-30DCZ</b>             |      | 120 | x 120L                 |
| <b>-40DCZ</b>             |      | 130 | x 130L                 |
| <b>-50DCZ</b>             |      | 140 | x 140L                 |
| <b>-75DCZ</b>             |      | 165 | x 165L                 |
| <b>-100DCZ</b>            |      | 190 | x 190L                 |
| <b>CDQ2B160-10DCZ</b>     | 27.7 | 110 | CQ-M14 x 110L          |
| <b>-20DCZ</b>             |      | 120 | x 120L                 |
| <b>-30DCZ</b>             |      | 130 | x 130L                 |
| <b>-40DCZ</b>             |      | 140 | x 140L                 |
| <b>-50DCZ</b>             |      | 150 | x 150L                 |
| <b>-75DCZ</b>             |      | 175 | x 175L                 |
| <b>-100DCZ</b>            |      | 200 | x 200L                 |

| Cylinder model        | C   | D      | Mounting bolt part no. |
|-----------------------|-----|--------|------------------------|
| <b>CDQ2B180-10DCZ</b> | 36  | 125    | CQ-M18 x 125L          |
| <b>-20DCZ</b>         |     | 135    | x 135L                 |
| <b>-30DCZ</b>         |     | 145    | x 145L                 |
| <b>-40DCZ</b>         |     | 155    | x 155L                 |
| <b>-50DCZ</b>         |     | 165    | x 165L                 |
| <b>-75DCZ</b>         | 190 | x 190L |                        |
| <b>-100DCZ</b>        | 215 | x 215L |                        |
| <b>CDQ2B200-10DCZ</b> | 39  | 135    | CQ-M18 x 135L          |
| <b>-20DCZ</b>         |     | 145    | x 145L                 |
| <b>-30DCZ</b>         |     | 155    | x 155L                 |
| <b>-40DCZ</b>         |     | 165    | x 165L                 |
| <b>-50DCZ</b>         |     | 175    | x 175L                 |
| <b>-75DCZ</b>         |     | 200    | x 200L                 |
| <b>-100DCZ</b>        |     | 225    | x 225L                 |

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Water Resistant Double Acting, Double Rod **CQ2-RV**

Water Resistant Double Acting, Single Rod **CQ2W-RV**

Axial Piping Single Acting, Spring Return, Single Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

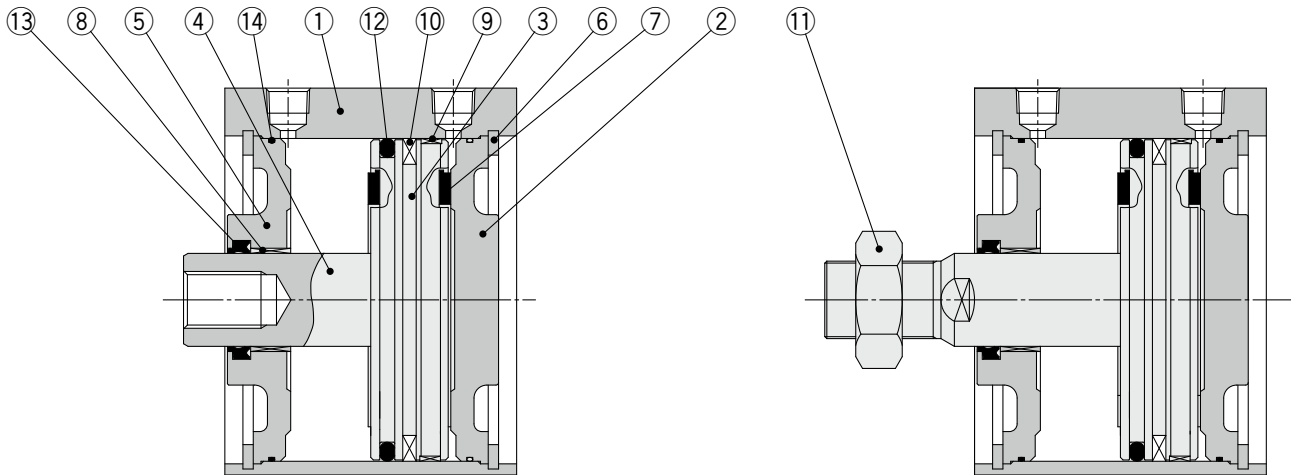
Auto Switch

Made to Order

# CQ2 Series

## Construction

Rod end male thread



### Component Parts

| No. | Description           | Material          | Note                |
|-----|-----------------------|-------------------|---------------------|
| 1   | <b>Cylinder tube</b>  | Aluminum alloy    | Hard anodized       |
| 2   | <b>Head cover</b>     | Carbon steel      | Nickel plating      |
| 3   | <b>Piston</b>         | Aluminum alloy    |                     |
| 4   | <b>Piston rod</b>     | Carbon steel      | Hard chrome plating |
| 5   | <b>Rod cover</b>      | Carbon steel      | Nickel plating      |
| 6   | <b>Retaining ring</b> | Carbon tool steel | Phosphate coated    |
| 7   | <b>Bumper</b>         | Urethane          |                     |
| 8   | <b>Bushing</b>        | Bearing alloy     |                     |
| 9   | <b>Wear ring</b>      | Resin             |                     |
| 10  | <b>Magnet</b>         | —                 | For CDQ2B□ only     |
| 11  | <b>Rod end nut</b>    | Carbon steel      | Nickel plating      |
| 12  | <b>Piston seal</b>    | NBR               |                     |
| 13  | <b>Rod seal</b>       | NBR               |                     |
| 14  | <b>Tube gasket</b>    | NBR               |                     |

### Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.    | Contents            |
|----------------|------------|---------------------|
| 125            | CQ2B125-PS | Set of nos. ⑫, ⑬, ⑭ |
| 140            | CQ2B140-PS |                     |
| 160            | CQ2B160-PS |                     |
| 180            | CQ2B180-PS |                     |
| 200            | CQ2B200-PS |                     |

\* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit based on each bore size.

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

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



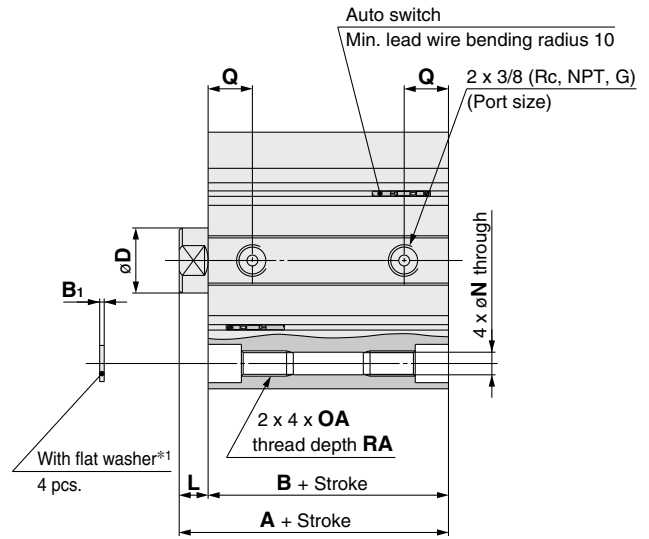
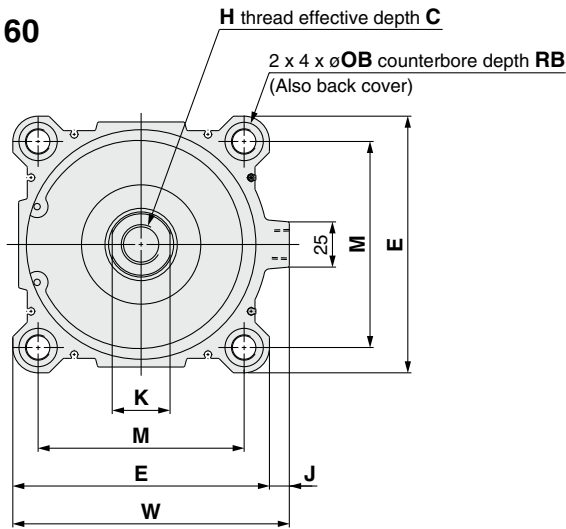
Bore Size

# ∅125 to ∅200

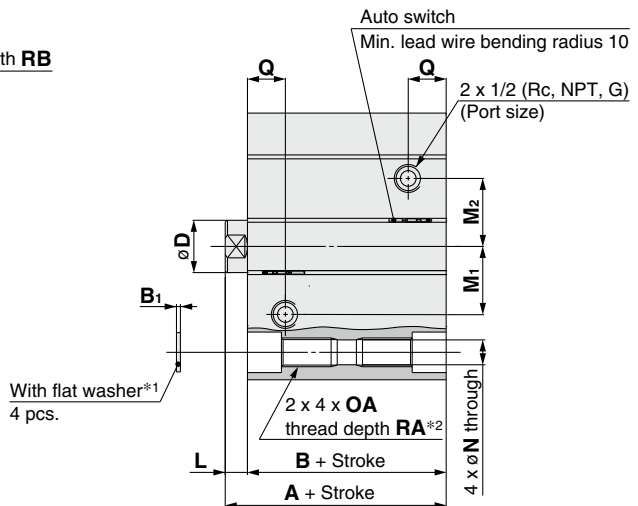
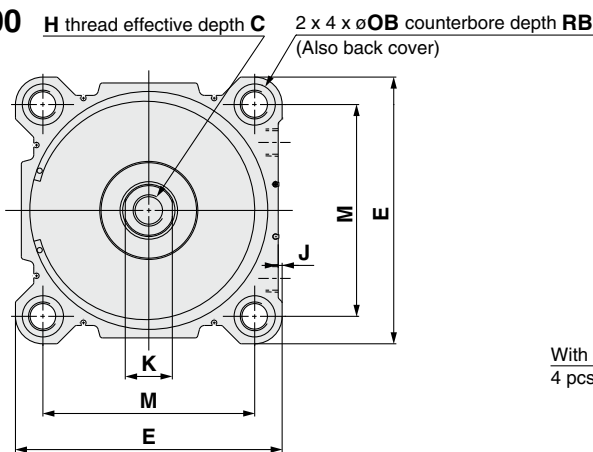
Through-hole: C□Q2B

The dimensions are the same with or without an auto switch magnet.

∅125 to ∅160



∅180, ∅200

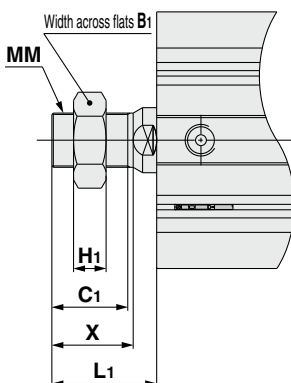


| Bore size [mm] | Standard stroke range | A   | B   | B <sub>1</sub> | C  | D  | E   | H         | J   | K  | L  | M   | M <sub>1</sub> | M <sub>2</sub> | N    | OA        | OB   | Q    | RA | RB   | W   |
|----------------|-----------------------|-----|-----|----------------|----|----|-----|-----------|-----|----|----|-----|----------------|----------------|------|-----------|------|------|----|------|-----|
| 125            |                       | 99  | 83  | 2.5            | 30 | 36 | 142 | M22 x 2.5 | 11  | 32 | 16 | 114 | —              | —              | 12.5 | M14 x 2   | 21.2 | 24.5 | 25 | 18.4 | 153 |
| 140            | 10, 20, 30, 40, 50    | 99  | 83  | 2.5            | 30 | 36 | 158 | M22 x 2.5 | 10  | 32 | 16 | 128 | —              | —              | 12.5 | M14 x 2   | 21.2 | 24.5 | 25 | 18.4 | 168 |
| 160            | 75, 100, 125, 150     | 108 | 91  | 2.5            | 33 | 40 | 178 | M24 x 3   | 10  | 36 | 17 | 144 | —              | —              | 14.5 | M16 x 2   | 24.2 | 27.5 | 28 | 21.2 | 188 |
| 180            | 175, 200, 250, 300    | 119 | 102 | 3              | 33 | 40 | 204 | M24 x 3   | 3   | 36 | 17 | 162 | 52             | 52             | 19   | M22 x 2.5 | 31.5 | 29   | 38 | 26   | —   |
| 200            |                       | 126 | 109 | 3              | 33 | 40 | 226 | M24 x 3   | 7.1 | 36 | 17 | 182 | 62             | 62             | 19   | M22 x 2.5 | 31.5 | 30   | 38 | 26   | —   |

\*1 Be sure to use the attached flat washer for mounting cylinder with through-holes.

\*2 In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

## Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X  |
|----------------|----------------|----------------|----------------|----------------|-----------|----|
| 125            | 46             | 42             | 18             | 58             | M30 x 1.5 | 45 |
| 140            | 46             | 42             | 18             | 58             | M30 x 1.5 | 45 |
| 160            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |
| 180            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |
| 200            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |

\* For details on the rod end nut ⇒ p. 26

|                   |                                   |          |
|-------------------|-----------------------------------|----------|
| Standard          | Double Acting, Single Rod         | CQ2      |
| Standard          | Double Acting, Double Rod         | CQ2W     |
| Standard          | Single Acting, Spring Return, End | CQ2      |
| Large Bore Size   | Double Acting, Single Rod         | CQ2      |
| Large Bore Size   | Double Acting, Double Rod         | CQ2W     |
| Anti-lateral Load | Double Acting, Single Rod         | CQ2□S    |
| Long Stroke       | Double Acting, Single Rod         | CQ2      |
| Non-rotating Rod  | Double Acting, Double Rod         | CQ2KW    |
| Water Resistant   | Double Acting, Single Rod         | CQ2-R/V  |
| Water Resistant   | Double Acting, Double Rod         | CQ2W-R/V |
| Axial Piping      | Double Acting, Single Rod         | CQP2     |
| Axial Piping      | Single Acting, Spring Return, End | CQP2     |
| With End Lock     | Double Acting, Single Rod         | CBQ2     |
| Auto Switch       |                                   |          |
| Made to Order     |                                   |          |

# Compact Cylinder: Large Bore Size Double Acting, Double Rod

## CQ2W Series

∅125, ∅140, ∅160, ∅180, ∅200

### How to Order

Without auto switch

CQ2WB 125 [ ] - 30 DC [ ] Z - [ ]

With auto switch

CDQ2WB 125 [ ] - 30 DC [ ] Z - M9BW [ ] - [ ]

With auto switch magnet

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

#### ① Type

|   |            |
|---|------------|
| W | Double rod |
|---|------------|

#### ② Mounting

|   |              |
|---|--------------|
| B | Through-hole |
|---|--------------|

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 62

#### ③ Bore size

|     |        |
|-----|--------|
| 125 | 125 mm |
| 140 | 140 mm |
| 160 | 160 mm |
| 180 | 180 mm |
| 200 | 200 mm |

#### ④ Port thread type

|     |     |
|-----|-----|
| Nil | Rc  |
| TN  | NPT |
| TF  | G   |

#### ⑤ Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size     | Standard stroke                  |
|---------------|----------------------------------|
| 125, 140, 160 | 10, 20, 30, 40, 50, 75, 100, 125 |
| 180, 200      | 150, 175, 200, 250, 300          |

\* For the manufacturing of intermediate strokes ⇨ p. 60

#### ⑥ Action

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|

#### ⑧ Body option

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| M   | Rod end male thread   |

#### ⑨ Auto switch mounting groove

|   |            |
|---|------------|
| Z | 4 surfaces |
|---|------------|

#### ⑩ Auto switch

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

\* For applicable auto switches, refer to the table below.

#### ⑪ Number of auto switches

|     |   |
|-----|---|
| Nil | 2 |
| S   | 1 |
| n   | n |

#### ⑫ Made to order common specifications

For details ⇨ p. 60

#### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2WB140-30DCZ

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

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

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

| Type   | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |         | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |            |
|--|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|---------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|------------|
|  |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | IC circuit      | Relay, PLC |            |            |
| Solid state auto switch                      | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV    | M9N                  | ●     | ●     | ●     | ○        | —                   | ○               | IC circuit | Relay, PLC |            |
|  |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PV    | M9P                  | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|  |   |                  |                 | 2-wire                  |              |           |                   | M9BV    | M9B                  | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|  |   |                  |                 | 3-wire (NPN)            |              |           |                   | M9NWV   | M9NW                 | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|  | Diagnostic indication (2-color indicator) |                  |                 | 3-wire (PNP)            |              |           |                   | M9PWV   | M9PW                 | ●     | ●     | ●     | ○        | —                   | ○               |            |            | IC circuit |
|  |   |                  |                 | 2-wire                  |              |           |                   | M9B WV  | M9B W                | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |
|  | Water resistant (2-color indicator)       |                  |                 | 3-wire (NPN)            |              |           |                   | M9NAV*1 | M9NA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            | IC circuit |
|  |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PAV*1 | M9PA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            |            |
| Magnetic field resistant (2-color indicator) | 2-wire                                    | M9BAV*1          | M9BA*1          | ○                       | ○            | ●         | ○                 | —       | ○                    | —     |       |       |          |                     |                 |            |            |            |
|  | 2-wire (Non-polar)                        | —                | P3DWA           | ●                       | —            | ●         | —                 | —       | ○                    |       |       |       |          |                     |                 |            |            |            |
| Reed auto switch                             | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V or less     | A96V    | A96                  | ●     | —     | ●     | —        | —                   | —               | IC circuit | —          |            |
|  |   |                  |                 | 2-wire                  |              |           |                   | A93V*2  | A93                  | ●     | ●     | ●     | ●        | —                   | —               | —          | —          | Relay, PLC |
|  |   |                  |                 | —                       |              |           |                   | A90V    | A90                  | ●     | —     | ●     | —        | —                   | —               | —          | —          | IC circuit |

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

Please contact SMC regarding water-resistant types with the above model numbers.

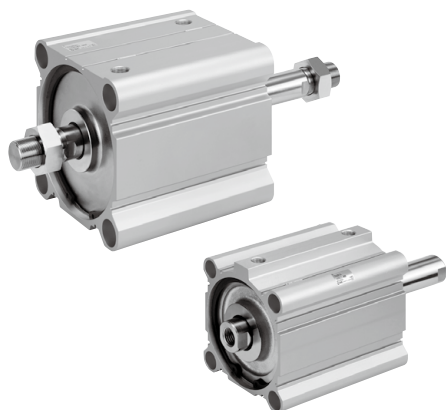
\*2 The 1 m lead wire is only applicable to the D-A93.

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

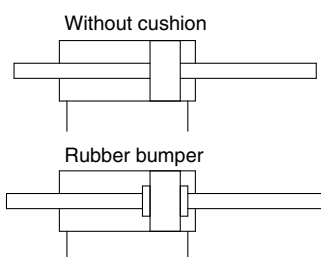
\* Solid state auto switches marked with "○" are produced upon receipt of order.

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

# Compact Cylinder: Large Bore Size **CQ2W Series**



## Symbol



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

| Symbol | Specifications                              |
|--------|---|
| -XA□   | Change of rod end shape                     |
| -XB10  | Intermediate stroke (Using exclusive body)  |
| -XC85  | Grease for food processing equipment        |
| -X235  | Special rod end for double rod cylinder     |
| -X271  | Fluororubber seals, ø125 to ø160 only       |
| -X633  | Intermediate stroke for double rod cylinder |

\* -X633: Intermediate stroke in 5 mm increments only

## Specifications

| Bore size [mm]                        | 125   | 140 | 160  | 180            | 200 |
|---------------------------------------|---|-----|------|----------------|-----|
| <b>Action</b>                         | Double acting, Double rod   |     |      |                |     |
| <b>Fluid</b>                          | Air   |     |      |                |     |
| <b>Proof pressure</b>                 | 1.5 MPa   |     |      | 1.05 MPa       |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |     |      | 0.7 MPa        |     |
| <b>Minimum operating pressure</b>     | 0.05 MPa  |     |      |                |     |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |     |      |                |     |
| <b>Lubrication</b>                    | Not required (Non-lube)   |     |      |                |     |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |     |      | 20 to 400 mm/s |     |
| <b>Allowable kinetic energy [J]</b>   | 7.4   | 9.8 | 12.4 |                |     |
| <b>Stroke length tolerance</b>        | +1.4 mm*1<br>0  |     |      |                |     |

\*1 Stroke length tolerance does not include the amount of bumper change.

## Manufacturing of Intermediate Strokes

| Type         | A spacer is installed in the standard stroke body.   | Exclusive body (-XB10)   |
|--------------|--|--|
| Part no.     | Suffix "-X633" to the end of standard model number. (⇨ p. 59)  | Suffix "-XB10" to the end of standard model number. (⇨ p. 59)                                  |
| Description  | Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.               | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |
| Stroke range | 15 to 295  | 11 to 299  |
| Example      | Part no.: CQ2WB160-165DCZ-X633<br>CQ2WB160-175DCZ with 10 mm width spacer inside<br>The B dimension is 266 mm. | Part no.: CQ2WB160-165DCZ-XB10<br>Makes 165 mm stroke tube.<br>The B dimension is 256 mm.      |

## ⚠ Precautions

Refer to page 189 before handling the products.

|                   |                                   |                      |
|-------------------|-----------------------------------|----------------------|
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>           |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>           |
| Anti-lateral Load | Double Acting, Double Rod         | <b>CQ2□S</b>         |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2□S</b>         |
| Long Stroke       | Double Acting, Double Rod         | <b>CQ2</b>           |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>           |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>          |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-RV</b>       |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-RV</b>        |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-RV</b>       |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-RV</b>        |
| Axial Piping      | Double Acting, Double Rod         | <b>CQP2</b>          |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>          |
| With End Lock     | Double Acting, Double Rod         | <b>CBQ2</b>          |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>          |
| Auto Switch       |                                   | <b>Auto Switch</b>   |
| Made to Order     |                                   | <b>Made to Order</b> |

# CQ2W Series

## Allowable Kinetic Energy

### Load Mass and Piston Speed

[J]

| Bore size [mm]                                   | 125 | 140 | 160  | 180 | 200 |
|--|-----|-----|------|-----|-----|
| Standard/<br>Allowable kinetic energy: <b>Ea</b> | 7.4 | 9.8 | 12.4 |     |     |

$$\text{Kinetic energy } E \text{ [J]} = \frac{(m1 + m2) V^2}{2}$$

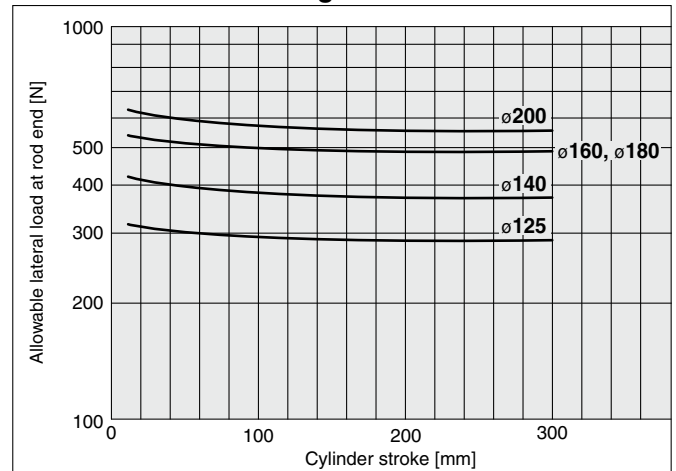
**m1**: Mass of cylinder movable parts [kg]

**m2**: Load mass [kg]

**V**: Piston speed [m/s]

## Allowable Lateral Load at Rod End

### Without Auto Switch Magnet



### Mass of Cylinder Movable Parts: Without Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |  |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                | 10                   | 20   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  |  |
| 125            | 1.58                 | 1.71 | 1.85 | 2.01 | 2.17 | 2.57 | 2.96 | 3.36 | 3.76 | 4.16 | 4.56 | 5.36 | 6.15 |  |
| 140            | 1.82                 | 1.95 | 2.08 | 2.24 | 2.4  | 2.8  | 3.2  | 3.6  | 3.99 | 4.39 | 4.79 | 5.59 | 6.38 |  |
| 160            | 2.42                 | 2.58 | 2.75 | 2.94 | 3.14 | 3.63 | 4.12 | 4.61 | 5.1  | 5.58 | 6.07 | 7.05 | 8.03 |  |
| 180            | 3.96                 | 4.12 | 4.23 | 4.43 | 4.63 | 4.97 | 5.47 | 5.96 | 6.46 | 6.95 | 7.83 | 8.43 | 9.42 |  |
| 200            | 4.75                 | 4.91 | 5.02 | 5.22 | 5.42 | 5.76 | 6.26 | 6.75 | 7.25 | 7.74 | 8.62 | 9.22 | 10.2 |  |

### Mass of Cylinder Movable Parts: With Auto Switch Magnet

[kg]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |      |  |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                | 10                   | 20   | 30   | 40   | 50   | 75   | 100  | 125  | 150  | 175  | 200  | 250  | 300  |  |
| 125            | 1.65                 | 1.77 | 1.91 | 2.07 | 2.23 | 2.63 | 3.03 | 3.42 | 3.82 | 4.22 | 4.62 | 5.42 | 6.21 |  |
| 140            | 1.88                 | 2.01 | 2.15 | 2.31 | 2.47 | 2.87 | 3.26 | 3.66 | 4.06 | 4.46 | 4.86 | 5.66 | 6.45 |  |
| 160            | 2.5                  | 2.65 | 2.82 | 3.02 | 3.22 | 3.71 | 4.2  | 4.68 | 5.17 | 5.66 | 6.15 | 7.13 | 8.11 |  |
| 180            | 4.04                 | 4.2  | 4.31 | 4.51 | 4.71 | 5.05 | 5.55 | 6.04 | 6.54 | 7.03 | 7.91 | 8.51 | 9.5  |  |
| 200            | 4.84                 | 5    | 5.11 | 5.31 | 5.51 | 5.85 | 6.35 | 6.84 | 7.34 | 7.83 | 8.71 | 9.31 | 10.3 |  |

### Additional Mass of Cylinder Movable Parts

[kg]

| Bore size [mm]      |             | 125  | 140  | 160, 180, 200 |
|---------------------|-------------|------|------|---------------|
| Rod end male thread | Male thread | 0.62 | 0.62 | 0.96          |
|                     | Nut         | 0.32 | 0.32 | 0.52          |

Calculation: (Example) **CDQ2WB125-100DCMZ**

• Basic mass : CDQ2WB125-100DCZ ..... 3.03 kg

• Additional mass : Rod end male thread ..... 0.94 kg

3.97 kg

## Theoretical Output

[N]

| Bore size [mm] | Operating pressure [MPa] |       |       |
|----------------|--------------------------|-------|-------|
|                | 0.3                      | 0.5   | 0.7   |
| 125            | 3376                     | 5627  | 7878  |
| 140            | 4313                     | 7188  | 10063 |
| 160            | 5655                     | 9425  | 13195 |
| 180            | 7257                     | 12095 | 16933 |
| 200            | 9048                     | 15080 | 21112 |

## Weight

### Without Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.47                 | 5.76  | 6.05  | 6.37  | 6.68  | 7.47  | 8.24  | 9.03  | 9.82  | 10.60 | 11.39 | 12.96 | 14.52 |
| 140            | 6.43                 | 6.73  | 7.06  | 7.40  | 7.75  | 8.61  | 9.47  | 10.33 | 11.20 | 12.06 | 12.92 | 14.64 | 16.37 |
| 160            | 8.87                 | 9.26  | 9.65  | 10.07 | 10.49 | 11.53 | 12.58 | 13.63 | 14.68 | 15.72 | 16.77 | 18.87 | 20.96 |
| 180            | 11.75                | 12.23 | 12.73 | 13.21 | 13.70 | 14.91 | 16.13 | 17.34 | 18.56 | 19.77 | 20.99 | 23.42 | 25.86 |
| 200            | 14.89                | 15.42 | 15.94 | 16.47 | 16.98 | 18.30 | 19.61 | 20.92 | 21.23 | 23.54 | 24.85 | 27.47 | 30.10 |

### With Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.53                 | 5.82  | 6.11  | 6.43  | 6.74  | 7.53  | 8.30  | 9.09  | 9.88  | 10.66 | 11.45 | 13.02 | 14.58 |
| 140            | 6.50                 | 6.80  | 7.13  | 7.47  | 7.82  | 8.68  | 9.54  | 10.40 | 11.27 | 12.13 | 12.99 | 14.71 | 16.44 |
| 160            | 8.95                 | 9.34  | 9.73  | 10.15 | 10.57 | 11.61 | 12.66 | 13.71 | 14.76 | 15.80 | 16.85 | 18.95 | 21.04 |
| 180            | 11.83                | 12.31 | 12.81 | 13.29 | 13.78 | 14.99 | 16.21 | 17.42 | 18.64 | 19.85 | 21.07 | 23.50 | 25.94 |
| 200            | 14.97                | 15.50 | 16.02 | 16.55 | 17.06 | 18.38 | 19.69 | 21.00 | 21.31 | 23.62 | 24.93 | 27.55 | 30.18 |

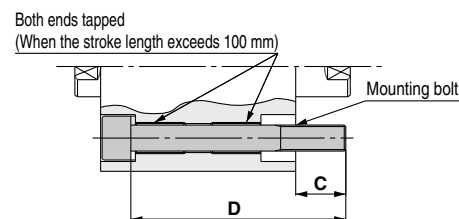
## Through-hole Type Mounting Bolt for the CDQ2W

Mounting bolt for the through-hole mounting of the C(D)Q2WB is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

### Example) CQ-M12 x 100L 4 pcs.

- \* To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.
- \* Mounting bolts for stroke lengths exceeding 100 mm are not available. Secure the cylinder with both ends of the cylinder tube tapped or prepare mounting bolts separately.

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model             | C    | D   | Mounting bolt part no. |
|----------------------------|------|-----|------------------------|
| <b>CDQ2WB125/140-10DCZ</b> | 22.9 | 100 | CQ-M12 x 100L          |
| <b>-20DCZ</b>              |      | 110 | x 110L                 |
| <b>-30DCZ</b>              |      | 120 | x 120L                 |
| <b>-40DCZ</b>              |      | 130 | x 130L                 |
| <b>-50DCZ</b>              |      | 140 | x 140L                 |
| <b>-75DCZ</b>              |      | 165 | x 165L                 |
| <b>-100DCZ</b>             |      | 190 | x 190L                 |
| <b>CDQ2WB160-10DCZ</b>     | 27.7 | 110 | CQ-M14 x 110L          |
| <b>-20DCZ</b>              |      | 120 | x 120L                 |
| <b>-30DCZ</b>              |      | 130 | x 130L                 |
| <b>-40DCZ</b>              |      | 140 | x 140L                 |
| <b>-50DCZ</b>              |      | 150 | x 150L                 |
| <b>-75DCZ</b>              |      | 175 | x 175L                 |
| <b>-100DCZ</b>             |      | 200 | x 200L                 |

| Cylinder model         | C  | D   | Mounting bolt part no. |
|------------------------|----|-----|------------------------|
| <b>CDQ2WB180-10DCZ</b> | 36 | 125 | CQ-M18 x 125L          |
| <b>-20DCZ</b>          |    | 135 | x 135L                 |
| <b>-30DCZ</b>          |    | 145 | x 145L                 |
| <b>-40DCZ</b>          |    | 155 | x 155L                 |
| <b>-50DCZ</b>          |    | 165 | x 165L                 |
| <b>-75DCZ</b>          |    | 190 | x 190L                 |
| <b>-100DCZ</b>         |    | 215 | x 215L                 |
| <b>CDQ2WB200-10DCZ</b> | 39 | 135 | CQ-M18 x 135L          |
| <b>-20DCZ</b>          |    | 145 | x 145L                 |
| <b>-30DCZ</b>          |    | 155 | x 155L                 |
| <b>-40DCZ</b>          |    | 165 | x 165L                 |
| <b>-50DCZ</b>          |    | 175 | x 175L                 |
| <b>-75DCZ</b>          |    | 200 | x 200L                 |
| <b>-100DCZ</b>         |    | 225 | x 225L                 |

### Additional Weight

| Bore size [mm]      | Cylinder stroke [mm] |      |                   |      |
|---------------------|----------------------|------|-------------------|------|
|                     | 125                  | 140  | 160<br>180<br>200 |      |
| Rod end male thread | Male thread          | 0.62 | 0.62              | 0.96 |
|                     | Nut                  | 0.32 | 0.32              | 0.52 |

Calculation: (Example) **CDQ2WB125-30DCMZ**  
 • Basic weight: CDQ2WB125-30DCZ .....6.11 kg  
 • Additional weight: Rod end male thread .....0.94 kg  
7.05 kg

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, End **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-RV**

Water Resistant Double Acting, Double Rod **CQ2W-RV**

Axial Piping Single Acting, Single Rod **CQP2**

Axial Piping Single Acting, Spring Return, End **CQP2**

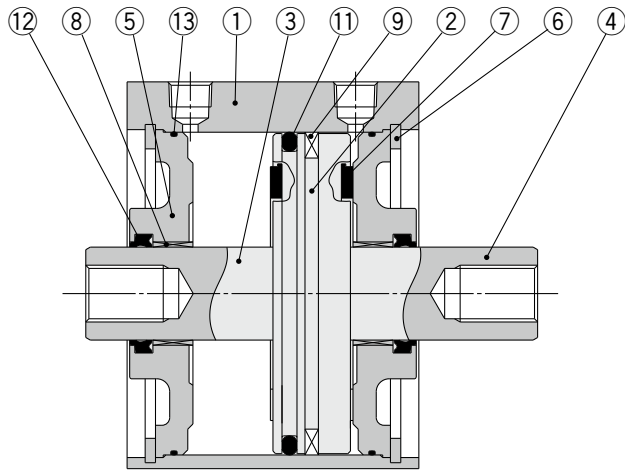
With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

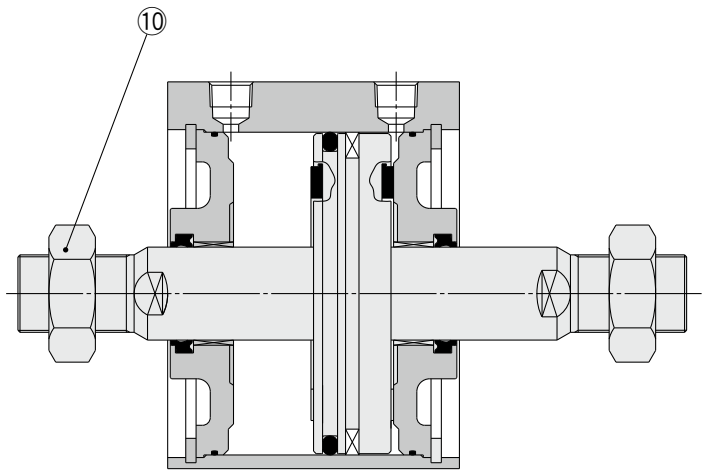
Made to Order

# CQ2W Series

## Construction



### Rod end male thread



### Component Parts

| No. | Description    | Material          | Note                |
|-----|----------------|-------------------|---------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized       |
| 2   | Piston         | Aluminum alloy    |                     |
| 3   | Piston rod A   | Carbon steel      | Hard chrome plating |
| 4   | Piston rod B   | Carbon steel      | Hard chrome plating |
| 5   | Rod cover      | Carbon steel      | Nickel plating      |
| 6   | Retaining ring | Carbon tool steel | Phosphate coated    |
| 7   | Bumper         | Resin             |                     |
| 8   | Bushing        | Bearing alloy     |                     |
| 9   | Magnet         | —                 | For CDQ2WB□ only    |
| 10  | Rod end nut    | Carbon steel      | Nickel plating      |
| 11  | Piston seal    | NBR               |                     |
| 12  | Rod seal       | NBR               |                     |
| 13  | Tube gasket    | NBR               |                     |
| 14  | Piston gasket  | NBR               |                     |

### Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.     | Contents            |
|----------------|-------------|---------------------|
| 125            | CQ2WB125-PS | Set of nos. ⑪, ⑫, ⑬ |
| 140            | CQ2WB140-PS |                     |
| 160            | CQ2WB160-PS |                     |
| 180            | CQ2WB180-PS |                     |
| 200            | CQ2WB200-PS |                     |

\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.

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

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



# Compact Cylinder: Large Bore Size **CQ2W Series**

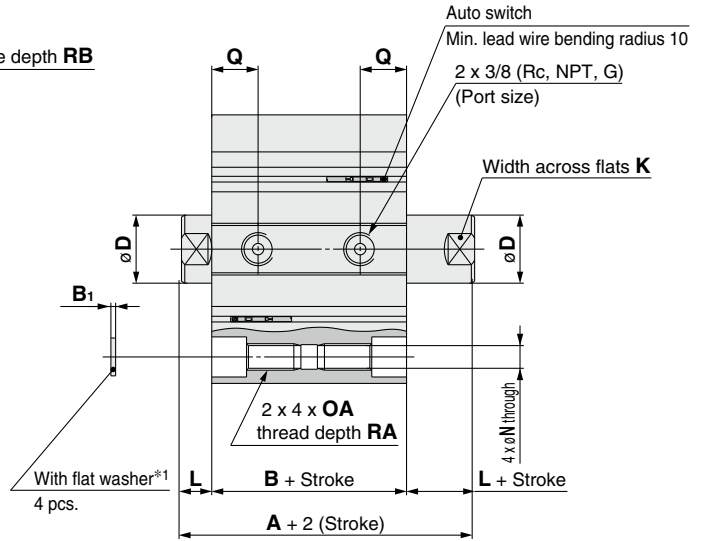
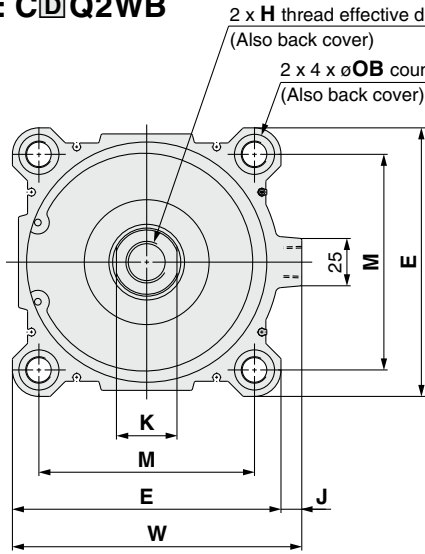
Bore Size

## ∅125 to ∅200

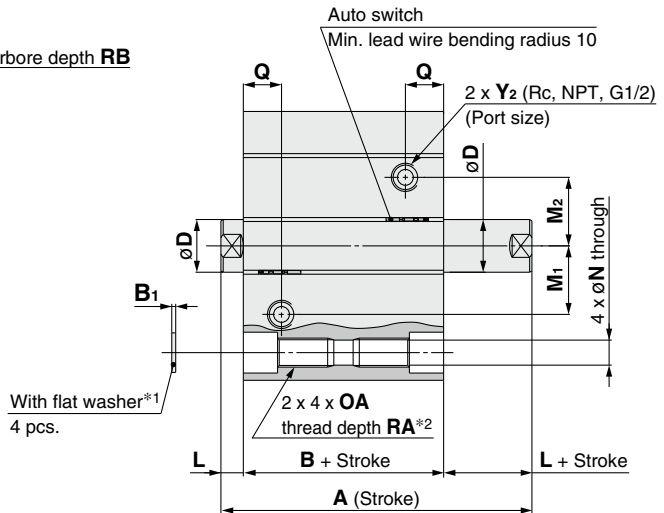
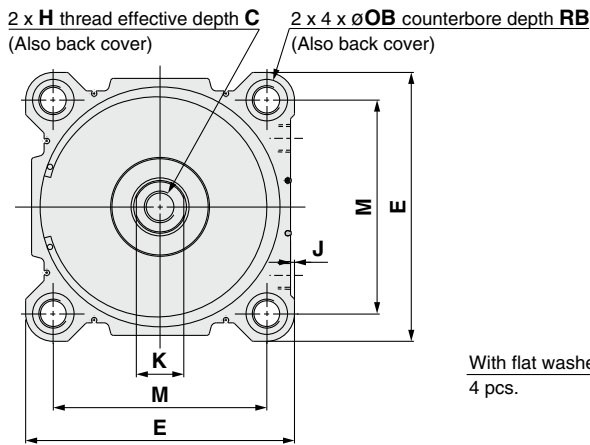
The dimensions are the same with or without an auto switch magnet.

Through-hole: **C□Q2WB**

∅125 to ∅160



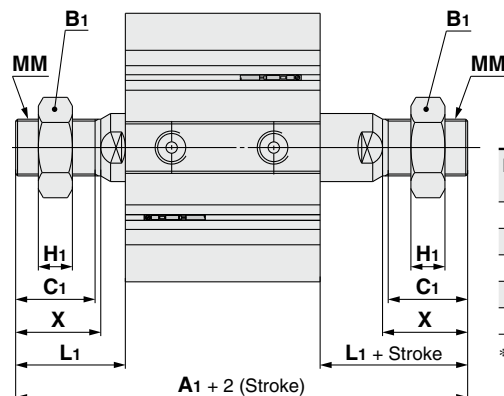
∅180, ∅200



| Bore size [mm] | Standard stroke range   | A   | B   | B <sub>1</sub> | C* <sup>3</sup> | D  | E   | H         | J   | K  | L  | M   | M <sub>1</sub> | M <sub>2</sub> | N    | OA        | OB   | Q    | RA | RB   | W   |
|----------------|---|-----|-----|----------------|-----------------|----|-----|-----------|-----|----|----|-----|----------------|----------------|------|-----------|------|------|----|------|-----|
| 125            | 10, 20, 30, 40, 50<br>75, 100, 125, 150<br>175, 200, 250, 300 | 115 | 83  | 2.5            | 30 (22.5)       | 36 | 142 | M22 x 2.5 | 11  | 32 | 16 | 114 | —              | —              | 12.5 | M14 x 2   | 21.2 | 24.5 | 25 | 18.4 | 153 |
| 140            |   | 115 | 83  | 2.5            | 30 (22.5)       | 36 | 158 | M22 x 2.5 | 10  | 32 | 16 | 128 | —              | —              | 12.5 | M14 x 2   | 21.2 | 24.5 | 25 | 18.4 | 168 |
| 160            |   | 125 | 91  | 2.5            | 33 (26.5)       | 40 | 178 | M24 x 3   | 10  | 36 | 17 | 144 | —              | —              | 14.5 | M16 x 2   | 24.2 | 27.5 | 28 | 21.2 | 188 |
| 180            |   | 136 | 102 | 3              | 33              | 40 | 204 | M24 x 3   | 3   | 36 | 17 | 162 | 52             | 52             | 19   | M22 x 2.5 | 31.5 | 29   | 38 | 26   | —   |
| 200            |   | 143 | 109 | 3              | 33              | 40 | 226 | M24 x 3   | 7.1 | 36 | 17 | 182 | 62             | 62             | 19   | M22 x 2.5 | 31.5 | 30   | 38 | 26   | —   |

\*1 Be sure to use the attached flat washer for mounting cylinder with through-holes.  
 \*2 In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.  
 \*3 ( ): Values of effective length in one side, only for 10 mm stroke model  
 \* The positions of double rod width across flats are not the same.

### Rod end male thread



| Bore size [mm] | A <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X  |
|----------------|----------------|----------------|----------------|----------------|----------------|-----------|----|
| 125            | 199            | 46             | 42             | 18             | 58             | M30 x 1.5 | 45 |
| 140            | 199            | 46             | 42             | 18             | 58             | M30 x 1.5 | 45 |
| 160            | 219            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |
| 180            | 230            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |
| 200            | 237            | 55             | 47             | 21             | 64             | M36 x 1.5 | 50 |

\* For details on the rod end nut ⇨ p. 26

|                   |                                  |                      |
|-------------------|----------------------------------|----------------------|
| Standard          | Double Acting, Single Rod        | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod        | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return-End | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Single Rod        | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod        | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod        | <b>CQ2□S</b>         |
| Long Stroke       | Double Acting, Single Rod        | <b>CQ2</b>           |
| Non-rotating Rod  | Double Acting, Single Rod        | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod        | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod        | <b>CQ2-R/V</b>       |
| Water Resistant   | Double Acting, Double Rod        | <b>CQ2W-R/V</b>      |
| Axial Piping      | Double Acting, Single Rod        | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return-End | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod        | <b>CBQ2</b>          |
| Auto Switch       |                                  | <b>Auto Switch</b>   |
| Made to Order     |                                  | <b>Made to Order</b> |

# Compact Cylinder: Anti-lateral Load

# CQ2□S Series

∅32, ∅40, ∅50, ∅63, ∅80, ∅100

## How to Order

Without auto switch

CQ2 B S 32 □ - 30 D □ C □ Z - □

With auto switch

CDQ2 B S 32 □ - 30 D □ C □ Z - M9BW □ - □

### With auto switch magnet

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

### 1 Mounting

|    |                  |
|----|------------------|
| B  | Through-hole     |
| A  | Both ends tapped |
| L  | Foot             |
| LC | Compact foot     |
| F  | Rod flange       |
| G  | Head flange      |
| D  | Double clevis    |

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

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 69

### 2 Type

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

### 3 Bore size

|     |        |
|-----|--------|
| 32  | 32 mm  |
| 40  | 40 mm  |
| 50  | 50 mm  |
| 63  | 63 mm  |
| 80  | 80 mm  |
| 100 | 100 mm |

### 4 Port thread type

|     |                               |
|-----|-------------------------------|
| Nil | Rc                            |
| TN  | NPT                           |
| TF  | G                             |
| F   | Built-in One-touch fittings*1 |

\*1 The bore sizes available with One-touch fittings are ∅32 to ∅63.

### 5 Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size       | Standard stroke                                |
|-----------------|--|
| 32, 40          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| 50, 63, 80, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 67

### 6 Action

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|

### 7 Body option 1

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

### 8 Cushion

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

### 9 Body option 2

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| M   | Rod end male thread   |

### 10 Auto switch mounting groove

|   |            |
|---|------------|
| Z | 4 surfaces |
|---|------------|

### 11 Auto switch

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

\* For applicable auto switches ⇨ p. 66

### 12 Number of auto switches

|     |   |
|-----|---|
| Nil | 2 |
| S   | 1 |
| n   | n |

### 13 Made to order common specifications

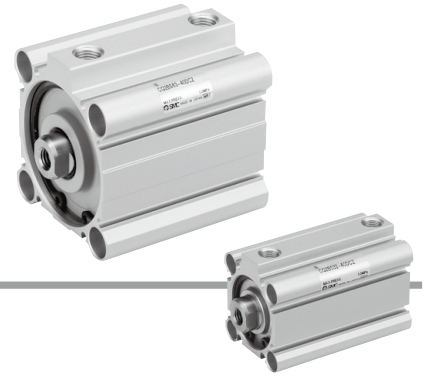
For details ⇨ p. 67

### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) CDQ2LS40-30DCZ

# Compact Cylinder: Anti-lateral Load **CQ2□S Series**



|                   |                                   |                      |
|-------------------|-----------------------------------|----------------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>           |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2□S</b>         |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>           |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-R/V</b>       |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-R/V</b>      |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>          |
| Auto Switch       |                                   | <b>Auto Switch</b>   |
| Made to Order     |                                   | <b>Made to Order</b> |

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

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

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

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

\*1 Water-resistant type auto switches can be mounted on the models on page 65, but SMC cannot guarantee water resistance.

Please contact SMC regarding water-resistant types with the model numbers on page 65.

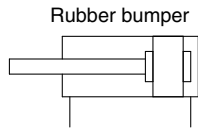
\*2 The 1 m lead wire is only applicable to the D-A93.

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

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

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

## Symbol



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

| Symbol  | Specifications  |
|---------|---|
| -XA□    | Change of rod end shape   |
| -XB10   | Intermediate stroke (Using exclusive body)  |
| -XC2(A) | Rod end length increased by 10 mm<br>(For foot and flange bracket)  |
| -XC6    | Piston rod/Retaining ring/Rod end nut material: Stainless steel   |
| -XC26   | With split pins for double clevis pin/<br>double knuckle joint pin and flat washers                                   |
| -XC26□  | Double clevis width/Double knuckle width 12.5 mm, 16.5 mm,<br>or 19.5 mm: With double clevis and double knuckle joint |
| -XC27   | Double clevis pin/Double knuckle joint pin<br>material: Stainless steel 304   |
| -XC85   | Grease for food processing equipment  |
| -XC88   | Spatter-resistant coil scraper, Lube-retainer,<br>Grease for welding (Piston rod: Stainless steel 304)                |
| -XC89   | Spatter-resistant coil scraper, Lube-retainer,<br>Grease for welding (Piston rod: S45C)                               |
| -X271   | Fluororubber seals  |
| -X1876  | Cylinder tube: With concave boss on head<br>end   |

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

## Specifications

| Bore size [mm]                 | 32  | 40   | 50   | 63   | 80   | 100  |
|--------------------------------|---|------|------|------|------|------|
| Action                         | Double acting, Single rod   |      |      |      |      |      |
| Fluid                          | Air   |      |      |      |      |      |
| Proof pressure                 | 1.5 MPa   |      |      |      |      |      |
| Maximum operating pressure     | 1.0 MPa   |      |      |      |      |      |
| Minimum operating pressure     | 0.05 MPa  |      |      |      |      |      |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |      |      |      |      |      |
| Lubrication                    | Not required (Non-lube)   |      |      |      |      |      |
| Piston speed                   | 50 to 500 mm/s  |      |      |      |      |      |
| Allowable kinetic energy [J]   | 0.29  | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| Stroke length tolerance        | +1.0 mm <sup>*1</sup><br>0  |      |      |      |      |      |

\*1 Stroke length tolerance does not include the amount of dumper change.

## Manufacturing of Intermediate Strokes

| Type         | A spacer is installed in the standard stroke body.  | Exclusive body (-XB10)   |
|--------------|---|--|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 65)  | Suffix "-XB10" to the end of standard model number. (⇨ p. 65)                                  |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.        | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |
| Stroke range | Bore size   | Bore size  |
|              | Stroke range  | Stroke range   |
| Example      | 32 to 100   | 1 to 99  |
|              | Part no.: CQ2BS50-57DCZ<br>CQ2BS50-75DCZ with 18 mm width spacer inside<br>The B dimension is 125.5 mm. | Part no.: CQ2BS50-57DCZ-XB10<br>Makes 57 stroke tube.<br>The B dimension is 107.5 mm.          |

• In the case of exclusive body type with  $\phi 32$  to  $\phi 100$  (-XB10) with the stroke length exceeding 50 mm, reference values of the longitudinal dimension will be changed.  
Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1  | Compact foot*1 | Flange  | Double clevis | Double clevis pivot bracket |
|----------------|---------|----------------|---------|---------------|-----------------------------|
| 32             | CQ-L032 | CQ-LC032       | CQ-F032 | CQ-D032       | CQ-C032                     |
| 40             | CQ-L040 | CQ-LC040       | CQ-F040 | CQ-D040       | CQ-C040                     |
| 50             | CQ-L050 | CQ-LC050       | CQ-F050 | CQ-D050       | CQ-C050                     |
| 63             | CQ-L063 | CQ-LC063       | CQ-F063 | CQ-D063       | CQ-C063                     |
| 80             | CQ-L080 | CQ-LC080       | CQ-F080 | CQ-D080       | CQ-C080                     |
| 100            | CQ-L100 | CQ-LC100       | CQ-F100 | CQ-D100       | CQ-C100                     |

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

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

Foot, Compact foot, Flange: Body mounting bolts, Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts

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

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

## Dimensions of Each Mounting Bracket

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

## ⚠ Precautions

Refer to page 189 before handling the products.



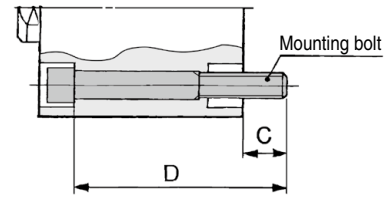
# CQ2□S Series

## Through-hole Type Mounting Bolt for the CQ2□S: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2BS is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M5 x 40L 4 pcs.

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model       | C    | D      | Mounting bolt part no. |
|----------------------|------|--------|------------------------|
| <b>CQ2BS32-5DCZ</b>  | 9    | 40     | CQ-M5 x 40L            |
| -10DCZ               |      | 45     | x 45L                  |
| -15DCZ               |      | 50     | x 50L                  |
| -20DCZ               |      | 55     | x 55L                  |
| -25DCZ               |      | 60     | x 60L                  |
| -30DCZ               |      | 65     | x 65L                  |
| -35DCZ               |      | 70     | x 70L                  |
| -40DCZ               |      | 75     | x 75L                  |
| -45DCZ               |      | 80     | x 80L                  |
| -50DCZ               |      | 85     | x 85L                  |
| -75DCZ               |      | 120    | x 120L                 |
| -100DCZ              | 145  | x 145L |                        |
| <b>CQ2BS40-5DCZ</b>  | 7.5  | 45     | CQ-M5 x 45L            |
| -10DCZ               |      | 50     | x 50L                  |
| -15DCZ               |      | 55     | x 55L                  |
| -20DCZ               |      | 60     | x 60L                  |
| -25DCZ               |      | 65     | x 65L                  |
| -30DCZ               |      | 70     | x 70L                  |
| -35DCZ               |      | 75     | x 75L                  |
| -40DCZ               |      | 80     | x 80L                  |
| -45DCZ               |      | 85     | x 85L                  |
| -50DCZ               |      | 90     | x 90L                  |
| -75DCZ               |      | 125    | x 125L                 |
| -100DCZ              | 150  | x 150L |                        |
| <b>CQ2BS50-10DCZ</b> | 12.5 | 55     | CQ-M6 x 55L            |
| -15DCZ               |      | 60     | x 60L                  |
| -20DCZ               |      | 65     | x 65L                  |
| -25DCZ               |      | 70     | x 70L                  |
| -30DCZ               |      | 75     | x 75L                  |
| -35DCZ               |      | 80     | x 80L                  |
| -40DCZ               |      | 85     | x 85L                  |
| -45DCZ               |      | 90     | x 90L                  |
| -50DCZ               |      | 95     | x 95L                  |
| -75DCZ               |      | 130    | x 130L                 |
| -100DCZ              |      | 155    | x 155L                 |

| Cylinder model        | C    | D   | Mounting bolt part no. |
|-----------------------|------|-----|------------------------|
| <b>CQ2BS63-10DCZ</b>  | 14.5 | 60  | CQ-M8 x 60L            |
| -15DCZ                |      | 65  | x 65L                  |
| -20DCZ                |      | 70  | x 70L                  |
| -25DCZ                |      | 75  | x 75L                  |
| -30DCZ                |      | 80  | x 80L                  |
| -35DCZ                |      | 85  | x 85L                  |
| -40DCZ                |      | 90  | x 90L                  |
| -45DCZ                |      | 95  | x 95L                  |
| -50DCZ                |      | 100 | x 100L                 |
| -75DCZ                |      | 135 | x 135L                 |
| -100DCZ               |      | 160 | x 160L                 |
| <b>CQ2BS80-10DCZ</b>  | 15   | 65  | CQ-M10 x 65L           |
| -15DCZ                |      | 70  | x 70L                  |
| -20DCZ                |      | 75  | x 75L                  |
| -25DCZ                |      | 80  | x 80L                  |
| -30DCZ                |      | 85  | x 85L                  |
| -35DCZ                |      | 90  | x 90L                  |
| -40DCZ                |      | 95  | x 95L                  |
| -45DCZ                |      | 100 | x 100L                 |
| -50DCZ                |      | 105 | x 105L                 |
| -75DCZ                |      | 140 | x 140L                 |
| -100DCZ               |      | 165 | x 165L                 |
| <b>CQ2BS100-10DCZ</b> | 15.5 | 75  | CQ-M10 x 75L           |
| -15DCZ                |      | 80  | x 80L                  |
| -20DCZ                |      | 85  | x 85L                  |
| -25DCZ                |      | 90  | x 90L                  |
| -30DCZ                |      | 95  | x 95L                  |
| -35DCZ                |      | 100 | x 100L                 |
| -40DCZ                |      | 105 | x 105L                 |
| -45DCZ                |      | 110 | x 110L                 |
| -50DCZ                |      | 115 | x 115L                 |
| -75DCZ                |      | 150 | x 150L                 |
| -100DCZ               |      | 175 | x 175L                 |

## Through-hole Type Mounting Bolt for the CDQ2□S: With Auto Switch Magnet

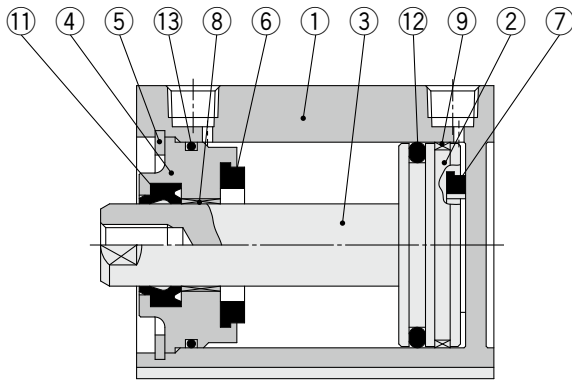
| Cylinder model        | C    | D      | Mounting bolt part no. |
|-----------------------|------|--------|------------------------|
| <b>CDQ2BS32-5DCZ</b>  | 9    | 50     | CQ-M5 x 50L            |
| -10DCZ                |      | 55     | x 55L                  |
| -15DCZ                |      | 60     | x 60L                  |
| -20DCZ                |      | 65     | x 65L                  |
| -25DCZ                |      | 70     | x 70L                  |
| -30DCZ                |      | 75     | x 75L                  |
| -35DCZ                |      | 80     | x 80L                  |
| -40DCZ                |      | 85     | x 85L                  |
| -45DCZ                |      | 90     | x 90L                  |
| -50DCZ                |      | 95     | x 95L                  |
| -75DCZ                |      | 120    | x 120L                 |
| -100DCZ               | 145  | x 145L |                        |
| <b>CDQ2BS40-5DCZ</b>  | 7.5  | 55     | CQ-M5 x 55L            |
| -10DCZ                |      | 60     | x 60L                  |
| -15DCZ                |      | 65     | x 65L                  |
| -20DCZ                |      | 70     | x 70L                  |
| -25DCZ                |      | 75     | x 75L                  |
| -30DCZ                |      | 80     | x 80L                  |
| -35DCZ                |      | 85     | x 85L                  |
| -40DCZ                |      | 90     | x 90L                  |
| -45DCZ                |      | 95     | x 95L                  |
| -50DCZ                |      | 100    | x 100L                 |
| -75DCZ                |      | 125    | x 125L                 |
| -100DCZ               | 150  | x 150L |                        |
| <b>CDQ2BS50-10DCZ</b> | 12.5 | 65     | CQ-M6 x 65L            |
| -15DCZ                |      | 70     | x 70L                  |
| -20DCZ                |      | 75     | x 75L                  |
| -25DCZ                |      | 80     | x 80L                  |
| -30DCZ                |      | 85     | x 85L                  |
| -35DCZ                |      | 90     | x 90L                  |
| -40DCZ                |      | 95     | x 95L                  |
| -45DCZ                |      | 100    | x 100L                 |
| -50DCZ                |      | 105    | x 105L                 |
| -75DCZ                |      | 130    | x 130L                 |
| -100DCZ               |      | 155    | x 155L                 |

| Cylinder model         | C    | D   | Mounting bolt part no. |
|------------------------|------|-----|------------------------|
| <b>CDQ2BS63-10DCZ</b>  | 14.5 | 70  | CQ-M8 x 70L            |
| -15DCZ                 |      | 75  | x 75L                  |
| -20DCZ                 |      | 80  | x 80L                  |
| -25DCZ                 |      | 85  | x 85L                  |
| -30DCZ                 |      | 90  | x 90L                  |
| -35DCZ                 |      | 95  | x 95L                  |
| -40DCZ                 |      | 100 | x 100L                 |
| -45DCZ                 |      | 105 | x 105L                 |
| -50DCZ                 |      | 110 | x 110L                 |
| -75DCZ                 |      | 135 | x 135L                 |
| -100DCZ                |      | 160 | x 160L                 |
| <b>CDQ2BS80-10DCZ</b>  | 15   | 75  | CQ-M10 x 75L           |
| -15DCZ                 |      | 80  | x 80L                  |
| -20DCZ                 |      | 85  | x 85L                  |
| -25DCZ                 |      | 90  | x 90L                  |
| -30DCZ                 |      | 95  | x 95L                  |
| -35DCZ                 |      | 100 | x 100L                 |
| -40DCZ                 |      | 105 | x 105L                 |
| -45DCZ                 |      | 110 | x 110L                 |
| -50DCZ                 |      | 115 | x 115L                 |
| -75DCZ                 |      | 140 | x 140L                 |
| -100DCZ                |      | 165 | x 165L                 |
| <b>CDQ2BS100-10DCZ</b> | 15.5 | 85  | CQ-M10 x 85L           |
| -15DCZ                 |      | 90  | x 90L                  |
| -20DCZ                 |      | 95  | x 95L                  |
| -25DCZ                 |      | 100 | x 100L                 |
| -30DCZ                 |      | 105 | x 105L                 |
| -35DCZ                 |      | 110 | x 110L                 |
| -40DCZ                 |      | 115 | x 115L                 |
| -45DCZ                 |      | 120 | x 120L                 |
| -50DCZ                 |      | 125 | x 125L                 |
| -75DCZ                 |      | 150 | x 150L                 |
| -100DCZ                |      | 175 | x 175L                 |

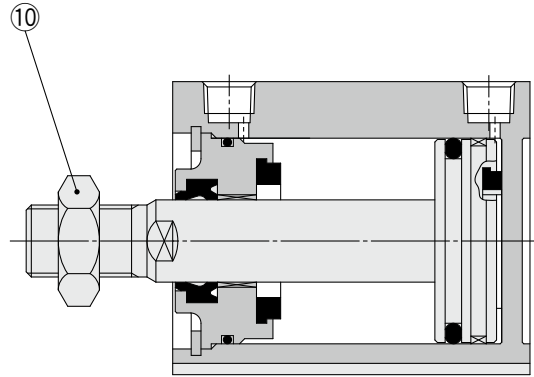


## Construction

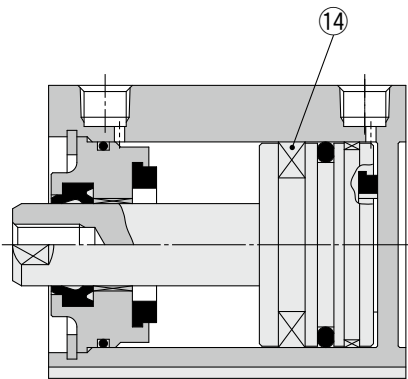
### Without auto switch magnet



Rod end male thread



### With auto switch magnet



### Component Parts

| No. | Description    | Material          | Note                |
|-----|----------------|-------------------|---------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized       |
| 2   | Piston         | Aluminum alloy    |                     |
| 3   | Piston rod     | Carbon steel      | Hard chrome plating |
| 4   | Collar         | Aluminum alloy    | Anodized            |
| 5   | Retaining ring | Carbon tool steel | Phosphate coated    |
| 6   | Bumper A       | Urethane          |                     |
| 7   | Bumper B       | Urethane          |                     |
| 8   | Bushing        | Bearing alloy     |                     |
| 9   | Wear ring      | Resin             |                     |
| 10  | Rod end nut    | Carbon steel      | Zinc chromated      |
| 11  | Rod seal       | NBR               |                     |
| 12  | Piston seal    | NBR               |                     |
| 13  | Tube gasket    | NBR               |                     |
| 14  | Magnet         | —                 |                     |

### Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.    | Contents            |
|----------------|------------|---------------------|
| 32             | CQ2B32-PS  | Set of nos. ⑪, ⑫, ⑬ |
| 40             | CQ2B40-PS  |                     |
| 50             | CQ2B50-PS  |                     |
| 63             | CQ2B63-PS  |                     |
| 80             | CQ2B80-PS  |                     |
| 100            | CQ2B100-PS |                     |

\* Seal kit includes ⑪, ⑫, ⑬. Order the seal kit based on each bore size.

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

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

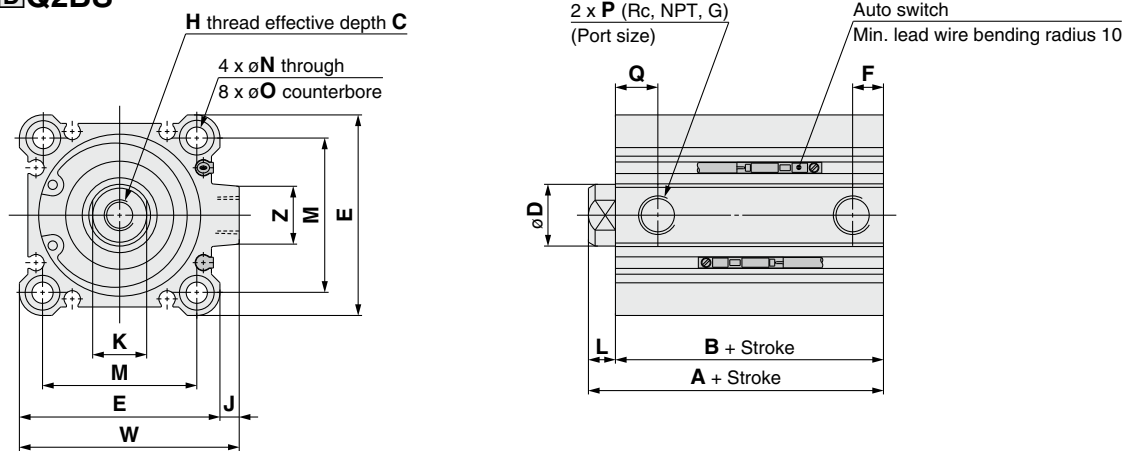
|                   |                           |         |                           |               |
|-------------------|---------------------------|---------|---------------------------|---------------|
| Standard          | Double Acting, Double Rod | CQ2W    | Double Acting, Single Rod | CQ2           |
| Large Bore Size   | Double Acting, Double Rod | CQ2W    | Double Acting, Single Rod | CQ2           |
| Anti-lateral Load | Double Acting, Single Rod | CQ2□S   | Double Acting, Single Rod | CQ2           |
| Long Stroke       | Double Acting, Single Rod | CQ2     | Double Acting, Single Rod | CQ2           |
| Non-rotating Rod  | Double Acting, Double Rod | CQ2KW   | Double Acting, Single Rod | CQ2K          |
| Water Resistant   | Double Acting, Double Rod | CQ2W-RV | Double Acting, Single Rod | CQ2-RV        |
| Axial Piping      | Double Acting, Single Rod | CQP2    | Double Acting, Single Rod | CQP2          |
| With End Lock     | Double Acting, Single Rod | CBQ2    | Double Acting, Single Rod | CBQ2          |
| Auto Switch       |                           |         |                           | Auto Switch   |
| Made to Order     |                           |         |                           | Made to Order |

# CQ2□S Series

Bore Size

## ∅32 to ∅100 With/Without Auto Switch Magnet

Through-hole: C□Q2BS

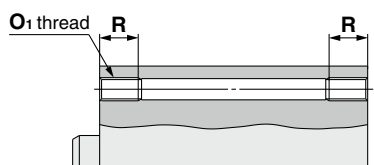


| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      | [mm] |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
|----------------|-------------------|----------------------------|------|-------------------------|------|------|----|-----|------|-----------|-----|----|----|----|-----|-----------------|-----|------|-------|----|
|                |                   | A                          | B    | A                       | B    | C    | D  | E   | F    | H         | J   | K  | L  | M  | N   | O               | P   | Q    | W     | Z  |
| 32             | 5 to 50           | 40                         | 33   | 50                      | 43   | 13   | 16 | 45  | 7.5  | M8 x 1.25 | 4.5 | 14 | 7  | 34 | 5.5 | 9 depth 7       | 1/8 | 10   | 49.5  | 14 |
|                | 75, 100           | 50                         | 43   |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
| 40             | 5 to 50           | 46.5                       | 39.5 | 56.5                    | 49.5 | 13   | 16 | 52  | 7.5  | M8 x 1.25 | 5   | 14 | 7  | 40 | 5.5 | 9 depth 7       | 1/8 | 12.5 | 57    | 15 |
|                | 75, 100           | 56.5                       | 49.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
| 50             | 10 to 50          | 48.5                       | 40.5 | 58.5                    | 50.5 | 15   | 20 | 64  | 10.5 | M10 x 1.5 | 7   | 17 | 8  | 50 | 6.6 | 11 depth 8      | 1/4 | 10.5 | 71    | 19 |
|                | 75, 100           | 58.5                       | 50.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
| 63             | 10 to 50          | 54                         | 46   | 64                      | 56   | 15   | 20 | 77  | 10.5 | M10 x 1.5 | 7   | 17 | 8  | 60 | 9   | 14 depth 10.5   | 1/4 | 15   | 84    | 19 |
|                | 75, 100           | 64                         | 56   |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
| 80             | 10 to 50          | 63.5                       | 53.5 | 73.5                    | 63.5 | 21   | 25 | 98  | 12.5 | M16 x 2.0 | 6   | 22 | 10 | 77 | 11  | 17.5 depth 13.5 | 3/8 | 16   | 104   | 25 |
|                | 75, 100           | 73.5                       | 63.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |
| 100            | 10 to 50          | 75                         | 63   | 85                      | 73   | 27   | 30 | 117 | 13   | M20 x 2.5 | 6.5 | 27 | 12 | 94 | 11  | 17.5 depth 13.5 | 3/8 | 23   | 123.5 | 25 |
|                | 75, 100           | 85                         | 73   |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |       |    |

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

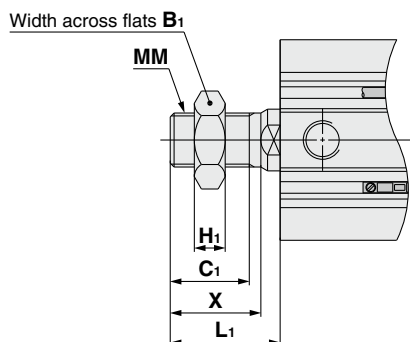
\* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 32             | M6 x 1.0       | 10 |
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |
| 63             | M10 x 1.5      | 18 |
| 80             | M12 x 1.75     | 22 |
| 100            | M12 x 1.75     | 22 |

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 32             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
| 63             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
| 80             | 32             | 32.5           | 13             | 43.5           | M22 x 1.5 | 35.5 |
| 100            | 41             | 32.5           | 16             | 43.5           | M26 x 1.5 | 35.5 |

The dimensions with boss on head end are equivalent to those of the standard type, double acting, single rod. ⇨ p. 19, 20

### Dimensions of Each Mounting Bracket

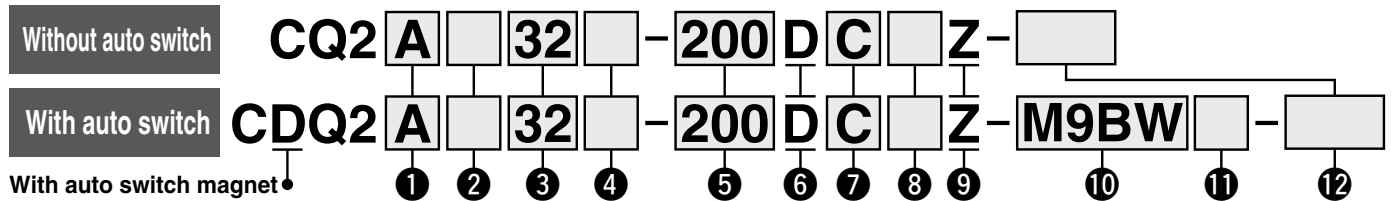
The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.

# Compact Cylinder: Long Stroke Double Acting, Single Rod

## CQ2 Series

∅32, ∅40, ∅50, ∅63, ∅80, ∅100

### How to Order



**1 Mounting**

|    |                  |
|----|------------------|
| A  | Both ends tapped |
| L  | Foot             |
| LC | Compact foot     |
| F  | Rod flange       |
| G  | Head flange      |
| D  | Double clevis    |

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

**2 Type**

|     |           |
|-----|-----------|
| Nil | Pneumatic |
| H   | Air-hydro |

**3 Bore size**

|     |        |
|-----|--------|
| 32  | 32 mm  |
| 40  | 40 mm  |
| 50  | 50 mm  |
| 63  | 63 mm  |
| 80  | 80 mm  |
| 100 | 100 mm |

**4 Port thread type**

|     |                               |
|-----|-------------------------------|
| Nil | Rc                            |
| TN  | NPT                           |
| TF  | G                             |
| F   | Built-in One-touch fittings*1 |

\*1 The bore sizes available with One-touch fittings are ∅32 to ∅63. However, they cannot be selected for the air-hydro type.  
\* "TF" is not selectable for the air-hydro type.

**5 Cylinder stroke**  
(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size   | Standard stroke |
|-------------|-----------------|
| 32, 40, 50  | 125, 150, 175   |
| 63, 80, 100 | 200, 250, 300   |

\* For the manufacturing of intermediate strokes ⇨ p. 73

**6 Action**

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|

**7 Cushion**

|     |                       |
|-----|-----------------------|
| Nil | Without rubber bumper |
| C   | With rubber bumper    |

\* Pneumatic type: With rubber bumper only  
Air-hydro type: Without rubber bumper only

**8 Body option**

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| M   | Rod end male thread   |

**9 Auto switch mounting groove**

|   |            |
|---|------------|
| Z | 4 surfaces |
|---|------------|

**10 Auto switch**

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

\* For applicable auto switches, refer to the table below.

**11 Number of auto switches**

|     |   |
|-----|---|
| Nil | 2 |
| S   | 1 |
| n   | n |

### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2L40-200DCZ

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

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

### 12 Made to order common specifications

For details ⇨ p. 73

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

| Type                                | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |         | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |            |   |   |   |   |
|-------------------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|---------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|------------|---|---|---|---|
|                                     |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | IC circuit      | Relay, PLC |            |            |   |   |   |   |
| Solid state auto switch             | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV    | M9N                  | ●     | ●     | ●     | ○        | —                   | ○               | IC circuit | Relay, PLC |            |   |   |   |   |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PV    | M9P                  | ●     | ●     | ●     | ○        | —                   | ○               |            |            |            |   |   |   |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | M9BV    | M9B                  | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          |   |   |   |   |
|                                     |   |                  |                 | 3-wire (NPN)            |              |           |                   | M9NWV   | M9NW                 | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          |   |   |   |   |
|                                     | Diagnostic indication (2-color indicator) |                  |                 | 3-wire (PNP)            |              |           |                   | M9PWV   | M9PW                 | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          | ○ | — | ○ | — |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | M9B WV  | M9B W                | ●     | ●     | ●     | ○        | —                   | ○               |            |            | —          | ○ | — | ○ | — |
|                                     |   |                  |                 | 3-wire (NPN)            |              |           |                   | M9NAV*1 | M9NA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            | —          | ○ | — | ○ | — |
|                                     |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PAV*1 | M9PA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            | —          | ○ | — | ○ | — |
| Water resistant (2-color indicator) | 2-wire                                    | M9BA*1           | M9BA*1          | ○                       | ○            | ●         | ○                 | —       | ○                    | —     | ○     | —     | ○        | —                   | —               | —          |            |            |   |   |   |   |
|                                     | 2-wire (Non-polar)                        | —                | P3DWA           | ●                       | —            | ●         | —                 | —       | ○                    | —     | ○     | —     | ○        | —                   | —               | —          |            |            |   |   |   |   |
| Reed auto switch                    | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V or less     | A96V    | A96                  | ●     | —     | ●     | —        | —                   | —               | IC circuit | —          |            |   |   |   |   |
|                                     |   |                  |                 | 2-wire                  |              |           |                   | A93V*2  | A93                  | ●     | ●     | ●     | ●        | —                   | —               | —          | —          | Relay, PLC |   |   |   |   |
|                                     |   |                  |                 | —                       |              |           |                   | A90V    | A90                  | ●     | —     | ●     | —        | —                   | —               | —          | —          | IC circuit |   |   |   |   |

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

Please contact SMC regarding water-resistant types with the above model numbers.

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

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

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

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

Standard Double Acting, Single Rod CQ2

Standard Double Acting, Double Rod CQ2W

Single Acting, Spring Return, Double Rod CQ2

Large Bore Size Double Acting, Single Rod CQ2

Large Bore Size Double Acting, Double Rod CQ2W

Anti-lateral Load Double Acting, Single Rod CQ2S

Long Stroke Double Acting, Single Rod CQ2

Long Stroke Double Acting, Double Rod CQ2K

Non-rotating Rod Double Acting, Single Rod CQ2K

Non-rotating Rod Double Acting, Double Rod CQ2KW

Water Resistant Double Acting, Single Rod CQ2-RV

Water Resistant Double Acting, Double Rod CQ2W-RV

Axial Piping Double Acting, Single Rod CQP2

Axial Piping Double Acting, Double Rod CQP2

Single Acting, Spring Return, Single Rod CQP2

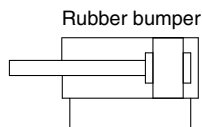
With End Lock Double Acting, Single Rod CQBQ2

Auto Switch

Made to Order



## Symbol



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

| Symbol | Specifications  |
|--------|---|
| -XA□   | Change of rod end shape   |
| -XB10  | Intermediate stroke (Using exclusive body)  |
| -XC4   | With heavy duty scraper   |
| -XC6   | Piston rod/Retaining ring/Rod end nut material: Stainless steel   |
| -XC26  | With split pins for double clevis pin/<br>double knuckle joint pin and flat washers                                   |
| -XC26□ | Double clevis width/Double knuckle width 12.5 mm, 16.5 mm,<br>or 19.5 mm: With double clevis and double knuckle joint |
| -XC27  | Double clevis pin/Double knuckle joint pin<br>material: Stainless steel 304   |
| -XC35  | With coil scraper   |
| -XC36  | With boss on rod end*2  |
| -XC85  | Grease for food processing equipment  |
| -XC88  | Spatter-resistant coil scraper, Lube-retainer,<br>Grease for welding (Piston rod: Stainless steel 304)                |
| -XC89  | Spatter-resistant coil scraper, Lube-retainer,<br>Grease for welding (Piston rod: S45C)                               |
| -X271  | Fluororubber seals*1  |

\*1 Excludes the air-hydro type

\*2 The standard model can be used for the type with boss on the rod end (-XC36).

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

## Specifications

### Pneumatic type

| Bore size [mm]                        | 32  | 40   | 50   | 63   | 80   | 100  |
|---------------------------------------|---|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.05 MPa  |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.29  | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| <b>Stroke length tolerance</b>        | +1.4 mm <sup>+1</sup><br>0  |      |      |      |      |      |

\*1 Stroke length tolerance does not include the amount of bumper change.

### Air-hydro type

| Bore size [mm]                        | 32                         | 40      | 50 | 63 | 80 | 100 |
|---------------------------------------|----------------------------|---------|----|----|----|-----|
| <b>Action</b>                         | Double acting, Single rod  |         |    |    |    |     |
| <b>Fluid</b>                          | Turbine oil*1              |         |    |    |    |     |
| <b>Proof pressure</b>                 | 1.5 MPa                    |         |    |    |    |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa                    |         |    |    |    |     |
| <b>Minimum operating pressure</b>     | 0.18 MPa                   | 0.1 MPa |    |    |    |     |
| <b>Ambient and fluid temperatures</b> | 5 to 60°C                  |         |    |    |    |     |
| <b>Piston speed</b>                   | 5 to 50 mm/s               |         |    |    |    |     |
| <b>Cushion</b>                        | None                       |         |    |    |    |     |
| <b>Stroke length tolerance</b>        | +1.4 mm <sup>+2</sup><br>0 |         |    |    |    |     |

\*1 Refer to Actuator Precautions 5 (Web Catalog).

\*2 The air-hydro type has no bumper.

## Manufacturing of Intermediate Strokes (Excludes the air-hydro type)

| Type         | A spacer is installed in the standard stroke body.   | Exclusive body (-XB10)   |
|--------------|--|--|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 72)                                       | Suffix "-XB10" to the end of standard model number. (⇨ p. 72)                                  |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.       | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |
| Stroke range | 101 to 299   | 101 to 299   |
| Example      | Part no.: CQ2A50-166DCZ<br>CQ2A50-175DCZ with 9 mm width spacer inside<br>The B dimension is 230.5 mm. | Part no.: CQ2A50-166DCZ-XB10<br>Makes 166 mm stroke tube.<br>The B dimension is 221.5 mm.      |

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1  | Compact foot*1 | Flange  | Double clevis | Double clevis pivot bracket |
|----------------|---------|----------------|---------|---------------|-----------------------------|
| <b>32</b>      | CQ-L032 | CQ-LC032       | CQ-F032 | CQ-D032       | CQ-C032                     |
| <b>40</b>      | CQ-L040 | CQ-LC040       | CQ-F040 | CQ-D040       | CQ-C040                     |
| <b>50</b>      | CQ-L050 | CQ-LC050       | CQ-F050 | CQ-D050       | CQ-C050                     |
| <b>63</b>      | CQ-L063 | CQ-LC063       | CQ-F063 | CQ-D063       | CQ-C063                     |
| <b>80</b>      | CQ-L080 | CQ-LC080       | CQ-F080 | CQ-D080       | CQ-C080                     |
| <b>100</b>     | CQ-L100 | CQ-LC100       | CQ-F100 | CQ-D100       | CQ-C100                     |

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

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

Foot, Compact foot, Flange: Body mounting bolts, Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts

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

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

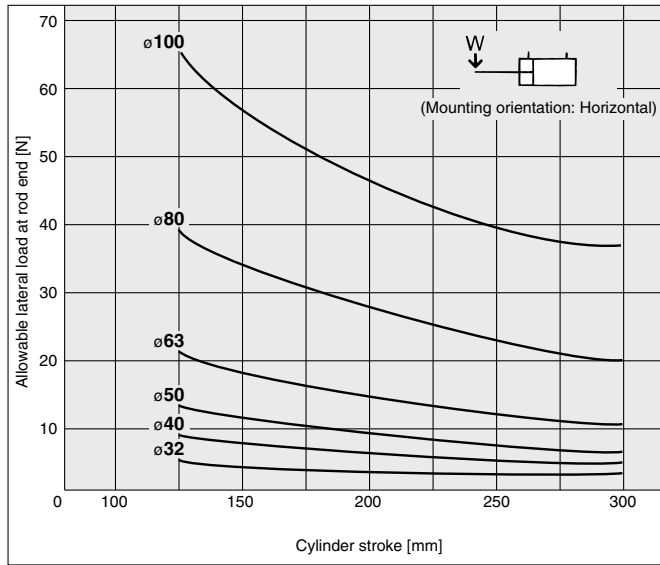
## ⚠ Precautions

**Refer to page 189 before handling the products.**

## Dimensions of Each Mounting Bracket

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

### Allowable Lateral Load at Rod End



### Theoretical Output



| Bore size [mm] | Operating direction | Operating pressure [MPa] |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1155 |
|                | OUT                 | 589                      | 982  | 1374 |
| 63             | IN                  | 841                      | 1402 | 1962 |
|                | OUT                 | 935                      | 1559 | 2182 |
| 80             | IN                  | 1361                     | 2268 | 3175 |
|                | OUT                 | 1508                     | 2513 | 3519 |
| 100            | IN                  | 2144                     | 3574 | 5003 |
|                | OUT                 | 2356                     | 3927 | 5498 |

### Weight

#### Without Auto Switch Magnet [g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|
|                | 125                  | 150  | 175  | 200  | 250  | 300  |
| 32             | 708                  | 817  | 918  | 1017 | 1215 | 1415 |
| 40             | 888                  | 997  | 1107 | 1217 | 1438 | 1657 |
| 50             | 1352                 | 1517 | 1682 | 1841 | 2177 | 2507 |
| 63             | 1706                 | 1900 | 2095 | 2292 | 2676 | 3065 |
| 80             | 2832                 | 3130 | 3429 | 3725 | 4324 | 4921 |
| 100            | 4540                 | 4906 | 5270 | 5634 | 6367 | 7096 |

#### With Auto Switch Magnet [g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|
|                | 125                  | 150  | 175  | 200  | 250  | 300  |
| 32             | 726                  | 826  | 927  | 1026 | 1224 | 1424 |
| 40             | 902                  | 1012 | 1121 | 1231 | 1451 | 1671 |
| 50             | 1367                 | 1532 | 1697 | 1856 | 2192 | 2522 |
| 63             | 1730                 | 1924 | 2119 | 2316 | 2700 | 3089 |
| 80             | 2856                 | 3154 | 3453 | 3749 | 4348 | 4945 |
| 100            | 4578                 | 4944 | 5308 | 5672 | 6405 | 7134 |

#### Additional Weight [g]

| Bore size [mm]  |             | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|-----|-----|-----|-----|------|------|
| Rod end male thread                                   | Male thread | 26  | 27  | 53  | 53  | 120  | 175  |
|   | Nut         | 17  | 17  | 32  | 32  | 49   | 116  |
| Foot (Including mounting bolts)                       |             | 104 | 122 | 194 | 272 | 550  | 912  |
| Compact foot (Including mounting bolts)               |             | 79  | 93  | 148 | 210 | 454  | 707  |
| Rod flange (Including mounting bolts)                 |             | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Head flange (Including mounting bolts)                |             | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining rings, bolts) |             | 151 | 196 | 393 | 554 | 1109 | 1887 |

Calculation: (Example) **CQ2D32-200DCMZ**

- Basic weight: CQ2A32-200DCZ ..... 1017 g
- Additional weight: Rod end male thread ..... 43 g
- Double clevis ..... 151 g
- 1211 g

Add each weight of auto switches when auto switches are mounted.

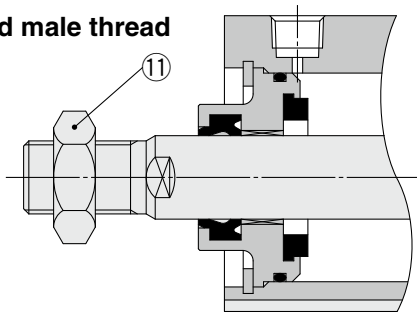
Standard  
 Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, Single Rod **CQ2**  
 Large Bore Size  
 Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load  
 Double Acting, Single Rod **CQ2** □ **S**  
 Long Stroke  
 Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2K**  
 Non-rotating Rod  
 Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant  
 Double Acting, Single Rod **CQ2-R/V**  
 Double Acting, Double Rod **CQ2W-R/V**  
 Axial Piping  
 Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, Single Rod **CQP2**  
 With End Lock  
 Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

# CQ2 Series

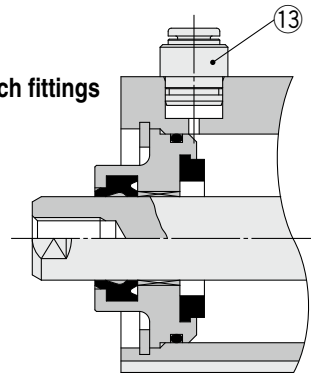
## Construction



Rod end male thread



Built-in One-touch fittings



### Component Parts

| No. | Description       | Material          | Note                |
|-----|-------------------|-------------------|---------------------|
| 1   | Cylinder tube     | Aluminum alloy    | Hard anodized       |
| 2   | Piston            | Aluminum alloy    |                     |
| 3   | Piston rod        | Carbon steel      | Hard chrome plating |
| 4   | Collar            | Aluminum alloy    | Anodized            |
| 5   | Bottom plate      | Aluminum alloy    | Anodized            |
| 6   | Retaining ring    | Carbon tool steel | Phosphate coated    |
| 7   | Bumper A          | Urethane          | Pneumatic type only |
| 8   | Bumper B          | Urethane          | Pneumatic type only |
| 9   | Bushing           | Bearing alloy     |                     |
| 10  | Wear ring         | Resin             | Zinc chromated      |
| 11  | Rod end nut       | Carbon steel      | For CDQ2A□ only     |
| 12  | Magnet            | —                 | ø32 to ø63          |
| 13  | One-touch fitting | —                 |                     |
| 14  | Rod seal          | NBR               |                     |
| 15  | Piston seal       | NBR               |                     |
| 16  | Tube gasket       | NBR               |                     |

### Replacement Parts/Seal Kit

#### Pneumatic Type

| Bore size [mm] | Kit no.      | Contents            |
|----------------|--------------|---------------------|
| 32             | CQ2A32-L-PS  | Set of nos. ⑭, ⑮, ⑯ |
| 40             | CQ2A40-L-PS  |                     |
| 50             | CQ2A50-L-PS  |                     |
| 63             | CQ2A63-L-PS  |                     |
| 80             | CQ2A80-L-PS  |                     |
| 100            | CQ2A100-L-PS |                     |

\* Seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.

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

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

#### Air-hydro Type

| Bore size [mm] | Kit no.       | Contents            |
|----------------|---------------|---------------------|
| 32             | CQ2AH32-L-PS  | Set of nos. ⑭, ⑮, ⑯ |
| 40             | CQ2AH40-L-PS  |                     |
| 50             | CQ2AH50-L-PS  |                     |
| 63             | CQ2AH63-L-PS  |                     |
| 80             | CQ2AH80-L-PS  |                     |
| 100            | CQ2AH100-L-PS |                     |

\* Seal kit includes ⑭, ⑮, ⑯. Order the seal kit based on each bore size.

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

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

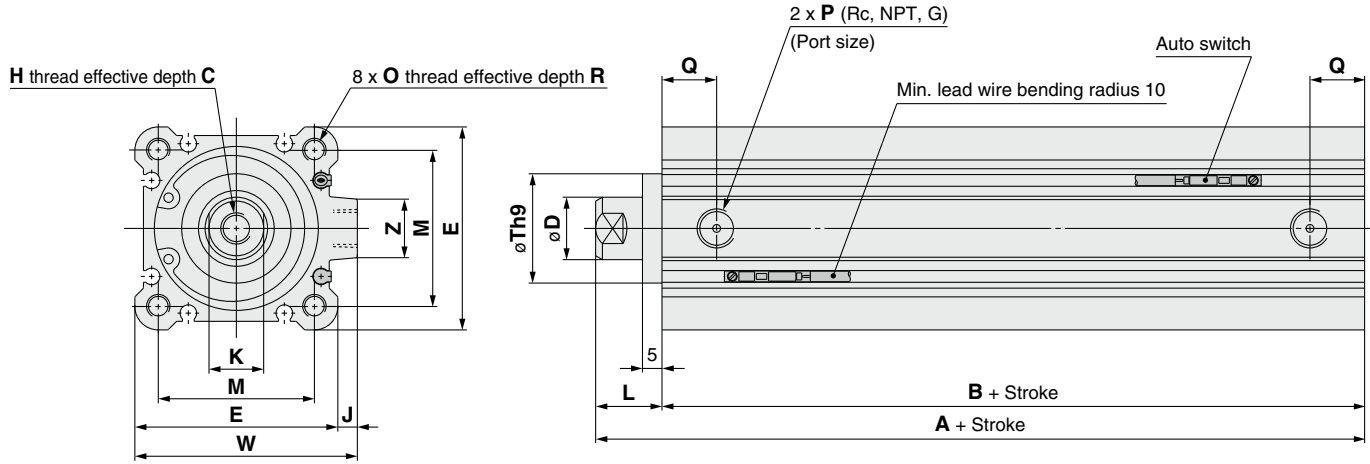


Bore Size

**∅32 to ∅100** With/Without Auto Switch Magnet

The dimensions are the same with or without an auto switch magnet.

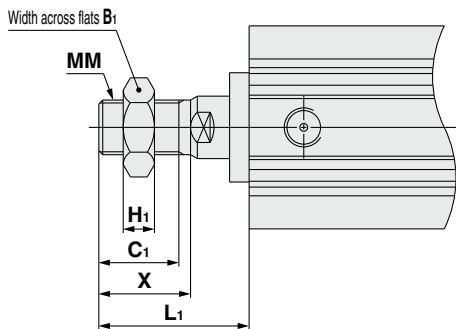
Both ends tapped: C□Q2A



| Bore size [mm] | Stroke range [mm]                  | A    | B    | C  | D  | E   | H         | J   | K  | L  | M  | O          | P   | Q    | R  | Th9                               | W     | Z  |
|----------------|------------------------------------|------|------|----|----|-----|-----------|-----|----|----|----|------------|-----|------|----|-----------------------------------|-------|----|
| 32             | 125, 150,<br>175, 200,<br>250, 300 | 62.5 | 45.5 | 13 | 16 | 45  | M8 x 1.25 | 4.5 | 14 | 17 | 34 | M6 x 1.0   | 1/8 | 10   | 10 | 22 <sup>0</sup> <sub>-0.052</sub> | 49.5  | 14 |
| 40             |                                    | 72   | 55   | 13 | 16 | 52  | M8 x 1.25 | 5   | 14 | 17 | 40 | M6 x 1.0   | 1/8 | 12.5 | 10 | 28 <sup>0</sup> <sub>-0.052</sub> | 57    | 15 |
| 50             |                                    | 73.5 | 55.5 | 15 | 20 | 64  | M10 x 1.5 | 7   | 17 | 18 | 50 | M8 x 1.25  | 1/4 | 14   | 14 | 35 <sup>0</sup> <sub>-0.062</sub> | 71    | 19 |
| 63             |                                    | 75   | 57   | 15 | 20 | 77  | M10 x 1.5 | 7   | 17 | 18 | 60 | M10 x 1.5  | 1/4 | 16.5 | 18 | 35 <sup>0</sup> <sub>-0.062</sub> | 84    | 19 |
| 80             |                                    | 86   | 66   | 21 | 25 | 98  | M16 x 2.0 | 6   | 22 | 20 | 77 | M12 x 1.75 | 3/8 | 19   | 22 | 43 <sup>0</sup> <sub>-0.062</sub> | 104   | 25 |
| 100            |                                    | 97.5 | 75.5 | 27 | 30 | 117 | M20 x 2.5 | 6.5 | 27 | 22 | 94 | M12 x 1.75 | 3/8 | 23   | 22 | 59 <sup>0</sup> <sub>-0.074</sub> | 123.5 | 25 |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 73
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 32             | 22             | 20.5           | 8              | 38.5           | M14 x 1.5 | 23.5 |
| 40             | 22             | 20.5           | 8              | 38.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 43.5           | M18 x 1.5 | 28.5 |
| 63             | 27             | 26             | 11             | 43.5           | M18 x 1.5 | 28.5 |
| 80             | 32             | 32.5           | 13             | 53.5           | M22 x 1.5 | 35.5 |
| 100            | 41             | 32.5           | 16             | 53.5           | M26 x 1.5 | 35.5 |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, single rod. ⇨ p. 19, 20

Dimensions of Each Mounting Bracket

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

Standard  
Double Acting, Single Rod  
**CQ2**

Standard  
Double Acting, Double Rod  
**CQ2W**

Single Acting, Spring Return-End  
Double Acting, Double Rod  
**CQ2**

Single Acting, Spring Return-End  
Double Acting, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Large Bore Size  
Double Acting, Single Rod  
**CQ2**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2□S**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Water Resistant  
Double Acting, Double Rod  
**CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Axial Piping  
Single Acting, Spring Return-End  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch

Made to Order

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

## CQ2K Series

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

### How to Order

Without auto switch  
ø12 to ø25

CQ2K B 20 □ - 30 D □ - □

Without auto switch  
ø32 to ø63

CQ2K B 32 □ - 30 D □ Z - □

With auto switch

CDQ2K B 32 □ - 30 D □ Z - M9BW □ - □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

#### With auto switch magnet

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

• Non-rotating rod

#### 1 Mounting

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

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

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

Without auto switch magnet ⇨ p. 81

With auto switch magnet ⇨ p. 82

#### 2 Bore size

|                         |       |
|-------------------------|-------|
| <b>12</b> <sup>*1</sup> | 12 mm |
| <b>16</b>               | 16 mm |
| <b>20</b>               | 20 mm |
| <b>25</b>               | 25 mm |
| <b>32</b>               | 32 mm |
| <b>40</b>               | 40 mm |
| <b>50</b>               | 50 mm |
| <b>63</b>               | 63 mm |

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

Example) CDQ2KB12-30DCZ

#### 3 Port thread type

|            |   |            |
|------------|---|------------|
| <b>Nil</b> | M thread                                  | ø12 to ø25 |
|            | Rc  |            |
| <b>TN</b>  | NPT                                       | ø32 to ø63 |
| <b>TF</b>  | G   |            |
| <b>F</b>   | Built-in One-touch fittings <sup>*1</sup> |            |

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

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

#### 4 Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size     | Standard stroke                                  |
|---------------|--|
| <b>12, 16</b> | 5, 10, 15, 20, 25, 30                            |
| <b>20, 25</b> | 5, 10, 15, 20, 25, 30, 35<br>40, 45, 50          |
| <b>32, 40</b> | 5, 10, 15, 20, 25, 30, 35<br>40, 45, 50, 75, 100 |
| <b>50, 63</b> | 10, 15, 20, 25, 30, 35, 40<br>45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 79

#### 5 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### 6 Body option

|            |  |
|------------|--|
| <b>Nil</b> | Rod end female thread                                    |
| <b>F</b>   | With boss on head end                                    |
| <b>C</b>   | With rubber bumper<br>(ø12 with auto switch magnet only) |
| <b>M</b>   | Rod end male thread                                      |

\* Combined body options "FM" can be selected.

# Compact Cylinder: Non-rotating Rod Double Acting, Single Rod **CQ2K Series**



## 7 Auto switch mounting groove

|   |            |            |
|---|------------|------------|
| Z | ø12 to ø25 | 2 surfaces |
|   | ø32 to ø63 | 4 surfaces |

## 8 Auto switch

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

\* For applicable auto switches, refer to the table below.

## 9 Number of auto switches

|     |   |
|-----|---|
| Nil | 2 |
| S   | 1 |
| n   | n |

## 10 Made to order common specifications

For details ⇒ p. 79

## Cylinder Model with Auto Switch Magnet

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

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

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

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

| Type   | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |         | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |
|--|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|---------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|
|  |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     | IC circuit      | Relay, PLC |            |
| Solid state auto switch                      | —   | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV    | M9N                  | ●     | ●     | ●     | ○        | —                   |                 |            | ○          |
|  |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PV    | M9P                  | ●     | ●     | ●     | ○        | —                   | ○               |            |            |
|  | 2-wire                                    |                  |                 | M9BV                    |              |           |                   | M9B     | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |
|  | 3-wire (NPN)                              |                  |                 | M9NVV                   |              |           |                   | M9NV    | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |
|  | 3-wire (PNP)                              |                  |                 | M9PVV                   |              |           |                   | M9PV    | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |
|  | 2-wire                                    |                  |                 | M9BVV                   |              |           |                   | M9BV    | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |
|  | Diagnostic indication (2-color indicator) | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NAV*1 | M9NA*1               | ○     | ○     | ●     | ○        | —                   | ○               | IC circuit | Relay, PLC |
|  |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PAV*1 | M9PA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            |
|  |   |                  |                 | 2-wire                  |              |           |                   | M9BAV*1 | M9BA*1               | ○     | ○     | ●     | ○        | —                   | ○               |            |            |
|  |   |                  |                 | 2-wire (Non-polar)      |              |           |                   | —       | P3DWA                | ●     | —     | ●     | —        | ○                   | ○               |            |            |
| Water resistant (2-color indicator)          | Grommet                                   | Yes              | 3-wire (NPN)    | 24 V                    | 5 V, 12 V    | —         | M9NAV*1           | M9NA*1  | ○                    | ○     | ●     | ○     | —        | ○                   | IC circuit      | Relay, PLC |            |
|  |   |                  | 3-wire (PNP)    |                         |              |           | M9PAV*1           | M9PA*1  | ○                    | ○     | ●     | ○     | —        | ○                   |                 |            |            |
|  |   |                  | 2-wire          |                         |              |           | M9BAV*1           | M9BA*1  | ○                    | ○     | ●     | ○     | —        | ○                   |                 |            |            |
| Magnetic field resistant (2-color indicator) | Grommet                                   | Yes              | 3-wire (NPN)    | 24 V                    | 5 V, 12 V    | —         | M9NAV*1           | M9NA*1  | ○                    | ○     | ●     | ○     | —        | ○                   | IC circuit      | Relay, PLC |            |
|  |   |                  | 3-wire (PNP)    |                         |              |           | M9PAV*1           | M9PA*1  | ○                    | ○     | ●     | ○     | —        | ○                   |                 |            |            |
| Reed auto switch                             | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V             | A96V    | A96                  | ●     | —     | ●     | —        | —                   | IC circuit      | Relay, PLC |            |
|  |   |                  |                 | 2-wire                  |              |           |                   | A93V*2  | A93                  | ●     | ●     | ●     | ●        | —                   |                 |            | —          |
| Reed auto switch                             | —   | Grommet          | No              | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 100 V or less     | A90V    | A90                  | ●     | —     | ●     | —        | —                   | IC circuit      | Relay, PLC |            |
|  |   |                  |                 | 2-wire                  |              |           |                   | A90V    | A90                  | ●     | —     | ●     | —        | —                   |                 |            | —          |

\*1 Water-resistant type auto switches can be mounted on the models on page 77, but SMC cannot guarantee water resistance. Please contact SMC regarding water-resistant types with the model numbers on page 77.

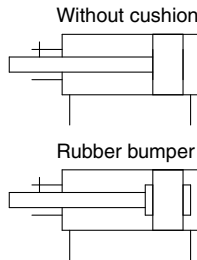
\*2 The 1 m lead wire is only applicable to the D-A93.

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
1 m ..... M (Example) M9NVM  
3 m ..... L (Example) M9NVL  
5 m ..... Z (Example) M9NVZ

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

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

## Symbol



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

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

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

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

## Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

## ⚠ Precautions

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

## Specifications

| Bore size [mm]                        | 12  | 16       | 20    | 25   | 32    | 40   | 50   | 63   |
|---------------------------------------|---|----------|-------|------|-------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |          |       |      |       |      |      |      |
| <b>Fluid</b>                          | Air   |          |       |      |       |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |          |       |      |       |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |          |       |      |       |      |      |      |
| <b>Minimum operating pressure</b>     | 0.07 MPa  | 0.05 MPa |       |      |       |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |          |       |      |       |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |          |       |      |       |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |          |       |      |       |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.022<br>0.043*1  | 0.038    | 0.055 | 0.09 | 0.15  | 0.26 | 0.46 | 0.77 |
| <b>Stroke length tolerance</b>        | +1.0 mm*2<br>0  |          |       |      |       |      |      |      |
| <b>Rod non-rotating accuracy</b>      | ±2°   | ±1°      |       |      | ±0.8° |      |      |      |

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

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

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

## Manufacturing of Intermediate Strokes

| Type         | A spacer is installed in the standard stroke body.  | Exclusive body (-XB10)   |  |              |
|--------------|---|--|--|--------------|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 77)                                      | Suffix "-XB10" to the end of standard model number. (⇨ p. 77)                                  |  |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.      | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |  |              |
| Stroke range | Bore size   | Stroke range   | Bore size  | Stroke range |
|              | 12, 16  | 1 to 29  | —  | —            |
|              | 20, 25  | 1 to 49  | 40   | 6 to 99      |
|              | 32 to 63  | 1 to 99  | 50, 63   | 11 to 99     |
| Example      | Part no.: CQ2KB50-57DZ<br>CQ2KB50-75DZ with 18 mm width spacer inside<br>The B dimension is 115.5 mm. |  | Part no.: CQ2KB50-57DZ-XB10<br>Makes 57 mm stroke tube.<br>The B dimension is 97.5 mm. |              |

## Mounting Bracket Part Nos.

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

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

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

Foot, Compact foot, Flange: Body mounting bolts

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

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

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

## Dimensions of Each Mounting Bracket

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

## Weight

### Without Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |     |     |     |     |     |      |      |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50  | 75   | 100  |
| 12             | 60                   | 67  | 74  | 81  | 88  | 95  | —   | —   | —   | —   | —    | —    |
| 16             | 58                   | 67  | 76  | 85  | 94  | 103 | —   | —   | —   | —   | —    | —    |
| 20             | 103                  | 117 | 131 | 145 | 159 | 173 | 187 | 201 | 215 | 229 | —    | —    |
| 25             | 137                  | 152 | 167 | 182 | 197 | 212 | 227 | 242 | 257 | 272 | —    | —    |
| 32             | 196                  | 215 | 234 | 253 | 272 | 291 | 310 | 329 | 347 | 366 | 506  | 601  |
| 40             | 205                  | 226 | 248 | 269 | 291 | 312 | 333 | 355 | 376 | 398 | 570  | 682  |
| 50             | —                    | 356 | 390 | 424 | 457 | 491 | 525 | 559 | 592 | 626 | 901  | 1075 |
| 63             | —                    | 524 | 563 | 602 | 641 | 680 | 720 | 759 | 798 | 837 | 1173 | 1375 |

### With Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |     |     |     |     |     |      |      |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50  | 75   | 100  |
| 12             | 71                   | 77  | 83  | 89  | 96  | 102 | —   | —   | —   | —   | —    | —    |
| 16             | 74                   | 82  | 89  | 97  | 105 | 113 | —   | —   | —   | —   | —    | —    |
| 20             | 119                  | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 217 | 229 | —    | —    |
| 25             | 162                  | 177 | 192 | 208 | 223 | 238 | 254 | 269 | 284 | 300 | —    | —    |
| 32             | 227                  | 247 | 266 | 286 | 306 | 326 | 345 | 365 | 385 | 404 | 504  | 604  |
| 40             | 240                  | 261 | 283 | 305 | 326 | 348 | 369 | 391 | 413 | 434 | 546  | 658  |
| 50             | —                    | 433 | 466 | 499 | 532 | 565 | 598 | 630 | 663 | 697 | 869  | 1041 |
| 63             | —                    | 622 | 660 | 698 | 736 | 774 | 812 | 850 | 888 | 926 | 1124 | 1321 |

## Theoretical Output



| Bore size [mm] | Operating direction | Operating pressure [MPa] |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 12             | IN                  | 25                       | 42   | 59   |
|                | OUT                 | 34                       | 57   | 79   |
| 16             | IN                  | 45                       | 75   | 106  |
|                | OUT                 | 60                       | 101  | 141  |
| 20             | IN                  | 71                       | 118  | 165  |
|                | OUT                 | 94                       | 157  | 220  |
| 25             | IN                  | 113                      | 189  | 264  |
|                | OUT                 | 147                      | 245  | 344  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1150 |
|                | OUT                 | 589                      | 982  | 1370 |
| 63             | IN                  | 841                      | 1400 | 1960 |
|                | OUT                 | 935                      | 1560 | 2180 |

### Additional Weight

| Bore size [mm]  | 12          | 16  | 20 | 25 | 32 | 40  | 50  | 63  |
|---|-------------|-----|----|----|----|-----|-----|-----|
| Both ends tapped                                      | —           | —   | —  | —  | —  | 6   | 6   | 19  |
| Rod end male thread                                   | Male thread | 1.5 | 3  | 6  | 12 | 26  | 27  | 53  |
|   | Nut         | 1   | 2  | 4  | 8  | 17  | 17  | 32  |
| With boss on head end                                 | 0.7         | 1.3 | 2  | 3  | 5  | 7   | 13  | 25  |
| Built-in One-touch fittings                           | —           | —   | —  | —  | 12 | 12  | 21  | 21  |
| Foot (Including mounting bolts)                       | —           | —   | —  | —  | —  | 138 | 219 | 297 |
| Compact foot (Including mounting bolts)               | —           | —   | —  | —  | —  | 109 | 172 | 234 |
| Rod flange (Including mounting bolts)                 | —           | —   | —  | —  | —  | 213 | 372 | 558 |
| Head flange (Including mounting bolts)                | —           | —   | —  | —  | —  | 198 | 348 | 534 |
| Double clevis (Including pin, retaining rings, bolts) | —           | —   | —  | —  | —  | 196 | 393 | 554 |

Calculation: (Example) **CDQ2KD40-25DMZ**

- Basic weight: CDQ2KB40-25DZ ..... 326 g
  - Additional weight: Both ends tapped ..... 6 g
  - Rod end male thread ..... 44 g
  - Double clevis ..... 196 g
- 572 g

Add each weight of auto switches when auto switches are mounted.

Standard Double Acting, Single Rod **CQ2**  
 Standard Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, End **CQ2**  
 Large Bore Size Double Acting, Single Rod **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2**  
 Anti-lateral Load Double Acting, Double Rod **CQ2S**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Long Stroke Double Acting, Double Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Non-rotating Rod Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-R/V**  
 Water Resistant Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Axial Piping Single Acting, Spring Return, End **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

# CQ2K Series

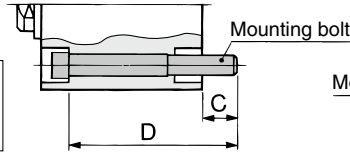
## Through-hole Type Mounting Bolt for the CQ2K: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2KB is available as an option.  
 Refer to the following for ordering procedures.  
 Order the actual number of bolts that will be used.  
 For models with an auto switch magnet ⇨ p. 82

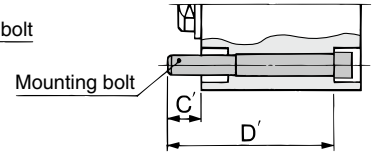
**Example) CQ-M3 x 30L 2 pcs.**

Type: Hexagon socket head cap screw  
 Material: Chromium molybdenum steel  
 Surface treatment: Zinc chromated

Head end mounting



Rod end mounting



| Cylinder model     | C   | D   | Mounting bolt part no. | C'  | D'          | Mounting bolt part no. |
|--------------------|-----|-----|------------------------|-----|-------------|------------------------|
| <b>CQ2KB12-5D</b>  | 6.5 | 30  | CQ-M3 x 30L            | 6.5 | 30          | CQ-M3 x 30L            |
| -10D               |     | 35  | x 35L                  |     | 35          | x 35L                  |
| -15D               |     | 40  | x 40L                  |     | 40          | x 40L                  |
| -20D               |     | 45  | x 45L                  |     | 45          | x 45L                  |
| -25D               |     | 50  | x 50L                  |     | 50          | x 50L                  |
| -30D               |     | 55  | x 55L                  |     | 55          | x 55L                  |
| <b>CQ2KB16-5D</b>  | 5   | 30  | CQ-M3 x 30L            | 5   | 30          | CQ-M3 x 30L            |
| -10D               |     | 35  | x 35L                  |     | 35          | x 35L                  |
| -15D               |     | 40  | x 40L                  |     | 40          | x 40L                  |
| -20D               |     | 45  | x 45L                  |     | 45          | x 45L                  |
| -25D               |     | 50  | x 50L                  |     | 50          | x 50L                  |
| -30D               |     | 55  | x 55L                  |     | 55          | x 55L                  |
| <b>CQ2KB20-5D</b>  | 8   | 35  | CQ-M5 x 35L            | 9.5 | 35          | CQ-M5 x 35L            |
| -10D               |     | 40  | x 40L                  |     | 40          | x 40L                  |
| -15D               |     | 45  | x 45L                  |     | 45          | x 45L                  |
| -20D               |     | 50  | x 50L                  |     | 50          | x 50L                  |
| -25D               |     | 55  | x 55L                  |     | 55          | x 55L                  |
| -30D               |     | 60  | x 60L                  |     | 60          | x 60L                  |
| -35D               |     | 65  | x 65L                  |     | 65          | x 65L                  |
| -40D               |     | 70  | x 70L                  |     | 70          | x 70L                  |
| -45D               |     | 75  | x 75L                  |     | 75          | x 75L                  |
| -50D               |     | 80  | x 80L                  |     | 80          | x 80L                  |
| <b>CQ2KB25-5D</b>  |     | 10  | 40                     |     | CQ-M5 x 40L | 6.5                    |
| -10D               | 45  |     | x 45L                  | 40  | x 40L       |                        |
| -15D               | 50  |     | x 50L                  | 45  | x 45L       |                        |
| -20D               | 55  |     | x 55L                  | 50  | x 50L       |                        |
| -25D               | 60  |     | x 60L                  | 55  | x 55L       |                        |
| -30D               | 65  |     | x 65L                  | 60  | x 60L       |                        |
| -35D               | 70  |     | x 70L                  | 65  | x 65L       |                        |
| -40D               | 75  |     | x 75L                  | 70  | x 70L       |                        |
| -45D               | 80  |     | x 80L                  | 75  | x 75L       |                        |
| -50D               | 85  |     | x 85L                  | 80  | x 80L       |                        |
| <b>CQ2KB32-5DZ</b> | 8.5 | 40  | CQ-M5 x 40L            | 10  | 40          | CQ-M5 x 40L            |
| -10DZ              |     | 45  | x 45L                  |     | 45          | x 45L                  |
| -15DZ              |     | 50  | x 50L                  |     | 50          | x 50L                  |
| -20DZ              |     | 55  | x 55L                  |     | 55          | x 55L                  |
| -25DZ              |     | 60  | x 60L                  |     | 60          | x 60L                  |
| -30DZ              |     | 65  | x 65L                  |     | 65          | x 65L                  |
| -35DZ              |     | 70  | x 70L                  |     | 70          | x 70L                  |
| -40DZ              |     | 75  | x 75L                  |     | 75          | x 75L                  |
| -45DZ              |     | 80  | x 80L                  |     | 80          | x 80L                  |
| -50DZ              |     | 85  | x 85L                  |     | 85          | x 85L                  |
| -75DZ              |     | 120 | x 120L                 |     | 120         | x 120L                 |
| -100DZ             |     | 145 | x 145L                 |     | 145         | x 145L                 |

| Cylinder model      | C, C' | D, D'  | Mounting bolt part no. |
|---------------------|-------|--------|------------------------|
| <b>CQ2KB40-5DZ</b>  | 7.5   | 35     | CQ-M5 x 35L            |
| -10DZ               |       | 40     | x 40L                  |
| -15DZ               |       | 45     | x 45L                  |
| -20DZ               |       | 50     | x 50L                  |
| -25DZ               |       | 55     | x 55L                  |
| -30DZ               |       | 60     | x 60L                  |
| -35DZ               |       | 65     | x 65L                  |
| -40DZ               |       | 70     | x 70L                  |
| -45DZ               |       | 75     | x 75L                  |
| -50DZ               |       | 80     | x 80L                  |
| <b>CQ2KB50-10DZ</b> | 12.5  | 45     | CQ-M6 x 45L            |
| -15DZ               |       | 50     | x 50L                  |
| -20DZ               |       | 55     | x 55L                  |
| -25DZ               |       | 60     | x 60L                  |
| -30DZ               |       | 65     | x 65L                  |
| -35DZ               |       | 70     | x 70L                  |
| -40DZ               |       | 75     | x 75L                  |
| -45DZ               |       | 80     | x 80L                  |
| -50DZ               |       | 85     | x 85L                  |
| -75DZ               |       | 120    | x 120L                 |
| -100DZ              | 145   | x 145L |                        |
| <b>CQ2KB63-10DZ</b> | 14.5  | 50     | CQ-M8 x 50L            |
| -15DZ               |       | 55     | x 55L                  |
| -20DZ               |       | 60     | x 60L                  |
| -25DZ               |       | 65     | x 65L                  |
| -30DZ               |       | 70     | x 70L                  |
| -35DZ               |       | 75     | x 75L                  |
| -40DZ               |       | 80     | x 80L                  |
| -45DZ               |       | 85     | x 85L                  |
| -50DZ               |       | 90     | x 90L                  |
| -75DZ               |       | 125    | x 125L                 |
| -100DZ              | 150   | x 150L |                        |

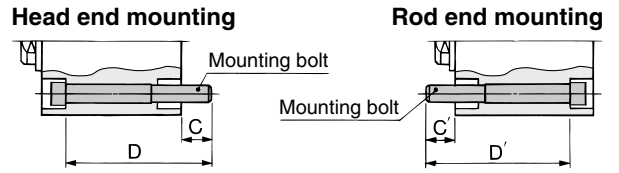


## Through-hole Type Mounting Bolt for the CDQ2KB: With Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CDQ2KB is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.  
For models without an auto switch magnet ⇨ p. 81

**Example) CQ-M3 x 35L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model       | C    | D   | Mounting bolt part no. | C'  | D'  | Mounting bolt part no. |
|----------------------|------|-----|------------------------|-----|-----|------------------------|
| <b>CDQ2KB12-5DCZ</b> | 5.5  | 35  | CQ-M3 x 35L            | 5.5 | 40  | CQ-M3 x 40L            |
| <b>-10DCZ</b>        |      | 40  | x 40L                  |     | 45  | x 45L                  |
| <b>-15DCZ</b>        |      | 45  | x 45L                  |     | 50  | x 50L                  |
| <b>-20DCZ</b>        |      | 50  | x 50L                  |     | 55  | x 55L                  |
| <b>-25DCZ</b>        |      | 55  | x 55L                  |     | 60  | x 60L                  |
| <b>-30DCZ</b>        |      | 60  | x 60L                  |     | 65  | x 65L                  |
| <b>CDQ2KB16-5DZ</b>  | 8    | 40  | CQ-M3 x 40L            | 8   | 45  | CQ-M3 x 45L            |
| <b>-10DZ</b>         |      | 45  | x 45L                  |     | 50  | x 50L                  |
| <b>-15DZ</b>         |      | 50  | x 50L                  |     | 55  | x 55L                  |
| <b>-20DZ</b>         |      | 55  | x 55L                  |     | 60  | x 60L                  |
| <b>-25DZ</b>         |      | 60  | x 60L                  |     | 65  | x 65L                  |
| <b>-30DZ</b>         |      | 65  | x 65L                  |     | 70  | x 70L                  |
| <b>CDQ2KB20-5DZ</b>  | 10.5 | 40  | CQ-M5 x 40L            | 7.5 | 45  | CQ-M5 x 45L            |
| <b>-10DZ</b>         |      | 45  | x 45L                  |     | 50  | x 50L                  |
| <b>-15DZ</b>         |      | 50  | x 50L                  |     | 55  | x 55L                  |
| <b>-20DZ</b>         |      | 55  | x 55L                  |     | 60  | x 60L                  |
| <b>-25DZ</b>         |      | 60  | x 60L                  |     | 65  | x 65L                  |
| <b>-30DZ</b>         |      | 65  | x 65L                  |     | 70  | x 70L                  |
| <b>-35DZ</b>         |      | 70  | x 70L                  |     | 75  | x 75L                  |
| <b>-40DZ</b>         |      | 75  | x 75L                  |     | 80  | x 80L                  |
| <b>-45DZ</b>         |      | 80  | x 80L                  |     | 85  | x 85L                  |
| <b>-50DZ</b>         |      | 85  | x 85L                  |     | 90  | x 90L                  |
| <b>CDQ2KB25-5DZ</b>  | 9.5  | 40  | CQ-M5 x 40L            | 6.5 | 45  | CQ-M5 x 45L            |
| <b>-10DZ</b>         |      | 45  | x 45L                  |     | 50  | x 50L                  |
| <b>-15DZ</b>         |      | 50  | x 50L                  |     | 55  | x 55L                  |
| <b>-20DZ</b>         |      | 55  | x 55L                  |     | 60  | x 60L                  |
| <b>-25DZ</b>         |      | 60  | x 60L                  |     | 65  | x 65L                  |
| <b>-30DZ</b>         |      | 65  | x 65L                  |     | 70  | x 70L                  |
| <b>-35DZ</b>         |      | 70  | x 70L                  |     | 75  | x 75L                  |
| <b>-40DZ</b>         |      | 75  | x 75L                  |     | 80  | x 80L                  |
| <b>-45DZ</b>         |      | 80  | x 80L                  |     | 85  | x 85L                  |
| <b>-50DZ</b>         |      | 85  | x 85L                  |     | 90  | x 90L                  |
| <b>CDQ2KB32-5DZ</b>  | 8.5  | 50  | CQ-M5 x 50L            | 10  | 50  | CQ-M5 x 50L            |
| <b>-10DZ</b>         |      | 55  | x 55L                  |     | 55  | x 55L                  |
| <b>-15DZ</b>         |      | 60  | x 60L                  |     | 60  | x 60L                  |
| <b>-20DZ</b>         |      | 65  | x 65L                  |     | 65  | x 65L                  |
| <b>-25DZ</b>         |      | 70  | x 70L                  |     | 70  | x 70L                  |
| <b>-30DZ</b>         |      | 75  | x 75L                  |     | 75  | x 75L                  |
| <b>CDQ2KB32-40DZ</b> | 8.5  | 85  | CQ-M5 x 85L            | 10  | 85  | CQ-M5 x 85L            |
| <b>-45DZ</b>         |      | 90  | x 90L                  |     | 90  | x 90L                  |
| <b>-50DZ</b>         |      | 95  | x 95L                  |     | 95  | x 95L                  |
| <b>-75DZ</b>         |      | 120 | x 120L                 |     | 120 | x 120L                 |
| <b>-100DZ</b>        |      | 145 | x 145L                 |     | 145 | x 145L                 |

| Cylinder model       | C, C' | D, D'  | Mounting bolt part no. |
|----------------------|-------|--------|------------------------|
| <b>CDQ2KB40-5DZ</b>  | 7.5   | 45     | CQ-M5 x 45L            |
| <b>-10DZ</b>         |       | 50     | x 50L                  |
| <b>-15DZ</b>         |       | 55     | x 55L                  |
| <b>-20DZ</b>         |       | 60     | x 60L                  |
| <b>-25DZ</b>         |       | 65     | x 65L                  |
| <b>-30DZ</b>         |       | 70     | x 70L                  |
| <b>-35DZ</b>         |       | 75     | x 75L                  |
| <b>-40DZ</b>         |       | 80     | x 80L                  |
| <b>-45DZ</b>         |       | 85     | x 85L                  |
| <b>-50DZ</b>         |       | 90     | x 90L                  |
| <b>CDQ2KB50-10DZ</b> | 12.5  | 55     | CQ-M6 x 55L            |
| <b>-15DZ</b>         |       | 60     | x 60L                  |
| <b>-20DZ</b>         |       | 65     | x 65L                  |
| <b>-25DZ</b>         |       | 70     | x 70L                  |
| <b>-30DZ</b>         |       | 75     | x 75L                  |
| <b>-35DZ</b>         |       | 80     | x 80L                  |
| <b>-40DZ</b>         |       | 85     | x 85L                  |
| <b>-45DZ</b>         |       | 90     | x 90L                  |
| <b>-50DZ</b>         |       | 95     | x 95L                  |
| <b>-75DZ</b>         |       | 120    | x 120L                 |
| <b>-100DZ</b>        | 145   | x 145L |                        |
| <b>CDQ2KB63-10DZ</b> | 14.5  | 60     | CQ-M8 x 60L            |
| <b>-15DZ</b>         |       | 65     | x 65L                  |
| <b>-20DZ</b>         |       | 70     | x 70L                  |
| <b>-25DZ</b>         |       | 75     | x 75L                  |
| <b>-30DZ</b>         |       | 80     | x 80L                  |
| <b>-35DZ</b>         |       | 85     | x 85L                  |
| <b>-40DZ</b>         |       | 90     | x 90L                  |
| <b>-45DZ</b>         |       | 95     | x 95L                  |
| <b>-50DZ</b>         |       | 100    | x 100L                 |
| <b>-75DZ</b>         |       | 125    | x 125L                 |
| <b>-100DZ</b>        | 150   | x 150L |                        |

Standard  
Double Acting, Single Rod **CQ2**  
Double Acting, Double Rod **CQ2W**  
Single Acting, Spring Return-End **CQ2**

Large Bore Size  
Double Acting, Single Rod **CQ2**  
Double Acting, Double Rod **CQ2W**

Anti-lateral Load  
Double Acting, Single Rod **CQ2**  
Double Acting, Double Rod **CQ2W**

Long Stroke  
Double Acting, Single Rod **CQ2**  
Double Acting, Double Rod **CQ2W**

Non-rotating Rod  
Double Acting, Single Rod **CQ2K**  
Double Acting, Double Rod **CQ2KW**

Water Resistant  
Double Acting, Single Rod **CQ2-R/V**  
Double Acting, Double Rod **CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod **CQP2**  
Single Acting, Spring Return-End **CQP2**

With End Lock  
Double Acting, Single Rod **CBQ2**

Auto Switch

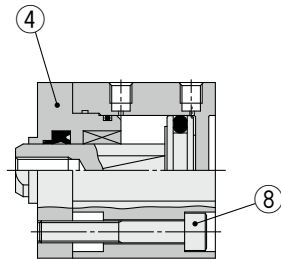
Made to Order

# CQ2K Series

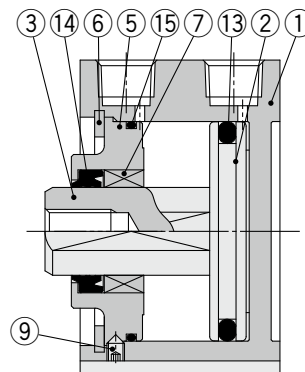
## Construction

Without auto switch magnet

ø12 to ø32

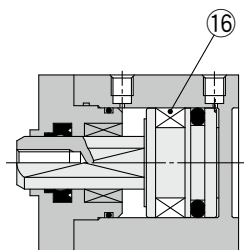


ø40 to ø63

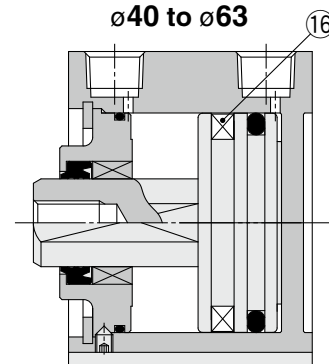


With auto switch magnet

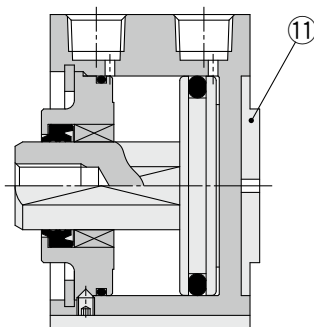
ø12 to ø32



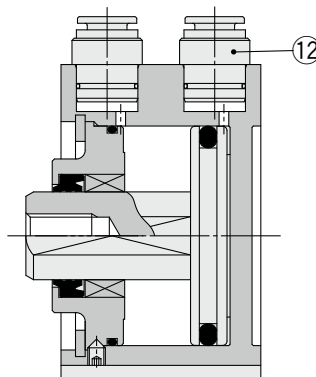
ø40 to ø63



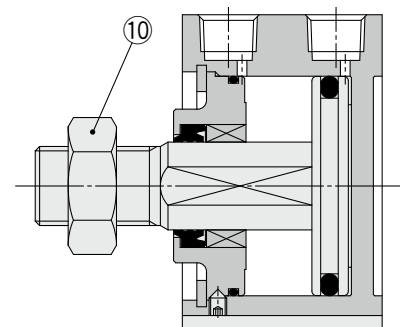
With boss on head end



Built-in One-touch fittings



Rod end male thread



### Component Parts

| No. | Description                   | Material                       | Note                            |
|-----|-------------------------------|--------------------------------|---------------------------------|
| 1   | Cylinder tube                 | Aluminum alloy                 | Hard anodized                   |
| 2   | Piston                        | Aluminum alloy                 |                                 |
| 3   | Piston rod                    | Stainless steel                | ø12 to ø25                      |
|     |                               | Carbon steel                   | ø32 to ø63, Hard chrome plating |
| 4   | Rod cover                     | Brass                          | ø12, Electroless nickel plating |
|     |                               | Aluminum alloy                 | ø16 to ø32, Anodized            |
| 5   | Collar                        | Aluminum alloy                 | ø40 to ø63, Anodized            |
| 6   | Retaining ring                | Carbon tool steel              | Phosphate coated                |
| 7   | Bushing                       | Oil-impregnated sintered alloy | ø16 to ø63                      |
| 8   | Hexagon socket head cap screw | Alloy steel                    | ø12 to ø32, Nickel plating      |
| 9   | Hexagon socket head set screw | Alloy steel                    | ø40 to ø63, Nickel plating      |
| 10  | Rod end nut                   | Carbon steel                   | Zinc chromated                  |
| 11  | Centering location ring       | Aluminum alloy                 | ø20 to ø63, Anodized            |
| 12  | One-touch fitting             | —                              | ø32 to ø63                      |
| 13  | Piston seal                   | NBR                            |                                 |
| 14  | Rod seal                      | NBR                            |                                 |
| 15  | Tube gasket                   | NBR                            |                                 |
| 16  | Magnet                        | —                              |                                 |

### Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.    | Contents               |
|----------------|------------|------------------------|
| 12             | CQ2KB12-PS | Set of nos. 13, 14, 15 |
| 16             | CQ2KB16-PS |                        |
| 20             | CQ2KB20-PS |                        |
| 25             | CQ2KB25-PS |                        |
| 32             | CQ2KB32-PS |                        |
| 40             | CQ2KB40-PS |                        |
| 50             | CQ2KB50-PS |                        |
| 63             | CQ2KB63-PS |                        |

\* Seal kit includes 13, 14, 15. Order the seal kit based on each bore size.

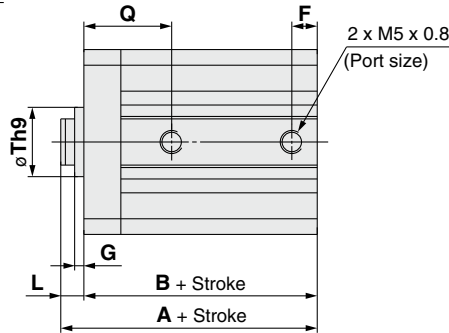
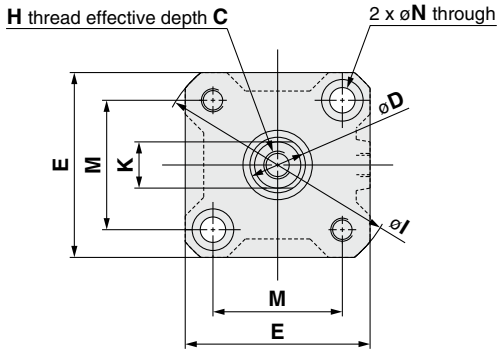
\* The seal kit does not include a grease pack. Order it separately.

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

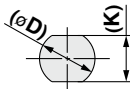
Bore Size

**∅12 to ∅25** Without Auto Switch Magnet

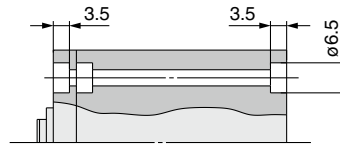
Through-hole: CQ2KB



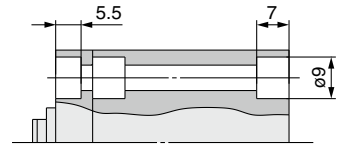
Piston rod cross section



∅12, ∅16



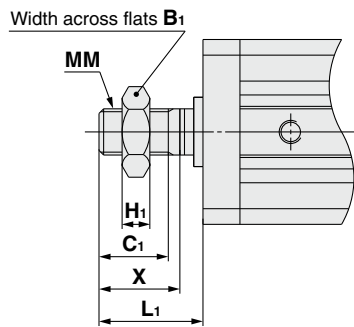
∅20, ∅25



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | F   | G   | H        | I  | K   | L   | M    | N   | Q    | Th9                               |
|----------------|-------------------|------|------|----|----|----|-----|-----|----------|----|-----|-----|------|-----|------|-----------------------------------|
| 12             | 5 to 30           | 25.5 | 22   | 6  | 6  | 25 | 5   | 1.5 | M3 x 0.5 | 32 | 5.2 | 3.5 | 15.5 | 3.5 | 12.5 | 15 <sup>0</sup> <sub>-0.043</sub> |
| 16             | 5 to 30           | 27   | 23.5 | 8  | 8  | 29 | 5.5 | 1.5 | M4 x 0.7 | 38 | 6   | 3.5 | 20   | 3.5 | 13   | 20 <sup>0</sup> <sub>-0.052</sub> |
| 20             | 5 to 50           | 32   | 27.5 | 7  | 10 | 36 | 5.5 | 2   | M5 x 0.8 | 47 | 8   | 4.5 | 25.5 | 5.5 | 16   | 13 <sup>0</sup> <sub>-0.043</sub> |
| 25             | 5 to 50           | 35.5 | 30.5 | 12 | 12 | 40 | 5.5 | 2   | M6 x 1.0 | 52 | 10  | 5   | 28   | 5.5 | 17   | 15 <sup>0</sup> <sub>-0.043</sub> |

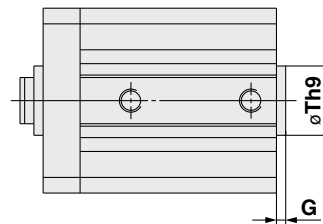
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |

With boss on head end



| Bore size [mm] | G   | Th9                               |
|----------------|-----|-----------------------------------|
| 12             | 1.5 | 15 <sup>0</sup> <sub>-0.043</sub> |
| 16             | 1.5 | 20 <sup>0</sup> <sub>-0.052</sub> |
| 20             | 2   | 13 <sup>0</sup> <sub>-0.043</sub> |
| 25             | 2   | 15 <sup>0</sup> <sub>-0.043</sub> |

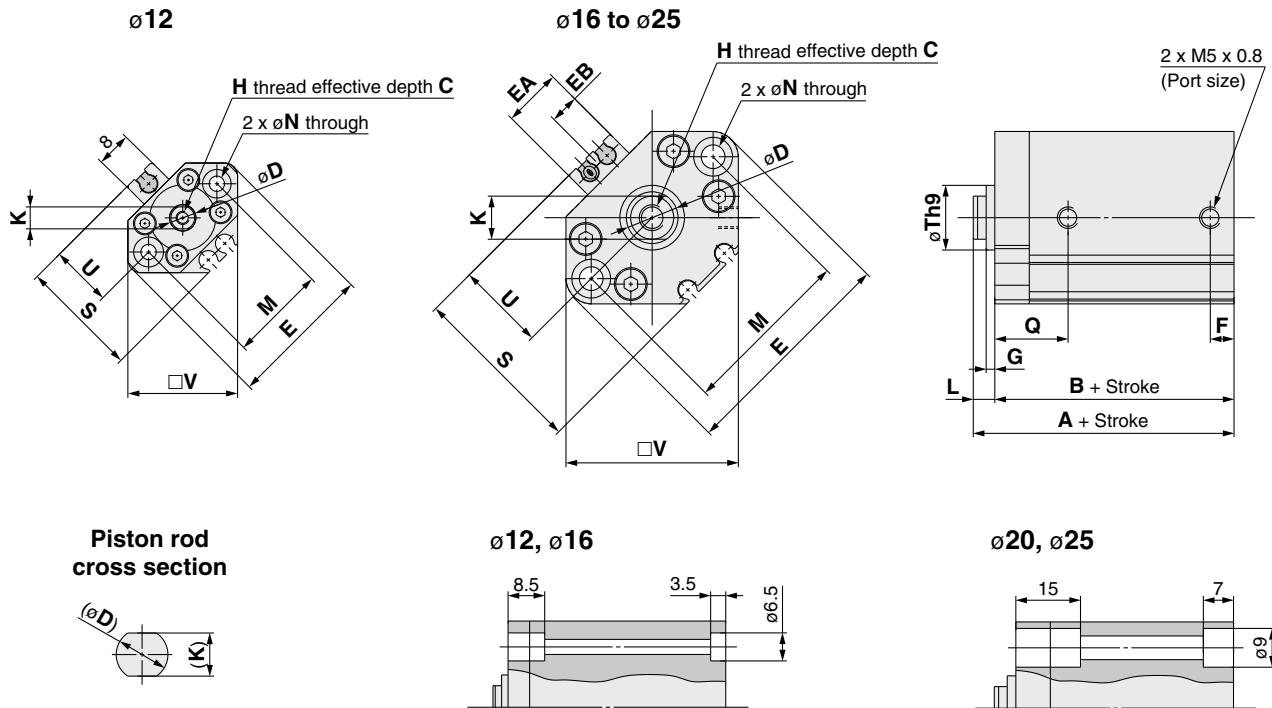
|                   |                                   |          |
|-------------------|-----------------------------------|----------|
| Standard          | Double Acting, Single Rod         | CQ2      |
| Standard          | Double Acting, Double Rod         | CQ2W     |
| Standard          | Single Acting, Spring Return, End | CQ2      |
| Standard          | Single Acting, Spring Return, End | CQ2      |
| Large Bore Size   | Double Acting, Single Rod         | CQ2      |
| Large Bore Size   | Double Acting, Double Rod         | CQ2W     |
| Anti-lateral Load | Double Acting, Single Rod         | CQ2□S    |
| Anti-lateral Load | Double Acting, Double Rod         | CQ2□S    |
| Long Stroke       | Double Acting, Single Rod         | CQ2      |
| Long Stroke       | Double Acting, Double Rod         | CQ2      |
| Non-rotating Rod  | Double Acting, Single Rod         | CQ2K     |
| Non-rotating Rod  | Double Acting, Double Rod         | CQ2KW    |
| Water Resistant   | Double Acting, Single Rod         | CQ2-R/V  |
| Water Resistant   | Double Acting, Double Rod         | CQ2W-R/V |
| Axial Piping      | Double Acting, Single Rod         | CQP2     |
| Axial Piping      | Double Acting, Double Rod         | CQP2     |
| Axial Piping      | Single Acting, Spring Return, End | CQP2     |
| With End Lock     | Double Acting, Single Rod         | CBQ2     |
| With End Lock     | Double Acting, Double Rod         | CBQ2     |
| Auto Switch       | Double Acting, Single Rod         | CQ2AS    |
| Auto Switch       | Double Acting, Double Rod         | CQ2WAS   |
| Made to Order     | Double Acting, Single Rod         | CQ2MO    |
| Made to Order     | Double Acting, Double Rod         | CQ2WMO   |

# CQ2K Series

Bore Size

## ∅12 to ∅25 With Auto Switch Magnet

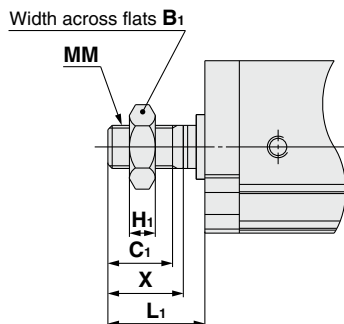
Through-hole: CDQ2KB



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | EA   | EB  | F   | G   | H        | K   | L   | M  | N   | Q  | S    | Th9                               | U  | V  |
|----------------|-------------------|------|------|----|----|----|------|-----|-----|-----|----------|-----|-----|----|-----|----|------|-----------------------------------|----|----|
| 12             | 5 to 30           | 36.5 | 33   | 6  | 6  | 33 | —    | —   | 6.5 | 1.5 | M3 x 0.5 | 5.2 | 3.5 | 22 | 3.5 | 16 | 27.5 | 15 <sup>0</sup> <sub>-0.043</sub> | 14 | 25 |
| 16             | 5 to 30           | 39   | 35.5 | 8  | 8  | 37 | 13.2 | 6.6 | 5.5 | 1.5 | M4 x 0.7 | 6   | 3.5 | 28 | 3.5 | 15 | 29.5 | 20 <sup>0</sup> <sub>-0.052</sub> | 15 | 29 |
| 20             | 5 to 50           | 44   | 39.5 | 7  | 10 | 47 | 13.6 | 6.8 | 5.5 | 2   | M5 x 0.8 | 8   | 4.5 | 36 | 5.5 | 16 | 35.5 | 13 <sup>0</sup> <sub>-0.043</sub> | 18 | 36 |
| 25             | 5 to 50           | 45.5 | 40.5 | 12 | 12 | 52 | 13.6 | 6.8 | 5.5 | 2   | M6 x 1.0 | 10  | 5   | 40 | 5.5 | 17 | 40.5 | 15 <sup>0</sup> <sub>-0.043</sub> | 21 | 40 |

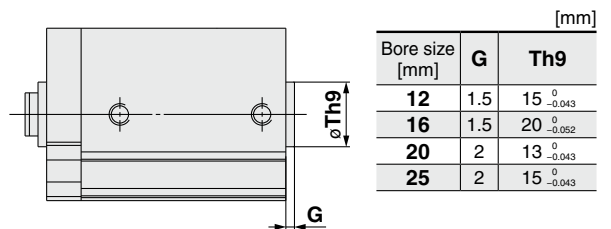
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
 \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |

### With boss on head end

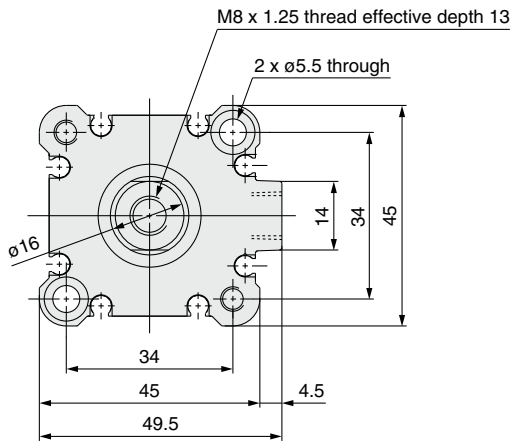


| Bore size [mm] | G   | Th9                               |
|----------------|-----|-----------------------------------|
| 12             | 1.5 | 15 <sup>0</sup> <sub>-0.043</sub> |
| 16             | 1.5 | 20 <sup>0</sup> <sub>-0.052</sub> |
| 20             | 2   | 13 <sup>0</sup> <sub>-0.043</sub> |
| 25             | 2   | 15 <sup>0</sup> <sub>-0.043</sub> |

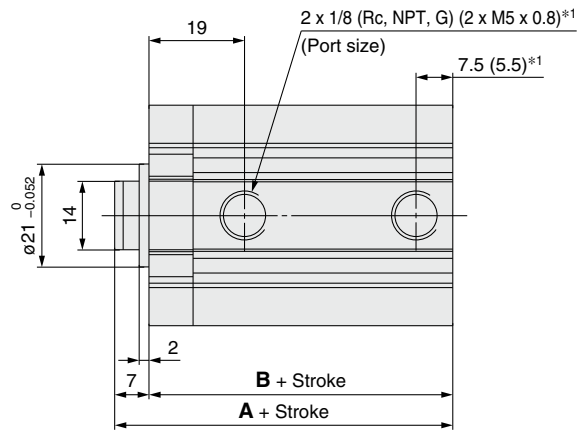
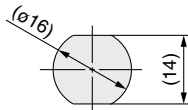
Bore Size

# Ø32 With/Without Auto Switch Magnet

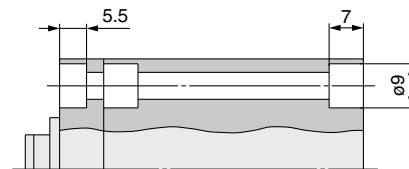
Through-hole: C□Q2KB



Piston rod cross section



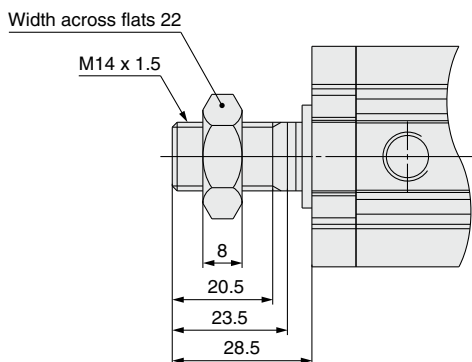
\*1 ( ): For the 5 mm stroke



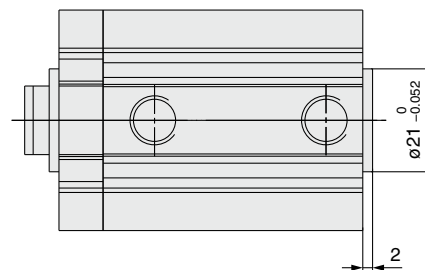
| Stroke range [mm] | Without auto switch magnet |    | With auto switch magnet |    |
|-------------------|----------------------------|----|-------------------------|----|
|                   | A                          | B  | A                       | B  |
| 5 to 50           | 39                         | 32 | 49                      | 42 |
| 75, 100           | 49                         | 42 |                         |    |

[mm]

Rod end male thread



With boss on head end



The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, single rod. ⇨ p. 19

## Dimensions of Each Mounting Bracket

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

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

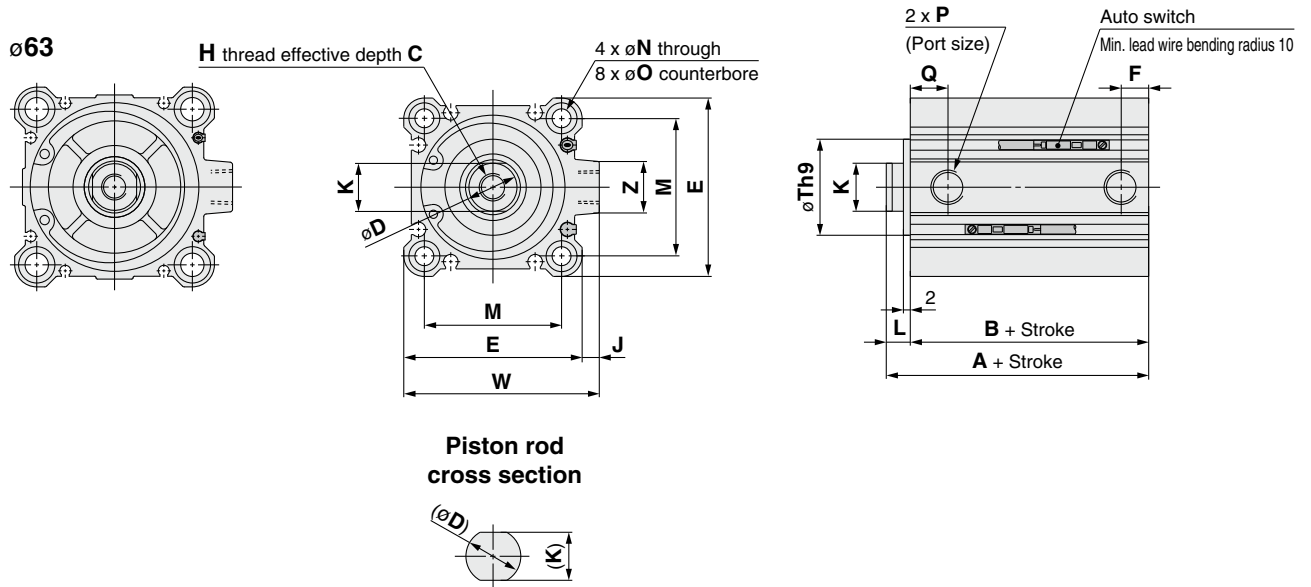
|               |
|---------------|
| Auto Switch   |
| Made to Order |

# CQ2K Series

Bore Size

## ∅40 to ∅63 With/Without Auto Switch Magnet

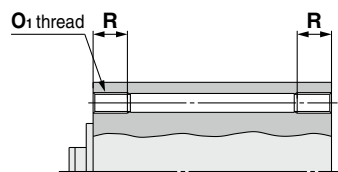
Through-hole: C□Q2KB



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      | C  | D  | E  | F    | H         | J | K  | L | M  | N   | O             | P   | Q    | Th9                               | W  | Z  |
|----------------|-------------------|----------------------------|------|-------------------------|------|----|----|----|------|-----------|---|----|---|----|-----|---------------|-----|------|-----------------------------------|----|----|
|                |                   | A                          | B    | A                       | B    |    |    |    |      |           |   |    |   |    |     |               |     |      |                                   |    |    |
| 40             | 5 to 50           | 36.5                       | 29.5 | 46.5                    | 39.5 | 13 | 16 | 52 | 7.5  | M8 x 1.25 | 5 | 14 | 7 | 40 | 5.5 | 9 depth 7     | 1/8 | 12.5 | 28 <sup>0</sup> <sub>-0.052</sub> | 57 | 15 |
|                | 75, 100           | 46.5                       | 39.5 |                         |      |    |    |    |      |           |   |    |   |    |     |               |     |      |                                   |    |    |
| 50             | 10 to 50          | 38.5                       | 30.5 | 48.5                    | 40.5 | 15 | 20 | 64 | 10.5 | M10 x 1.5 | 7 | 18 | 8 | 50 | 6.6 | 11 depth 8    | 1/4 | 10.5 | 35 <sup>0</sup> <sub>-0.062</sub> | 71 | 19 |
|                | 75, 100           | 48.5                       | 40.5 |                         |      |    |    |    |      |           |   |    |   |    |     |               |     |      |                                   |    |    |
| 63             | 10 to 50          | 44                         | 36   | 54                      | 46   | 15 | 20 | 77 | 10.5 | M10 x 1.5 | 7 | 18 | 8 | 60 | 9   | 14 depth 10.5 | 1/4 | 15   | 35 <sup>0</sup> <sub>-0.062</sub> | 84 | 19 |
|                | 75, 100           | 54                         | 46   |                         |      |    |    |    |      |           |   |    |   |    |     |               |     |      |                                   |    |    |

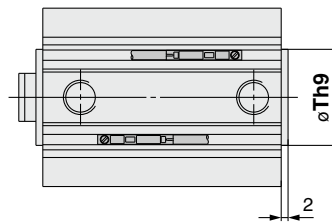
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

### Both ends tapped



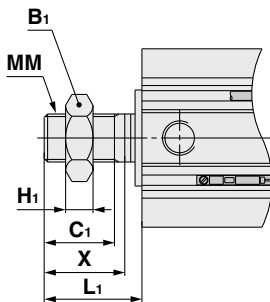
| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |
| 63             | M10 x 1.5      | 18 |

### With boss on head end



| Bore size [mm] | Th9                               |
|----------------|-----------------------------------|
| 40             | 28 <sup>0</sup> <sub>-0.052</sub> |
| 50             | 35 <sup>0</sup> <sub>-0.062</sub> |
| 63             | 35 <sup>0</sup> <sub>-0.062</sub> |

### Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
| 63             | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, single rod. ⇨ p. 19, 20

### Dimensions of Each Mounting Bracket

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



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

## CQ2KW Series

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

### How to Order

Without auto switch  
ø12 to ø25

CQ2KW **B** **20**  - **30** **D**

Without auto switch  
ø32 to ø63

CQ2KW **B** **32**  - **30** **D**  **Z**

With auto switch

CDQ2KW **B** **32**  - **30** **D**  **Z** - **M9BW**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

#### With auto switch magnet

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

#### ① Mounting

|           |                  |            |
|-----------|------------------|------------|
| <b>B</b>  | Through-hole     | ø12 to ø63 |
| <b>A</b>  | Both ends tapped | ø40 to ø63 |
| <b>L</b>  | Foot             |            |
| <b>LC</b> | Compact foot     |            |
| <b>F</b>  | Flange           |            |

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

\* A through-hole type mounting bolt is available as an option. For details:  
Without auto switch magnet ⇨ p. 93  
With auto switch magnet ⇨ p. 94

#### ② Bore size

|           |       |
|-----------|-------|
| <b>12</b> | 12 mm |
| <b>16</b> | 16 mm |
| <b>20</b> | 20 mm |
| <b>25</b> | 25 mm |
| <b>32</b> | 32 mm |
| <b>40</b> | 40 mm |
| <b>50</b> | 50 mm |
| <b>63</b> | 63 mm |

#### ③ Port thread type

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

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

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

#### ④ Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size     | Standard stroke                                  |
|---------------|--|
| <b>12, 16</b> | 5, 10, 15, 20, 25, 30                            |
| <b>20, 25</b> | 5, 10, 15, 20, 25, 30, 35<br>40, 45, 50          |
| <b>32, 40</b> | 5, 10, 15, 20, 25, 30, 35<br>40, 45, 50, 75, 100 |
| <b>50, 63</b> | 10, 15, 20, 25, 30, 35, 40<br>45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 91

#### ⑤ Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### ⑥ Body option

|            |  |
|------------|--|
| <b>Nil</b> | Rod end female thread                                    |
| <b>C</b>   | With rubber bumper<br>(ø12 with auto switch magnet only) |
| <b>M</b>   | Rod end male thread                                      |

#### ⑦ Auto switch mounting groove

|          |            |            |
|----------|------------|------------|
| <b>Z</b> | ø12 to ø25 | 2 surfaces |
|          | ø32 to ø63 | 4 surfaces |

#### ⑧ Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the next page.

#### ⑨ Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

#### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) CDQ2KWB32-30DZ

# Compact Cylinder: Non-rotating Rod Double Acting, Double Rod **CQ2KW Series**



|                                  |                           |                 |
|----------------------------------|---------------------------|-----------------|
| Standard                         | Double Acting, Single Rod | <b>CQ2</b>      |
| Standard                         | Double Acting, Double Rod | <b>CQ2W</b>     |
| Single Acting, Spring Return-End | Double Acting, Single Rod | <b>CQ2</b>      |
| Single Acting, Spring Return-End | Double Acting, Double Rod | <b>CQ2W</b>     |
| Large Bore Size                  | Double Acting, Single Rod | <b>CQ2</b>      |
| Large Bore Size                  | Double Acting, Double Rod | <b>CQ2W</b>     |
| Anti-lateral Load                | Double Acting, Single Rod | <b>CQ2□S</b>    |
| Anti-lateral Load                | Double Acting, Double Rod | <b>CQ2□SW</b>   |
| Long Stroke                      | Double Acting, Single Rod | <b>CQ2</b>      |
| Long Stroke                      | Double Acting, Double Rod | <b>CQ2W</b>     |
| Non-rotating Rod                 | Double Acting, Single Rod | <b>CQ2K</b>     |
| Non-rotating Rod                 | Double Acting, Double Rod | <b>CQ2KW</b>    |
| Water Resistant                  | Double Acting, Single Rod | <b>CQ2-R/V</b>  |
| Water Resistant                  | Double Acting, Double Rod | <b>CQ2W-R/V</b> |
| Axial Piping                     | Double Acting, Single Rod | <b>CQP2</b>     |
| Axial Piping                     | Double Acting, Double Rod | <b>CQP2W</b>    |
| With End Lock                    | Double Acting, Single Rod | <b>CBQ2</b>     |
| With End Lock                    | Double Acting, Double Rod | <b>CBQ2W</b>    |
| Auto Switch                      |                           |                 |
| Made to Order                    |                           |                 |

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

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

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

| Type                    | Special function                             | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |    | Auto switch model |         | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |            |            |            |
|-------------------------|--|------------------|-----------------|-------------------------|--------------|----|-------------------|---------|----------------------|-------|-------|-------|----------|---------------------|-----------------|------------|------------|------------|
|                         |  |                  |                 |                         | DC           | AC | Perpendicular     | In-line | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     |                 |            |            |            |
| Solid state auto switch | —  | Grommet          | Yes             | 3-wire (NPN)            | 24 V         | —  | M9NV              | M9N     | ●                    | ●     | ●     | ○     | —        | ○                   | IC circuit      | Relay, PLC |            |            |
|                         |  |                  |                 | 3-wire (PNP)            |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |            |
|                         |  |                  |                 | 2-wire                  |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |            |
|                         |  |                  |                 | 3-wire (NPN)            |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   |                 |            |            |            |
|                         | Diagnostic indication (2-color indicator)    |                  |                 | 3-wire (PNP)            |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   | ○               |            | IC circuit |            |
|                         |  |                  |                 | 2-wire                  |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   | ○               |            |            |            |
|                         | Water resistant (2-color indicator)          |                  |                 | 3-wire (NPN)            |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   | ○               |            | IC circuit |            |
|                         |  |                  |                 | 3-wire (PNP)            |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   | ○               |            |            |            |
|                         | Magnetic field resistant (2-color indicator) |                  |                 | 2-wire                  |              |    |                   |         | ●                    | ●     | ●     | ○     | —        | ○                   | ○               |            | —          |            |
|                         |  |                  |                 | 2-wire (Non-polar)      |              |    |                   |         | —                    | —     | —     | —     | —        | —                   | —               |            |            | ○          |
| Reed auto switch        | —  | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | —  | A96V              | A96     | ●                    | —     | ●     | —     | —        | —                   | IC circuit      | —          |            |            |
|                         |  |                  |                 | 2-wire                  |              |    |                   |         | ●                    | ●     | ●     | ●     | —        | —                   | —               |            | —          | Relay, PLC |
|                         |  |                  |                 | 2-wire                  |              |    |                   |         | ●                    | —     | ●     | —     | —        | —                   | —               |            | —          | IC circuit |

\*1 Water-resistant type auto switches can be mounted on the models on page 89, but SMC cannot guarantee water resistance.

Please contact SMC regarding water-resistant types with the model numbers on page 89.

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWZ

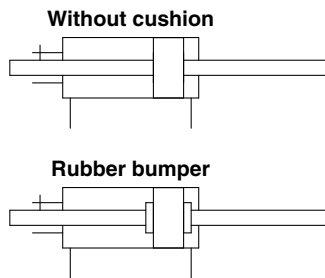
\* Solid state auto switches marked with "○" are produced upon receipt of order.

\* The D-P3DWA□ type is only available in sizes ø25 to ø63.

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

# CQ2KW Series

## Symbol



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

| Symbol  | Specifications  |
|---------|---|
| -XA□    | Change of rod end shape   |
| -XB6    | Heat-resistant cylinder (-10 to 150°C)                          |
| -XB10   | Intermediate stroke (Using exclusive body)                      |
| -XC2(A) | Rod end length increased by 10 mm (For foot and flange bracket) |
| -XC36   | With boss on rod end*1  |
| -XC85   | Grease for food processing equipment                            |
| -X633   | Intermediate stroke for double rod cylinder                     |

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

\* -X633: Intermediate stroke in 5 mm increments only

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

### Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

## ⚠ Precautions

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

## Specifications

| Bore size [mm]                        | 12  | 16       | 20    | 25   | 32    | 40   | 50   | 63   |
|---------------------------------------|---|----------|-------|------|-------|------|------|------|
| <b>Action</b>                         | Double acting, Double rod   |          |       |      |       |      |      |      |
| <b>Fluid</b>                          | Air   |          |       |      |       |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |          |       |      |       |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |          |       |      |       |      |      |      |
| <b>Minimum operating pressure</b>     | 0.07 MPa  | 0.05 MPa |       |      |       |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |          |       |      |       |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |          |       |      |       |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |          |       |      |       |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.022<br>0.043*1  | 0.038    | 0.055 | 0.09 | 0.15  | 0.26 | 0.46 | 0.77 |
| <b>Stroke length tolerance</b>        | +1.0 mm*2<br>0  |          |       |      |       |      |      |      |
| <b>Rod non-rotating accuracy</b>      | ±2°   | ±1°      |       |      | ±0.8° |      |      |      |

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

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

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

## Manufacturing of Intermediate Strokes

| Type                | A spacer is installed in the standard stroke body.  |              | A spacer is installed in the standard stroke body. (1 mm increments)                                       |                     | Exclusive body (-XB10)   |                     |
|---------------------|---|--------------|--|---------------------|--|---------------------|
| <b>Part no.</b>     | Refer to "How to Order" for the standard model number. (⇨ p. 89)  |              | Suffix "-X633" (p. 186) to the end of standard model number. (⇨ p. 89)                                     |                     | Suffix "-XB10" to the end of standard model number. (⇨ p. 89)                                  |                     |
| <b>Description</b>  | Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.        |              | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.           |                     | Strokes in 1 mm increments are available by using an exclusive body with the specified stroke. |                     |
| <b>Stroke range</b> | Bore size   | Stroke range | Bore size  | Stroke range        | Bore size  | Stroke range        |
|                     | —   | —            | 12, 16<br>20, 25   | 6 to 29<br>6 to 49  | —  | —                   |
| <b>Example</b>      | 32 to 63  | 55 to 95     | 32, 40<br>50, 63   | 6 to 99<br>11 to 99 | 40<br>50, 63   | 6 to 99<br>11 to 99 |
|                     | Part no.: CQ2KWB50-65DZ<br>CQ2KWB50-75DZ with 10 mm width spacer inside<br>The B dimension is 125.5 mm. |              | Part no.: CQ2KWB50-72DZ-X633<br>CQ2KW50-75DZ with 3 mm width spacer inside<br>The B dimension is 125.5 mm. |                     | Part no.: CQ2KWB50-65DZ-XB10<br>Makes 65 mm stroke tube.<br>The B dimension is 115.5 mm.       |                     |

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1  | Compact foot*1 | Flange  |
|----------------|---------|----------------|---------|
| <b>40</b>      | CQ-L040 | CQ-LC040       | CQ-F040 |
| <b>50</b>      | CQ-L050 | CQ-LC050       | CQ-F050 |
| <b>63</b>      | CQ-L063 | CQ-LC063       | CQ-F063 |

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

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

Foot, Compact foot, Flange: Body mounting bolts

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

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

## Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

## Weight

### Without Auto Switch Magnet

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |     |     |     |     |      |      |      |
|----------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50   | 75   | 100  |
| 12             | 62                   | 69  | 76  | 83  | 90  | 97  | —   | —   | —   | —    | —    | —    |
| 16             | 62                   | 73  | 84  | 95  | 106 | 117 | —   | —   | —   | —    | —    | —    |
| 20             | 101                  | 116 | 131 | 146 | 161 | 176 | 191 | 206 | 221 | 236  | —    | —    |
| 25             | 138                  | 155 | 172 | 189 | 206 | 223 | 240 | 257 | 274 | 291  | —    | —    |
| 32             | 233                  | 256 | 279 | 302 | 325 | 348 | 371 | 394 | 417 | 440  | 600  | 715  |
| 40             | 336                  | 365 | 394 | 424 | 453 | 483 | 512 | 541 | 571 | 600  | 806  | 953  |
| 50             | —                    | 517 | 558 | 600 | 642 | 684 | 725 | 767 | 809 | 850  | 1142 | 1351 |
| 63             | —                    | 742 | 779 | 815 | 851 | 887 | 923 | 959 | 995 | 1032 | 1285 | 1465 |

### With Auto Switch Magnet

[g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |     |     |      |      |      |      |      |      |      |
|----------------|----------------------|-----|-----|-----|-----|------|------|------|------|------|------|------|
|                | 5                    | 10  | 15  | 20  | 25  | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 76                   | 83  | 90  | 98  | 105 | 113  | —    | —    | —    | —    | —    | —    |
| 16             | 89                   | 99  | 109 | 118 | 128 | 138  | —    | —    | —    | —    | —    | —    |
| 20             | 148                  | 164 | 179 | 194 | 210 | 225  | 240  | 256  | 271  | 286  | —    | —    |
| 25             | 213                  | 228 | 244 | 259 | 275 | 291  | 306  | 322  | 337  | 353  | —    | —    |
| 32             | 259                  | 282 | 305 | 328 | 351 | 374  | 397  | 420  | 443  | 466  | 580  | 695  |
| 40             | 441                  | 471 | 500 | 530 | 559 | 588  | 618  | 647  | 677  | 706  | 853  | 1000 |
| 50             | —                    | 642 | 684 | 726 | 767 | 809  | 851  | 892  | 934  | 976  | 1184 | 1393 |
| 63             | —                    | 871 | 907 | 943 | 979 | 1015 | 1051 | 1088 | 1124 | 1160 | 1341 | 1521 |

## Theoretical Output

[N]

| Bore size [mm] | Operating pressure [MPa] |      |      |
|----------------|--------------------------|------|------|
|                | 0.3                      | 0.5  | 0.7  |
| 12             | 25                       | 42   | 59   |
| 16             | 45                       | 75   | 106  |
| 20             | 71                       | 118  | 165  |
| 25             | 113                      | 189  | 264  |
| 32             | 181                      | 302  | 422  |
| 40             | 317                      | 528  | 739  |
| 50             | 495                      | 825  | 1150 |
| 63             | 841                      | 1400 | 1960 |

### Additional Weight

[g]

| Bore size [mm]                          | 12          | 16 | 20 | 25 | 32 | 40  | 50  | 63  |
|---|-------------|----|----|----|----|-----|-----|-----|
| Both ends tapped                        | —           | —  | —  | —  | —  | 6   | 6   | 19  |
| Rod end male thread                     | Male thread | 3  | 6  | 12 | 24 | 52  | 54  | 106 |
|   | Nut         | 2  | 4  | 8  | 16 | 34  | 34  | 64  |
| Built-in One-touch fittings             | —           | —  | —  | —  | 12 | 12  | 21  | 21  |
| Foot (Including mounting bolts)         | —           | —  | —  | —  | —  | 154 | 243 | 321 |
| Compact foot (Including mounting bolts) | —           | —  | —  | —  | —  | 124 | 197 | 259 |
| Flange (Including mounting bolts)       | —           | —  | —  | —  | —  | 214 | 373 | 559 |

Calculation: (Example) **CDQ2KWA40-20DMZ**

• Basic weight: CDQ2KWB40-20DZ ..... 530 g

• Additional weight: Both ends tapped ..... 6 g

Rod end male thread ..... 88 g

624 g

Add each weight of auto switches when auto switches are mounted.

|                   |                                   |                       |
|-------------------|-----------------------------------|-----------------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>            |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>           |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>            |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>            |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>           |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2</b> □ <b>S</b> |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>            |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>           |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>          |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-R/V</b>        |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-R/V</b>       |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>           |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>           |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>           |
| Auto Switch       |                                   | <b>Auto Switch</b>    |
| Made to Order     |                                   | <b>Made to Order</b>  |

# CQ2KW Series

## Through-hole Type Mounting Bolt for the CQ2KW: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2KWB is available as an option.

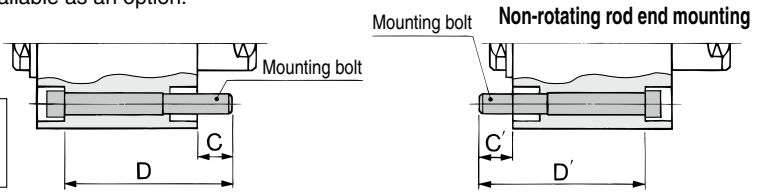
Refer to the following for ordering procedures.

Order the actual number of bolts that will be used.

For models with an auto switch magnet ⇨ p. 94

**Example) CQ-M3 x 40L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model      | C   | D      | Mounting bolt part no. | C'     | D'  | Mounting bolt part no. |
|---------------------|-----|--------|------------------------|--------|-----|------------------------|
| <b>CQ2KWB12-5D</b>  | 8.3 | 40     | CQ-M3 x 40L            | 8.3    | 40  | CQ-M3 x 40L            |
| <b>-10D</b>         |     | 45     | x 45L                  |        | 45  | x 45L                  |
| <b>-15D</b>         |     | 50     | x 50L                  |        | 50  | x 50L                  |
| <b>-20D</b>         |     | 55     | x 55L                  |        | 55  | x 55L                  |
| <b>-25D</b>         |     | 60     | x 60L                  |        | 60  | x 60L                  |
| <b>-30D</b>         |     | 65     | x 65L                  |        | 65  | x 65L                  |
| <b>CQ2KWB16-5D</b>  | 7.5 | 40     | CQ-M3 x 40L            | 7.5    | 40  | CQ-M3 x 40L            |
| <b>-10D</b>         |     | 45     | x 45L                  |        | 45  | x 45L                  |
| <b>-15D</b>         |     | 50     | x 50L                  |        | 50  | x 50L                  |
| <b>-20D</b>         |     | 55     | x 55L                  |        | 55  | x 55L                  |
| <b>-25D</b>         |     | 60     | x 60L                  |        | 60  | x 60L                  |
| <b>-30D</b>         |     | 65     | x 65L                  |        | 65  | x 65L                  |
| <b>CQ2KWB20-5D</b>  | 6.5 | 40     | CQ-M5 x 40L            | 8      | 40  | CQ-M5 x 40L            |
| <b>-10D</b>         |     | 45     | x 45L                  |        | 45  | x 45L                  |
| <b>-15D</b>         |     | 50     | x 50L                  |        | 50  | x 50L                  |
| <b>-20D</b>         |     | 55     | x 55L                  |        | 55  | x 55L                  |
| <b>-25D</b>         |     | 60     | x 60L                  |        | 60  | x 60L                  |
| <b>-30D</b>         |     | 65     | x 65L                  |        | 65  | x 65L                  |
| <b>-35D</b>         |     | 70     | x 70L                  |        | 70  | x 70L                  |
| <b>-40D</b>         |     | 75     | x 75L                  |        | 75  | x 75L                  |
| <b>-45D</b>         |     | 80     | x 80L                  |        | 80  | x 80L                  |
| <b>-50D</b>         |     | 85     | x 85L                  |        | 85  | x 85L                  |
| <b>CQ2KWB25-5D</b>  | 8.5 | 45     | CQ-M5 x 45L            | 10     | 45  | CQ-M5 x 45L            |
| <b>-10D</b>         |     | 50     | x 50L                  |        | 50  | x 50L                  |
| <b>-15D</b>         |     | 55     | x 55L                  |        | 55  | x 55L                  |
| <b>-20D</b>         |     | 60     | x 60L                  |        | 60  | x 60L                  |
| <b>-25D</b>         |     | 65     | x 65L                  |        | 65  | x 65L                  |
| <b>-30D</b>         |     | 70     | x 70L                  |        | 70  | x 70L                  |
| <b>-35D</b>         |     | 75     | x 75L                  |        | 75  | x 75L                  |
| <b>-40D</b>         |     | 80     | x 80L                  |        | 80  | x 80L                  |
| <b>-45D</b>         |     | 85     | x 85L                  |        | 85  | x 85L                  |
| <b>-50D</b>         |     | 90     | x 90L                  |        | 90  | x 90L                  |
| <b>CQ2KWB32-5DZ</b> | 11  | 50     | CQ-M5 x 50L            | 7.5    | 45  | CQ-M5 x 45L            |
| <b>-10DZ</b>        |     | 55     | x 55L                  |        | 50  | x 50L                  |
| <b>-15DZ</b>        |     | 60     | x 60L                  |        | 55  | x 55L                  |
| <b>-20DZ</b>        |     | 65     | x 65L                  |        | 60  | x 60L                  |
| <b>-25DZ</b>        |     | 70     | x 70L                  |        | 65  | x 65L                  |
| <b>-30DZ</b>        |     | 75     | x 75L                  |        | 70  | x 70L                  |
| <b>-35DZ</b>        |     | 80     | x 80L                  |        | 75  | x 75L                  |
| <b>-40DZ</b>        |     | 85     | x 85L                  |        | 80  | x 80L                  |
| <b>-45DZ</b>        |     | 90     | x 90L                  |        | 85  | x 85L                  |
| <b>-50DZ</b>        |     | 95     | x 95L                  |        | 90  | x 90L                  |
| <b>-75DZ</b>        |     | 130    | x 130L                 |        | 125 | x 125L                 |
| <b>-100DZ</b>       | 155 | x 155L | 150                    | x 150L |     |                        |

| Cylinder model       | C, C' | D, D'  | Mounting bolt part no. |             |
|----------------------|-------|--------|------------------------|-------------|
| <b>CQ2KWB40-5DZ</b>  | 7     | 45     | CQ-M5 x 45L            |             |
| <b>-10DZ</b>         |       | 50     | x 50L                  |             |
| <b>-15DZ</b>         |       | 55     | x 55L                  |             |
| <b>-20DZ</b>         |       | 60     | x 60L                  |             |
| <b>-25DZ</b>         |       | 65     | x 65L                  |             |
| <b>-30DZ</b>         |       | 70     | x 70L                  |             |
| <b>-35DZ</b>         |       | 75     | x 75L                  |             |
| <b>-40DZ</b>         |       | 80     | x 80L                  |             |
| <b>-45DZ</b>         |       | 85     | x 85L                  |             |
| <b>-50DZ</b>         |       | 90     | x 90L                  |             |
| <b>-75DZ</b>         | 12.5  | 125    | x 125L                 |             |
| <b>-100DZ</b>        |       | 150    | x 150L                 |             |
| <b>CQ2KWB50-10DZ</b> |       | 12.5   | 55                     | CQ-M6 x 55L |
| <b>-15DZ</b>         |       |        | 60                     | x 60L       |
| <b>-20DZ</b>         |       |        | 65                     | x 65L       |
| <b>-25DZ</b>         |       |        | 70                     | x 70L       |
| <b>-30DZ</b>         |       |        | 75                     | x 75L       |
| <b>-35DZ</b>         |       |        | 80                     | x 80L       |
| <b>-40DZ</b>         |       |        | 85                     | x 85L       |
| <b>-45DZ</b>         |       |        | 90                     | x 90L       |
| <b>-50DZ</b>         | 95    |        | x 95L                  |             |
| <b>-75DZ</b>         | 130   |        | x 130L                 |             |
| <b>-100DZ</b>        | 155   | x 155L |                        |             |
| <b>CQ2KWB63-10DZ</b> | 13.5  | 55     | CQ-M8 x 55L            |             |
| <b>-15DZ</b>         |       | 60     | x 60L                  |             |
| <b>-20DZ</b>         |       | 65     | x 65L                  |             |
| <b>-25DZ</b>         |       | 70     | x 70L                  |             |
| <b>-30DZ</b>         |       | 75     | x 75L                  |             |
| <b>-35DZ</b>         |       | 80     | x 80L                  |             |
| <b>-40DZ</b>         |       | 85     | x 85L                  |             |
| <b>-45DZ</b>         |       | 90     | x 90L                  |             |
| <b>-50DZ</b>         |       | 95     | x 95L                  |             |
| <b>-75DZ</b>         |       | 130    | x 130L                 |             |
| <b>-100DZ</b>        | 155   | x 155L |                        |             |

\* ø40 to ø63: The C' and D' dimensions are the same as those of C and D.

## Through-hole Type Mounting Bolt for the CDQ2KW: With Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CDQ2KWB is available as an option.

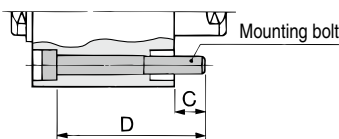
Refer to the following for ordering procedures.

Order the actual number of bolts that will be used.

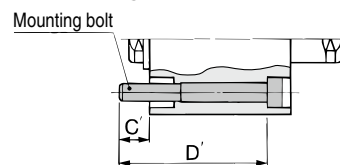
For models without an auto switch magnet ⇨ p. 93

**Example) CQ-M3 x 40L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



Non-rotating rod end mounting



| Cylinder model        | C   | D      | Mounting bolt part no. | C'     | D'  | Mounting bolt part no. |
|-----------------------|-----|--------|------------------------|--------|-----|------------------------|
| <b>CDQ2KWB12-5DCZ</b> | 6.1 | 40     | CQ-M3 x 40L            | 6.1    | 45  | CQ-M3 x 45L            |
| <b>-10DCZ</b>         |     | 45     | x 45L                  |        | 50  | x 50L                  |
| <b>-15DCZ</b>         |     | 50     | x 50L                  |        | 55  | x 55L                  |
| <b>-20DCZ</b>         |     | 55     | x 55L                  |        | 60  | x 60L                  |
| <b>-25DCZ</b>         |     | 60     | x 60L                  |        | 65  | x 65L                  |
| <b>-30DCZ</b>         |     | 65     | x 65L                  |        | 70  | x 70L                  |
| <b>CDQ2KWB16-5DZ</b>  | 7.5 | 45     | CQ-M3 x 45L            | 7.5    | 50  | CQ-M3 x 50L            |
| <b>-10DZ</b>          |     | 50     | x 50L                  |        | 55  | x 55L                  |
| <b>-15DZ</b>          |     | 55     | x 55L                  |        | 60  | x 60L                  |
| <b>-20DZ</b>          |     | 60     | x 60L                  |        | 65  | x 65L                  |
| <b>-25DZ</b>          |     | 65     | x 65L                  |        | 70  | x 70L                  |
| <b>-30DZ</b>          |     | 70     | x 70L                  |        | 75  | x 75L                  |
| <b>CDQ2KWB20-5DZ</b>  | 9   | 45     | CQ-M5 x 45L            | 11     | 55  | CQ-M5 x 55L            |
| <b>-10DZ</b>          |     | 50     | x 50L                  |        | 60  | x 60L                  |
| <b>-15DZ</b>          |     | 55     | x 55L                  |        | 65  | x 65L                  |
| <b>-20DZ</b>          |     | 60     | x 60L                  |        | 70  | x 70L                  |
| <b>-25DZ</b>          |     | 65     | x 65L                  |        | 75  | x 75L                  |
| <b>-30DZ</b>          |     | 70     | x 70L                  |        | 80  | x 80L                  |
| <b>-35DZ</b>          |     | 75     | x 75L                  |        | 85  | x 85L                  |
| <b>-40DZ</b>          |     | 80     | x 80L                  |        | 90  | x 90L                  |
| <b>-45DZ</b>          |     | 85     | x 85L                  |        | 95  | x 95L                  |
| <b>-50DZ</b>          |     | 90     | x 90L                  |        | 100 | x 100L                 |
| <b>CDQ2KWB25-5DZ</b>  | 8   | 45     | CQ-M5 x 45L            | 10     | 55  | CQ-M5 x 55L            |
| <b>-10DZ</b>          |     | 50     | x 50L                  |        | 60  | x 60L                  |
| <b>-15DZ</b>          |     | 55     | x 55L                  |        | 65  | x 65L                  |
| <b>-20DZ</b>          |     | 60     | x 60L                  |        | 70  | x 70L                  |
| <b>-25DZ</b>          |     | 65     | x 65L                  |        | 75  | x 75L                  |
| <b>-30DZ</b>          |     | 70     | x 70L                  |        | 80  | x 80L                  |
| <b>-35DZ</b>          |     | 75     | x 75L                  |        | 85  | x 85L                  |
| <b>-40DZ</b>          |     | 80     | x 80L                  |        | 90  | x 90L                  |
| <b>-45DZ</b>          |     | 85     | x 85L                  |        | 95  | x 95L                  |
| <b>-50DZ</b>          |     | 90     | x 90L                  |        | 100 | x 100L                 |
| <b>CDQ2KWB32-5DZ</b>  | 11  | 60     | CQ-M5 x 60L            | 7.5    | 55  | CQ-M5 x 55L            |
| <b>-10DZ</b>          |     | 65     | x 65L                  |        | 60  | x 60L                  |
| <b>-15DZ</b>          |     | 70     | x 70L                  |        | 65  | x 65L                  |
| <b>-20DZ</b>          |     | 75     | x 75L                  |        | 70  | x 70L                  |
| <b>-25DZ</b>          |     | 80     | x 80L                  |        | 75  | x 75L                  |
| <b>-30DZ</b>          |     | 85     | x 85L                  |        | 80  | x 80L                  |
| <b>-35DZ</b>          |     | 90     | x 90L                  |        | 85  | x 85L                  |
| <b>-40DZ</b>          |     | 95     | x 95L                  |        | 90  | x 90L                  |
| <b>-45DZ</b>          |     | 100    | x 100L                 |        | 95  | x 95L                  |
| <b>-50DZ</b>          |     | 105    | x 105L                 |        | 100 | x 100L                 |
| <b>-75DZ</b>          | 130 | x 130L | 125                    | x 125L |     |                        |
| <b>-100DZ</b>         | 155 | x 155L | 150                    | x 150L |     |                        |

| Cylinder model        | C, C' | D, D'  | Mounting bolt part no. |             |
|-----------------------|-------|--------|------------------------|-------------|
| <b>CDQ2KWB40-5DZ</b>  | 7     | 55     | CQ-M5 x 55L            |             |
| <b>-10DZ</b>          |       | 60     | x 60L                  |             |
| <b>-15DZ</b>          |       | 65     | x 65L                  |             |
| <b>-20DZ</b>          |       | 70     | x 70L                  |             |
| <b>-25DZ</b>          |       | 75     | x 75L                  |             |
| <b>-30DZ</b>          |       | 80     | x 80L                  |             |
| <b>-35DZ</b>          |       | 85     | x 85L                  |             |
| <b>-40DZ</b>          |       | 90     | x 90L                  |             |
| <b>-45DZ</b>          |       | 95     | x 95L                  |             |
| <b>-50DZ</b>          |       | 100    | x 100L                 |             |
| <b>-75DZ</b>          | 12.5  | 125    | x 125L                 |             |
| <b>-100DZ</b>         |       | 150    | x 150L                 |             |
| <b>CDQ2KWB50-10DZ</b> |       | 12.5   | 65                     | CQ-M6 x 65L |
| <b>-15DZ</b>          |       |        | 70                     | x 70L       |
| <b>-20DZ</b>          |       |        | 75                     | x 75L       |
| <b>-25DZ</b>          |       |        | 80                     | x 80L       |
| <b>-30DZ</b>          |       |        | 85                     | x 85L       |
| <b>-35DZ</b>          |       |        | 90                     | x 90L       |
| <b>-40DZ</b>          |       |        | 95                     | x 95L       |
| <b>-45DZ</b>          |       |        | 100                    | x 100L      |
| <b>-50DZ</b>          | 105   |        | x 105L                 |             |
| <b>-75DZ</b>          | 130   |        | x 130L                 |             |
| <b>-100DZ</b>         | 155   | x 155L |                        |             |
| <b>CDQ2KWB63-10DZ</b> | 13.5  | 65     | CQ-M8 x 65L            |             |
| <b>-15DZ</b>          |       | 70     | x 70L                  |             |
| <b>-20DZ</b>          |       | 75     | x 75L                  |             |
| <b>-25DZ</b>          |       | 80     | x 80L                  |             |
| <b>-30DZ</b>          |       | 85     | x 85L                  |             |
| <b>-35DZ</b>          |       | 90     | x 90L                  |             |
| <b>-40DZ</b>          |       | 95     | x 95L                  |             |
| <b>-45DZ</b>          |       | 100    | x 100L                 |             |
| <b>-50DZ</b>          |       | 105    | x 105L                 |             |
| <b>-75DZ</b>          |       | 130    | x 130L                 |             |
| <b>-100DZ</b>         | 155   | x 155L |                        |             |

\* ø40 to ø63: The C' and D' dimensions are the same as those of C and D.

|                   |                                   |                                       |
|-------------------|-----------------------------------|---------------------------------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>                            |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>                           |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>                            |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>                            |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>                           |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2</b> <input type="checkbox"/> S |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>                            |
| Long Stroke       | Double Acting, Double Rod         | <b>CQ2W</b>                           |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>                           |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>                          |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-RV</b>                         |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-RV</b>                        |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>                           |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>                           |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>                           |
| Auto Switch       |                                   | <b>Auto Switch</b>                    |
| Made to Order     |                                   | <b>Made to Order</b>                  |

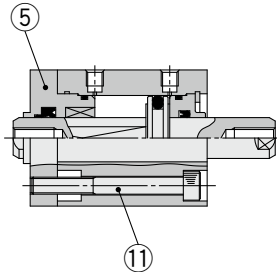


# CQ2KW Series

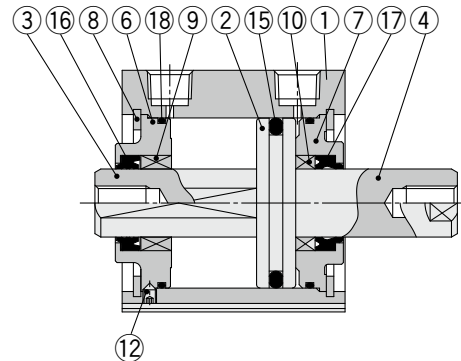
## Construction

### Without auto switch magnet

ø12 to ø32

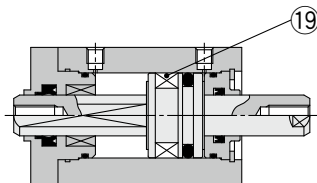


ø40 to ø63

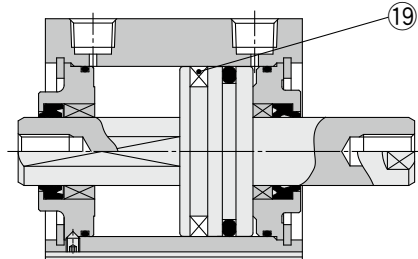


### With auto switch magnet

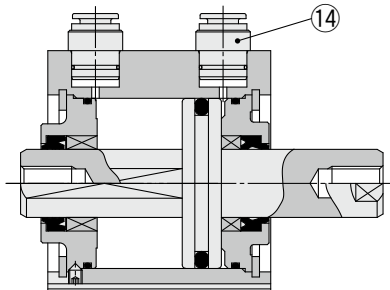
ø12 to ø32



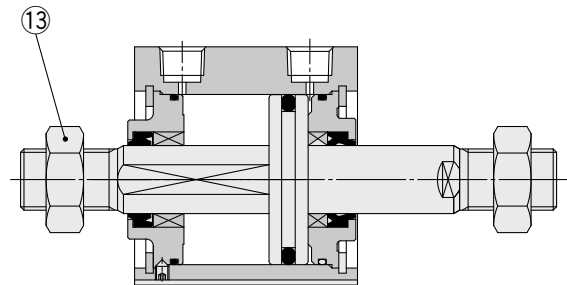
ø40 to ø63



### Built-in One-touch fittings



### Rod end male thread



## Component Parts

| No. | Description                   | Material                       | Note                            |
|-----|-------------------------------|--------------------------------|---------------------------------|
| 1   | Cylinder tube                 | Aluminum alloy                 | Hard anodized                   |
| 2   | Piston                        | Aluminum alloy                 |                                 |
| 3   | Piston rod A                  | Stainless steel                | ø12 to ø25                      |
|     |                               | Carbon steel                   | ø32 to ø63, Hard chrome plating |
| 4   | Piston rod B                  | Stainless steel                | ø12 to ø25                      |
|     |                               | Carbon steel                   | ø32 to ø63, Hard chrome plating |
| 5   | Rod cover                     | Brass                          | ø12, Electroless nickel plating |
|     |                               | Aluminum alloy                 | ø16 to ø32, Anodized            |
| 6   | Collar for non-rotating       | Aluminum alloy                 | ø40 to ø63, Anodized            |
| 7   | Collar                        | Aluminum alloy                 | ø12 to ø40, Anodized            |
|     |                               | Aluminum alloy casted          | ø50 to ø63, Chromated, Painted  |
| 8   | Retaining ring                | Carbon tool steel              | Phosphate coated                |
| 9   | Bushing for non-rotating      | Oil-impregnated sintered alloy | ø16 to ø63                      |
| 10  | Bushing                       | Bearing alloy                  | ø50, ø63                        |
| 11  | Hexagon socket head cap screw | Alloy steel                    | ø12 to ø32, Zinc chromated      |
| 12  | Hexagon socket head set screw | Alloy steel                    | ø40 to ø63, Zinc chromated      |
| 13  | Rod end nut                   | Carbon steel                   | Zinc chromated                  |
| 14  | One-touch fitting             | —                              | ø32 to ø63                      |
| 15  | Piston seal                   | NBR                            |                                 |
| 16  | Rod seal for non-rotating     | NBR                            |                                 |
| 17  | Rod seal                      | NBR                            |                                 |
| 18  | Gasket                        | NBR                            |                                 |
| 19  | Magnet                        | —                              |                                 |

## Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.     | Contents                   |
|----------------|-------------|----------------------------|
| 12             | CQ2KWB12-PS | Set of nos. 15, 16, 17, 18 |
| 16             | CQ2KWB16-PS |                            |
| 20             | CQ2KWB20-PS |                            |
| 25             | CQ2KWB25-PS |                            |
| 32             | CQ2KWB32-PS |                            |
| 40             | CQ2KWB40-PS |                            |
| 50             | CQ2KWB50-PS |                            |
| 63             | CQ2KWB63-PS |                            |

\* Seal kit includes 15, 16, 17, 18. Order the seal kit based on each bore size.

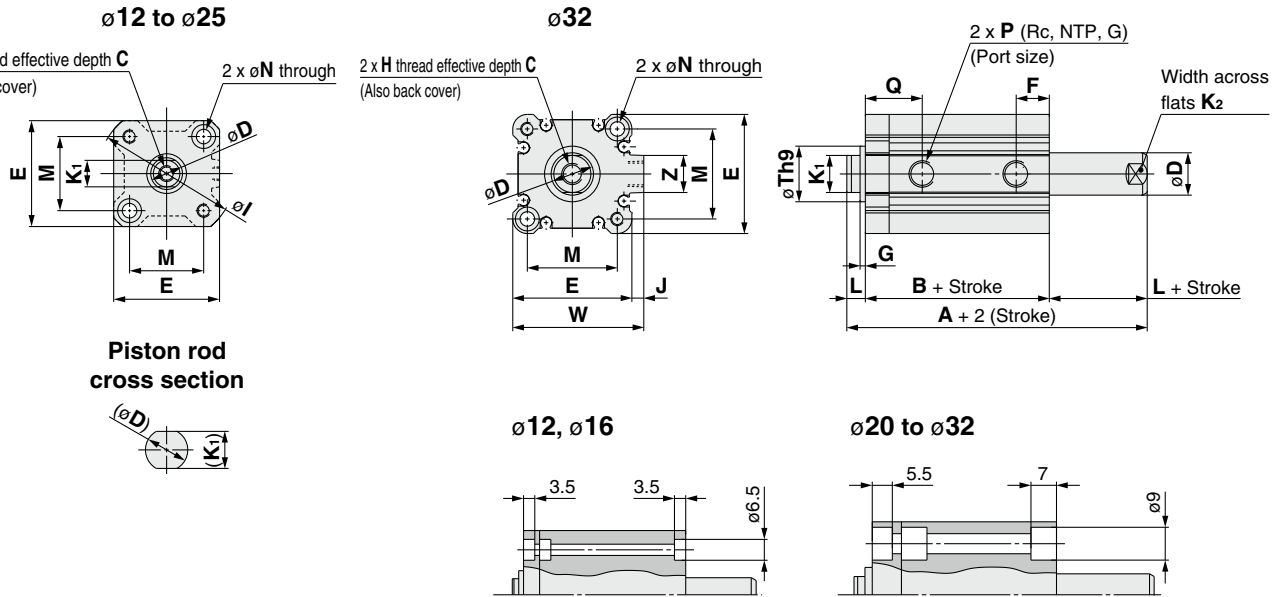
\* The seal kit does not include a grease pack. Order it separately.

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

Bore Size

**∅12 to ∅32** Without Auto Switch Magnet

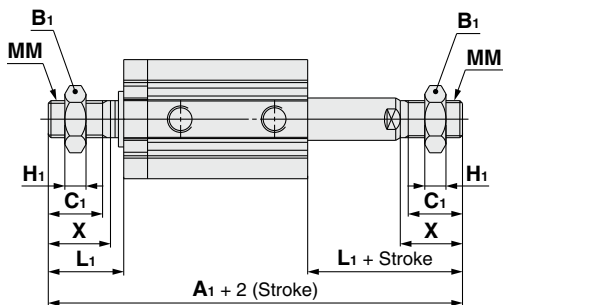
Through-hole: CQ2KWB



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | F  | G   | H         | I  | J   | K <sub>1</sub> | K <sub>2</sub> | L   | M    | N   | P        | Q  | Th9                               | W    | Z  |
|----------------|-------------------|------|------|----|----|----|----|-----|-----------|----|-----|----------------|----------------|-----|------|-----|----------|----|-----------------------------------|------|----|
| 12             | 5 to 30           | 37.2 | 30.2 | 6  | 6  | 25 | 10 | 1.5 | M3 x 0.5  | 32 | —   | 5.2            | 5              | 3.5 | 15.5 | 3.5 | M5 x 0.8 | 15 | 15 <sup>0</sup> <sub>-0.043</sub> | —    | —  |
| 16             | 5 to 30           | 38   | 31   | 8  | 8  | 29 | 10 | 1.5 | M4 x 0.7  | 38 | —   | 6              | 6              | 3.5 | 20   | 3.5 | M5 x 0.8 | 15 | 20 <sup>0</sup> <sub>-0.052</sub> | —    | —  |
| 20             | 5 to 50           | 43   | 34   | 7  | 10 | 36 | 8  | 2   | M5 x 0.8  | 47 | —   | 8              | 8              | 4.5 | 25.5 | 5.5 | M5 x 0.8 | 16 | 13 <sup>0</sup> <sub>-0.043</sub> | —    | —  |
| 25             | 5 to 50           | 47   | 37   | 12 | 12 | 40 | 9  | 2   | M6 x 1.0  | 52 | —   | 10             | 10             | 5   | 28   | 5.5 | M5 x 0.8 | 17 | 15 <sup>0</sup> <sub>-0.043</sub> | —    | —  |
| 32             | 5                 | 53.5 | 39.5 | 13 | 16 | 45 | 10 | 2   | M8 x 1.25 | —  | 4.5 | 14             | 14             | 7   | 34   | 5.5 | M5 x 0.8 | 19 | 21 <sup>0</sup> <sub>-0.052</sub> | 49.5 | 14 |
|                | 10 to 50          |      |      |    |    |    |    |     |           |    |     |                |                |     |      |     | 1/8      |    |                                   |      |    |
|                | 75,100            | 63.5 | 49.5 |    |    |    |    |     |           |    |     |                |                |     |      |     |          |    |                                   |      |    |

\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
\* The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.

Rod end male thread



| Bore size [mm] | Stroke range [mm] | A <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|-------------------|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 5 to 30           | 58.2           | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 5 to 30           | 62             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 5 to 50           | 71             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 5 to 50           | 82             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |
| 32             | 5 to 50           | 96.5           | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |
|                | 75,100            | 106.5          |                |                |                |                |            |      |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, double rod. ⇨ p. 38

\* The dimensions of ∅32-5 mm stroke with built-in One-touch fittings are the same as those of the 10 mm stroke cylinder tube.

Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

Standard Double Acting, Single Rod CQ2

Standard Double Acting, Double Rod CQ2W

Single Acting, Spring Return, End CQ2

Large Bore Size Double Acting, Single Rod CQ2

Large Bore Size Double Acting, Double Rod CQ2W

Anti-lateral Load Double Acting, Single Rod CQ2S

Long Stroke Double Acting, Single Rod CQ2

Non-rotating Rod Double Acting, Single Rod CQ2K

Non-rotating Rod Double Acting, Double Rod CQ2KW

Water Resistant Double Acting, Single Rod CQ2-RV

Water Resistant Double Acting, Double Rod CQ2W-RV

Axial Piping Double Acting, Single Rod CQP2

Axial Piping Single Acting, Spring Return, End CQP2

With End Lock Double Acting, Single Rod CBQ2

Auto Switch

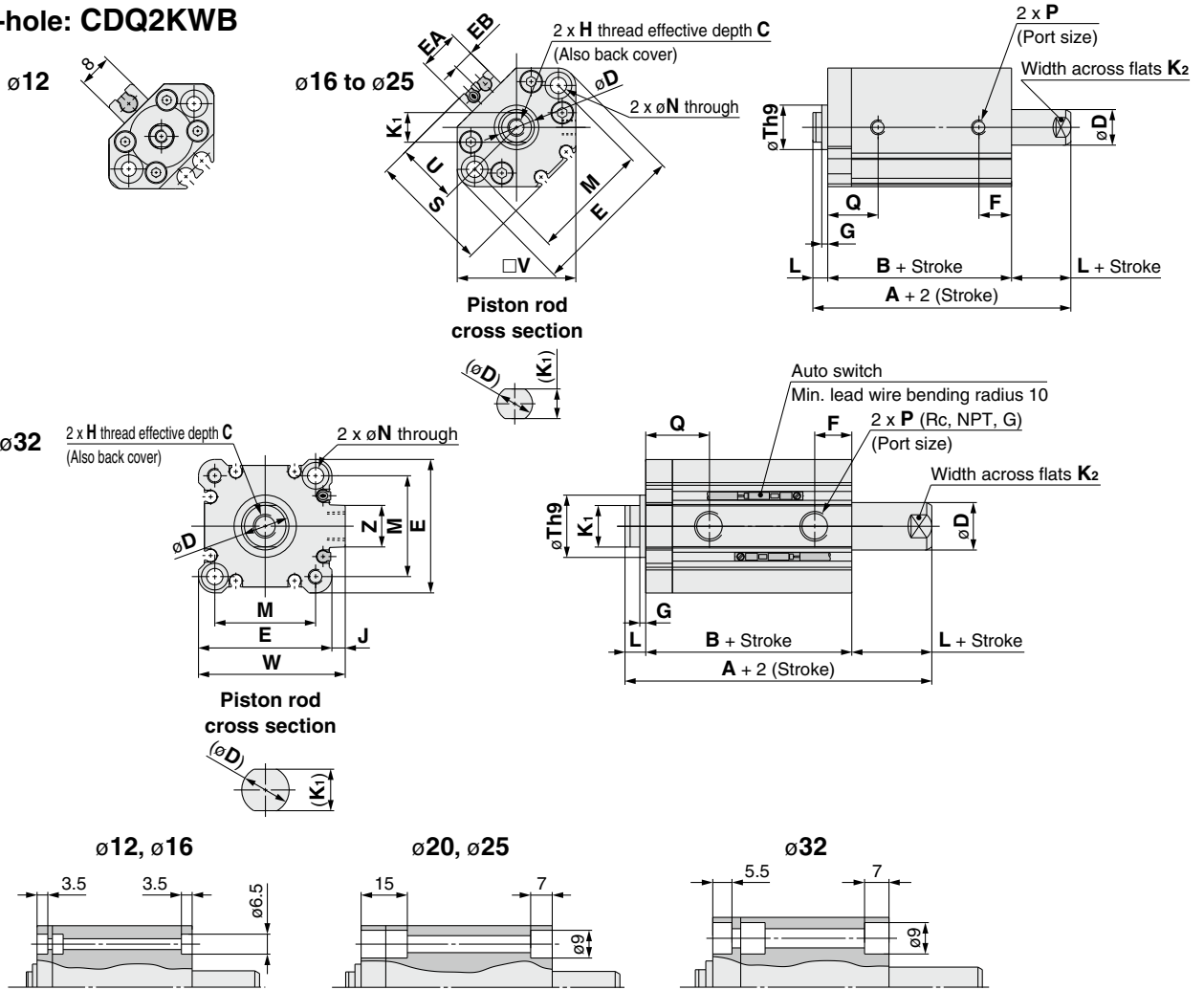
Made to Order

# CQ2KW Series

Bore Size

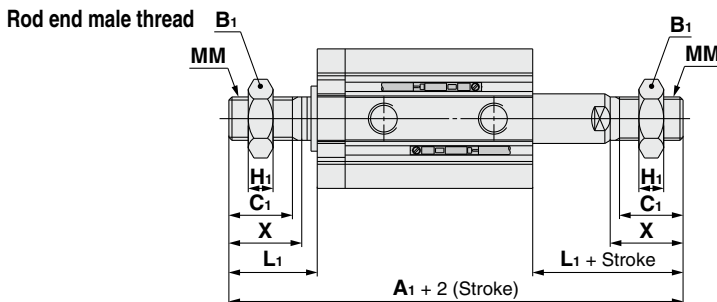
## Ø12 to Ø32 With Auto Switch Magnet

Through-hole: CDQ2KWB



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | EA   | EB  | F    | G   | H         | J   | K <sub>1</sub> | K <sub>2</sub> | L   | M  | N   | P        | Q    | S    | Th9                               | U  | V  | W    | Z  |
|----------------|-------------------|------|------|----|----|----|------|-----|------|-----|-----------|-----|----------------|----------------|-----|----|-----|----------|------|------|-----------------------------------|----|----|------|----|
| 12             | 5 to 30           | 44.4 | 37.4 | 6  | 6  | 33 | —    | —   | 10.5 | 1.5 | M3 x 0.5  | —   | 5.2            | 5              | 3.5 | 22 | 3.5 | M5 x 0.8 | 15.5 | 27.5 | 15 <sup>0</sup> <sub>-0.043</sub> | 14 | 25 | —    | —  |
| 16             | 5 to 30           | 48   | 41   | 8  | 8  | 37 | 13.2 | 6.6 | 10   | 1.5 | M4 x 0.7  | —   | 6              | 6              | 3.5 | 28 | 3.5 | M5 x 0.8 | 15   | 29.5 | 20 <sup>0</sup> <sub>-0.052</sub> | 15 | 29 | —    | —  |
| 20             | 5 to 50           | 55   | 46   | 7  | 10 | 47 | 13.6 | 6.8 | 8    | 2   | M5 x 0.8  | —   | 8              | 8              | 4.5 | 36 | 5.5 | M5 x 0.8 | 16   | 35.5 | 13 <sup>0</sup> <sub>-0.043</sub> | 18 | 36 | —    | —  |
| 25             | 5 to 50           | 57   | 47   | 12 | 12 | 52 | 13.6 | 6.8 | 9    | 2   | M6 x 1.0  | —   | 10             | 10             | 5   | 40 | 5.5 | M5 x 0.8 | 17   | 40.5 | 15 <sup>0</sup> <sub>-0.043</sub> | 21 | 40 | —    | —  |
| 32             | 5 to 50, 75, 100  | 63.5 | 49.5 | 13 | 16 | 45 | —    | —   | 10   | 2   | M8 x 1.25 | 4.5 | 14             | 14             | 7   | 34 | 5.5 | 1/8      | 19   | —    | 21 <sup>0</sup> <sub>-0.052</sub> | —  | —  | 49.5 | 14 |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145



| Bore size [mm] | A <sub>1</sub> | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|----------------|------------|------|
| 12             | 65.4           | 8              | 9              | 4              | 14             | M5 x 0.8   | 10.5 |
| 16             | 72             | 10             | 10             | 5              | 15.5           | M6 x 1.0   | 12   |
| 20             | 83             | 13             | 12             | 5              | 18.5           | M8 x 1.25  | 14   |
| 25             | 92             | 17             | 15             | 6              | 22.5           | M10 x 1.25 | 17.5 |
| 32             | 106.5          | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, double rod. ⇨ p. 38

### Dimensions of Each Mounting Bracket

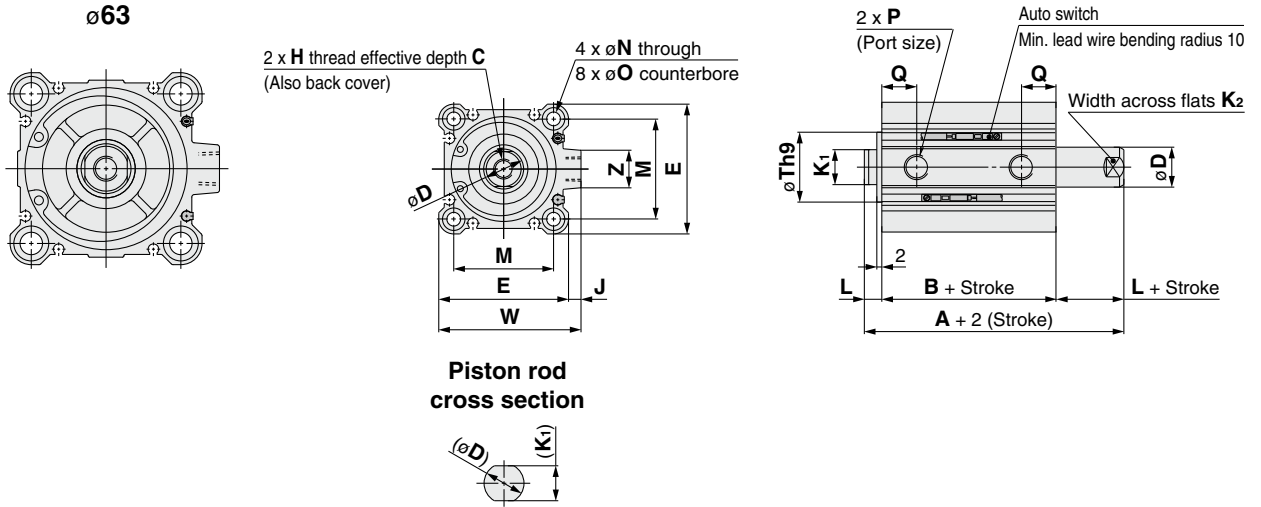
The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

- \* The dimensions of Ø32-5 mm stroke with built-in One-touch fittings are the same as those of the 10 mm stroke cylinder tube.

Bore Size

**ø40 to ø63** With/Without Auto Switch Magnet

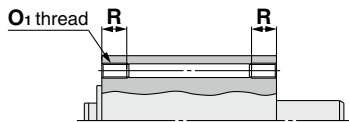
Through-hole: **C□Q2KWB**



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      | C  | D  | E  | H         | J | K <sub>1</sub> | K <sub>2</sub> | L | M  | N   | O             | P   | Q    | Th9                               | W  | Z  |
|----------------|-------------------|----------------------------|------|-------------------------|------|----|----|----|-----------|---|----------------|----------------|---|----|-----|---------------|-----|------|-----------------------------------|----|----|
|                |                   | A                          | B    | A                       | B    |    |    |    |           |   |                |                |   |    |     |               |     |      |                                   |    |    |
| 40             | 5 to 50           | 54                         | 40   | 64                      | 50   | 13 | 16 | 52 | M8 x 1.25 | 5 | 14             | 14             | 7 | 40 | 5.5 | 9 depth 7     | 1/8 | 12.5 | 28 <sup>0</sup> <sub>-0.052</sub> | 57 | 15 |
|                | 75,100            | 64                         | 50   |                         |      |    |    |    |           |   |                |                |   |    |     |               |     |      |                                   |    |    |
| 50             | 10 to 50          | 56.5                       | 40.5 | 66.5                    | 50.5 | 15 | 20 | 64 | M10 x 1.5 | 7 | 18             | 17             | 8 | 50 | 6.6 | 11 depth 8    | 1/4 | 14   | 35 <sup>0</sup> <sub>-0.062</sub> | 71 | 19 |
|                | 75,100            | 66.5                       | 50.5 |                         |      |    |    |    |           |   |                |                |   |    |     |               |     |      |                                   |    |    |
| 63             | 10 to 50          | 58                         | 42   | 68                      | 52   | 15 | 20 | 77 | M10 x 1.5 | 7 | 18             | 17             | 8 | 60 | 9   | 14 depth 10.5 | 1/4 | 15.5 | 35 <sup>0</sup> <sub>-0.062</sub> | 84 | 19 |
|                | 75,100            | 68                         | 52   |                         |      |    |    |    |           |   |                |                |   |    |     |               |     |      |                                   |    |    |

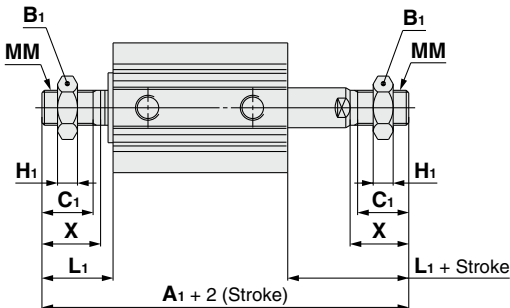
- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The positions of piston rod's width across flats (K<sub>2</sub>) are not constant.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

**Both ends tapped**



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |
| 63             | M10 x 1.5      | 18 |

**Rod end male thread**



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |                | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|-------------------|----------------------------|----------------|----------------|----------------|----------------|----------------|-----------|------|
|                |                   | A <sub>1</sub>             | A <sub>1</sub> |                |                |                |                |           |      |
| 40             | 5 to 50           | 97                         | 107            | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5 |
|                | 75, 100           | 107                        |                |                |                |                |                |           |      |
| 50             | 10 to 50          | 107.5                      | 117.5          | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
|                | 75, 100           | 117.5                      |                |                |                |                |                |           |      |
| 63             | 10 to 50          | 109                        | 119            | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5 |
|                | 75, 100           | 119                        |                |                |                |                |                |           |      |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, double rod. ⇨ p. 38, 39

**Dimensions of Each Mounting Bracket**

The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, End Double Acting, Single Rod **CQ2**

Single Acting, Spring Return, End Double Acting, Double Rod **CQ2W**

Large Bore Size Double Acting, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2□S**

Long Stroke Double Acting, Single Rod **CQ2**

Long Stroke Double Acting, Double Rod **CQ2W**

Non-rotating Rod Double Acting, Single Rod **CQ2KW**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Double Acting, Single Rod **CQP2**

Axial Piping Single Acting, Spring Return, End Double Acting, Single Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

Made to Order

# Compact Cylinder: Water Resistant Double Acting, Single Rod

## CQ2-R/V Series

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

Without auto switch  
ø20, ø25

CQ2 B 20 [ ] R - 30 D [ ] — [ ]

Without auto switch  
ø32 to ø100

CQ2 B 32 [ ] R - 30 D [ ] Z - [ ]

With auto switch

CDQ2 B 32 [ ] R - 30 D [ ] Z - M9BA [ ] - [ ]

#### With auto switch magnet

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

#### 1 Mounting

|           |                  |               |
|-----------|------------------|---------------|
| <b>B</b>  | Through-hole     | (ø20 to ø100) |
| <b>A</b>  | Both ends tapped | (ø40 to ø100) |
| <b>L</b>  | Foot             |               |
| <b>LC</b> | Compact foot     |               |
| <b>F</b>  | Rod flange       |               |
| <b>G</b>  | Head flange      |               |
| <b>D</b>  | Double clevis    |               |

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

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 102

#### 2 Bore size

|            |        |
|------------|--------|
| <b>20</b>  | 20 mm  |
| <b>25</b>  | 25 mm  |
| <b>32</b>  | 32 mm  |
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

#### 3 Port thread type

|            |          |
|------------|----------|
| <b>Nil</b> | M thread |
|            | Rc       |
| <b>TN</b>  | NPT      |
| <b>TF</b>  | G        |

#### 4 Water-resistant cylinder

|          |                           |
|----------|---------------------------|
| <b>R</b> | NBR seal (Nitrile rubber) |
| <b>V</b> | FKM seal (Fluororubber)   |

#### 5 Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size              | Standard stroke                                |
|------------------------|--|
| <b>20, 25</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |
| <b>32, 40</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| <b>50, 63, 80, 100</b> | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 100

#### 6 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### 7 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>M</b>   | Rod end male thread   |

#### 8 Auto switch mounting groove

|          |             |            |
|----------|-------------|------------|
| <b>Z</b> | ø20 to ø25  | 2 surfaces |
|          | ø32 to ø100 | 4 surfaces |

#### 9 Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

#### 10 Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

#### 11 Made to order common specifications

For details ⇨ p. 100

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

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

#### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) CDQ2B32R-25DMZ

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

| Type                    | Special function                    | Electrical entry | Indicator light | Wiring (Output) | Load voltage |                 | Auto switch model |              | Lead wire length [m] |       |       |       | Pre-wired connector | Applicable load |            |   |
|-------------------------|-------------------------------------|------------------|-----------------|-----------------|--------------|-----------------|-------------------|--------------|----------------------|-------|-------|-------|---------------------|-----------------|------------|---|
|                         |                                     |                  |                 |                 | DC           | AC              | Perpendicular     | In-line      | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) |                     | IC circuit      | Relay, PLC |   |
| Solid state auto switch | Water resistant (2-color indicator) | Grommet          | Yes             | 3-wire (NPN)    | 24 V         | 5 V, 12 V, 12 V | —                 | <b>M9NAV</b> | <b>M9NA</b>          | ○     | ○     | ●     | ○                   | ○               | —          | — |
|                         |                                     |                  |                 | 3-wire (PNP)    |              |                 |                   | <b>M9PAV</b> | <b>M9PA</b>          | ○     | ○     | ●     | ○                   |                 |            |   |
|                         |                                     |                  |                 | 2-wire          |              |                 |                   | <b>M9BAV</b> | <b>M9BA</b>          | ○     | ○     | ●     | ○                   |                 |            |   |

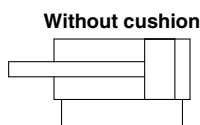
\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9BA  
1 m ..... M (Example) M9BAM  
3 m ..... L (Example) M9BAL  
5 m ..... Z (Example) M9BAZ

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

# Compact Cylinder: Water Resistant Double Acting, Single Rod **CQ2-R/V Series**



Symbol




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

| Symbol  | Specifications  |
|---------|---|
| -XB10   | Intermediate stroke (Using exclusive body)                      |
| -XC6(A) | Piston rod/Retaining ring/Rod end nut material: Stainless steel |
| -XC85   | Grease for food processing equipment                            |

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

**Moisture Control Tube  
IDK Series**



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

**⚠ Precautions**

Refer to pages 189 and 190 before handling the products.

## Specifications

| Bore size [mm]                        | 20  | 25   | 32   | 40   | 50   | 63   | 80   | 100  |
|---------------------------------------|---|------|------|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |      |      |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |      |      |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |      |      |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |      |      |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.08 MPa  |      |      |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |      |      |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |      |      |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |      |      |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.055   | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| <b>Stroke length tolerance</b>        | +1.0 mm<br>0  |      |      |      |      |      |      |      |

## Manufacturing of Intermediate Strokes

|              |   |              |
|--------------|---|--------------|
| Type         | A spacer is installed in the standard stroke body.  |              |
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 99)                                      |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.      |              |
| Stroke range | Bore size   | Stroke range |
|              | 20, 25  | 1 to 49      |
|              | 32 to 100   | 1 to 99      |
| Example      | Part no.: CQ2B50R-57DZ<br>CQ2B50R-75DZ with 18 mm width spacer inside<br>The B dimension is 115.5 mm. |              |

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1  | Compact foot*1 | Flange  | Double clevis | Double clevis pivot bracket |
|----------------|---------|----------------|---------|---------------|-----------------------------|
| <b>40</b>      | CQ-L040 | CQ-LC040       | CQ-F040 | CQ-D040       | CQ-C040                     |
| <b>50</b>      | CQ-L050 | CQ-LC050       | CQ-F050 | CQ-D050       | CQ-C050                     |
| <b>63</b>      | CQ-L063 | CQ-LC063       | CQ-F063 | CQ-D063       | CQ-C063                     |
| <b>80</b>      | CQ-L080 | CQ-LC080       | CQ-F080 | CQ-D080       | CQ-C080                     |
| <b>100</b>     | CQ-L100 | CQ-LC100       | CQ-F100 | CQ-D100       | CQ-C100                     |

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

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

Foot, Compact foot, Flange: Body mounting bolts, Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts

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

## Dimensions of Each Mounting Bracket

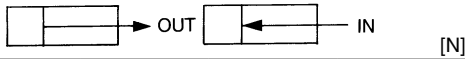
The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.

|                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| Standard                            | Double Acting, Single Rod           | <b>CQ2</b>                                   |
| Standard                            | Double Acting, Double Rod           | <b>CQ2W</b>                                  |
| Single Acting, Spring Return-Extend | Single Acting, Single Rod           | <b>CQ2</b>                                   |
| Large Bore Size                     | Double Acting, Single Rod           | <b>CQ2</b>                                   |
| Large Bore Size                     | Double Acting, Double Rod           | <b>CQ2W</b>                                  |
| Anti-lateral Load                   | Double Acting, Single Rod           | <b>CQ2</b> <input type="checkbox"/> <b>S</b> |
| Long Stroke                         | Double Acting, Single Rod           | <b>CQ2</b>                                   |
| Non-rotating Rod                    | Double Acting, Single Rod           | <b>CQ2K</b>                                  |
| Non-rotating Rod                    | Double Acting, Double Rod           | <b>CQ2KW</b>                                 |
| Water Resistant                     | Double Acting, Single Rod           | <b>CQ2-R/V</b>                               |
| Water Resistant                     | Double Acting, Double Rod           | <b>CQ2W-R/V</b>                              |
| Axial Piping                        | Double Acting, Single Rod           | <b>CQP2</b>                                  |
| Axial Piping                        | Single Acting, Spring Return-Extend | <b>CQP2</b>                                  |
| With End Lock                       | Double Acting, Single Rod           | <b>CBQ2</b>                                  |
| Auto Switch                         |                                     | <b>Auto Switch</b>                           |
| Made to Order                       |                                     | <b>Made to Order</b>                         |



# CQ2-R/V Series

## Theoretical Output



| Bore size [mm] | Operating direction | Operating pressure [MPa] |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 20             | IN                  | 71                       | 118  | 165  |
|                | OUT                 | 94                       | 157  | 220  |
| 25             | IN                  | 113                      | 189  | 264  |
|                | OUT                 | 147                      | 245  | 344  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1150 |
|                | OUT                 | 589                      | 982  | 1370 |
| 63             | IN                  | 841                      | 1400 | 1960 |
|                | OUT                 | 935                      | 1560 | 2180 |
| 80             | IN                  | 1360                     | 2270 | 3170 |
|                | OUT                 | 1510                     | 2510 | 3520 |
| 100            | IN                  | 2140                     | 3570 | 5000 |
|                | OUT                 | 2360                     | 3930 | 5500 |

## Weight

### Without Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 20             | 112                  | 126  | 141  | 155  | 169  | 184  | 198  | 212  | 227  | 241  | —    | —    |
| 25             | 149                  | 165  | 182  | 197  | 213  | 229  | 245  | 261  | 277  | 293  | —    | —    |
| 32             | 203                  | 224  | 246  | 267  | 288  | 309  | 330  | 352  | 373  | 394  | 544  | 650  |
| 40             | 220                  | 241  | 263  | 284  | 306  | 327  | 349  | 371  | 392  | 414  | 568  | 680  |
| 50             | —                    | 378  | 411  | 444  | 476  | 509  | 542  | 575  | 608  | 641  | 879  | 1051 |
| 63             | —                    | 547  | 585  | 623  | 662  | 700  | 738  | 776  | 814  | 852  | 1125 | 1321 |
| 80             | —                    | 973  | 1034 | 1094 | 1154 | 1214 | 1275 | 1335 | 1395 | 1455 | 1873 | 2169 |
| 100            | —                    | 1703 | 1783 | 1863 | 1944 | 2024 | 2104 | 2185 | 2265 | 2345 | 2915 | 3323 |

### With Auto Switch Magnet

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 20             | 130                  | 142  | 155  | 167  | 179  | 191  | 204  | 216  | 228  | 240  | —    | —    |
| 25             | 182                  | 197  | 213  | 228  | 244  | 259  | 275  | 290  | 306  | 320  | —    | —    |
| 32             | 263                  | 284  | 305  | 327  | 348  | 369  | 390  | 412  | 433  | 454  | 561  | 668  |
| 40             | 293                  | 315  | 336  | 358  | 379  | 401  | 422  | 444  | 465  | 487  | 598  | 710  |
| 50             | —                    | 489  | 522  | 555  | 588  | 620  | 653  | 687  | 720  | 753  | 925  | 1097 |
| 63             | —                    | 700  | 738  | 776  | 814  | 852  | 890  | 928  | 966  | 1004 | 1201 | 1397 |
| 80             | —                    | 1219 | 1279 | 1340 | 1400 | 1460 | 1520 | 1581 | 1641 | 1701 | 1998 | 2295 |
| 100            | —                    | 2061 | 2142 | 2222 | 2302 | 2383 | 2463 | 2543 | 2624 | 2704 | 3112 | 3520 |

### Additional Weight

| Bore size [mm]  | 20          | 25 | 32 | 40  | 50  | 63  | 80   | 100  |
|---|-------------|----|----|-----|-----|-----|------|------|
| Both ends tapped                                      | —           | —  | —  | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                                   | Male thread | 6  | 12 | 26  | 27  | 53  | 53   | 120  |
|   | Nut         | 4  | 8  | 17  | 17  | 32  | 32   | 49   |
| Foot (Including mounting bolts)                       | —           | —  | —  | 122 | 194 | 272 | 550  | 912  |
| Compact foot (Including mounting bolts)               | —           | —  | —  | 93  | 148 | 210 | 454  | 707  |
| Rod flange (Including mounting bolts)                 | —           | —  | —  | 214 | 373 | 559 | 1056 | 1365 |
| Head flange (Including mounting bolts)                | —           | —  | —  | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining rings, bolts) | —           | —  | —  | 196 | 393 | 554 | 1109 | 1887 |

Calculation: (Example) **CDQ2D40R-20DMZ**

- Basic weight: CDQ2B40R-20DZ ..... 358 g
- Additional weight: Both ends tapped ..... 6 g
- Rod end male thread ..... 44 g
- Double clevis ..... 196 g

Add each weight of auto switches when auto switches are mounted.

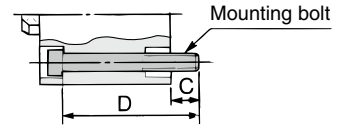
604 g

### Through-hole Type Mounting Bolt for the CQ2: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2B is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

**Example) CQ-M5 x 35L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model                | C   | D      | Mounting bolt part no. |
|-------------------------------|-----|--------|------------------------|
| <b>CQ2B20<sup>□</sup>-5D</b>  | 7.5 | 35     | CQ-M5 x 35L            |
| -10DZ                         |     | 40     | x 40L                  |
| -15DZ                         |     | 45     | x 45L                  |
| -20DZ                         |     | 50     | x 50L                  |
| -25DZ                         |     | 55     | x 55L                  |
| -30DZ                         |     | 60     | x 60L                  |
| -35DZ                         |     | 65     | x 65L                  |
| -40DZ                         |     | 70     | x 70L                  |
| -45DZ                         |     | 75     | x 75L                  |
| -50DZ                         |     | 80     | x 80L                  |
| <b>CQ2B25<sup>□</sup>-5D</b>  | 9.5 | 40     | CQ-M5 x 40L            |
| -10DZ                         |     | 45     | x 45L                  |
| -15DZ                         |     | 50     | x 50L                  |
| -20DZ                         |     | 55     | x 55L                  |
| -25DZ                         |     | 60     | x 60L                  |
| -30DZ                         |     | 65     | x 65L                  |
| -35DZ                         |     | 70     | x 70L                  |
| -40DZ                         |     | 75     | x 75L                  |
| -45DZ                         |     | 80     | x 80L                  |
| -50DZ                         |     | 85     | x 85L                  |
| <b>CQ2B32<sup>□</sup>-5DZ</b> | 9   | 40     | CQ-M5 x 40L            |
| -10DZ                         |     | 45     | x 45L                  |
| -15DZ                         |     | 50     | x 50L                  |
| -20DZ                         |     | 55     | x 55L                  |
| -25DZ                         |     | 60     | x 60L                  |
| -30DZ                         |     | 65     | x 65L                  |
| -35DZ                         |     | 70     | x 70L                  |
| -40DZ                         |     | 75     | x 75L                  |
| -45DZ                         |     | 80     | x 80L                  |
| -50DZ                         |     | 85     | x 85L                  |
| -75DZ                         | 120 | x 120L |                        |
| -100DZ                        | 145 | x 145L |                        |

| Cylinder model                 | C    | D      | Mounting bolt part no. |
|--------------------------------|------|--------|------------------------|
| <b>CQ2B40<sup>□</sup>-5DZ</b>  | 7.5  | 35     | CQ-M5 x 35L            |
| -10DZ                          |      | 40     | x 40L                  |
| -15DZ                          |      | 45     | x 45L                  |
| -20DZ                          |      | 50     | x 50L                  |
| -25DZ                          |      | 55     | x 55L                  |
| -30DZ                          |      | 60     | x 60L                  |
| -35DZ                          |      | 65     | x 65L                  |
| -40DZ                          |      | 70     | x 70L                  |
| -45DZ                          |      | 75     | x 75L                  |
| -50DZ                          |      | 80     | x 80L                  |
| -75DZ                          | 115  | x 115L |                        |
| -100DZ                         | 140  | x 140L |                        |
| <b>CQ2B50<sup>□</sup>-10DZ</b> | 12.5 | 45     | CQ-M6 x 45L            |
| -15DZ                          |      | 50     | x 50L                  |
| -20DZ                          |      | 55     | x 55L                  |
| -25DZ                          |      | 60     | x 60L                  |
| -30DZ                          |      | 65     | x 65L                  |
| -35DZ                          |      | 70     | x 70L                  |
| -40DZ                          |      | 75     | x 75L                  |
| -45DZ                          |      | 80     | x 80L                  |
| -50DZ                          |      | 85     | x 85L                  |
| -75DZ                          |      | 120    | x 120L                 |
| -100DZ                         | 145  | x 145L |                        |
| <b>CQ2B63<sup>□</sup>-10DZ</b> | 14.5 | 50     | CQ-M8 x 50L            |
| -15DZ                          |      | 55     | x 55L                  |
| -20DZ                          |      | 60     | x 60L                  |
| -25DZ                          |      | 65     | x 65L                  |
| -30DZ                          |      | 70     | x 70L                  |
| -35DZ                          |      | 75     | x 75L                  |
| -40DZ                          |      | 80     | x 80L                  |
| -45DZ                          |      | 85     | x 85L                  |
| -50DZ                          |      | 90     | x 90L                  |
| -75DZ                          |      | 125    | x 125L                 |
| -100DZ                         | 150  | x 150L |                        |

| Cylinder model                  | C    | D      | Mounting bolt part no. |
|---------------------------------|------|--------|------------------------|
| <b>CQ2B80<sup>□</sup>-10DZ</b>  | 15   | 55     | CQ-M10 x 55L           |
| -15DZ                           |      | 60     | x 60L                  |
| -20DZ                           |      | 65     | x 65L                  |
| -25DZ                           |      | 70     | x 70L                  |
| -30DZ                           |      | 75     | x 75L                  |
| -35DZ                           |      | 80     | x 80L                  |
| -40DZ                           |      | 85     | x 85L                  |
| -45DZ                           |      | 90     | x 90L                  |
| -50DZ                           |      | 95     | x 95L                  |
| -75DZ                           |      | 130    | x 130L                 |
| -100DZ                          | 155  | x 155L |                        |
| <b>CQ2B100<sup>□</sup>-10DZ</b> | 15.5 | 65     | CQ-M10 x 65L           |
| -15DZ                           |      | 70     | x 70L                  |
| -20DZ                           |      | 75     | x 75L                  |
| -25DZ                           |      | 80     | x 80L                  |
| -30DZ                           |      | 85     | x 85L                  |
| -35DZ                           |      | 90     | x 90L                  |
| -40DZ                           |      | 95     | x 95L                  |
| -45DZ                           |      | 100    | x 100L                 |
| -50DZ                           |      | 105    | x 105L                 |
| -75DZ                           |      | 140    | x 140L                 |
| -100DZ                          | 165  | x 165L |                        |

### Through-hole Type Mounting Bolt for the CDQ2: With Auto Switch Magnet

| Cylinder model                 | C    | D      | Mounting bolt part no. |
|--------------------------------|------|--------|------------------------|
| <b>CDQ2B20<sup>□</sup>-5DZ</b> | 10.5 | 50     | CQ-M5 x 50L            |
| -10DZ                          |      | 55     | x 55L                  |
| -15DZ                          |      | 60     | x 60L                  |
| -20DZ                          |      | 65     | x 65L                  |
| -25DZ                          |      | 70     | x 70L                  |
| -30DZ                          |      | 75     | x 75L                  |
| -35DZ                          |      | 80     | x 80L                  |
| -40DZ                          |      | 85     | x 85L                  |
| -45DZ                          |      | 90     | x 90L                  |
| -50DZ                          |      | 95     | x 95L                  |
| <b>CDQ2B25<sup>□</sup>-5DZ</b> | 9.5  | 50     | CQ-M5 x 50L            |
| -10DZ                          |      | 55     | x 55L                  |
| -15DZ                          |      | 60     | x 60L                  |
| -20DZ                          |      | 65     | x 65L                  |
| -25DZ                          |      | 70     | x 70L                  |
| -30DZ                          |      | 75     | x 75L                  |
| -35DZ                          |      | 80     | x 80L                  |
| -40DZ                          |      | 85     | x 85L                  |
| -45DZ                          |      | 90     | x 90L                  |
| -50DZ                          |      | 95     | x 95L                  |
| <b>CDQ2B32<sup>□</sup>-5DZ</b> | 9    | 50     | CQ-M5 x 50L            |
| -10DZ                          |      | 55     | x 55L                  |
| -15DZ                          |      | 60     | x 60L                  |
| -20DZ                          |      | 65     | x 65L                  |
| -25DZ                          |      | 70     | x 70L                  |
| -30DZ                          |      | 75     | x 75L                  |
| -35DZ                          |      | 80     | x 80L                  |
| -40DZ                          |      | 85     | x 85L                  |
| -45DZ                          |      | 90     | x 90L                  |
| -50DZ                          |      | 95     | x 95L                  |
| -75DZ                          | 120  | x 120L |                        |
| -100DZ                         | 145  | x 145L |                        |

| Cylinder model                  | C    | D      | Mounting bolt part no. |
|---------------------------------|------|--------|------------------------|
| <b>CDQ2B40<sup>□</sup>-5DZ</b>  | 7.5  | 45     | CQ-M5 x 45L            |
| -10DZ                           |      | 50     | x 50L                  |
| -15DZ                           |      | 55     | x 55L                  |
| -20DZ                           |      | 60     | x 60L                  |
| -25DZ                           |      | 65     | x 65L                  |
| -30DZ                           |      | 70     | x 70L                  |
| -35DZ                           |      | 75     | x 75L                  |
| -40DZ                           |      | 80     | x 80L                  |
| -45DZ                           |      | 85     | x 85L                  |
| -50DZ                           |      | 90     | x 90L                  |
| -75DZ                           | 115  | x 115L |                        |
| -100DZ                          | 140  | x 140L |                        |
| <b>CDQ2B50<sup>□</sup>-10DZ</b> | 12.5 | 55     | CQ-M6 x 55L            |
| -15DZ                           |      | 60     | x 60L                  |
| -20DZ                           |      | 65     | x 65L                  |
| -25DZ                           |      | 70     | x 70L                  |
| -30DZ                           |      | 75     | x 75L                  |
| -35DZ                           |      | 80     | x 80L                  |
| -40DZ                           |      | 85     | x 85L                  |
| -45DZ                           |      | 90     | x 90L                  |
| -50DZ                           |      | 95     | x 95L                  |
| -75DZ                           |      | 120    | x 120L                 |
| -100DZ                          | 145  | x 145L |                        |
| <b>CDQ2B63<sup>□</sup>-10DZ</b> | 14.5 | 60     | CQ-M8 x 60L            |
| -15DZ                           |      | 65     | x 65L                  |
| -20DZ                           |      | 70     | x 70L                  |
| -25DZ                           |      | 75     | x 75L                  |
| -30DZ                           |      | 80     | x 80L                  |
| -35DZ                           |      | 85     | x 85L                  |
| -40DZ                           |      | 90     | x 90L                  |
| -45DZ                           |      | 95     | x 95L                  |
| -50DZ                           |      | 100    | x 100L                 |
| -75DZ                           |      | 125    | x 125L                 |
| -100DZ                          | 150  | x 150L |                        |

| Cylinder model                   | C    | D      | Mounting bolt part no. |
|----------------------------------|------|--------|------------------------|
| <b>CDQ2B80<sup>□</sup>-10DZ</b>  | 15   | 65     | CQ-M10 x 65L           |
| -15DZ                            |      | 70     | x 70L                  |
| -20DZ                            |      | 75     | x 75L                  |
| -25DZ                            |      | 80     | x 80L                  |
| -30DZ                            |      | 85     | x 85L                  |
| -35DZ                            |      | 90     | x 90L                  |
| -40DZ                            |      | 95     | x 95L                  |
| -45DZ                            |      | 100    | x 100L                 |
| -50DZ                            |      | 105    | x 105L                 |
| -75DZ                            |      | 130    | x 130L                 |
| -100DZ                           | 155  | x 155L |                        |
| <b>CDQ2B100<sup>□</sup>-10DZ</b> | 15.5 | 75     | CQ-M10 x 75L           |
| -15DZ                            |      | 80     | x 80L                  |
| -20DZ                            |      | 85     | x 85L                  |
| -25DZ                            |      | 90     | x 90L                  |
| -30DZ                            |      | 95     | x 95L                  |
| -35DZ                            |      | 100    | x 100L                 |
| -40DZ                            |      | 105    | x 105L                 |
| -45DZ                            |      | 110    | x 110L                 |
| -50DZ                            |      | 115    | x 115L                 |
| -75DZ                            |      | 140    | x 140L                 |
| -100DZ                           | 165  | x 165L |                        |

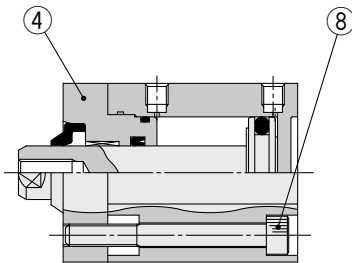
Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, Double Rod **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Double Acting, Single Rod **CQ2**  
 Anti-lateral Load Double Acting, Single Rod **CQ2S**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-R/V**  
 Double Acting, Double Rod **CQ2W-R/V**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, Double Rod **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch **Auto Switch**  
 Made to Order **Made to Order**

# CQ2-R/V Series

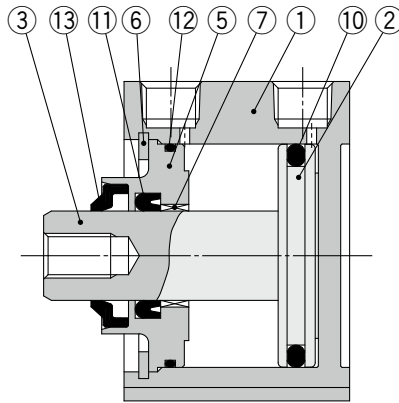
## Construction

### Without auto switch magnet

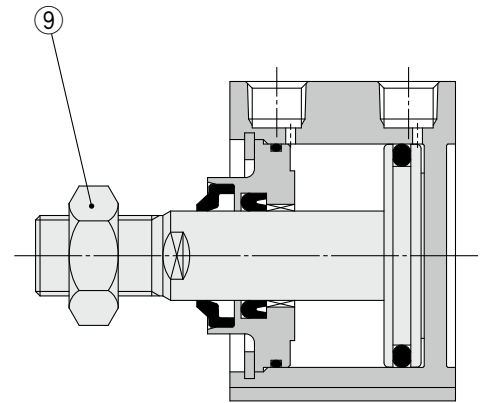
ø20 to ø32



ø40 to ø100

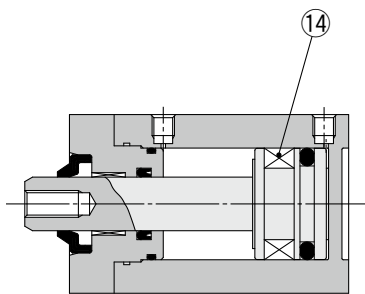


Rod end male thread

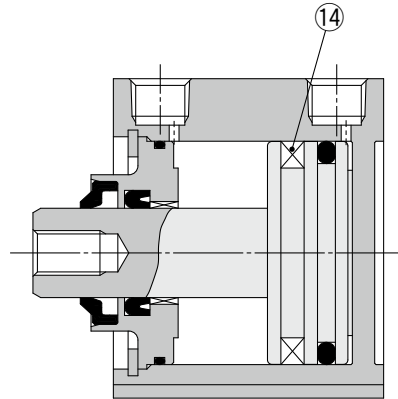


### With auto switch magnet

ø20 to ø32



ø40 to ø100



### Component Parts

| No. | Description                   | Material                       | Note                             |
|-----|-------------------------------|--------------------------------|----------------------------------|
| 1   | Cylinder tube                 | Aluminum alloy                 | Hard anodized                    |
| 2   | Piston                        | Aluminum alloy                 |                                  |
| 3   | Piston rod                    | Stainless steel                | ø20 to ø25                       |
|     |                               | Carbon steel                   | ø32 to ø100, Hard chrome plating |
| 4   | Rod cover                     | Aluminum alloy                 | ø20 to ø32, Anodized             |
| 5   | Collar                        | Aluminum alloy                 | ø40 to ø100, Anodized            |
| 6   | Retaining ring                | Carbon tool steel              | ø40 to ø100, Phosphate coated    |
| 7   | Bushing                       | Oil-impregnated sintered alloy | ø20, ø25                         |
|     |                               | Bearing alloy                  | ø32 to ø100                      |
| 8   | Hexagon socket head cap screw | Chromium molybdenum steel      | ø20 to ø32, Zinc chromated       |
| 9   | Rod end nut                   | Carbon steel                   | Zinc chromated                   |
| 10  | Piston seal                   | R: NBR                         |                                  |
|     |                               | V: FKM                         |                                  |
| 11  | Rod seal                      | R: NBR                         |                                  |
|     |                               | V: FKM                         |                                  |
| 12  | Tube gasket                   | R: NBR                         |                                  |
|     |                               | V: FKM                         |                                  |
| 13  | Rod scraper                   | R: NBR                         |                                  |
|     |                               | V: FKM                         |                                  |
| 14  | Magnet                        | —                              |                                  |

\* R: NBR seal (Nitrile rubber) V: FKM seal (Fluororubber)

### Replacement Parts/Seal Kit

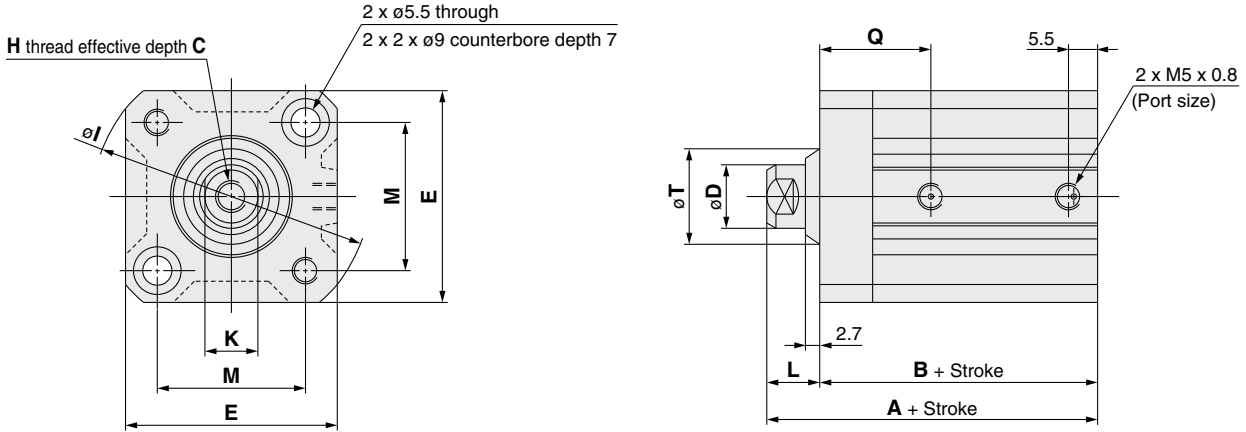
| Bore size [mm] | Kit no.     |             | Contents               |
|----------------|-------------|-------------|------------------------|
|                | R: NBR      | V: FKM      |                        |
| 20             | CQ2B20R-PS  | CQ2B20V-PS  | Set of nos.<br>⑩, ⑪, ⑫ |
| 25             | CQ2B25R-PS  | CQ2B25V-PS  |                        |
| 32             | CQ2B32R-PS  | CQ2B32V-PS  |                        |
| 40             | CQ2B40R-PS  | CQ2B40V-PS  |                        |
| 50             | CQ2B50R-PS  | CQ2B50V-PS  |                        |
| 63             | CQ2B63R-PS  | CQ2B63V-PS  |                        |
| 80             | CQ2B80R-PS  | CQ2B80V-PS  |                        |
| 100            | CQ2B100R-PS | CQ2B100V-PS |                        |

- \* Seal kit includes ⑩, ⑪, ⑫. Order the seal kit based on each bore size.
- \* A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a rod cover and collar, but also with a rod cover assembly and collar assembly. Contact SMC separately for how to order them.
- \* The seal kit does not include a grease pack. Order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

Bore Size

**Ø20, Ø25** Without Auto Switch Magnet

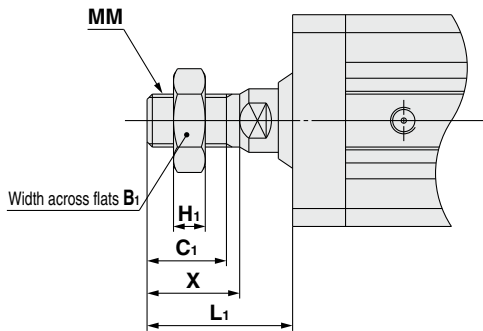
Through-hole: CQ2B-R/V



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | H        | I  | K  | L   | M    | Q  | T    |
|----------------|-------------------|------|------|----|----|----|----------|----|----|-----|------|----|------|
| 20             | 5 to 50           | 39   | 29.5 | 7  | 10 | 36 | M5 x 0.8 | 47 | 8  | 9.5 | 25.5 | 18 | 16.1 |
| 25             | 5 to 50           | 42.5 | 32.5 | 12 | 12 | 40 | M6 x 1.0 | 52 | 10 | 10  | 28   | 19 | 18.1 |

\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
\* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 100

Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|------------|------|
| 20             | 13             | 12             | 5              | 23.5           | M8 x 1.25  | 14   |
| 25             | 17             | 15             | 6              | 27.5           | M10 x 1.25 | 17.5 |

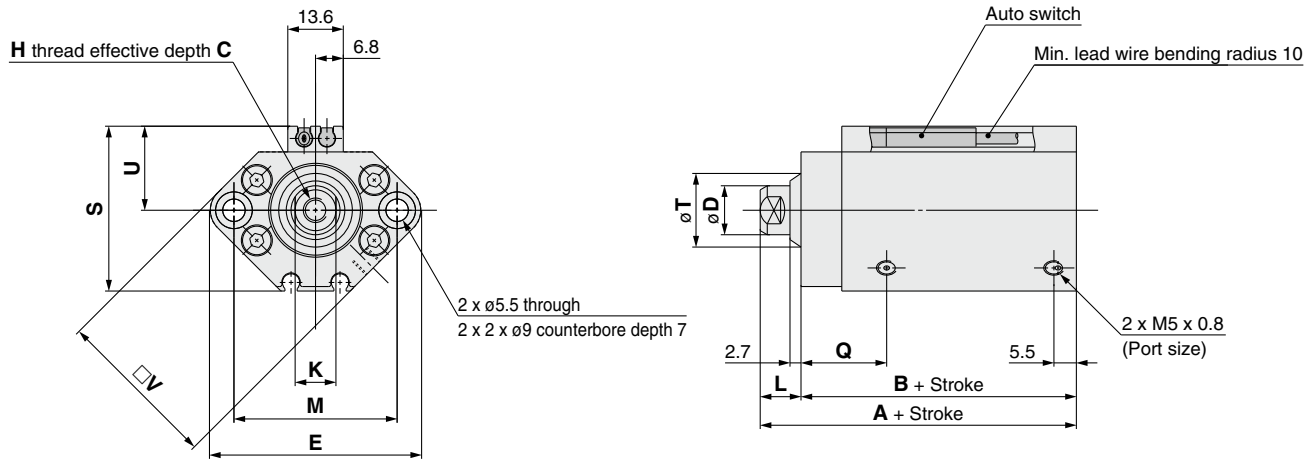
|                   |                                   |               |
|-------------------|-----------------------------------|---------------|
| Standard          | Double Acting, Single Rod         | CQ2           |
| Standard          | Double Acting, Double Rod         | CQ2W          |
| Standard          | Single Acting, Spring Return, End | CQ2           |
| Large Bore Size   | Double Acting, Single Rod         | CQ2           |
| Large Bore Size   | Double Acting, Double Rod         | CQ2W          |
| Anti-lateral Load | Double Acting, Single Rod         | CQ2□S         |
| Long Stroke       | Double Acting, Single Rod         | CQ2           |
| Long Stroke       | Double Acting, Double Rod         | CQ2KW         |
| Non-rotating Rod  | Double Acting, Single Rod         | CQ2K          |
| Non-rotating Rod  | Double Acting, Double Rod         | CQ2KW         |
| Water Resistant   | Double Acting, Single Rod         | CQ2-R/V       |
| Water Resistant   | Double Acting, Double Rod         | CQ2W-R/V      |
| Axial Piping      | Double Acting, Single Rod         | CQP2          |
| Axial Piping      | Single Acting, Spring Return, End | CQP2          |
| With End Lock     | Double Acting, Single Rod         | CBQ2          |
| Auto Switch       |                                   | Auto Switch   |
| Made to Order     |                                   | Made to Order |

# CQ2-R/V Series

Bore Size

**Ø20, Ø25** With Auto Switch Magnet

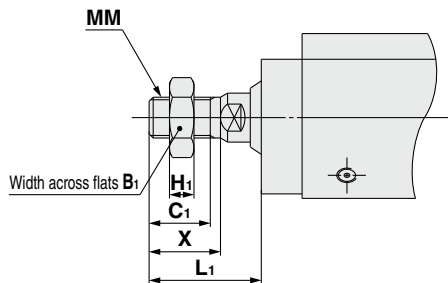
Through-hole: CDQ2B-R/V



| Bore size [mm] | Stroke range [mm] | A    | B    | C  | D  | E  | H        | K  | L   | M  | Q  | S    | T    | U  | V  |
|----------------|-------------------|------|------|----|----|----|----------|----|-----|----|----|------|------|----|----|
| 20             | 5 to 50           | 51   | 41.5 | 7  | 10 | 47 | M5 x 0.8 | 8  | 9.5 | 36 | 18 | 35.5 | 16.1 | 18 | 36 |
| 25             | 5 to 50           | 52.5 | 42.5 | 12 | 12 | 52 | M6 x 1.0 | 10 | 10  | 40 | 19 | 40.5 | 18.1 | 21 | 40 |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 100
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

## Rod end male thread

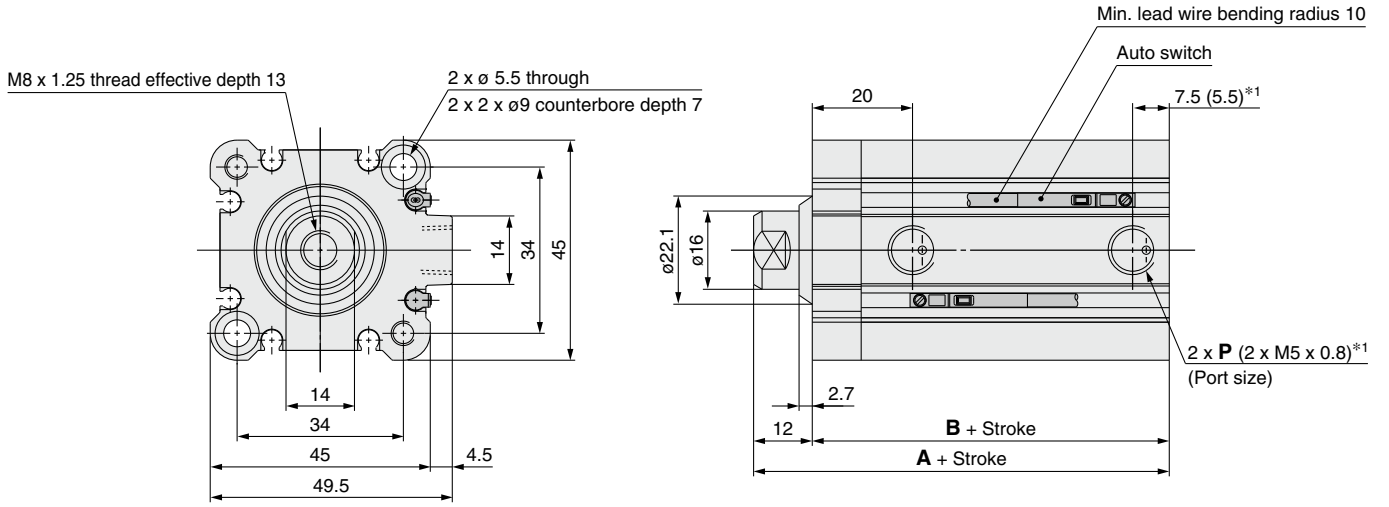


| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|------------|------|
| 20             | 13             | 12             | 5              | 23.5           | M8 x 1.25  | 14   |
| 25             | 17             | 15             | 6              | 27.5           | M10 x 1.25 | 17.5 |

Bore Size

**∅32** With/Without Auto Switch Magnet

Through-hole: **C□Q2B-R/V**

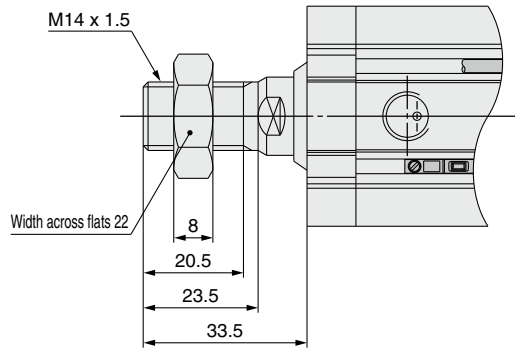


\*1 ( ): Without auto switch, 5 mm stroke

| Stroke range | Without auto switch magnet |    | With auto switch magnet |    | P     |        |      |
|--------------|----------------------------|----|-------------------------|----|-------|--------|------|
|              | A                          | B  | A                       | B  | —     | TN     | TF   |
| 5 to 50      | 45                         | 33 | 55                      | 43 | Rc1/8 | NPT1/8 | G1/8 |
| 75, 100      | 55                         | 43 |                         |    |       |        |      |

\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
 \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 100

Rod end male thread



|                   |                                   |                      |
|-------------------|-----------------------------------|----------------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2□S</b>         |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>           |
| Long Stroke       | Double Acting, Double Rod         | <b>CQ2KW</b>         |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-R/V</b>       |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-R/V</b>      |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>          |
| Axial Piping      | Double Acting, Double Rod         | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>          |
| With End Lock     | Double Acting, Double Rod         | <b>CBQ2W</b>         |
| Auto Switch       |                                   | <b>Auto Switch</b>   |
| Made to Order     |                                   | <b>Made to Order</b> |

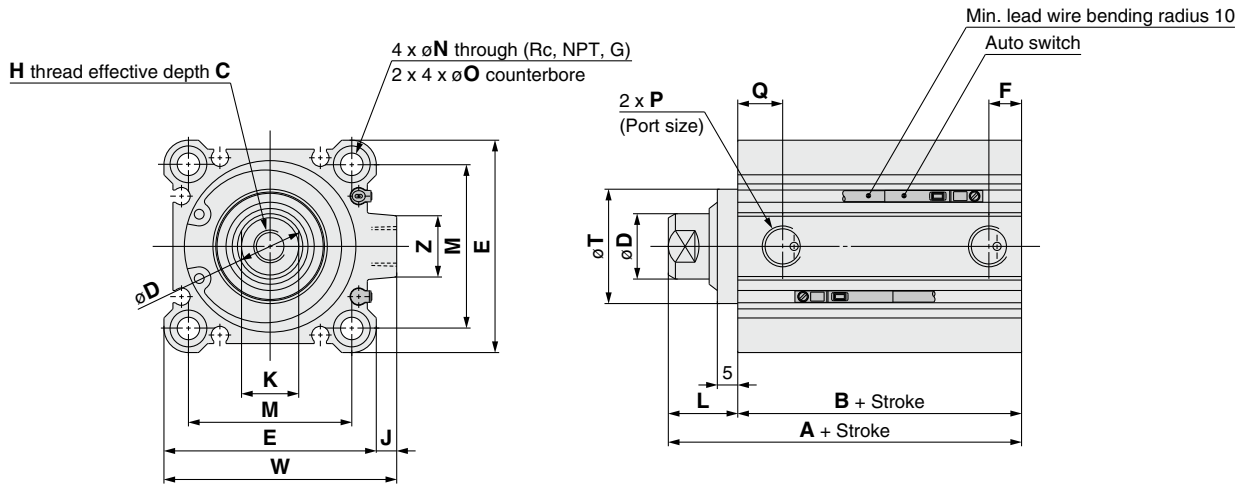


# CQ2-R/V Series

Bore Size

## ∅40 to ∅100 With/Without Auto Switch Magnet

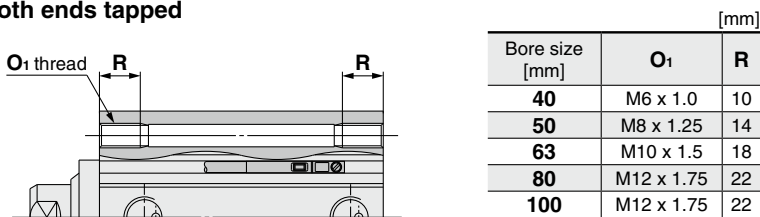
Through-hole: C□Q2B-R/V



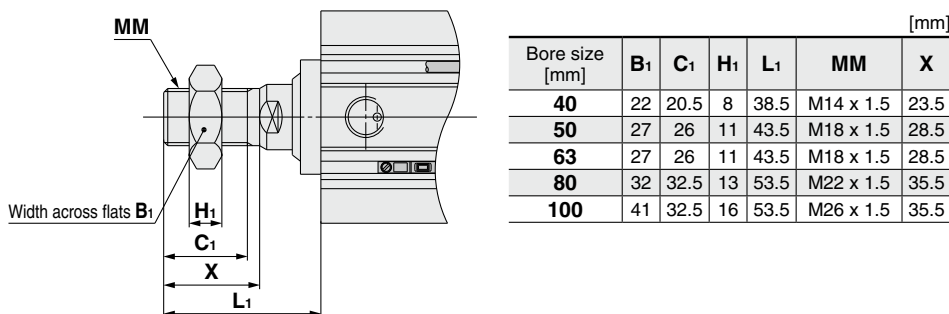
| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      | [mm] |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |
|----------------|-------------------|----------------------------|------|-------------------------|------|------|----|-----|------|-----------|-----|----|----|----|-----|-----------------|-----|------|----|-------|----|
|                |                   | A                          | B    | A                       | B    | C    | D  | E   | F    | H         | J   | K  | L  | M  | N   | O               | P   | Q    | T  | W     | Z  |
| 40             | 5 to 50           | 46.5                       | 29.5 | 56.5                    | 39.5 | 13   | 16 | 52  | 7.5  | M8 x 1.25 | 5   | 14 | 17 | 40 | 5.5 | 9 depth 7       | 1/8 | 12.5 | 28 | 57    | 15 |
|                | 75, 100           | 56.5                       | 39.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |
| 50             | 10 to 50          | 48.5                       | 30.5 | 58.5                    | 40.5 | 15   | 20 | 64  | 10.5 | M10 x 1.5 | 7   | 17 | 18 | 50 | 6.6 | 11 depth 8      | 1/4 | 10.5 | 35 | 71    | 19 |
|                | 75, 100           | 58.5                       | 40.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |
| 63             | 10 to 50          | 54                         | 36   | 64                      | 46   | 15   | 20 | 77  | 10.5 | M10 x 1.5 | 7   | 17 | 18 | 60 | 9   | 14 depth 10.5   | 1/4 | 15   | 35 | 84    | 19 |
|                | 75, 100           | 64                         | 46   |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |
| 80             | 10 to 50          | 63.5                       | 43.5 | 73.5                    | 53.5 | 21   | 25 | 98  | 12.5 | M16 x 2.0 | 6   | 22 | 20 | 77 | 11  | 17.5 depth 13.5 | 3/8 | 16   | 43 | 104   | 25 |
|                | 75, 100           | 73.5                       | 53.5 |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |
| 100            | 10 to 50          | 75                         | 53   | 85                      | 63   | 27   | 30 | 117 | 13   | M20 x 2.5 | 6.5 | 27 | 22 | 94 | 11  | 17.5 depth 13.5 | 3/8 | 23   | 59 | 123.5 | 25 |
|                | 75, 100           | 85                         | 63   |                         |      |      |    |     |      |           |     |    |    |    |     |                 |     |      |    |       |    |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* For calculation on the longitudinal dimension of intermediate strokes ⇨ p. 100
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Both ends tapped



### Rod end male thread



### Dimensions of Each Mounting Bracket

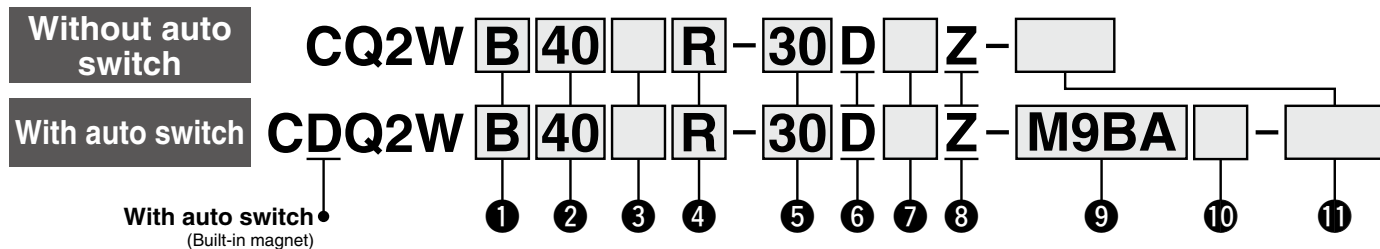
The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.

# Compact Cylinder: Water Resistant Double Acting, Double Rod

# CQ2W-R/V Series

∅40, ∅50, ∅63, ∅80, ∅100

## How to Order



### 1 Mounting

|           |                  |
|-----------|------------------|
| <b>B</b>  | Through-hole     |
| <b>A</b>  | Both ends tapped |
| <b>L</b>  | Foot             |
| <b>LC</b> | Compact foot     |
| <b>F</b>  | Rod flange       |

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

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 111

### 6 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

### 9 Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

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

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

### 2 Bore size

|            |        |
|------------|--------|
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

### 3 Port thread type

|            |          |
|------------|----------|
| <b>Nil</b> | M thread |
|            | Rc       |
| <b>TN</b>  | NPT      |
| <b>TF</b>  | G        |

### 4 Water-resistant cylinder

|          |                           |
|----------|---------------------------|
| <b>R</b> | NBR seal (Nitrile rubber) |
| <b>V</b> | FKM seal (Fluororubber)   |

### 5 Cylinder stroke [mm]

For standard strokes ⇨ p. 109

### 7 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>M</b>   | Rod end male thread   |

### 8 Auto switch mounting groove

|          |             |            |
|----------|-------------|------------|
| <b>Z</b> | ∅40 to ∅100 | 4 surfaces |
|----------|-------------|------------|

### 10 Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

### 11 Made to order common specifications

For details ⇨ p. 109

## Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDQ2B40R-50DMZ

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

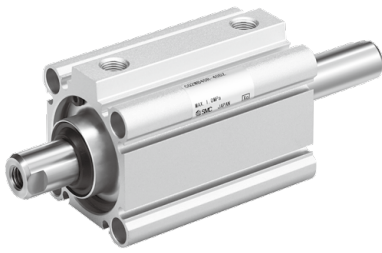
| Type                    | Special function                    | Electrical entry | Indicator light | Wiring (Output) | Load voltage |           | Auto switch model |              | Lead wire length [m] |       |       |       | Pre-wired connector | Applicable load |            |   |
|-------------------------|-------------------------------------|------------------|-----------------|-----------------|--------------|-----------|-------------------|--------------|----------------------|-------|-------|-------|---------------------|-----------------|------------|---|
|                         |                                     |                  |                 |                 | DC           | AC        | Perpendicular     | In-line      | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) |                     | IC circuit      | Relay, PLC |   |
| Solid state auto switch | Water resistant (2-color indicator) | Grommet          | Yes             | 3-wire (NPN)    | 24 V         | 5 V, 12 V | —                 | <b>M9NAV</b> | <b>M9NA</b>          | ○     | ○     | ●     | ○                   | ○               | —          | — |
|                         |                                     |                  |                 | 3-wire (PNP)    |              |           |                   | <b>M9PAV</b> | <b>M9PA</b>          | ○     | ○     | ●     | ○                   |                 |            |   |
|                         |                                     |                  |                 | 2-wire          |              |           |                   | <b>M9BAV</b> | <b>M9BA</b>          | ○     | ○     | ●     | ○                   |                 |            |   |

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9BA  
1 m ..... M (Example) M9BAM  
3 m ..... L (Example) M9BAL  
5 m ..... Z (Example) M9BAZ

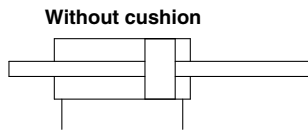
\* Solid state auto switches marked with "○" are produced upon receipt of order.



# CQ2W-R/V Series



## Symbol



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

| Symbol  | Specifications  |
|---------|---|
| -XB10   | Intermediate stroke (Using exclusive body)                          |
| -XC6    | Piston rod/Retaining ring/Rod end nut material: Stainless steel     |
| -XC6A*1 | Piston rod/Rod end nut/Cover holding bolt material: Stainless steel |
| -XC85   | Grease for food processing equipment                                |

\*1 -XC6A:  $\varnothing 20$ ,  $\varnothing 25$ ,  $\varnothing 32$  of the C□Q2□□ only

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

## Specifications

| Bore size [mm]                        | 40  | 50   | 63   | 80   | 100  |
|---------------------------------------|---|------|------|------|------|
| <b>Action</b>                         | Double acting, Double rod   |      |      |      |      |
| <b>Fluid</b>                          | Air   |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.08 MPa  |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.26  | 0.46 | 0.77 | 1.36 | 2.27 |
| <b>Stroke length tolerance</b>        | +1.0 mm<br>0  |      |      |      |      |

## Standard Strokes

| Bore size       | Standard stroke [mm]                           |
|-----------------|--|
| 40              | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| 50, 63, 80, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

## Manufacturing of Intermediate Strokes

| Type         | A spacer is installed in the standard stroke body.  |              |
|--------------|---|--------------|
| Part no.     | Refer to "How to Order" for the standard model number. (p. 108)   |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.        |              |
| Stroke range | Bore size   | Stroke range |
|              | 40 to 100   | 1 to 99      |
| Example      | Part no.: CQ2WB50R-57DZ<br>CQ2WB50R-75DZ with 18 mm width spacer inside<br>The B dimension is 115.5 mm. |              |

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1  | Compact foot*1 | Flange  |
|----------------|---------|----------------|---------|
| 40             | CQ-L040 | CQ-LC040       | CQ-F040 |
| 50             | CQ-L050 | CQ-LC050       | CQ-F050 |
| 63             | CQ-L063 | CQ-LC063       | CQ-F063 |
| 80             | CQ-L080 | CQ-LC080       | CQ-F080 |
| 100            | CQ-L100 | CQ-LC100       | CQ-F100 |

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

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

Foot, Compact foot, Flange: Body mounting bolts

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

## ⚠ Precautions

Refer to pages 189 and 190 before handling the products.

## Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

## Theoretical Output

| Bore size [mm] | Operating pressure [MPa] |      |      |
|----------------|--------------------------|------|------|
|                | 0.3                      | 0.5  | 0.7  |
| 40             | 317                      | 528  | 739  |
| 50             | 495                      | 825  | 1150 |
| 63             | 841                      | 1400 | 1960 |
| 80             | 1360                     | 2270 | 3170 |
| 100            | 2140                     | 3570 | 5000 |

## Weight

### Without Auto Switch Magnet

| Stroke<br>Bore size | 5   | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
|---------------------|-----|------|------|------|------|------|------|------|------|------|------|------|
|                     | ø40 | 357  | 387  | 416  | 446  | 475  | 505  | 534  | 564  | 594  | 624  | 855  |
| ø50                 | —   | 645  | 692  | 737  | 782  | 829  | 874  | 918  | 965  | 1010 | 1343 | 1572 |
| ø63                 | —   | 786  | 837  | 886  | 935  | 986  | 1035 | 1084 | 1135 | 1184 | 1555 | 1804 |
| ø80                 | —   | 1447 | 1526 | 1604 | 1682 | 1761 | 1839 | 1917 | 1996 | 2074 | 2674 | 3066 |
| ø100                | —   | 2464 | 2572 | 2680 | 2787 | 2896 | 3003 | 3111 | 3219 | 3326 | 4156 | 4695 |

### With Auto Switch Magnet

| Stroke<br>Bore size | 5   | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
|---------------------|-----|------|------|------|------|------|------|------|------|------|------|------|
|                     | ø40 | 452  | 482  | 510  | 540  | 569  | 599  | 629  | 659  | 689  | 719  | 867  |
| ø50                 | —   | 764  | 810  | 856  | 901  | 946  | 992  | 1037 | 1084 | 1129 | 1357 | 1586 |
| ø63                 | —   | 930  | 980  | 1030 | 1079 | 1129 | 1179 | 1228 | 1279 | 1328 | 1577 | 1826 |
| ø80                 | —   | 1680 | 1757 | 1836 | 1915 | 1992 | 2071 | 2150 | 2227 | 2306 | 2697 | 3089 |
| ø100                | —   | 2791 | 2899 | 3008 | 3114 | 3222 | 3330 | 3438 | 3546 | 3653 | 4191 | 4730 |

### Additional Weight

| Bore size [mm]                          | 40          | 50  | 63  | 80   | 100  |
|---|-------------|-----|-----|------|------|
| Both ends tapped                        | 6           | 6   | 19  | 45   | 45   |
| Rod end male thread                     | Male thread | 54  | 106 | 106  | 240  |
|   | Nut         | 34  | 64  | 64   | 98   |
| Foot (Including mounting bolts)         | 122         | 194 | 272 | 550  | 912  |
| Compact foot (Including mounting bolts) | 93          | 148 | 210 | 454  | 707  |
| Flange (Including mounting bolts)       | 214         | 373 | 559 | 1056 | 1365 |

Calculation: (Example) **CQ2WF40R-20DMZ**

- Basic weight: CQ2WB40R-20DZ ..... 446 g
- Additional weight: Both ends tapped ..... 6 g
- Rod end male thread ..... 88 g
- Flange ..... 214 g

Add each weight of auto switches when auto switches are mounted.

754 g

|                   |  |  |
|-------------------|--|--|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>                                   |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>                                  |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2</b>                                   |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>                                   |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>                                  |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2</b> <input type="checkbox"/> <b>S</b> |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>                                   |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2K</b>                                  |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2KW</b>                                 |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-R/V</b>                               |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-R/V</b>                              |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>                                  |
| Axial Piping      | Single Acting, Spring Return, Double Rod | <b>CQP2</b>                                  |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>                                  |
| Auto Switch       |  | <b>Auto Switch</b>                           |
| Made to Order     |  | <b>Made to Order</b>                         |

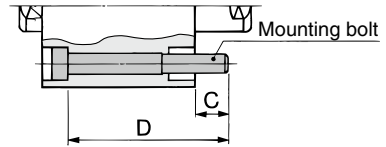
# CQ2W-R/V Series

## Through-hole Type Mounting Bolt for the CQ2W: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQ2WB is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

**Example) CQ-M5 x 45L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model                  | C    | D      | Mounting bolt part no. |
|---------------------------------|------|--------|------------------------|
| <b>CQ2WB40<sup>φ</sup>-5DZ</b>  | 7    | 45     | CQ-M5 x 45L            |
| -10DZ                           |      | 50     | x 50L                  |
| -15DZ                           |      | 55     | x 55L                  |
| -20DZ                           |      | 60     | x 60L                  |
| -25DZ                           |      | 65     | x 65L                  |
| -30DZ                           |      | 70     | x 70L                  |
| -35DZ                           |      | 75     | x 75L                  |
| -40DZ                           |      | 80     | x 80L                  |
| -45DZ                           |      | 85     | x 85L                  |
| -50DZ                           |      | 90     | x 90L                  |
| -75DZ                           |      | 125    | x 125L                 |
| -100DZ                          |      | 150    | x 150L                 |
| <b>CQ2WB50<sup>φ</sup>-10DZ</b> | 12.5 | 55     | CQ-M6 x 55L            |
| -15DZ                           |      | 60     | x 60L                  |
| -20DZ                           |      | 65     | x 65L                  |
| -25DZ                           |      | 70     | x 70L                  |
| -30DZ                           |      | 75     | x 75L                  |
| -35DZ                           |      | 80     | x 80L                  |
| -40DZ                           |      | 85     | x 85L                  |
| -45DZ                           |      | 90     | x 90L                  |
| -50DZ                           |      | 95     | x 95L                  |
| -75DZ                           |      | 130    | x 130L                 |
| -100DZ                          | 155  | x 155L |                        |

| Cylinder model                  | C    | D      | Mounting bolt part no. |
|---------------------------------|------|--------|------------------------|
| <b>CQ2WB63<sup>φ</sup>-10DZ</b> | 13.5 | 55     | CQ-M8 x 55L            |
| -15DZ                           |      | 60     | x 60L                  |
| -20DZ                           |      | 65     | x 65L                  |
| -25DZ                           |      | 70     | x 70L                  |
| -30DZ                           |      | 75     | x 75L                  |
| -35DZ                           |      | 80     | x 80L                  |
| -40DZ                           |      | 85     | x 85L                  |
| -45DZ                           |      | 90     | x 90L                  |
| -50DZ                           |      | 95     | x 95L                  |
| -75DZ                           |      | 130    | x 130L                 |
| -100DZ                          |      | 155    | x 155L                 |
| <b>CQ2WB80<sup>φ</sup>-10DZ</b> |      | 12.5   | 60                     |
| -15DZ                           | 65   |        | x 65L                  |
| -20DZ                           | 70   |        | x 70L                  |
| -25DZ                           | 75   |        | x 75L                  |
| -30DZ                           | 80   |        | x 80L                  |
| -35DZ                           | 85   |        | x 85L                  |
| -40DZ                           | 90   |        | x 90L                  |
| -45DZ                           | 95   |        | x 95L                  |
| -50DZ                           | 100  |        | x 100L                 |
| -75DZ                           | 135  |        | x 135L                 |
| -100DZ                          | 160  | x 160L |                        |

| Cylinder model                   | C   | D      | Mounting bolt part no. |
|----------------------------------|-----|--------|------------------------|
| <b>CQ2WB100<sup>φ</sup>-10DZ</b> | 13  | 70     | CQ-M10 x 70L           |
| -15DZ                            |     | 75     | x 75L                  |
| -20DZ                            |     | 80     | x 80L                  |
| -25DZ                            |     | 85     | x 85L                  |
| -30DZ                            |     | 90     | x 90L                  |
| -35DZ                            |     | 95     | x 95L                  |
| -40DZ                            |     | 100    | x 100L                 |
| -45DZ                            |     | 105    | x 105L                 |
| -50DZ                            |     | 110    | x 110L                 |
| -75DZ                            |     | 145    | x 145L                 |
| -100DZ                           | 170 | x 170L |                        |

## Through-hole Type Mounting Bolt for the CDQ2W: With Auto Switch Magnet

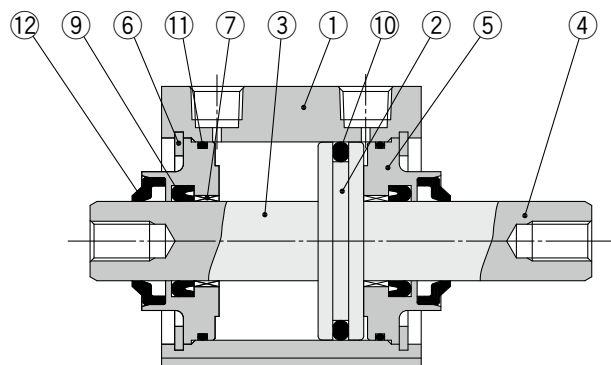
| Cylinder model                   | C    | D      | Mounting bolt part no. |
|----------------------------------|------|--------|------------------------|
| <b>CDQ2WB40<sup>φ</sup>-5DZ</b>  | 7    | 55     | CQ-M5 x 55L            |
| -10DZ                            |      | 60     | x 60L                  |
| -15DZ                            |      | 65     | x 65L                  |
| -20DZ                            |      | 70     | x 70L                  |
| -25DZ                            |      | 75     | x 75L                  |
| -30DZ                            |      | 80     | x 80L                  |
| -35DZ                            |      | 85     | x 85L                  |
| -40DZ                            |      | 90     | x 90L                  |
| -45DZ                            |      | 95     | x 95L                  |
| -50DZ                            |      | 100    | x 100L                 |
| -75DZ                            |      | 125    | x 125L                 |
| -100DZ                           |      | 150    | x 150L                 |
| <b>CDQ2WB50<sup>φ</sup>-10DZ</b> | 12.5 | 65     | CQ-M6 x 65L            |
| -15DZ                            |      | 70     | x 70L                  |
| -20DZ                            |      | 75     | x 75L                  |
| -25DZ                            |      | 80     | x 80L                  |
| -30DZ                            |      | 85     | x 85L                  |
| -35DZ                            |      | 90     | x 90L                  |
| -40DZ                            |      | 95     | x 95L                  |
| -45DZ                            |      | 100    | x 100L                 |
| -50DZ                            |      | 105    | x 105L                 |
| -75DZ                            |      | 130    | x 130L                 |
| -100DZ                           | 155  | x 155L |                        |

| Cylinder model                   | C    | D      | Mounting bolt part no. |
|----------------------------------|------|--------|------------------------|
| <b>CDQ2WB63<sup>φ</sup>-10DZ</b> | 13.5 | 65     | CQ-M8 x 65L            |
| -15DZ                            |      | 70     | x 70L                  |
| -20DZ                            |      | 75     | x 75L                  |
| -25DZ                            |      | 80     | x 80L                  |
| -30DZ                            |      | 85     | x 85L                  |
| -35DZ                            |      | 90     | x 90L                  |
| -40DZ                            |      | 95     | x 95L                  |
| -45DZ                            |      | 100    | x 100L                 |
| -50DZ                            |      | 105    | x 105L                 |
| -75DZ                            |      | 130    | x 130L                 |
| -100DZ                           |      | 155    | x 155L                 |
| <b>CDQ2WB80<sup>φ</sup>-10DZ</b> |      | 12.5   | 70                     |
| -15DZ                            | 75   |        | x 75L                  |
| -20DZ                            | 80   |        | x 80L                  |
| -25DZ                            | 85   |        | x 85L                  |
| -30DZ                            | 90   |        | x 90L                  |
| -35DZ                            | 95   |        | x 95L                  |
| -40DZ                            | 100  |        | x 100L                 |
| -45DZ                            | 105  |        | x 105L                 |
| -50DZ                            | 110  |        | x 110L                 |
| -75DZ                            | 135  |        | x 135L                 |
| -100DZ                           | 160  | x 160L |                        |

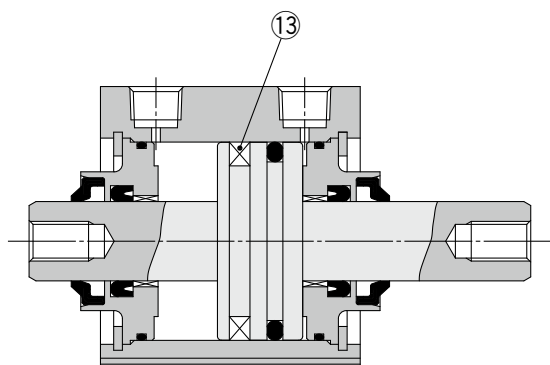
| Cylinder model                    | C   | D      | Mounting bolt part no. |
|-----------------------------------|-----|--------|------------------------|
| <b>CDQ2WB100<sup>φ</sup>-10DZ</b> | 13  | 80     | CQ-M10 x 80L           |
| -15DZ                             |     | 85     | x 85L                  |
| -20DZ                             |     | 90     | x 90L                  |
| -25DZ                             |     | 95     | x 95L                  |
| -30DZ                             |     | 100    | x 100L                 |
| -35DZ                             |     | 105    | x 105L                 |
| -40DZ                             |     | 110    | x 110L                 |
| -45DZ                             |     | 115    | x 115L                 |
| -50DZ                             |     | 120    | x 120L                 |
| -75DZ                             |     | 145    | x 145L                 |
| -100DZ                            | 170 | x 170L |                        |

## Construction

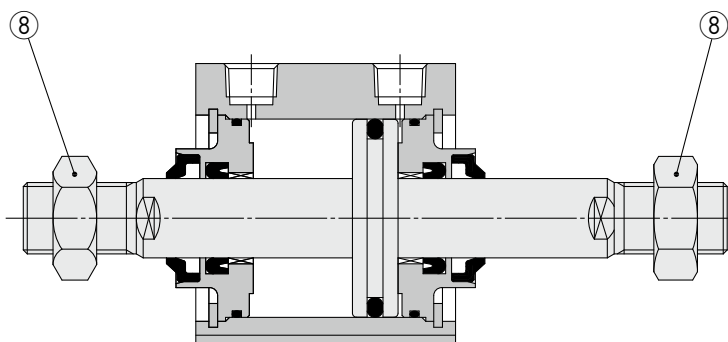
### Without auto switch magnet



### With auto switch magnet



### Rod end male thread



### Component Parts

| No. | Description    | Material          | Note                |
|-----|----------------|-------------------|---------------------|
| 1   | Cylinder tube  | Aluminum alloy    | Hard anodized       |
| 2   | Piston         | Aluminum alloy    |                     |
| 3   | Piston rod A   | Carbon steel      | Hard chrome plating |
| 4   | Piston rod B   | Carbon steel      | Hard chrome plating |
| 5   | Collar         | Aluminum alloy    |                     |
| 6   | Retaining ring | Carbon tool steel | Phosphate coated    |
| 7   | Bushing        | Bearing alloy     |                     |
| 8   | Rod end nut    | Carbon steel      | Zinc chromated      |
| 9   | Rod seal       | R: NBR<br>V: FKM  |                     |
| 10  | Piston seal    | R: NBR<br>V: FKM  |                     |
| 11  | Tube gasket    | R: NBR<br>V: FKM  |                     |
| 12  | Rod scraper    | R: NBR<br>V: FKM  |                     |
| 13  | Magnet         |                   |                     |

\* R: NBR seal (Nitrile rubber)  
V: FKM seal (Fluororubber)

### Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.      |              | Contents               |
|----------------|--------------|--------------|------------------------|
|                | R: NBR       | V: FKM       |                        |
| 40             | CQ2WB40R-PS  | CQ2WB40V-PS  | Set of nos.<br>⑨, ⑩, ⑪ |
| 50             | CQ2WB50R-PS  | CQ2WB50V-PS  |                        |
| 63             | CQ2WB63R-PS  | CQ2WB63V-PS  |                        |
| 80             | CQ2WB80R-PS  | CQ2WB80V-PS  |                        |
| 100            | CQ2WB100R-PS | CQ2WB100V-PS |                        |

· Seal kit includes ⑨, ⑩, ⑪. Order the seal kit based on each bore size.  
· A rod scraper cannot be replaced independently. It is press-fitted, so replace it not only with a collar, but also with a collar assembly. Please contact SMC separately for how to order it.

\* The seal kit does not include a grease pack. Order it separately.  
**Grease pack part no.: GR-S-010 (10 g)**

|                   |                                      |          |                           |         |
|-------------------|--------------------------------------|----------|---------------------------|---------|
| Standard          | Double Acting, Double Rod            | CQ2W     | Double Acting, Single Rod | CQ2     |
| Large Bore Size   | Double Acting, Double Rod            | CQ2W     | Double Acting, Single Rod | CQ2     |
| Anti-lateral Load | Double Acting, Single Rod            | CQ2□S    | Double Acting, Single Rod | CQ2□S   |
| Long Stroke       | Double Acting, Single Rod            | CQ2      | Double Acting, Single Rod | CQ2     |
| Non-rotating Rod  | Double Acting, Double Rod            | CQ2KW    | Double Acting, Single Rod | CQ2KW   |
| Water Resistant   | Double Acting, Double Rod            | CQ2W-R/V | Double Acting, Single Rod | CQ2-R/V |
| Axial Piping      | Single Acting, Spring Return, Energy | CQP2     | Double Acting, Single Rod | CQP2    |
| With End Lock     | Double Acting, Single Rod            | CBQ2     | Double Acting, Single Rod | CBQ2    |
| Auto Switch       |                                      |          |                           |         |
| Made to Order     |                                      |          |                           |         |

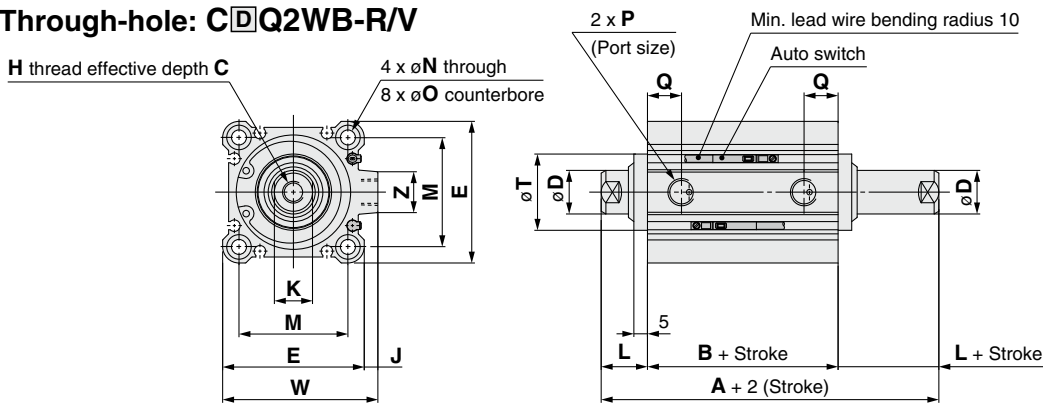


# CQ2W-R/V Series

Bore Size

## ∅40 to ∅100 With/Without Auto Switch Magnet

### Through-hole: C□Q2WB-R/V

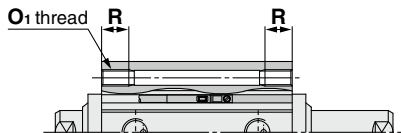


| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      |
|----------------|-------------------|----------------------------|------|-------------------------|------|
|                |                   | A                          | B    | A                       | B    |
| 40             | 5 to 50           | 74                         | 40   | 84                      | 50   |
|                | 75,100            | 84                         | 50   |                         |      |
| 50             | 10 to 50          | 76.5                       | 40.5 | 86.5                    | 50.5 |
|                | 75,100            | 86.5                       | 50.5 |                         |      |
| 63             | 10 to 50          | 78                         | 42   | 88                      | 52   |
|                | 75,100            | 88                         | 52   |                         |      |
| 80             | 10 to 50          | 91                         | 51   | 101                     | 61   |
|                | 75,100            | 101                        | 61   |                         |      |
| 100            | 10 to 50          | 104.5                      | 60.5 | 114.5                   | 70.5 |
|                | 75,100            | 114.5                      | 70.5 |                         |      |

| Bore size [mm] | C  | D  | E   | H         | J   | K  | L  | M  | N   | O               | P   | Q    | T  | W     | Z  |
|----------------|----|----|-----|-----------|-----|----|----|----|-----|-----------------|-----|------|----|-------|----|
| 40             | 13 | 16 | 52  | M8 x 1.25 | 5   | 14 | 17 | 40 | 5.5 | 9 depth 7       | 1/8 | 12.5 | 28 | 57    | 15 |
| 50             | 15 | 20 | 64  | M10 x 1.5 | 7   | 17 | 18 | 50 | 6.6 | 11 depth 8      | 1/4 | 14   | 35 | 71    | 19 |
| 63             | 15 | 20 | 77  | M10 x 1.5 | 7   | 17 | 18 | 60 | 9   | 14 depth 10.5   | 1/4 | 15.5 | 35 | 84    | 19 |
| 80             | 21 | 25 | 98  | M16 x 2.0 | 6   | 22 | 20 | 77 | 11  | 17.5 depth 13.5 | 3/8 | 18   | 43 | 104   | 25 |
| 100            | 27 | 30 | 117 | M20 x 2.5 | 6.5 | 27 | 22 | 94 | 11  | 17.5 depth 13.5 | 3/8 | 22   | 59 | 123.5 | 25 |

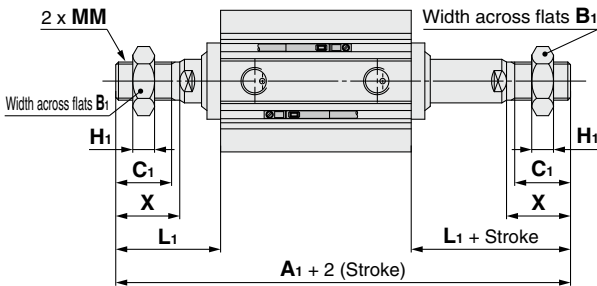
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
 \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R  |
|----------------|----------------|----|
| 40             | M6 x 1.0       | 10 |
| 50             | M8 x 1.25      | 14 |
| 63             | M10 x 1.5      | 18 |
| 80             | M12 x 1.75     | 22 |
| 100            | M12 x 1.75     | 22 |

### Rod end male thread



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet | With auto switch magnet |
|----------------|-------------------|----------------------------|-------------------------|
| 40             | 5 to 50           | 117                        | 127                     |
|                | 75,100            | 127                        |                         |
| 50             | 10 to 50          | 127.5                      | 137.5                   |
|                | 75,100            | 137.5                      |                         |
| 63             | 10 to 50          | 129                        | 139                     |
|                | 75,100            | 139                        |                         |
| 80             | 10 to 50          | 158                        | 168                     |
|                | 75,100            | 168                        |                         |
| 100            | 10 to 50          | 167.5                      | 177.5                   |
|                | 75,100            | 177.5                      |                         |

| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X    |
|----------------|----------------|----------------|----------------|----------------|-----------|------|
| 40             | 22             | 20.5           | 8              | 38.5           | M14 x 1.5 | 23.5 |
| 50             | 27             | 26             | 11             | 43.5           | M18 x 1.5 | 28.5 |
| 63             | 27             | 26             | 11             | 43.5           | M18 x 1.5 | 28.5 |
| 80             | 32             | 32.5           | 13             | 53.5           | M22 x 1.5 | 35.5 |
| 100            | 41             | 32.5           | 16             | 53.5           | M26 x 1.5 | 35.5 |

### Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket are the same as those of the standard type, double acting, double rod (except the configuration of the piston rod). Refer to pages 40 to 42.

# Compact Cylinder: Axial Piping Double Acting, Single Rod

## CQP2 Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

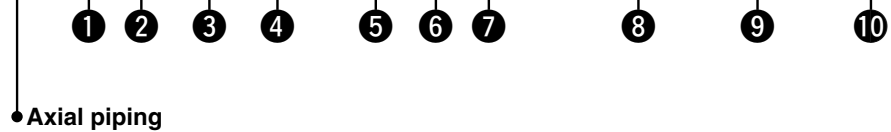
Without auto switch

CQP2B [ ] [ ] 50 [ ] [ ] - 30 D [ ] - [ ]

With auto switch

CDQP2B [ ] [ ] 50 [ ] [ ] - 30 D [ ] - M9BW [ ] - [ ]

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



#### 1 Mounting

|          |              |
|----------|--------------|
| <b>B</b> | Through-hole |
|----------|--------------|

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 119

#### 2 Type

|            |             |
|------------|-------------|
| <b>Nil</b> | Pneumatic   |
| <b>H</b>   | Air-hydro*1 |

\*1 The bore sizes available for the air-hydro type are ø20 to ø100.

#### 3 Bore size

|            |        |
|------------|--------|
| <b>12</b>  | 12 mm  |
| <b>16</b>  | 16 mm  |
| <b>20</b>  | 20 mm  |
| <b>25</b>  | 25 mm  |
| <b>32</b>  | 32 mm  |
| <b>40</b>  | 40 mm  |
| <b>50</b>  | 50 mm  |
| <b>63</b>  | 63 mm  |
| <b>80</b>  | 80 mm  |
| <b>100</b> | 100 mm |

#### 4 Port thread type

|            |          |             |
|------------|----------|-------------|
| <b>Nil</b> | M thread | ø12 to ø25  |
|            | Rc       |             |
| <b>TN</b>  | NPT      | ø32 to ø100 |
| <b>TF</b>  | G        |             |

#### 5 Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145)

| Pneumatic type (Non-lube) [mm] |  |
|--------------------------------|--|
| Bore size                      | Standard stroke                                |
| <b>12, 16</b>                  | 5, 10, 15, 20, 25, 30                          |
| <b>20, 25</b>                  | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |
| <b>32, 40</b>                  | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| <b>50, 63, 80, 100</b>         | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

\* For the manufacturing of intermediate strokes ⇨ p. 117

| Air-hydro type [mm]    |  |
|------------------------|--|
| Bore size              | Standard stroke                                |
| <b>20, 25</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50          |
| <b>32, 40</b>          | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 |
| <b>50, 63, 80, 100</b> | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100    |

#### 6 Action

|          |               |
|----------|---------------|
| <b>D</b> | Double acting |
|----------|---------------|

#### 7 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>C</b>   | With rubber bumper*1  |
| <b>M</b>   | Rod end male thread   |

\*1 The type with a rubber bumper is not selectable for the air-hydro type.  
\* Combined body options "CM" can be selected.

#### 8 Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches ⇨ p. 116

#### 9 Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

#### 10 Made to order common specifications

For details ⇨ p. 117



**Cylinder Model with Auto Switch Magnet**

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDQP2B32-30D

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

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

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

| Type                    | Special function                          | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |           | Auto switch model |           | Lead wire length [m] |       |       |       |            | Pre-wired connector | Applicable load |            |            |            |            |
|-------------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|-----------|----------------------|-------|-------|-------|------------|---------------------|-----------------|------------|------------|------------|------------|
|                         |   |                  |                 |                         | DC           | AC        | Perpendicular     | In-line   | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N)   |                     |                 |            |            |            |            |
| Solid state auto switch | —   | Grommet          | No              | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NV      | M9N                  | ●     | ●     | ●     | ○          | —                   | ○               | IC circuit | Relay, PLC |            |            |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PV      | M9P                  | ●     | ●     | ●     | ○          | —                   | ○               |            |            |            |            |
|                         |   | 2-wire           |                 | M9BV                    |              |           |                   | M9B       | ●                    | ●     | ●     | ○     | —          | ○                   | —               |            |            |            |            |
|                         |   | J79C             |                 | —                       |              |           |                   | ●         | —                    | ●     | ●     | —     | —          |                     |                 |            |            |            |            |
|                         | Diagnostic indication (2-color indicator) | Connector        | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V | —                 | M9NVV     | M9NW                 | ●     | ●     | ●     | ○          | —                   | ○               | IC circuit |            |            |            |
|                         |   |                  |                 | 3-wire (PNP)            |              |           |                   | M9PVV     | M9PW                 | ●     | ●     | ●     | ○          | —                   | ○               |            |            |            |            |
|                         | 2-wire                                    | M9BVV            |                 | M9BW                    |              |           |                   | ●         | ●                    | ●     | ○     | —     | ○          | —                   |                 |            |            |            |            |
|                         | 3-wire (NPN)                              | M9NAV*1          |                 | M9NA*1                  |              |           |                   | ○         | ○                    | ●     | ○     | —     | ○          |                     | IC circuit      |            |            |            |            |
|                         | Water resistant (2-color indicator)       | Grommet          | Yes             | 3-wire (PNP)            | 24 V         | 5 V, 12 V | —                 | M9PAV*1   | M9PA*1               | ○     | ○     | ●     | ○          | —                   |                 | ○          |            | IC circuit |            |
|                         |   |                  |                 | 2-wire                  |              |           |                   | M9BAV*1   | M9BA*1               | ○     | ○     | ●     | ○          | —                   | ○               |            |            |            |            |
| 4-wire                  | —   | F79F             |                 | ●                       |              |           |                   | —         | ●                    | ○     | —     | ○     | IC circuit |                     |                 |            |            |            |            |
| 2-wire (Non-polar)      | —   | P4DW             |                 | —                       |              |           |                   | —         | ●                    | ●     | —     | ○     |            | —                   |                 |            |            |            |            |
| Reed auto switch        | —   | Grommet          | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V | 24 V or less      | A96V      | A96                  | ●     | —     | ●     | —          | —                   | —               | IC circuit | Relay, PLC |            |            |
|                         |   |                  |                 | —                       |              |           |                   | A72       | A72H                 | ●     | —     | ●     | —          | —                   | —               |            |            |            |            |
|                         |   |                  |                 | 12 V                    |              |           |                   | A93V*2    | A93                  | ●     | ●     | ●     | ●          | —                   | —               |            |            |            |            |
|                         |   | Connector        |                 | No                      |              |           |                   | 5 V, 12 V | 100 V or less        | A90V  | A90   | ●     | —          | ●                   | —               | —          |            | —          | IC circuit |
|                         |   |                  |                 |                         |              |           |                   | 12 V      | —                    | A73C  | —     | ●     | —          | ●                   | ●               | —          |            | —          |            |
|                         |   |                  |                 |                         |              |           |                   | 5 V, 12 V | 24 V or less         | A80C  | —     | ●     | —          | ●                   | ●               | —          |            | —          |            |
| Grommet                 | Yes                                       | —                | —               | A79W                    | —            | ●         | —                 | ●         | —                    | —     | —     | —     |            |                     |                 |            |            |            |            |

\*1 Water-resistant type auto switches can be mounted on the models on page 115, but SMC cannot guarantee water resistance. Please contact SMC regarding water-resistant types with the model numbers on page 115.

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

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWZ  
 None ..... N (Example) J79CN

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
 \* The D-P4DW type is only available in sizes ø40 to ø100.  
 \* Only for the D-P4DW type, an auto switch is assembled and shipped with the cylinder.

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

Standard Double Acting, Single Rod CQ2

Standard Double Acting, Double Rod CQ2W

Single Acting, Spring Return, End CQ2

Large Bore Size Double Acting, Double Rod CQ2W

Large Bore Size Double Acting, Single Rod CQ2

Anti-lateral Load Double Acting, Single Rod CQ2S

Long Stroke Double Acting, Single Rod CQ2

Non-rotating Rod Double Acting, Single Rod CQ2K

Non-rotating Rod Double Acting, Double Rod CQ2KW

Water Resistant Double Acting, Single Rod CQ2-R/V

Water Resistant Double Acting, Double Rod CQ2W-R/V

Axial Piping Double Acting, Single Rod CQP2

Axial Piping Single Acting, Spring Return, End CQP2

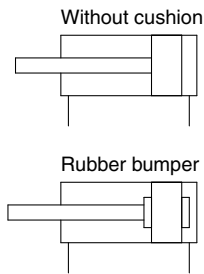
With End Lock Double Acting, Single Rod CBQ2

Auto Switch

Made to Order

# CQP2 Series

## Symbol



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

| Symbol | Specifications  |
|--------|---|
| -XA□   | Change of rod end shape   |
| -XB6   | Heat-resistant cylinder (-10 to 150°C) w/o auto switch only*1   |
| -XB7   | Cold-resistant cylinder (-40 to 70°C) w/o auto switch only      |
| -XB9   | Low-speed cylinder (10 to 50 mm/s)                              |
| -XB13  | Low-speed cylinder (5 to 50 mm/s)                               |
| -XC4   | With heavy duty scraper, ø32 to ø100 only                       |
| -XC6   | Piston rod/Retaining ring/Rod end nut material: Stainless steel |
| -XC35  | With coil scraper   |
| -XC36  | With boss on rod end  |
| -XC85  | Grease for food processing equipment                            |
| -X271  | Fluororubber seals*1  |

\*1 Excludes the air-hydro type

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

## Specifications

### Pneumatic type

| Bore size [mm]                        | 12  | 16    | 20       | 25    | 32   | 40   | 50   | 63   | 80   | 100  |      |
|---------------------------------------|---|-------|----------|-------|------|------|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |       |          |       |      |      |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |       |          |       |      |      |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |       |          |       |      |      |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.07 MPa  |       | 0.05 MPa |       |      |      |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |       |          |       |      |      |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |       |          |       |      |      |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |       |          |       |      |      |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | Without cushion   | 0.022 | 0.038    | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
|                                       | With rubber bumper  | 0.043 | 0.075    | 0.11  | 0.18 | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| <b>Stroke length tolerance</b>        | +1.0 mm <sup>-1</sup><br>0  |       |          |       |      |      |      |      |      |      |      |

\*1 Stroke length tolerance does not include the amount of bumper change.

### Air-hydro type

| Bore size [mm]                        | 20                         | 25 | 32 | 40 | 50      | 63 | 80 | 100 |
|---------------------------------------|----------------------------|----|----|----|---------|----|----|-----|
| <b>Action</b>                         | Double acting, Single rod  |    |    |    |         |    |    |     |
| <b>Fluid</b>                          | Turbine oil*1              |    |    |    |         |    |    |     |
| <b>Proof pressure</b>                 | 1.5 MPa                    |    |    |    |         |    |    |     |
| <b>Maximum operating pressure</b>     | 1.0 MPa                    |    |    |    |         |    |    |     |
| <b>Minimum operating pressure</b>     | 0.18 MPa                   |    |    |    | 0.1 MPa |    |    |     |
| <b>Ambient and fluid temperatures</b> | 5 to 60°C                  |    |    |    |         |    |    |     |
| <b>Piston speed</b>                   | 5 to 50 mm/s               |    |    |    |         |    |    |     |
| <b>Cushion</b>                        | None                       |    |    |    |         |    |    |     |
| <b>Stroke length tolerance</b>        | +1.0 mm <sup>-1</sup><br>0 |    |    |    |         |    |    |     |

\*1 Actuator Precautions 5 ⇨ Refer to the **Web Catalog**.

## Manufacturing of Intermediate Strokes

|              |   |              |
|--------------|---|--------------|
| Type         | A spacer is installed in the standard stroke body.  |              |
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 115)                                   |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder.    |              |
| Stroke range | Bore size   | Stroke range |
|              | 12, 16  | 1 to 29      |
|              | 20, 25  | 1 to 49      |
|              | 32 to 100   | 1 to 99      |
| Example      | Part no.: CQP2B50-57D<br>CQP2B50-75D with 18 mm width spacer inside<br>The B dimension is 115.5 mm. |              |

- Excludes the air-hydro type
- In the case of spacer type, intermediate strokes with bumper for ø40 to ø100, it can be manufactured in 5 mm increments in 5 mm and 55 to 95 mm.

### Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

## ⚠ Precautions

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

## Weight

### Without Auto Switch Magnet

[g]

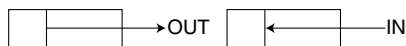
| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 32                   | 39   | 46   | 53   | 60   | 67   | —    | —    | —    | —    | —    | —    |
| 16             | 54                   | 63   | 72   | 81   | 90   | 98   | —    | —    | —    | —    | —    | —    |
| 20             | 70                   | 84   | 98   | 112  | 126  | 140  | 154  | 168  | 182  | 196  | —    | —    |
| 25             | 102                  | 117  | 132  | 147  | 161  | 176  | 191  | 206  | 220  | 235  | —    | —    |
| 32             | 149                  | 173  | 199  | 222  | 246  | 270  | 295  | 319  | 343  | 367  | 487  | 607  |
| 40             | 224                  | 258  | 280  | 310  | 336  | 362  | 388  | 414  | 440  | 467  | 602  | 737  |
| 50             | —                    | 414  | 455  | 496  | 538  | 579  | 620  | 662  | 703  | 744  | 949  | 1154 |
| 63             | —                    | 584  | 632  | 679  | 727  | 774  | 822  | 870  | 917  | 965  | 1205 | 1445 |
| 80             | —                    | 1085 | 1163 | 1242 | 1320 | 1399 | 1477 | 1556 | 1634 | 1713 | 2108 | 2503 |
| 100            | —                    | 1894 | 1992 | 2091 | 2189 | 2287 | 2385 | 2483 | 2581 | 2679 | 3169 | 3659 |

### With Auto Switch Magnet

[g]

| Bore size [mm] | Cylinder stroke [mm] |      |      |      |      |      |      |      |      |      |      |      |
|----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
|                | 5                    | 10   | 15   | 20   | 25   | 30   | 35   | 40   | 45   | 50   | 75   | 100  |
| 12             | 54                   | 62   | 69   | 75   | 82   | 89   | —    | —    | —    | —    | —    | —    |
| 16             | 91                   | 99   | 107  | 115  | 123  | 131  | —    | —    | —    | —    | —    | —    |
| 20             | 121                  | 135  | 147  | 161  | 175  | 188  | 201  | 214  | 228  | 242  | —    | —    |
| 25             | 177                  | 190  | 203  | 217  | 230  | 244  | 257  | 270  | 284  | 297  | —    | —    |
| 32             | 217                  | 242  | 266  | 290  | 315  | 339  | 363  | 387  | 412  | 436  | 557  | 679  |
| 40             | 319                  | 345  | 371  | 397  | 423  | 449  | 475  | 502  | 528  | 554  | 684  | 814  |
| 50             | —                    | 546  | 588  | 629  | 670  | 712  | 753  | 794  | 836  | 877  | 1084 | 1291 |
| 63             | —                    | 764  | 812  | 859  | 907  | 955  | 1002 | 1050 | 1098 | 1145 | 1384 | 1622 |
| 80             | —                    | 1377 | 1455 | 1534 | 1612 | 1691 | 1769 | 1848 | 1926 | 2005 | 2397 | 2790 |
| 100            | —                    | 2296 | 2394 | 2492 | 2590 | 2688 | 2786 | 2884 | 2982 | 3080 | 3570 | 4060 |

## Theoretical Output



[N]

| Bore size [mm] | Operating direction | Operating pressure [MPa] |      |      |
|----------------|---------------------|--------------------------|------|------|
|                |                     | 0.3                      | 0.5  | 0.7  |
| 12             | IN                  | 25                       | 42   | 59   |
|                | OUT                 | 34                       | 57   | 79   |
| 16             | IN                  | 45                       | 75   | 106  |
|                | OUT                 | 60                       | 101  | 141  |
| 20             | IN                  | 71                       | 118  | 165  |
|                | OUT                 | 94                       | 157  | 220  |
| 25             | IN                  | 113                      | 189  | 264  |
|                | OUT                 | 147                      | 245  | 344  |
| 32             | IN                  | 181                      | 302  | 422  |
|                | OUT                 | 241                      | 402  | 563  |
| 40             | IN                  | 317                      | 528  | 739  |
|                | OUT                 | 377                      | 628  | 880  |
| 50             | IN                  | 495                      | 825  | 1150 |
|                | OUT                 | 589                      | 982  | 1370 |
| 63             | IN                  | 841                      | 1400 | 1960 |
|                | OUT                 | 935                      | 1560 | 2180 |
| 80             | IN                  | 1360                     | 2270 | 3170 |
|                | OUT                 | 1510                     | 2510 | 3520 |
| 100            | IN                  | 2140                     | 3570 | 5000 |
|                | OUT                 | 2360                     | 3930 | 5500 |

### Additional Weight

[g]

| Bore size [mm]      |             | 12  | 16 | 20 | 25 | 32 | 40 | 50 | 63  | 80  | 100 |
|---------------------|-------------|-----|----|----|----|----|----|----|-----|-----|-----|
| Rod end male thread | Male thread | 1.5 | 3  | 6  | 12 | 26 | 27 | 53 | 53  | 120 | 175 |
|                     | Nut         | 1   | 2  | 4  | 8  | 17 | 17 | 32 | 32  | 49  | 116 |
| With rubber bumper  |             | 0   | -1 | -2 | -3 | -3 | -7 | -9 | -18 | -31 | -56 |

Calculation: (Example) **CDQP2B32-20DCM**

- Basic weight: CDQP2B32-20D ..... 290 g
- Additional weight: Rod end male thread ..... 43 g
- With rubber bumper ..... -3 g

Add each weight of auto switches and mounting brackets when auto switches are mounted.

330 g

### Auto Switch Mounting Bracket Weight

| Mounting bracket part no. | Applicable bore size | Weight [g] |
|---------------------------|----------------------|------------|
| BQ-1                      | ø12 to ø25           | 1.5        |
| BQ-2                      | ø32 to ø100          | 1.5        |
| BQ2-012                   | ø12 to ø100          | 5          |

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, End **CQ2**

Single Acting, Spring Return, End **CQ2S**

Large Bore Size Double Acting, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2S**

Anti-lateral Load Double Acting, Double Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Long Stroke Double Acting, Double Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Double Acting, Single Rod **CQP2**

Axial Piping Single Acting, Spring Return, End **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

Made to Order

# CQP2 Series

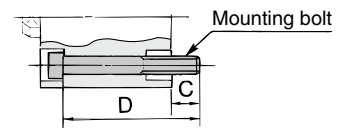
## Through-hole Type Mounting Bolt for the CQP2: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQP2B is available as an option.

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

**Example) CQ-M3 x 25L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



| Cylinder model    | C   | D  | Mounting bolt part no. |
|-------------------|-----|----|------------------------|
| <b>CQP2B12-5D</b> | 6.5 | 25 | CQ-M3 x 25L            |
| -10D              |     | 30 | x 30L                  |
| -15D              |     | 35 | x 35L                  |
| -20D              |     | 40 | x 40L                  |
| -25D              |     | 45 | x 45L                  |
| -30D              |     | 50 | x 50L                  |
| <b>CQP2B16-5D</b> | 5   | 25 | CQ-M3 x 25L            |
| -10D              |     | 30 | x 30L                  |
| -15D              |     | 35 | x 35L                  |
| -20D              |     | 40 | x 40L                  |
| -25D              |     | 45 | x 45L                  |
| -30D              |     | 50 | x 50L                  |
| <b>CQP2B20-5D</b> | 7.5 | 25 | CQ-M5 x 25L            |
| -10D              |     | 30 | x 30L                  |
| -15D              |     | 35 | x 35L                  |
| -20D              |     | 40 | x 40L                  |
| -25D              |     | 45 | x 45L                  |
| -30D              |     | 50 | x 50L                  |
| -35D              |     | 55 | x 55L                  |
| -40D              |     | 60 | x 60L                  |
| -45D              |     | 65 | x 65L                  |
| -50D              |     | 70 | x 70L                  |
| <b>CQP2B25-5D</b> | 9.5 | 30 | CQ-M5 x 30L            |
| -10D              |     | 35 | x 35L                  |
| -15D              |     | 40 | x 40L                  |
| -20D              |     | 45 | x 45L                  |
| -25D              |     | 50 | x 50L                  |
| -30D              |     | 55 | x 55L                  |
| -35D              |     | 60 | x 60L                  |
| -40D              |     | 65 | x 65L                  |
| -45D              |     | 70 | x 70L                  |
| -50D              |     | 75 | x 75L                  |

| Cylinder model     | C    | D      | Mounting bolt part no. |
|--------------------|------|--------|------------------------|
| <b>CQP2B32-5D</b>  | 9    | 30     | CQ-M5 x 30L            |
| -10D               |      | 35     | x 35L                  |
| -15D               |      | 40     | x 40L                  |
| -20D               |      | 45     | x 45L                  |
| -25D               |      | 50     | x 50L                  |
| -30D               |      | 55     | x 55L                  |
| -35D               |      | 60     | x 60L                  |
| -40D               |      | 65     | x 65L                  |
| -45D               |      | 70     | x 70L                  |
| -50D               |      | 75     | x 75L                  |
| <b>CQP2B40-5D</b>  | 7.5  | 35     | CQ-M5 x 35L            |
| -10D               |      | 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                  |
| <b>CQP2B50-10D</b> | 12.5 | 45     | CQ-M6 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                  |
| -75D               |      | 120    | x 120L                 |
| -100D              | 145  | x 145L |                        |

| Cylinder model      | C    | D      | Mounting bolt part no. |
|---------------------|------|--------|------------------------|
| <b>CQP2B63-10D</b>  | 14.5 | 50     | CQ-M8 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                  |
| -75D                |      | 125    | x 125L                 |
| <b>CQP2B80-10D</b>  | 15   | 55     | CQ-M10 x 55L           |
| -15D                |      | 60     | x 60L                  |
| -20D                |      | 65     | x 65L                  |
| -25D                |      | 70     | x 70L                  |
| -30D                |      | 75     | x 75L                  |
| -35D                |      | 80     | x 80L                  |
| -40D                |      | 85     | x 85L                  |
| -45D                |      | 90     | x 90L                  |
| -50D                |      | 95     | x 95L                  |
| -75D                |      | 130    | x 130L                 |
| <b>CQP2B100-10D</b> | 15.5 | 65     | CQ-M10 x 65L           |
| -15D                |      | 70     | x 70L                  |
| -20D                |      | 75     | x 75L                  |
| -25D                |      | 80     | x 80L                  |
| -30D                |      | 85     | x 85L                  |
| -35D                |      | 90     | x 90L                  |
| -40D                |      | 95     | x 95L                  |
| -45D                |      | 100    | x 100L                 |
| -50D                |      | 105    | x 105L                 |
| -75D                |      | 140    | x 140L                 |
| -100D               | 165  | x 165L |                        |

## Through-hole Type Mounting Bolt for the CDQP2: With Auto Switch Magnet

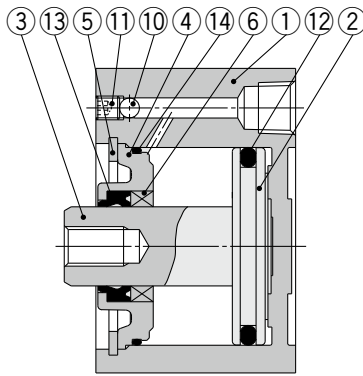
| Cylinder model     | C    | D  | Mounting bolt part no. |
|--------------------|------|----|------------------------|
| <b>CDQP2B12-5D</b> | 5.5  | 35 | CQ-M3 x 35L            |
| -10D               |      | 40 | x 40L                  |
| -15D               |      | 45 | x 45L                  |
| -20D               |      | 50 | x 50L                  |
| -25D               |      | 55 | x 55L                  |
| -30D               |      | 60 | x 60L                  |
| <b>CDQP2B16-5D</b> | 8    | 40 | CQ-M3 x 40L            |
| -10D               |      | 45 | x 45L                  |
| -15D               |      | 50 | x 50L                  |
| -20D               |      | 55 | x 55L                  |
| -25D               |      | 60 | x 60L                  |
| -30D               |      | 65 | x 65L                  |
| <b>CDQP2B20-5D</b> | 10.5 | 40 | CQ-M5 x 40L            |
| -10D               |      | 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                  |
| <b>CDQP2B25-5D</b> | 9.5  | 40 | CQ-M5 x 40L            |
| -10D               |      | 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                  |

| Cylinder model      | C    | D      | Mounting bolt part no. |
|---------------------|------|--------|------------------------|
| <b>CDQP2B32-5D</b>  | 9    | 40     | CQ-M5 x 40L            |
| -10D                |      | 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                  |
| <b>CDQP2B40-5D</b>  | 7.5  | 45     | CQ-M5 x 45L            |
| -10D                |      | 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                  |
| <b>CDQP2B50-10D</b> | 12.5 | 55     | CQ-M6 x 55L            |
| -15D                |      | 60     | x 60L                  |
| -20D                |      | 65     | x 65L                  |
| -25D                |      | 70     | x 70L                  |
| -30D                |      | 75     | x 75L                  |
| -35D                |      | 80     | x 80L                  |
| -40D                |      | 85     | x 85L                  |
| -45D                |      | 90     | x 90L                  |
| -50D                |      | 95     | x 95L                  |
| -75D                |      | 120    | x 120L                 |
| -100D               | 145  | x 145L |                        |

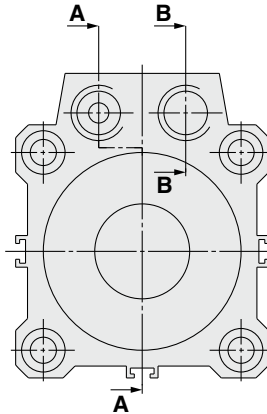
| Cylinder model       | C    | D      | Mounting bolt part no. |
|----------------------|------|--------|------------------------|
| <b>CDQP2B63-10D</b>  | 14.5 | 60     | CQ-M8 x 60L            |
| -15D                 |      | 65     | x 65L                  |
| -20D                 |      | 70     | x 70L                  |
| -25D                 |      | 75     | x 75L                  |
| -30D                 |      | 80     | x 80L                  |
| -35D                 |      | 85     | x 85L                  |
| -40D                 |      | 90     | x 90L                  |
| -45D                 |      | 95     | x 95L                  |
| -50D                 |      | 100    | x 100L                 |
| -75D                 |      | 125    | x 125L                 |
| <b>CDQP2B80-10D</b>  | 15   | 65     | CQ-M10 x 65L           |
| -15D                 |      | 70     | x 70L                  |
| -20D                 |      | 75     | x 75L                  |
| -25D                 |      | 80     | x 80L                  |
| -30D                 |      | 85     | x 85L                  |
| -35D                 |      | 90     | x 90L                  |
| -40D                 |      | 95     | x 95L                  |
| -45D                 |      | 100    | x 100L                 |
| -50D                 |      | 105    | x 105L                 |
| -75D                 |      | 130    | x 130L                 |
| <b>CDQP2B100-10D</b> | 15.5 | 75     | CQ-M10 x 75L           |
| -15D                 |      | 80     | x 80L                  |
| -20D                 |      | 85     | x 85L                  |
| -25D                 |      | 90     | x 90L                  |
| -30D                 |      | 95     | x 95L                  |
| -35D                 |      | 100    | x 100L                 |
| -40D                 |      | 105    | x 105L                 |
| -45D                 |      | 110    | x 110L                 |
| -50D                 |      | 115    | x 115L                 |
| -75D                 |      | 140    | x 140L                 |
| -100D                | 165  | x 165L |                        |

## Construction

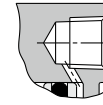
Without auto switch magnet



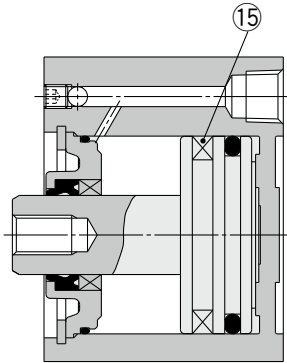
A-A section (Port on rod end)



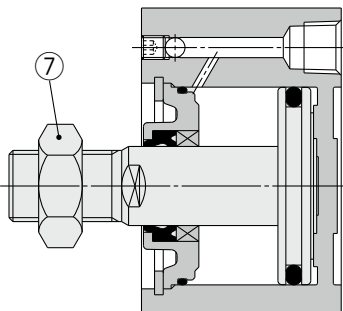
B-B section  
(Port on head end)



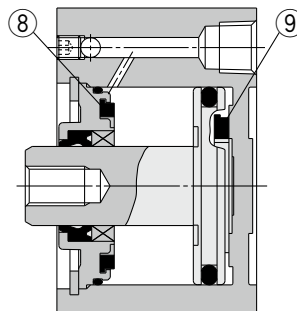
With auto switch magnet



Rod end male thread



With rubber bumper



### Component Parts

| No. | Description                   | Material              | Note                             |
|-----|-------------------------------|-----------------------|----------------------------------|
| 1   | Cylinder tube                 | Aluminum alloy        | Hard anodized                    |
| 2   | Piston                        | Aluminum alloy        |                                  |
| 3   | Piston rod                    | Stainless steel       | ø12 to ø25                       |
|     |                               | Carbon steel          | ø32 to ø100, Hard chrome plating |
| 4   | Collar                        | Aluminum alloy        | ø12 to ø40, Anodized             |
|     |                               | Aluminum alloy casted | ø50 to ø100, Chromated, Painted  |
| 5   | Retaining ring                | Carbon tool steel     | Phosphate coated                 |
| 6   | Bushing                       | Bearing alloy         | ø50 to ø100                      |
| 7   | Rod end nut                   | Carbon steel          | Zinc chromated                   |
| 8   | Bumper A                      | Urethane              |                                  |
| 9   | Bumper B                      | Urethane              |                                  |
| 10  | Steel ball                    | Carbon steel          |                                  |
| 11  | Hexagon socket head set screw | Alloy steel           | Zinc chromated                   |
| 12  | Piston seal                   | NBR                   |                                  |
| 13  | Rod seal                      | NBR                   |                                  |
| 14  | Gasket                        | NBR                   |                                  |
| 15  | Magnet                        | —                     |                                  |

### Replacement Parts/Seal Kit

| Bore size<br>[mm] | Kit no.                   |                | Contents                    |
|-------------------|---------------------------|----------------|-----------------------------|
|                   | Pneumatic type (Non-lube) | Air-hydro type |                             |
| 12                | CQ2B12-PS                 | —              | Set of nos.<br>(12, 13, 14) |
| 16                | CQ2B16-PS                 | —              |                             |
| 20                | CQ2B20-PS                 | CQ2BH20-PS     |                             |
| 25                | CQ2B25-PS                 | CQ2BH25-PS     |                             |
| 32                | CQ2B32-PS                 | CQ2BH32-PS     |                             |
| 40                | CQ2B40-PS                 | CQ2BH40-PS     |                             |
| 50                | CQ2B50-PS                 | CQ2BH50-PS     |                             |
| 63                | CQ2B63-PS                 | CQ2BH63-PS     |                             |
| 80                | CQ2B80-PS                 | CQ2BH80-PS     |                             |
| 100               | CQ2B100-PS                | CQ2BH100-PS    |                             |

\* Seal kit includes (12), (13), (14). Order the seal kit based on each bore size.

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

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

|                   |  |         |
|-------------------|--|---------|
| Standard          | Double Acting, Double Rod                | CQ2W    |
| Standard          | Double Acting, Single Rod                | CQ2     |
| Large Bore Size   | Double Acting, Double Rod                | CQ2W    |
| Large Bore Size   | Double Acting, Single Rod                | CQ2     |
| Anti-lateral Load | Double Acting, Single Rod                | CQ2S    |
| Long Stroke       | Double Acting, Single Rod                | CQ2     |
| Non-rotating Rod  | Double Acting, Single Rod                | CQ2K    |
| Non-rotating Rod  | Double Acting, Double Rod                | CQ2KW   |
| Water Resistant   | Double Acting, Single Rod                | CQ2-RV  |
| Water Resistant   | Double Acting, Double Rod                | CQ2W-RV |
| Axial Piping      | Double Acting, Single Rod                | CQP2    |
| Axial Piping      | Single Acting, Spring Return, Single Rod | CQP2    |
| With End Lock     | Double Acting, Single Rod                | CBQ2    |
| Auto Switch       |  |         |
| Made to Order     |  |         |



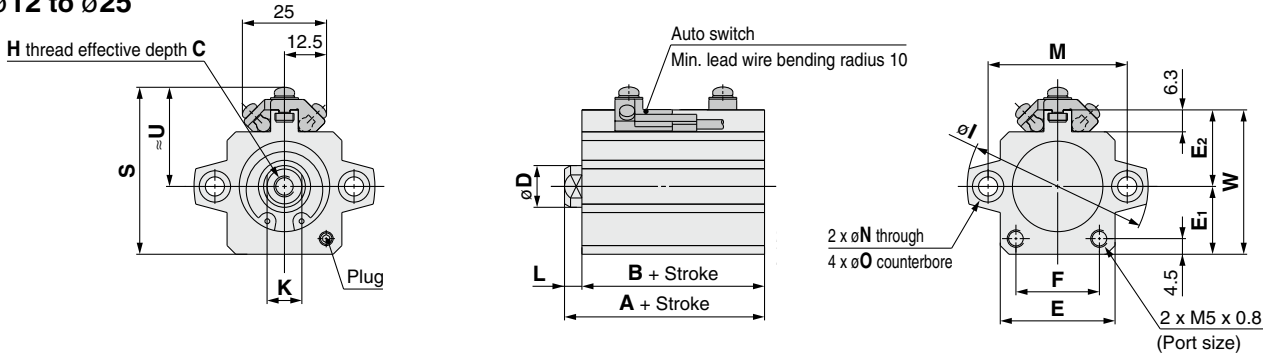
# CQP2 Series

Bore Size

## Ø12 to Ø100 With/Without Auto Switch Magnet

### Through-hole: C□QP2B

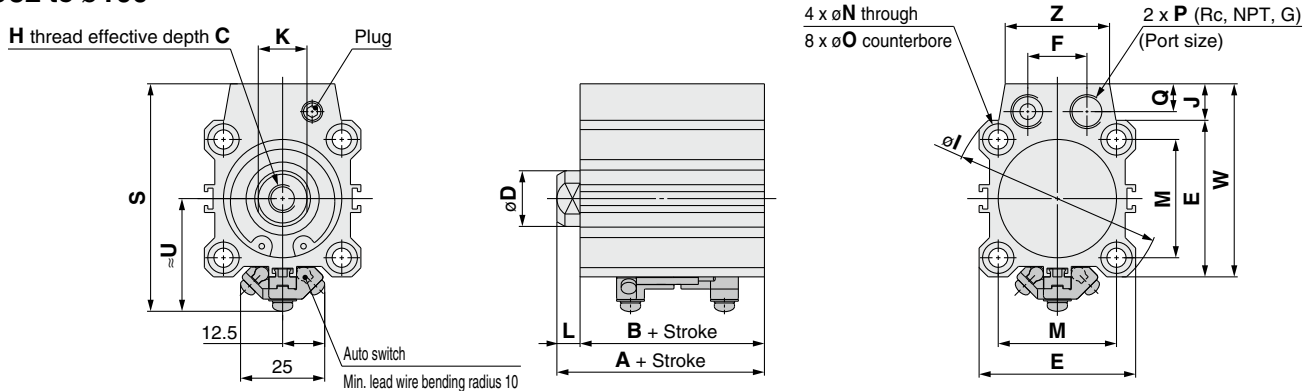
Ø12 to Ø25



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      |      |      | C  | D  | E  | E <sub>1</sub> | E <sub>2</sub> | F  | H        | I  | K  | L   | M  | N   | O             | W    |
|----------------|-------------------|----------------------------|------|-------------------------|------|------|------|----|----|----|----------------|----------------|----|----------|----|----|-----|----|-----|---------------|------|
|                |                   | A                          | B    | A                       | B    | S    | U    |    |    |    |                |                |    |          |    |    |     |    |     |               |      |
| 12             | 5 to 30           | 20.5                       | 17   | 31.5                    | 28   | 33.5 | 20.5 | 6  | 6  | 23 | 13             | 14             | 14 | M3 x 0.5 | 32 | 5  | 3.5 | 22 | 3.5 | 6.5 depth 3.5 | 27   |
| 16             | 5 to 30           | 22                         | 18.5 | 34                      | 30.5 | 38.5 | 23.5 | 8  | 8  | 26 | 15             | 17             | 17 | M4 x 0.7 | 38 | 6  | 3.5 | 28 | 3.5 | 6.5 depth 3.5 | 32   |
| 20             | 5 to 50           | 24                         | 19.5 | 36                      | 31.5 | 42.5 | 25.5 | 7  | 10 | 30 | 17             | 19             | 21 | M5 x 0.8 | 47 | 8  | 4.5 | 36 | 5.5 | 9 depth 7     | 36   |
| 25             | 5 to 50           | 27.5                       | 22.5 | 37.5                    | 32.5 | 48   | 28.5 | 12 | 12 | 33 | 19.5           | 22             | 24 | M6 x 1.0 | 52 | 10 | 5   | 40 | 5.5 | 9 depth 7     | 41.5 |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

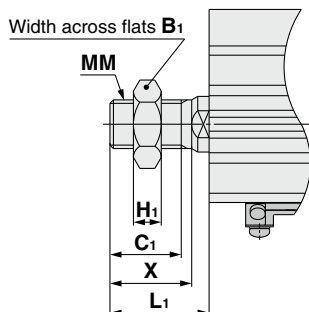
### Ø32 to Ø100



| Bore size [mm] | Stroke range [mm] | Without auto switch magnet |      | With auto switch magnet |      |       |      | C  | D  | E   | F  | H         | I   | J    | K  | L  | M  | N   | O               | P   | Q    | W     | Z  |
|----------------|-------------------|----------------------------|------|-------------------------|------|-------|------|----|----|-----|----|-----------|-----|------|----|----|----|-----|-----------------|-----|------|-------|----|
|                |                   | A                          | B    | A                       | B    | S     | U    |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 32             | 5 to 50           | 30                         | 23   | 40                      | 33   | 65.5  | 32.5 | 13 | 16 | 45  | 17 | M8 x 1.25 | 60  | 10.5 | 14 | 7  | 34 | 5.5 | 9 depth 7       | 1/8 | 8    | 55.5  | 30 |
|                | 75, 100           | 40                         | 33   |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 40             | 5 to 50           | 36.5                       | 29.5 | 46.5                    | 39.5 | 72    | 36   | 13 | 16 | 52  | 17 | M8 x 1.25 | 69  | 10   | 14 | 7  | 40 | 5.5 | 9 depth 7       | 1/8 | 8    | 62    | 30 |
|                | 75, 100           | 46.5                       | 39.5 |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 50             | 10 to 50          | 38.5                       | 30.5 | 48.5                    | 40.5 | 87    | 42   | 15 | 20 | 64  | 22 | M10 x 1.5 | 86  | 13   | 17 | 8  | 50 | 6.6 | 11 depth 8      | 1/4 | 10   | 77    | 39 |
|                | 75, 100           | 48.5                       | 40.5 |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 63             | 10 to 50          | 44                         | 36   | 54                      | 46   | 100   | 48.5 | 15 | 20 | 77  | 22 | M10 x 1.5 | 103 | 13   | 17 | 8  | 60 | 9   | 14 depth 10.5   | 1/4 | 10   | 90    | 39 |
|                | 75, 100           | 54                         | 46   |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 80             | 10 to 50          | 53.5                       | 43.5 | 63.5                    | 53.5 | 123.5 | 58.5 | 21 | 25 | 98  | 26 | M16 x 2.0 | 132 | 16   | 22 | 10 | 77 | 11  | 17.5 depth 13.5 | 3/8 | 12.5 | 114   | 48 |
|                | 75, 100           | 63.5                       | 53.5 |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |
| 100            | 10 to 50          | 65                         | 53   | 75                      | 63   | 144.5 | 68.5 | 27 | 30 | 117 | 26 | M20 x 2.5 | 156 | 17.5 | 27 | 12 | 94 | 11  | 17.5 depth 13.5 | 3/8 | 12.5 | 134.5 | 48 |
|                | 75, 100           | 75                         | 63   |                         |      |       |      |    |    |     |    |           |     |      |    |    |    |     |                 |     |      |       |    |

- \* For details on the rod end nut and accessory brackets ⇨ p. 26, 27
- \* The external dimensions with rubber bumper are same as those of the standard, as shown above.
- \* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

### Rod end male thread



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | 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 |
| 32             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5  | 28.5 |
| 63             | 27             | 26             | 11             | 33.5           | M18 x 1.5  | 28.5 |
| 80             | 32             | 32.5           | 13             | 43.5           | M22 x 1.5  | 35.5 |
| 100            | 41             | 32.5           | 16             | 43.5           | M26 x 1.5  | 35.5 |

# Compact Cylinder: Axial Piping Single Acting, Single Rod

## CQP2 Series

∅12, ∅16, ∅20, ∅25, ∅32, ∅40, ∅50

### How to Order

Without auto switch

CQP2B 50 - 10 T

With auto switch

CDQP2B 50 - 10 T - M9BW

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

#### 1 Mounting

|          |              |
|----------|--------------|
| <b>B</b> | Through-hole |
|----------|--------------|

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 126

#### 5 Action

|          |                              |
|----------|------------------------------|
| <b>S</b> | Single acting, Spring return |
| <b>T</b> | Single acting, Spring extend |

#### 8 Number of auto switches

|            |   |
|------------|---|
| <b>Nil</b> | 2 |
| <b>S</b>   | 1 |
| <b>n</b>   | n |

#### 2 Bore size

|           |       |           |       |
|-----------|-------|-----------|-------|
| <b>12</b> | 12 mm | <b>32</b> | 32 mm |
| <b>16</b> | 16 mm | <b>40</b> | 40 mm |
| <b>20</b> | 20 mm | <b>50</b> | 50 mm |
| <b>25</b> | 25 mm |           |       |

#### 6 Body option

|            |                       |
|------------|-----------------------|
| <b>Nil</b> | Rod end female thread |
| <b>M</b>   | Rod end male thread   |

#### 3 Port thread type

|            |          |            |
|------------|----------|------------|
| <b>Nil</b> | M thread | ∅12 to ∅25 |
|            | Rc       |            |
| <b>TN</b>  | NPT      | ∅32 to ∅50 |
| <b>TF</b>  | G        |            |

#### 7 Auto switch

|            |                            |
|------------|----------------------------|
| <b>Nil</b> | Without auto switch magnet |
|------------|----------------------------|

\* For applicable auto switches, refer to the table below.

#### 4 Cylinder stroke

(For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size              | Standard stroke |
|------------------------|-----------------|
| 12, 16, 20, 25, 32, 40 | 5, 10           |
| 50                     | 10, 20          |

\* For the manufacturing of intermediate strokes ⇨ p. 123

#### 9 Made to order common specifications

For details ⇨ p. 123

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

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

#### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQP2B32-10S

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

| Type                                       | Special function                          | Electrical entry                    | Indicator light | Wiring (Output)         | Load voltage |             | Auto switch model |               | Lead wire length [m] |             |            |                |               | Pre-wired connector | Applicable load |            |            |            |   |            |            |
|--|---|-------------------------------------|-----------------|-------------------------|--------------|-------------|-------------------|---------------|----------------------|-------------|------------|----------------|---------------|---------------------|-----------------|------------|------------|------------|---|------------|------------|
|  |   |                                     |                 |                         | DC           | AC          | Perpendicular     | In-line       | 0.5 (Nil)            | 1 (M)       | 3 (L)      | 5 (Z)          | None (N)      |                     | Relay, PLC      | —          |            |            |   |            |            |
| Solid state auto switch                    | —   | Grommet                             | No              | 3-wire (NPN)            | 24 V         | 5 V, 12 V   | —                 | <b>M9NV</b>   | <b>M9N</b>           | ●           | ●          | ●              | ○             | —                   |                 |            | ○          | IC circuit | — |            |            |
|  |   |                                     |                 | 3-wire (PNP)            |              |             |                   | <b>M9PV</b>   | <b>M9P</b>           | ●           | ●          | ●              | ○             | —                   | ○               |            |            |            |   |            |            |
|  |   | 2-wire                              |                 | <b>M9BV</b>             |              |             |                   | <b>M9B</b>    | ●                    | ●           | ●          | ○              | —             | ○                   |                 |            |            |            |   |            |            |
|  |   | —                                   |                 | <b>J79C</b>             |              |             |                   | —             | ●                    | —           | ●          | ●              | —             | —                   |                 |            |            |            |   |            |            |
|  | Diagnostic indication (2-color indicator) | Grommet                             | Yes             | 3-wire (NPN)            | 24 V         | 5 V, 12 V   | —                 | <b>M9NWV</b>  | <b>M9NW</b>          | ●           | ●          | ●              | ○             | —                   | ○               | IC circuit | Relay, PLC |            |   |            |            |
|  |   |                                     |                 | 3-wire (PNP)            |              |             |                   | <b>M9PWV</b>  | <b>M9PW</b>          | ●           | ●          | ●              | ○             | —                   | ○               |            |            |            |   |            |            |
|  |   |                                     |                 | 2-wire                  |              |             |                   | <b>M9B WV</b> | <b>M9B W</b>         | ●           | ●          | ●              | ○             | —                   | ○               |            |            |            |   |            |            |
|  |   | Water resistant (2-color indicator) |                 | Grommet                 |              |             |                   | 3-wire (NPN)  | 24 V                 | 5 V, 12 V   | —          | <b>M9NAV*1</b> | <b>M9NA*1</b> | ○                   | ○               | ●          |            | ○          | — | ○          | IC circuit |
|  |   |                                     |                 |                         |              |             |                   | 3-wire (PNP)  |                      |             |            | <b>M9PAV*1</b> | <b>M9PA*1</b> | ○                   | ○               | ●          |            | ○          | — | ○          |            |
|  |   |                                     |                 |                         |              |             |                   | 2-wire        |                      |             |            | <b>M9BAV*1</b> | <b>M9BA*1</b> | ○                   | ○               | ●          |            | ○          | — | ○          |            |
| With diagnostic output (2-color indicator) | —   | —                                   | 4-wire          | 5 V, 12 V               | —            | <b>F79F</b> | —                 | ●             | —                    | ●           | ○          | —              | ○             | IC circuit          |                 |            |            |            |   |            |            |
| Reed auto switch                           | —   | Grommet                             | Yes             | 3-wire (NPN equivalent) | 24 V         | 5 V, 12 V   | —                 | <b>A96V</b>   | <b>A96</b>           | ●           | —          | ●              | —             | —                   | —               | IC circuit | —          |            |   |            |            |
|  |   |                                     |                 | —                       |              |             |                   | <b>A72</b>    | <b>A72H</b>          | ●           | —          | ●              | —             | —                   | —               |            |            |            |   |            |            |
|  |   |                                     |                 | —                       |              |             |                   | <b>A93V*2</b> | <b>A93</b>           | ●           | ●          | ●              | ●             | —                   | —               |            |            |            |   |            |            |
|  |   | Connector                           |                 | No                      |              |             |                   | 5 V, 12 V     | 100 V or less        | <b>A90V</b> | <b>A90</b> | ●              | —             | ●                   | —               | —          |            | —          | — | IC circuit |            |
|  |   |                                     |                 |                         |              |             |                   | 12 V          | —                    | <b>A73C</b> | —          | ●              | —             | ●                   | ●               | ●          |            | —          | — |            |            |
|  |   |                                     |                 |                         |              |             |                   | 5 V, 12 V     | 24 V or less         | <b>A80C</b> | —          | ●              | —             | ●                   | ●               | ●          |            | —          | — |            |            |
| Diagnostic indication (2-color indicator)  | —   | —                                   | Yes             | —                       | —            | —           | <b>A79W</b>       | —             | ●                    | —           | ●          | —              | —             | —                   |                 |            |            |            |   |            |            |

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

Please contact SMC regarding water-resistant types with the above model numbers.

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

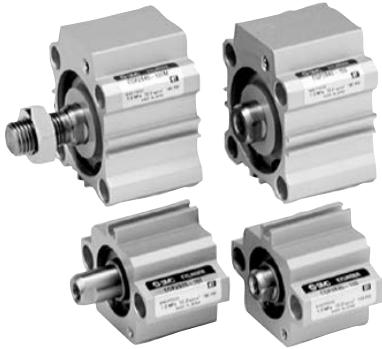
\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ  
None ..... N (Example) J79CN

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

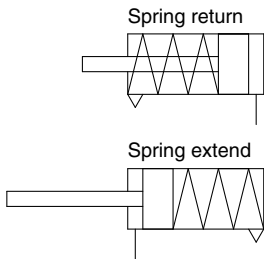
\* There are applicable auto switches other than those listed above. For details ⇨ p. 152

Standard Double Acting, Single Rod CQ2  
Standard Double Acting, Double Rod CQ2W  
Single Acting, Spring Return CQ2  
Single Acting, Spring Extend CQ2  
Large Bore Size Double Acting, Single Rod CQ2  
Large Bore Size Double Acting, Double Rod CQ2W  
Anti-lateral Load Double Acting, Single Rod CQ2S  
Anti-lateral Load Double Acting, Double Rod CQ2WS  
Long Stroke Double Acting, Single Rod CQ2  
Long Stroke Double Acting, Double Rod CQ2K  
Non-rotating Rod Double Acting, Single Rod CQ2KW  
Non-rotating Rod Double Acting, Double Rod CQ2KW  
Water Resistant Double Acting, Single Rod CQ2-RV  
Water Resistant Double Acting, Double Rod CQ2W-RV  
Axial Piping Double Acting, Single Rod CQP2  
Axial Piping Double Acting, Double Rod CQP2  
With End Lock Single Acting, Single Rod CBQ2  
With End Lock Single Acting, Double Rod CBQ2  
Auto Switch  
Made to Order

# CQP2 Series



## Symbol



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

| Symbol | Specifications  |
|--------|---|
| -XA□   | Change of rod end shape   |
| -XC6   | Piston rod/Retaining ring/Rod end nut material: Stainless steel |
| -XC36  | With boss on rod end  |
| -XC85  | Grease for food processing equipment                            |
| -X271  | Fluororubber seals  |

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

## Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

## ⚠ Precautions

Refer to pages 189 and 190 before handling the products.

## Specifications

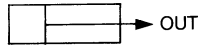
| Bore size [mm]                          | 12  | 16    | 20    | 25   | 32   | 40   | 50   |
|---|---|-------|-------|------|------|------|------|
| <b>Action</b>                           | Double acting, Single rod   |       |       |      |      |      |      |
| <b>Fluid</b>                            | Air   |       |       |      |      |      |      |
| <b>Proof pressure</b>                   | 1.5 MPa   |       |       |      |      |      |      |
| <b>Maximum operating pressure</b>       | 1.0 MPa   |       |       |      |      |      |      |
| <b>Minimum operating pressure [MPa]</b> | 0.25  | 0.25  | 0.18  | 0.18 | 0.17 | 0.15 | 0.13 |
| <b>Ambient and fluid temperatures</b>   | Without auto switch magnet: -10 to 70°C (No freezing)<br>With auto switch magnet: -10 to 60°C |       |       |      |      |      |      |
| <b>Lubrication</b>                      | Not required (Non-lube)   |       |       |      |      |      |      |
| <b>Piston speed</b>                     | 50 to 500 mm/s  |       |       |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>     | 0.022   | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 |
| <b>Stroke length tolerance</b>          | +1.0 mm<br>0  |       |       |      |      |      |      |

## Manufacturing of Intermediate Strokes (Except single acting, spring return)

| Type         | A spacer is installed in the standard stroke body.   |              |
|--------------|--|--------------|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 122)                                |              |
| Description  | Strokes in 1 mm increments are available by installing a spacer in the standard stroke cylinder. |              |
| Stroke range | Bore size  | Stroke range |
|              | 12 to 40   | 1 to 9       |
|              | 50   | 1 to 19      |
| Example      | Part no.: CQP2B20-3T<br>CQP2B20-5T with 2 mm width spacer inside<br>The B dimension is 24.5 mm.  |              |

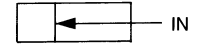
## Theoretical Output

### Single Acting, Spring Return



| Bore size [mm] | Operating direction | Operating pressure [MPa] |     |      |
|----------------|---------------------|--------------------------|-----|------|
|                |                     | 0.3                      | 0.5 | 0.7  |
| 12             | OUT                 | 21                       | 44  | 66   |
| 16             |                     | 45                       | 86  | 126  |
| 20             |                     | 79                       | 142 | 205  |
| 25             |                     | 126                      | 224 | 323  |
| 32             |                     | 211                      | 372 | 533  |
| 40             |                     | 338                      | 589 | 841  |
| 50             |                     | 535                      | 928 | 1316 |

### Single Acting, Spring Extend



| Bore size [mm] | Operating direction | Operating pressure [MPa] |     |      |
|----------------|---------------------|--------------------------|-----|------|
|                |                     | 0.3                      | 0.5 | 0.7  |
| 12             | IN                  | 14                       | 31  | 48   |
| 16             |                     | 24                       | 54  | 85   |
| 20             |                     | 71                       | 118 | 165  |
| 25             |                     | 113                      | 189 | 264  |
| 32             |                     | 181                      | 302 | 422  |
| 40             |                     | 317                      | 528 | 739  |
| 50             |                     | 495                      | 825 | 1150 |

## Spring Force

### Single Acting, Spring Return

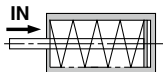
| Bore size [mm] | Stroke [mm] | Spring reaction force [N] |       |
|----------------|-------------|---------------------------|-------|
|                |             | Second                    | First |
| 12             | 5           | 13                        | 8.6   |
|                | 10          | 13                        | 3.9   |
| 16             | 5           | 15                        | 10.3  |
|                | 10          | 15                        | 5.9   |
| 20             | 5           | 15                        | 10    |
|                | 10          | 15                        | 5.9   |
| 25             | 5           | 20                        | 16    |
|                | 10          | 20                        | 11    |
| 32             | 5           | 30                        | 23    |
|                | 10          | 30                        | 16    |
| 40             | 5           | 30                        | 13    |
|                | 10          | 39                        | 21    |
| 50             | 10          | 50                        | 30    |
|                | 20          | 54                        | 24    |

### Single Acting, Spring Extend

| Bore size [mm] | Stroke [mm] | Spring reaction force [N] |       |
|----------------|-------------|---------------------------|-------|
|                |             | Second                    | First |
| 12             | 5           | 11                        | 2.9   |
|                | 10          | 9.7                       | 2.8   |
| 16             | 5           | 20                        | 3.9   |
|                | 10          | 20                        | 3.9   |
| 20             | 5           | 27                        | 5.3   |
|                | 10          | 27                        | 5.9   |
| 25             | 5           | 29                        | 9.8   |
|                | 10          | 29                        | 9.8   |
| 32             | 5           | 29                        | 20    |
|                | 10          | 29                        | 20    |
| 40             | 5           | 29                        | 20    |
|                | 10          | 29                        | 20    |
| 50             | 10          | 83                        | 24    |
|                | 20          | 83                        | 24    |

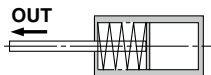
### Single acting, Spring return

- First spring state



When spring is set in cylinder

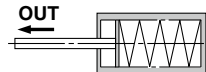
- Second spring state



When spring is compressed with air

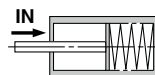
### Single acting, Spring extend

- First spring state



When spring is set in cylinder

- Second spring state



When spring is compressed with air

Standard  
Double Acting, Single Rod  
CQ2

Standard  
Double Acting, Double Rod  
CQ2W

Single Acting, Spring Return  
CQ2

Large Bore Size  
Double Acting, Single Rod  
CQ2

Large Bore Size  
Double Acting, Double Rod  
CQ2W

Anti-lateral Load  
Double Acting, Single Rod  
CQ2S

Long Stroke  
Double Acting, Single Rod  
CQ2

Non-rotating Rod  
Double Acting, Single Rod  
CQ2K

Water Resistant  
Double Acting, Single Rod  
CQ2-RV

Water Resistant  
Double Acting, Double Rod  
CQ2W-RV

Axial Piping  
Double Acting, Single Rod  
CQP2

Axial Piping, Spring Return  
CQP2

With End Lock  
Double Acting, Single Rod  
CBQ2

Auto Switch

Made to Order

# CQP2 Series

## Weight

### Without Auto Switch Magnet

#### Spring Return [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 33                   | 40  | —   |
| 16             | 55                   | 64  | —   |
| 20             | 68                   | 83  | —   |
| 25             | 103                  | 118 | —   |
| 32             | 149                  | 173 | —   |
| 40             | 236                  | 262 | —   |
| 50             | —                    | 426 | 691 |

#### Spring Extend [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 33                   | 40  | —   |
| 16             | 55                   | 64  | —   |
| 20             | 73                   | 87  | —   |
| 25             | 109                  | 124 | —   |
| 32             | 160                  | 180 | —   |
| 40             | 262                  | 284 | —   |
| 50             | —                    | 468 | 540 |

### With Auto Switch Magnet

#### Spring Return [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 55                   | 63  | —   |
| 16             | 92                   | 100 | —   |
| 20             | 121                  | 135 | —   |
| 25             | 178                  | 191 | —   |
| 32             | 217                  | 242 | —   |
| 40             | 323                  | 349 | —   |
| 50             | —                    | 558 | 641 |

#### Spring Extend [g]

| Bore size [mm] | Cylinder stroke [mm] |     |     |
|----------------|----------------------|-----|-----|
|                | 5                    | 10  | 20  |
| 12             | 61                   | 69  | —   |
| 16             | 92                   | 100 | —   |
| 20             | 126                  | 140 | —   |
| 25             | 184                  | 197 | —   |
| 32             | 228                  | 253 | —   |
| 40             | 349                  | 375 | —   |
| 50             | —                    | 600 | 683 |

### Additional Weight [g]

| Bore size [mm]      |             | 12  | 16 | 20 | 25 | 32 | 40 | 50 |
|---------------------|-------------|-----|----|----|----|----|----|----|
| Rod end male thread | Male thread | 1.5 | 3  | 6  | 12 | 26 | 27 | 53 |
|                     | Nut         | 1   | 2  | 4  | 8  | 17 | 17 | 32 |

Calculation: (Example) **CDQP2B32-10SM**

- Basic weight: CDQP2B32-10S ..... 242 g
- Additional weight: Rod end male thread ..... 43 g

Add each weight of auto switches when auto switches are mounted.

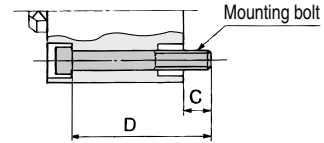
285 g

### Through-hole Type Mounting Bolt for the CQP2: Without Auto Switch Magnet

Mounting bolt for the through-hole mounting of the CQP2B is available as an option.  
Refer to the following for ordering procedures.  
Order the actual number of bolts that will be used.

**Example) CQ-M3 x 25L 2 pcs.**

Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



#### Spring Return

| Cylinder model | C    | D  | Mounting bolt part no. |
|----------------|------|----|------------------------|
| CQP2B12-5S     | 6.5  | 25 | CQ-M3 x 25L            |
| -10S           |      | 30 | x 30L                  |
| CQP2B16-5S     | 5    | 25 | CQ-M3 x 25L            |
| -10S           |      | 30 | x 30L                  |
| CQP2B20-5S     | 7.5  | 25 | CQ-M5 x 25L            |
| -10S           |      | 30 | x 30L                  |
| CQP2B25-5S     | 9.5  | 30 | CQ-M5 x 30L            |
| -10S           |      | 35 | x 35L                  |
| CQP2B32-5S     | 9    | 30 | CQ-M5 x 30L            |
| -10S           |      | 35 | x 35L                  |
| CQP2B40-5S     | 7.5  | 35 | CQ-M5 x 35L            |
| -10S           |      | 40 | x 40L                  |
| CQP2B50-10S    | 12.5 | 45 | CQ-M6 x 45L            |
| -20S           |      | 55 | x 55L                  |

#### Spring Extend

| Cylinder model | C    | D  | Mounting bolt part no. |
|----------------|------|----|------------------------|
| CQP2B12-5T     | 6.5  | 25 | CQ-M3 x 25L            |
| -10T           |      | 30 | x 30L                  |
| CQP2B16-5T     | 5    | 25 | CQ-M3 x 25L            |
| -10T           |      | 30 | x 30L                  |
| CQP2B20-5T     | 7.5  | 25 | CQ-M5 x 25L            |
| -10T           |      | 30 | x 30L                  |
| CQP2B25-5T     | 9.5  | 30 | CQ-M5 x 30L            |
| -10T           |      | 35 | x 35L                  |
| CQP2B32-5T     | 9    | 30 | CQ-M5 x 30L            |
| -10T           |      | 35 | x 35L                  |
| CQP2B40-5T     | 7.5  | 35 | CQ-M5 x 35L            |
| -10T           |      | 40 | x 40L                  |
| CQP2B50-10T    | 12.5 | 45 | CQ-M6 x 45L            |
| -20T           |      | 55 | x 55L                  |

### Through-hole Type Mounting Bolt for the CDQP2: With Auto Switch Magnet

#### Spring Return

| Cylinder model | C    | D  | Mounting bolt part no. |
|----------------|------|----|------------------------|
| CDQP2B12-5S    | 5.5  | 35 | CQ-M3 x 35L            |
| -10S           |      | 40 | x 40L                  |
| CDQP2B16-5S    | 8    | 40 | CQ-M3 x 40L            |
| -10S           |      | 45 | x 45L                  |
| CDQP2B20-5S    | 10.5 | 40 | CQ-M5 x 40L            |
| -10S           |      | 45 | x 45L                  |
| CDQP2B25-5S    | 9.5  | 40 | CQ-M5 x 40L            |
| -10S           |      | 45 | x 45L                  |
| CDQP2B32-5S    | 9    | 40 | CQ-M5 x 40L            |
| -10S           |      | 45 | x 45L                  |
| CDQP2B40-5S    | 7.5  | 45 | CQ-M5 x 45L            |
| -10S           |      | 50 | x 50L                  |
| CDQP2B50-10S   | 12.5 | 55 | CQ-M6 x 55L            |
| -20S           |      | 65 | x 65L                  |

#### Spring Extend

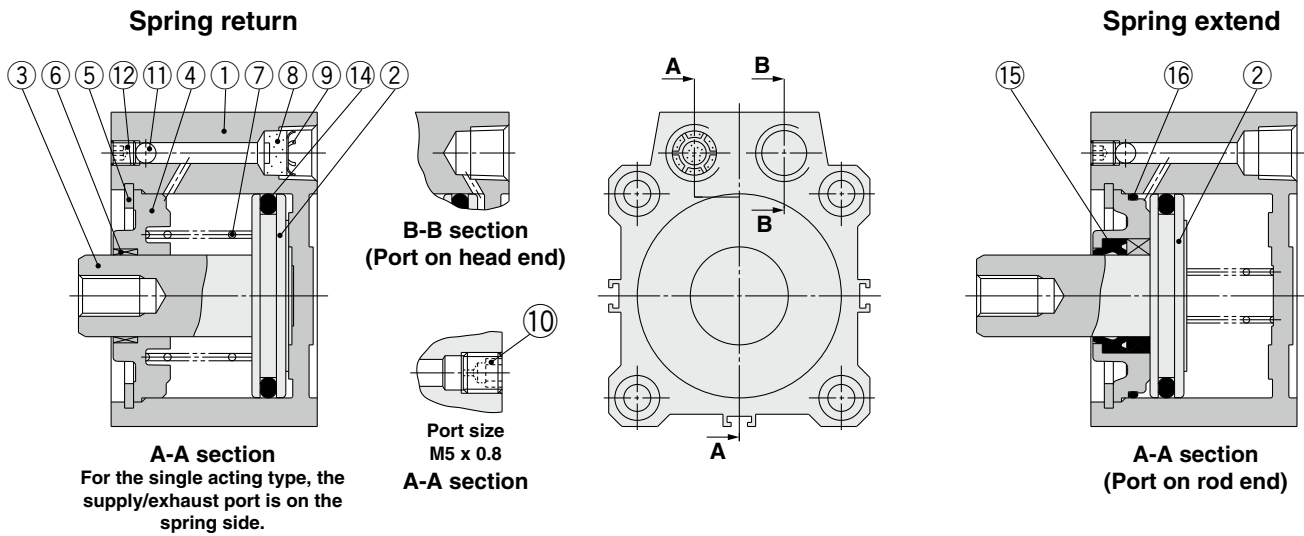
| Cylinder model | C    | D  | Mounting bolt part no. |
|----------------|------|----|------------------------|
| CDQP2B12-5T    | 6.1  | 40 | CQ-M3 x 40L            |
| -10T           |      | 45 | x 45L                  |
| CDQP2B16-5T    | 8    | 40 | CQ-M3 x 40L            |
| -10T           |      | 45 | x 45L                  |
| CDQP2B20-5T    | 10.5 | 40 | CQ-M5 x 40L            |
| -10T           |      | 45 | x 45L                  |
| CDQP2B25-5T    | 9.5  | 40 | CQ-M5 x 40L            |
| -10T           |      | 45 | x 45L                  |
| CDQP2B32-5T    | 9    | 40 | CQ-M5 x 40L            |
| -10T           |      | 45 | x 45L                  |
| CDQP2B40-5T    | 7.5  | 45 | CQ-M5 x 45L            |
| -10T           |      | 50 | x 50L                  |
| CDQP2B50-10T   | 12.5 | 55 | CQ-M6 x 55L            |
| -20T           |      | 65 | x 65L                  |

|                   |                                     |               |
|-------------------|-------------------------------------|---------------|
| Standard          | Double Acting, Single Rod           | CQ2           |
| Standard          | Double Acting, Double Rod           | CQ2W          |
| Standard          | Single Acting, Spring Return-Extend | CQ2           |
| Large Bore Size   | Double Acting, Single Rod           | CQ2           |
| Large Bore Size   | Double Acting, Double Rod           | CQ2W          |
| Anti-lateral Load | Double Acting, Single Rod           | CQ2□S         |
| Long Stroke       | Double Acting, Single Rod           | CQ2           |
| Non-rotating Rod  | Double Acting, Single Rod           | CQ2K          |
| Non-rotating Rod  | Double Acting, Double Rod           | CQ2KW         |
| Water Resistant   | Double Acting, Single Rod           | CQ2-RV        |
| Water Resistant   | Double Acting, Double Rod           | CQ2W-RV       |
| Axial Piping      | Double Acting, Single Rod           | CQP2          |
| Axial Piping      | Single Acting, Spring Return-Extend | CQP2          |
| With End Lock     | Double Acting, Single Rod           | CBQ2          |
| Auto Switch       |                                     | Auto Switch   |
| Made to Order     |                                     | Made to Order |

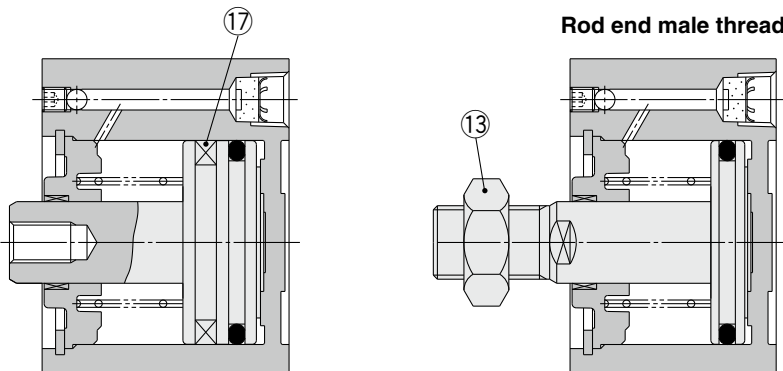
# CQP2 Series

## Construction

### Without auto switch magnet



### With auto switch magnet



## Component Parts

| No. | Description                   | Material              | Note                            |
|-----|-------------------------------|-----------------------|---------------------------------|
| 1   | Cylinder tube                 | Aluminum alloy        | Hard anodized                   |
| 2*1 | Piston                        | Aluminum alloy        |                                 |
| 3   | Piston rod                    | Stainless steel       | ø12 to ø25                      |
|     |                               | Carbon steel          | ø32 to ø50, Hard chrome plating |
| 4   | Collar                        | Aluminum alloy        | ø12 to ø40, Anodized            |
|     |                               | Aluminum alloy casted | ø50, Chromated, Painted         |
| 5   | Retaining ring                | Carbon tool steel     | Phosphate coated                |
| 6   | Bushing                       | Bearing alloy         |                                 |
| 7   | Return spring                 | Piano wire            | Zinc chromated                  |
| 8   | Bronze element                | Sintered metallic BC  |                                 |
| 9   | Retaining ring                | Carbon tool steel     | Port sizes Rc1/8, 1/4           |
| 10  | Plug with fixed orifice       | Alloy steel           | Port size M5 x 0.8              |
| 11  | Steel ball                    | Carbon steel          |                                 |
| 12  | Hexagon socket head set screw | Alloy steel           | Zinc chromated                  |
| 13  | Rod end nut                   | Carbon steel          | Zinc chromated                  |
| 14  | Piston seal                   | NBR                   |                                 |
| 15  | Rod seal                      | NBR                   |                                 |
| 16  | Gasket                        | NBR                   |                                 |
| 17  | Magnet                        | —                     |                                 |

\*1 For the spring extend type (Type T), the piston and piston rod are integrated (stainless steel).

## Replacement Parts/Seal Kit

| Bore size [mm] | Kit no.<br>(Single acting/Spring return) | Kit no.<br>(Single acting/Spring extend) |
|----------------|--|--|
| 12             | CQ2B12-S-PS                              | CQ2B12-T-PS                              |
| 16             | CQ2B16-S-PS                              | CQ2B16-T-PS                              |
| 20             | CQ2B20-S-PS                              | CQ2B20-T-PS                              |
| 25             | CQ2B25-S-PS                              | CQ2B25-T-PS                              |
| 32             | CQ2B32-S-PS                              | CQ2B32-T-PS                              |
| 40             | CQ2B40-S-PS                              | CQ2B40-T-PS                              |
| 50             | CQ2B50-S-PS                              | CQ2B50-T-PS                              |
| Contents       | ⑭ only                                   | Set of nos. ⑭, ⑮, ⑯                      |

\* Order the seal kit based on each bore size.

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

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

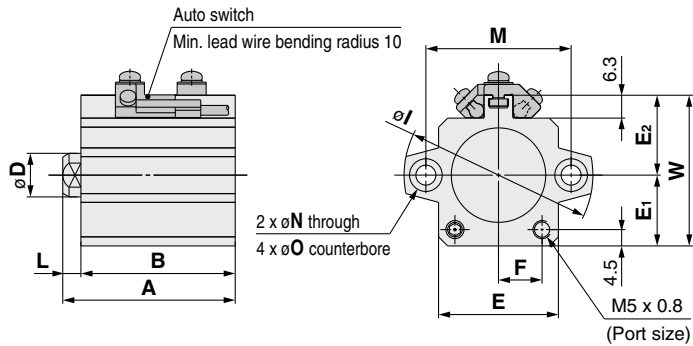
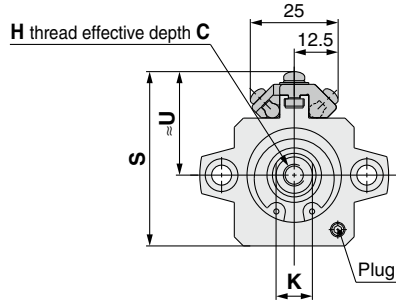


Bore Size

**∅12 to ∅50 Spring Return With/Without Auto Switch Magnet**

Through-hole: **C□QP2B□S**

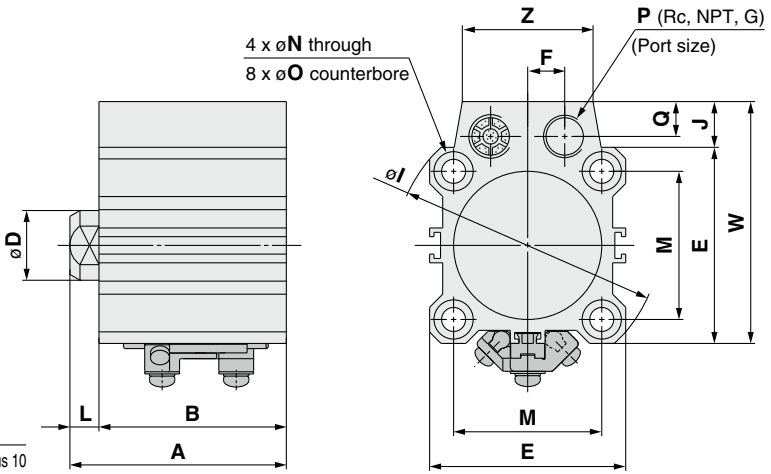
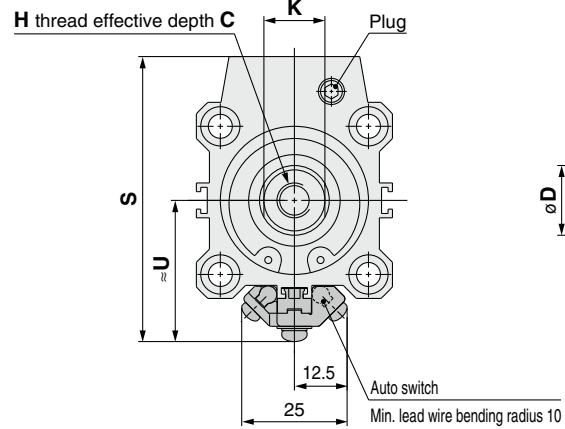
∅12 to ∅25



| Bore size [mm] | Without auto switch magnet |       |      |       | With auto switch magnet |       |      |       |      |      |    |    |    |                |                |      |          |    |    |     |    |     |               |      |
|----------------|----------------------------|-------|------|-------|-------------------------|-------|------|-------|------|------|----|----|----|----------------|----------------|------|----------|----|----|-----|----|-----|---------------|------|
|                | A                          |       | B    |       | A                       |       | B    |       | S    | U    | C  | D  | E  | E <sub>1</sub> | E <sub>2</sub> | F    | H        | I  | K  | L   | M  | N   | O             | W    |
|                | 5 st                       | 10 st | 5 st | 10 st | 5 st                    | 10 st | 5 st | 10 st |      |      |    |    |    |                |                |      |          |    |    |     |    |     |               |      |
| 12             | 25.5                       | 30.5  | 22   | 27    | 36.5                    | 41.5  | 33   | 38    | 33.5 | 20.5 | 6  | 6  | 23 | 13             | 14             | 7    | M3 x 0.5 | 32 | 5  | 3.5 | 22 | 3.5 | 6.5 depth 3.5 | 27   |
| 16             | 27                         | 32    | 23.5 | 28.5  | 39                      | 44    | 35.5 | 40.5  | 38.5 | 23.5 | 8  | 8  | 26 | 15             | 17             | 8.5  | M4 x 0.7 | 38 | 6  | 3.5 | 28 | 3.5 | 6.5 depth 3.5 | 32   |
| 20             | 29                         | 34    | 24.5 | 29.5  | 41                      | 46    | 36.5 | 41.5  | 42.5 | 25.5 | 7  | 10 | 30 | 17             | 19             | 10.5 | M5 x 0.8 | 47 | 8  | 4.5 | 36 | 5.5 | 9 depth 7     | 36   |
| 25             | 32.5                       | 37.5  | 27.5 | 32.5  | 42.5                    | 47.5  | 37.5 | 42.5  | 48   | 28.5 | 12 | 12 | 33 | 19.5           | 22             | 12   | M6 x 1.0 | 52 | 10 | 5   | 40 | 5.5 | 9 depth 7     | 41.5 |

\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27  
\* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

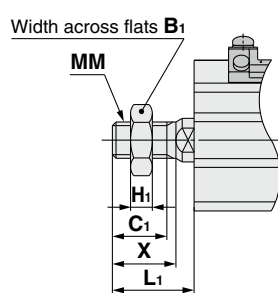
**∅32 to ∅50**



| Bore size [mm] | Without auto switch magnet |       |       |      | With auto switch magnet |       |      |       |      |      |      |      |      |      |    |    |    |     |           |    |      |    |   |    |     |            |       |      |       |       |
|----------------|----------------------------|-------|-------|------|-------------------------|-------|------|-------|------|------|------|------|------|------|----|----|----|-----|-----------|----|------|----|---|----|-----|------------|-------|------|-------|-------|
|                | A                          |       | B     |      | A                       |       | B    |       | S    | U    | C    | D    | E    | F    | H  | I  | J  | K   | L         | M  | N    | O  | P | Q  | W   | Z          |       |      |       |       |
|                | 5 st                       | 10 st | 20 st | 5 st | 10 st                   | 20 st | 5 st | 10 st |      |      |      |      |      |      |    |    |    |     |           |    |      |    |   |    |     |            | 20 st | 5 st | 10 st | 20 st |
| 32             | 35                         | 40    | —     | 28   | 33                      | —     | 45   | 50    | —    | 38   | 43   | —    | 65.5 | 32.5 | 13 | 16 | 45 | 8.5 | M8 x 1.25 | 60 | 10.5 | 14 | 7 | 34 | 5.5 | 9 depth 7  | 1/8   | 8    | 55.5  | 30    |
| 40             | 41.5                       | 46.5  | —     | 34.5 | 39.5                    | —     | 51.5 | 56.5  | —    | 44.5 | 49.5 | —    | 72   | 36   | 13 | 16 | 52 | 8.5 | M8 x 1.25 | 69 | 10   | 14 | 7 | 40 | 5.5 | 9 depth 7  | 1/8   | 8    | 62    | 30    |
| 50             | —                          | 48.5  | 58.5  | —    | 40.5                    | 50.5  | —    | 58.5  | 68.5 | —    | 50.5 | 60.5 | 87   | 42   | 15 | 20 | 64 | 11  | M10 x 1.5 | 86 | 13   | 17 | 8 | 50 | 6.6 | 11 depth 8 | 1/4   | 10   | 77    | 39    |

\* For details on the rod end nut ⇨ p. 26  
\* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

**Rod end male thread**



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | 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 |
| 32             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |
| 40             | 22             | 20.5           | 8              | 28.5           | M14 x 1.5  | 23.5 |
| 50             | 27             | 26             | 11             | 33.5           | M18 x 1.5  | 28.5 |

|                   |                                   |                |
|-------------------|-----------------------------------|----------------|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>     |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>    |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>     |
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>     |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>    |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>     |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>    |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2□S</b>   |
| Anti-lateral Load | Double Acting, Double Rod         | <b>CQ2□SW</b>  |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>     |
| Long Stroke       | Double Acting, Double Rod         | <b>CQ2W</b>    |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>    |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>   |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-RV</b>  |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-RV</b> |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>    |
| Axial Piping      | Double Acting, Double Rod         | <b>CQP2W</b>   |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>    |
| With End Lock     | Double Acting, Double Rod         | <b>CBQ2W</b>   |
| Auto Switch       | Double Acting, Single Rod         | <b>CQP2</b>    |
| Auto Switch       | Double Acting, Double Rod         | <b>CQP2W</b>   |
| Made to Order     | Double Acting, Single Rod         | <b>CQP2</b>    |
| Made to Order     | Double Acting, Double Rod         | <b>CQP2W</b>   |

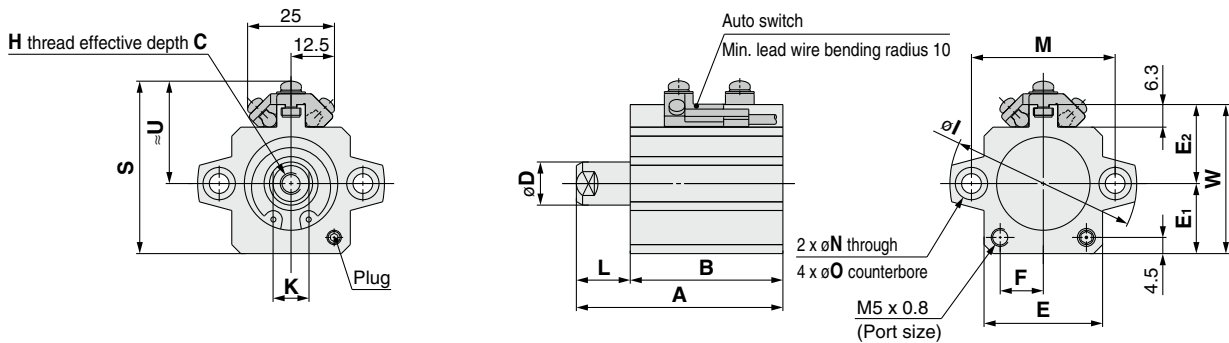
# CQP2 Series

Bore Size

## ∅12 to ∅50 Spring Extend With/Without Auto Switch Magnet

Through-hole: C□QP2B□T

∅12 to ∅25

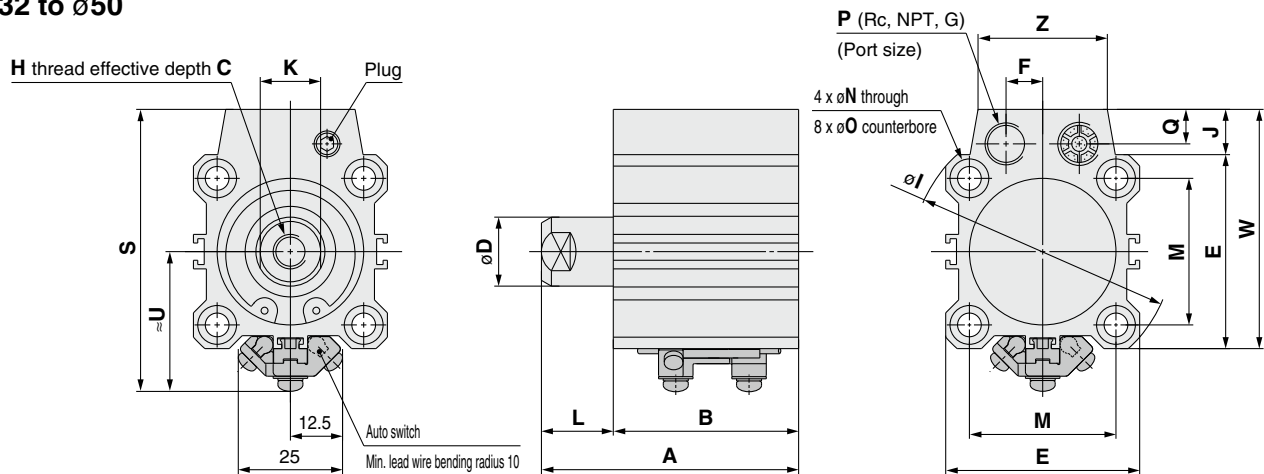


| Bore size [mm] | Without auto switch magnet |       |      |       | With auto switch magnet |       |      |       | S    | U    | C  | D  | E  | E <sub>1</sub> | E <sub>2</sub> | F    | H        | I  | K  | L    |       | M  | N   | O             | W    |
|----------------|----------------------------|-------|------|-------|-------------------------|-------|------|-------|------|------|----|----|----|----------------|----------------|------|----------|----|----|------|-------|----|-----|---------------|------|
|                | A                          |       | B    |       | A                       |       | B    |       |      |      |    |    |    |                |                |      |          |    |    | 5 st | 10 st |    |     |               |      |
|                | 5 st                       | 10 st | 5 st | 10 st | 5 st                    | 10 st | 5 st | 10 st |      |      |    |    |    |                |                |      |          |    |    | 5 st | 10 st |    |     |               |      |
| 12             | 30.5                       | 40.5  | 22   | 27    | 45.9                    | 55.9  | 37.4 | 42.4  | 33.5 | 20.5 | 6  | 6  | 23 | 13             | 14             | 7    | M3 x 0.5 | 32 | 5  | 8.5  | 13.5  | 22 | 3.5 | 6.5 depth 3.5 | 27   |
| 16             | 32                         | 42    | 23.5 | 28.5  | 44                      | 54    | 35.5 | 40.5  | 38.5 | 23.5 | 8  | 8  | 26 | 15             | 17             | 8.5  | M4 x 0.7 | 38 | 6  | 8.5  | 13.5  | 28 | 3.5 | 6.5 depth 3.5 | 32   |
| 20             | 34                         | 44    | 24.5 | 29.5  | 46                      | 56    | 36.5 | 41.5  | 42.5 | 25.5 | 7  | 10 | 30 | 17             | 19             | 10.5 | M5 x 0.8 | 47 | 8  | 9.5  | 14.5  | 36 | 5.5 | 9 depth 7     | 36   |
| 25             | 37.5                       | 47.5  | 27.5 | 32.5  | 47.5                    | 57.5  | 37.5 | 42.5  | 48   | 28.5 | 12 | 12 | 33 | 19.5           | 22             | 12   | M6 x 1.0 | 52 | 10 | 10   | 15    | 40 | 5.5 | 9 depth 7     | 41.5 |

\* For details on the rod end nut ⇨ p. 26

\* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

∅32 to ∅50



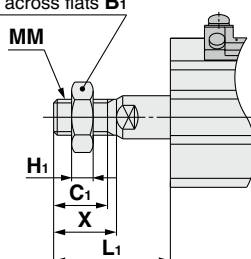
| Bore size [mm] | Without auto switch magnet |       |       |      | With auto switch magnet |       |      |       | S    | U    | C    | D    | E    | F    | H  | I  | J  | K   | L         |       |       | M  | N  | O  | P  | Q  | W   | Z          |       |    |      |    |
|----------------|----------------------------|-------|-------|------|-------------------------|-------|------|-------|------|------|------|------|------|------|----|----|----|-----|-----------|-------|-------|----|----|----|----|----|-----|------------|-------|----|------|----|
|                | A                          |       | B     |      | A                       |       | B    |       |      |      |      |      |      |      |    |    |    |     | 5 st      | 10 st | 20 st |    |    |    |    |    |     |            |       |    |      |    |
|                | 5 st                       | 10 st | 20 st | 5 st | 10 st                   | 20 st | 5 st | 10 st |      |      |      |      |      |      |    |    |    |     | 20 st     | 5 st  | 10 st |    |    |    |    |    |     |            | 20 st |    |      |    |
| 32             | 40                         | 50    | —     | 28   | 33                      | —     | 50   | 60    | —    | 38   | 43   | —    | 62   | 29   | 13 | 16 | 45 | 8.5 | M8 x 1.25 | 60    | 10.5  | 14 | 12 | 17 | —  | 34 | 5.5 | 9 depth 7  | 1/8   | 8  | 55.5 | 30 |
| 40             | 46.5                       | 56.5  | —     | 34.5 | 39.5                    | —     | 56.5 | 66.5  | —    | 44.5 | 49.5 | —    | 68.5 | 32.5 | 13 | 16 | 52 | 8.5 | M8 x 1.25 | 69    | 10    | 14 | 12 | 17 | —  | 40 | 5.5 | 9 depth 7  | 1/8   | 8  | 62   | 30 |
| 50             | —                          | 58.5  | 78.5  | —    | 40.5                    | 50.5  | —    | 68.5  | 88.5 | —    | 50.5 | 60.5 | 83.5 | 38.5 | 15 | 20 | 64 | 11  | M10 x 1.5 | 86    | 13    | 17 | —  | 18 | 28 | 50 | 6.6 | 11 depth 8 | 1/4   | 10 | 77   | 39 |

\* For details on the rod end nut ⇨ p. 26

\* For the auto switch proper mounting position and mounting height ⇨ p. 139 to 145

Rod end male thread

Width across flats B<sub>1</sub>



| Bore size [mm] | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> |       |       | MM         | X    |
|----------------|----------------|----------------|----------------|----------------|-------|-------|------------|------|
|                |                |                |                | 5 st           | 10 st | 20 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 |
| 32             | 22             | 20.5           | 8              | 33.5           | 38.5  | —     | M14 x 1.5  | 23.5 |
| 40             | 22             | 20.5           | 8              | 33.5           | 38.5  | —     | M14 x 1.5  | 23.5 |
| 50             | 27             | 26             | 11             | —              | 43.5  | 53.5  | M18 x 1.5  | 28.5 |

# Compact Cylinder: With End Lock

## CBQ2 Series

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

### How to Order

Without auto switch

CBQ2 B 40 [ ] - 30 DC [ ] - H N - [ ]

With auto switch

CDBQ2 B 40 [ ] - 30 DC [ ] - H N - M9BW [ ] - [ ]

With auto switch magnet

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

#### ① Mounting

|    |                  |             |
|----|------------------|-------------|
| B  | Through-hole*1   | ø20 to ø100 |
| L  | Foot             |             |
| LC | Compact foot     |             |
| F  | Rod flange       |             |
| G  | Head flange      |             |
| D  | Double clevis    |             |
| A  | Both ends tapped |             |

\*1 At the 75 and 100 mm strokes with ø80, ø100, both ends tapped (A) is the standard. Through-hole (B) is not available.

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

\* A through-hole type mounting bolt is available as an option. For details ⇨ p. 135

#### ④ Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 145) [mm]

| Bore size              | Standard stroke             |
|------------------------|-----------------------------|
| 20, 25, 32, 40, 50, 63 | 10, 15, 20, 25, 50, 75, 100 |
| 80, 100                | 25, 50, 75, 100             |

\* For the manufacturing of intermediate strokes ⇨ p. 133

#### ⑦ Body option

|     |                       |
|-----|-----------------------|
| Nil | Rod end female thread |
| M   | Rod end male thread   |

#### ⑧ Lock position

|   |               |
|---|---------------|
| H | Head end lock |
| R | Rod end lock  |

#### ⑪ Number of auto switches

|     |   |
|-----|---|
| Nil | 2 |
| S   | 1 |
| n   | n |

#### ⑫ Made to order common specifications

For details ⇨ p. 133

#### ② Bore size

|     |        |
|-----|--------|
| 20  | 20 mm  |
| 25  | 25 mm  |
| 32  | 32 mm  |
| 40  | 40 mm  |
| 50  | 50 mm  |
| 63  | 63 mm  |
| 80  | 80 mm  |
| 100 | 100 mm |

#### ③ Port thread type

|     |          |             |
|-----|----------|-------------|
| Nil | M thread | ø12, ø25    |
|     | Rc       |             |
| TN  | NPT      | ø32 to ø100 |
| TF  | G        |             |

#### ⑤ Action

|   |               |
|---|---------------|
| D | Double acting |
|---|---------------|

#### ⑥ Cushion

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

#### ⑨ Manual release type

|   |               |
|---|---------------|
| N | Non-lock type |
| L | Lock type     |

#### ⑩ Auto switch

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

\* For applicable auto switches ⇨ p. 132

### Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) CDBQ2L32-30DC-RL

# Compact Cylinder: With End Lock **CBQ2 Series**



Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, End **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2□S**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, End **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

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

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

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

| Type   | Special function                          | Electrical entry   | Indicator light | Wiring (Output) | Load voltage            |      | Auto switch model |                | Lead wire length [m] |             |             |             |               | Pre-wired connector | Applicable load |             |              |             |   |            |   |            |   |   |   |   |
|--|---|--------------------|-----------------|-----------------|-------------------------|------|-------------------|----------------|----------------------|-------------|-------------|-------------|---------------|---------------------|-----------------|-------------|--------------|-------------|---|------------|---|------------|---|---|---|---|
|  |   |                    |                 |                 | DC                      | AC   | Perpendicular     |                | In-line              |             | 0.5 (Nil)   | 1 (M)       | 3 (L)         |                     |                 | 5 (Z)       | None (N)     |             |   |            |   |            |   |   |   |   |
|  |   |                    |                 |                 |                         |      | ø20, ø25          | ø32 to ø100    | ø20, ø25             | ø32 to ø100 |             |             |               |                     |                 |             |              |             |   |            |   |            |   |   |   |   |
| Solid state auto switch                      | —   | Grommet            | Yes             | 3-wire (NPN)    | 24 V                    | —    | 5 V, 12 V         | <b>M9NV</b>    | <b>M9N</b>           | ●           | ●           | ●           | ○             | —                   | ○               | IC circuit  |              |             |   |            |   |            |   |   |   |   |
|  |   |                    |                 | 3-wire (PNP)    |                         |      |                   | <b>M9PV</b>    | <b>M9P</b>           | ●           | ●           | ●           | ○             | —                   | ○               |             |              |             |   |            |   |            |   |   |   |   |
|  |   | 2-wire             |                 | <b>M9BV</b>     |                         |      |                   | <b>M9B</b>     | ●                    | ●           | ●           | ○           | —             | ○                   |                 |             |              |             |   |            |   |            |   |   |   |   |
|  |   | —                  |                 | <b>J79C</b>     |                         |      |                   | —              | ●                    | —           | ●           | ●           | —             | —                   | —               |             |              |             |   |            |   |            |   |   |   |   |
|  | Diagnostic indication (2-color indicator) | Connector          |                 | 3-wire (NPN)    | 24 V                    | —    | 5 V, 12 V         | <b>M9NVV</b>   | <b>M9NW</b>          | ●           | ●           | ●           | ○             | —                   | ○               | IC circuit  |              |             |   |            |   |            |   |   |   |   |
|  |   |                    |                 | 3-wire (PNP)    |                         |      |                   | <b>M9PWW</b>   | <b>M9PW</b>          | ●           | ●           | ●           | ○             | —                   | ○               |             |              |             |   |            |   |            |   |   |   |   |
|  | 2-wire                                    | <b>M9BWW</b>       |                 | <b>M9BW</b>     |                         |      |                   | ●              | ●                    | ●           | ○           | —           | ○             |                     |                 |             |              |             |   |            |   |            |   |   |   |   |
|  | 3-wire (NPN)                              | <b>M9NAV</b> *1    |                 | <b>M9NA</b> *1  |                         |      |                   | ○              | ○                    | ●           | ○           | —           | ○             | IC circuit          |                 |             |              |             |   |            |   |            |   |   |   |   |
|  | 3-wire (PNP)                              | <b>M9PAV</b> *1    | <b>M9PA</b> *1  | ○               | ○                       | ●    | ○                 | —              | ○                    |             |             |             |               |                     |                 |             |              |             |   |            |   |            |   |   |   |   |
|  | Water resistant (2-color indicator)       | Grommet            | 2-wire          | 24 V            | —                       | 12 V | <b>M9BAV</b> *1   | <b>M9BA</b> *1 | ○                    | ○           | ●           | ○           | —             | ○                   | —               |             |              |             |   |            |   |            |   |   |   |   |
| 4-wire                                       |   |                    | —               |                 |                         |      | <b>F79F</b>       | ●              | —                    | ●           | ○           | —           | ○             | IC circuit          |                 |             |              |             |   |            |   |            |   |   |   |   |
| With diagnostic output (2-color indicator)   | Connector                                 | 2-wire (Non-polar) | 24 V            |                 |                         |      | —                 | 5 V, 12 V      | —                    | —           | <b>P4DW</b> | —           | —             |                     | ●               | ●           | —            | ○           | — |            |   |            |   |   |   |   |
| Magnetic field resistant (2-color indicator) |   | —                  |                 |                 |                         |      |                   |                | —                    | —           | —           | —           | —             | —                   | —               | —           | —            | —           |   |            |   |            |   |   |   |   |
| Reed auto switch                             | —   | Grommet            |                 | Yes             | 3-wire (NPN equivalent) | 24 V |                   |                | —                    | 5 V         | —           | <b>A96V</b> | <b>A96</b>    | ●                   | —               | ●           | —            | —           |   | IC circuit |   |            |   |   |   |   |
|  |   |                    |                 |                 |                         |      |                   |                |                      |             |             | —           | <b>A72</b>    | —                   | <b>A72H</b>     | ●           | —            | ●           |   |            | — | —          | — |   |   |   |
|  |   |                    | 12 V            |                 |                         |      | 100 V             | <b>A93V</b> *2 |                      |             |             | <b>A93</b>  | ●             | ●                   | ●               | ●           | —            | —           |   |            |   |            |   |   |   |   |
|  |   | Connector          | No              |                 | 2-wire                  |      | 24 V              | —              |                      |             |             | 5 V, 12 V   | 100 V or less | —                   | —               | <b>A90V</b> | <b>A90</b>   | ●           | — | ●          | — | IC circuit |   |   |   |   |
|  |   |                    |                 |                 |                         |      |                   |                |                      |             |             |             |               |                     |                 | 12 V        | —            | <b>A73C</b> | — | ●          | — |            | ● | ● | — | — |
|  |   |                    |                 |                 |                         |      |                   |                |                      |             |             |             |               |                     |                 | 5 V, 12 V   | 24 V or less | <b>A80C</b> | — | ●          | — |            | ● | ● | — |   |
| Grommet                                      | Yes                                       | 2-wire             | 24 V            | —               | —                       | —    |                   |                | —                    | —           | <b>A79W</b> |             |               |                     |                 | —           | ●            | —           | ● | —          | — |            |   |   |   |   |
|  |   |                    |                 |                 |                         |      |                   |                |                      |             | —           |             |               |                     |                 | —           | —            | —           | — | —          |   | —          | — | — | — |   |

\*1 Water-resistant type auto switches can be mounted on the models on page 131, but SMC cannot guarantee water resistance.

Please contact SMC regarding water-resistant types with the model numbers on page 131.

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

- \* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NV  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWZ  
 None ..... N (Example) J79CN

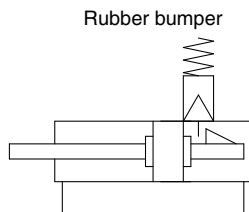
- \* Solid state auto switches marked with "○" are produced upon receipt of order.
- \* The D-P4DW type is only available in sizes ø40 to ø100.
- \* Only for the D-P4DW type, an auto switch is assembled and shipped with the cylinder.

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

\* When the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types with ø32 to ø50 are mounted on a surface other than the port side, order auto switch mounting brackets separately. For details ⇨ p. 150, 151

# CBQ2 Series

## Symbol



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

| Symbol | Specifications  |
|--------|---|
| -XB10  | Intermediate stroke (Using exclusive body)  |
| -XC26  | With split pins for double clevis pin/<br>double knuckle joint pin and flat washers |
| -XC85  | Grease for food processing equipment  |

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

## Specifications

| Bore size [mm]                        | 20  | 25   | 32   | 40   | 50   | 63   | 80   | 100  |
|---------------------------------------|---|------|------|------|------|------|------|------|
| <b>Action</b>                         | Double acting, Single rod   |      |      |      |      |      |      |      |
| <b>Fluid</b>                          | Air   |      |      |      |      |      |      |      |
| <b>Proof pressure</b>                 | 1.5 MPa   |      |      |      |      |      |      |      |
| <b>Maximum operating pressure</b>     | 1.0 MPa   |      |      |      |      |      |      |      |
| <b>Minimum operating pressure</b>     | 0.15 MPa* <sup>1</sup>  |      |      |      |      |      |      |      |
| <b>Ambient and fluid temperatures</b> | Without auto switch magnet: -10 to 70°C<br>With auto switch magnet: -10 to 60°C (No freezing) |      |      |      |      |      |      |      |
| <b>Lubrication</b>                    | Not required (Non-lube)   |      |      |      |      |      |      |      |
| <b>Piston speed</b>                   | 50 to 500 mm/s  |      |      |      |      |      |      |      |
| <b>Allowable kinetic energy [J]</b>   | 0.055   | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| <b>Stroke length tolerance</b>        | +1.0 mm* <sup>2</sup><br>0  |      |      |      |      |      |      |      |

\*1 0.05 MPa except for the end lock unit

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

## Lock Specifications

| Bore size [mm]                  | 20                       | 25  | 32  | 40  | 50   | 63   | 80   | 100  |
|---------------------------------|--------------------------|-----|-----|-----|------|------|------|------|
| <b>Holding force (Max.) [N]</b> | 215                      | 330 | 550 | 860 | 1340 | 2140 | 3450 | 5390 |
| <b>Backlash</b>                 | 2 mm or less             |     |     |     |      |      |      |      |
| <b>Manual release</b>           | Non-lock type, Lock type |     |     |     |      |      |      |      |

## Manufacturing of Intermediate Strokes

| Type         | A spacer is installed in the standard stroke body.  | Exclusive body (-XB10)   |
|--------------|---|--|
| Part no.     | Refer to "How to Order" for the standard model number. (⇨ p. 131)                                     | Suffix "-XB10" to the end of standard model number. (⇨ p. 131)                                   |
| Description  | Strokes in 5 mm increments are available by installing a spacer in the standard stroke cylinder.      | Dealing with the stroke in 1 mm increments by using an exclusive body with the specified stroke. |
| Stroke range | Bore size<br>20 to 100  | Stroke range<br>5 to 95  |
|              |   | Bore size<br>20 to 100   |
|              |   | Stroke range<br>6 to 99  |
| Example      | Part no.: CBQ2B40-45DC-HL<br>CBQ2B40-50DC-HL with 5 mm width spacer inside.<br>B dimension is 125 mm. | Part no.: CBQ2B40-45DC-HL-XB10<br>Makes 45 stroke tube.<br>B dimension is 120 mm.                |

In the case of an exclusive body type for ø20, ø25, ø80 and ø100 (-XB10) with the stroke length exceeding 25 mm, the reference values of the longitudinal dimension will be changed.  
Subtract from 50, 75 and 100 stroke dimensions and figure it out.

## Mounting Bracket Part Nos.

| Bore size [mm] | Foot* <sup>1</sup> | Compact foot* <sup>1</sup> | Flange   | Double clevis* <sup>2</sup> | Double clevis pivot bracket |
|----------------|--------------------|----------------------------|----------|-----------------------------|-----------------------------|
| 20             | CQS-L020           | CQS-LC020                  | CQS-F020 | CQS-D020                    | CQ-C020                     |
| 25             | CQS-L025           | CQS-LC025                  | CQS-F025 | CQS-D025                    | CQ-C025                     |
| 32             | CQ-L032            | CQ-LC032                   | CQ-F032  | CQ-D032                     | CQ-C032                     |
| 40             | CQ-L040            | CQ-LC040                   | CQ-F040  | CQ-D040                     | CQ-C040                     |
| 50             | CQ-L050            | CQ-LC050                   | CQ-F050  | CQ-D050                     | CQ-C050                     |
| 63             | CQ-L063            | CQ-LC063                   | CQ-F063  | CQ-D063                     | CQ-C063                     |
| 80             | CQ-L080            | CQ-LC080                   | CQ-F080  | CQ-D080                     | CQ-C080                     |
| 100            | CQ-L100            | CQ-LC100                   | CQ-F100  | CQ-D100                     | CQ-C100                     |

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

\*2 Parts included with each type of bracket are as follows. Foot, Compact foot, Flange: Body mounting bolts, Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts

\* Clevis pin and retaining rings are included with double clevis.

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

### Moisture Control Tube IDK Series



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

Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

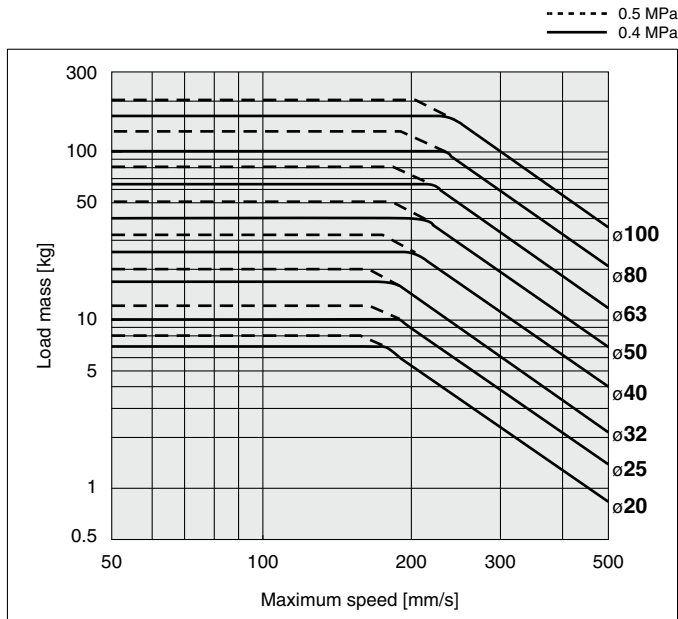
## ⚠ Precautions

**Refer to pages 189 to 191 before handling the products.**

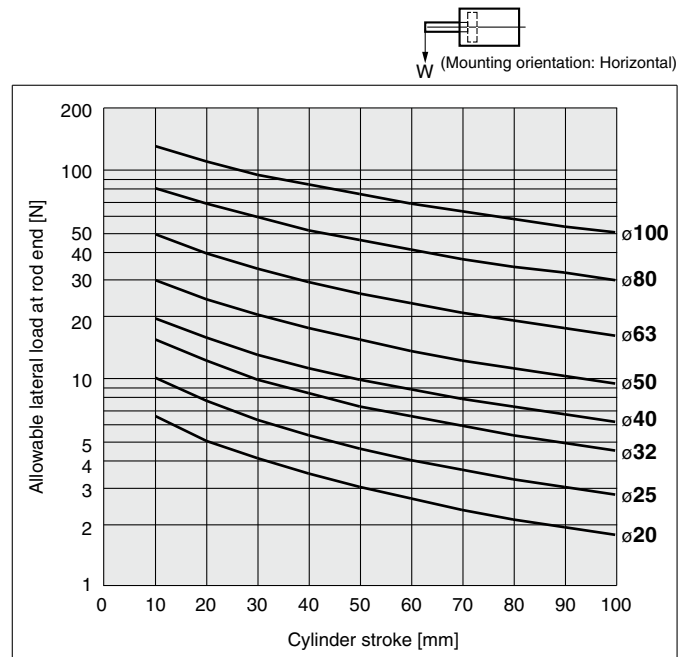
## Dimensions of Each Mounting Bracket

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

## Allowable Kinetic Energy



## Allowable Lateral Load at Rod End



## Weight

### Without Auto Switch Magnet, Non-lock Type (-□N)

| Bore size [mm] | Cylinder stroke [mm] |     |     |      |      |      |      |
|----------------|----------------------|-----|-----|------|------|------|------|
|                | 10                   | 15  | 20  | 25   | 50   | 75   | 100  |
| 20             | 211                  | 224 | 237 | 249  | 313  | 416  | 480  |
| 25             | 278                  | 294 | 310 | 325  | 405  | 534  | 613  |
| 32             | 378                  | 399 | 419 | 440  | 544  | 649  | 754  |
| 40             | 540                  | 563 | 586 | 610  | 725  | 845  | 965  |
| 50             | 868                  | 904 | 940 | 976  | 1158 | 1346 | 1534 |
| 63             | —                    | —   | —   | 1220 | 1424 | 1636 | 1847 |
| 80             | —                    | —   | —   | 2821 | 3160 | 3495 | 3829 |
| 100            | —                    | —   | —   | 4306 | 4760 | 5220 | 5680 |

### Additional Weight

| Bore size [mm]  | 20          | 25  | 32  | 40  | 50  | 63  | 80   | 100  |
|---|-------------|-----|-----|-----|-----|-----|------|------|
| Lock type (-□L)                                       | 10          | 10  | 10  | 20  | 20  | 20  | 30   | 30   |
| With auto switch magnet                               | 5           | 6   | 11  | 13  | 18  | 22  | 24   | 35   |
| Both ends tapped                                      | —           | —   | 6   | 6   | 6   | 19  | 45   | 45   |
| Rod end male thread                                   | Male thread | 6   | 12  | 26  | 27  | 53  | 120  | 175  |
|   | Nut         | 4   | 8   | 17  | 17  | 32  | 49   | 116  |
| Foot (Including mounting bolts)                       | 152         | 177 | 120 | 138 | 219 | 297 | 589  | 968  |
| Compact foot (Including mounting bolts)               | 117         | 135 | 94  | 109 | 172 | 234 | 492  | 762  |
| Rod flange (Including mounting bolts)                 | 143         | 180 | 180 | 214 | 373 | 559 | 1056 | 1365 |
| Head flange (Including mounting bolts)                | 137         | 171 | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis (Including pin, retaining rings, bolts) | 92          | 127 | 151 | 196 | 393 | 554 | 1109 | 1887 |

Calculation: (Example) **CBQ2B32-50DCM-HN**

- Basic weight: CBQ2B32-50DC-HN ..... 544 g
  - Additional weight: Rod end male thread ..... 43 g (26 g + 17g)
- Total 587 g

|                                  |                      |
|----------------------------------|----------------------|
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Standard                         | <b>CQ2W</b>          |
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Single Acting, Spring Return-End | <b>CQ2</b>           |
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Large Bore Size                  | <b>CQ2W</b>          |
| Double Acting, Double Rod        | <b>CQ2W</b>          |
| Anti-lateral Load                | <b>CQ2□S</b>         |
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Long Stroke                      | <b>CQ2</b>           |
| Double Acting, Single Rod        | <b>CQ2K</b>          |
| Non-rotating Rod                 | <b>CQ2KW</b>         |
| Double Acting, Double Rod        | <b>CQ2-RV</b>        |
| Water Resistant                  | <b>CQ2-RV</b>        |
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Double Acting, Double Rod        | <b>CQ2</b>           |
| Axial Piping                     | <b>CQ2</b>           |
| Double Acting, Single Rod        | <b>CQ2</b>           |
| Single Acting, Spring Return-End | <b>CQ2</b>           |
| With End Lock                    | <b>CBQ2</b>          |
| Double Acting, Single Rod        | <b>Auto Switch</b>   |
| Double Acting, Single Rod        | <b>Made to Order</b> |



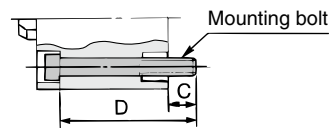
# CBQ2 Series

## Through-hole Type Mounting Bolt for the C(D)BQ2

Mounting bolt for the through-hole mounting of the C(D)BQ2 is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

**Example) CQ-M5 x 75L 4 pcs.**

\* Be sure to use the attached flat washers when mounting ø20 and ø25 cylinders with through-holes.



Type: Hexagon socket head cap screw  
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated

### With Head End Lock (H□)

| Cylinder model     | C   | D   | Mounting bolt part no. |
|--------------------|-----|-----|------------------------|
| C(D)BQ2B20-10DC-H□ | 10  | 75  | CQ-M5 x 75L            |
| -15DC-H□           |     | 80  | x 80L                  |
| -20DC-H□           |     | 85  | x 85L                  |
| -25DC-H□           |     | 90  | x 90L                  |
| -50DC-H□           |     | 120 | x 120L                 |
| -75DC-H□           |     | 145 | x 145L                 |
| -100DC-H□          |     | 170 | x 170L                 |
| C(D)BQ2B25-10DC-H□ | 7   | 75  | CQ-M5 x 75L            |
| -15DC-H□           |     | 80  | x 80L                  |
| -20DC-H□           |     | 85  | x 85L                  |
| -25DC-H□           |     | 90  | x 90L                  |
| -50DC-H□           |     | 120 | x 120L                 |
| -75DC-H□           |     | 145 | x 145L                 |
| -100DC-H□          |     | 170 | x 170L                 |
| C(D)BQ2B32-10DC-H□ | 6.5 | 75  | CQ-M5 x 75L            |
| -15DC-H□           |     | 80  | x 80L                  |
| -20DC-H□           |     | 85  | x 85L                  |
| -25DC-H□           |     | 90  | x 90L                  |
| -50DC-H□           |     | 115 | x 115L                 |
| -75DC-H□           |     | 140 | x 140L                 |
| -100DC-H□          |     | 165 | x 165L                 |
| C(D)BQ2B40-10DC-H□ | 7   | 85  | CQ-M5 x 85L            |
| -15DC-H□           |     | 90  | x 90L                  |
| -20DC-H□           |     | 95  | x 95L                  |
| -25DC-H□           |     | 100 | x 100L                 |
| -50DC-H□           |     | 125 | x 125L                 |
| -75DC-H□           |     | 150 | x 150L                 |
| -100DC-H□          |     | 175 | x 175L                 |

| Cylinder model      | C    | D   | Mounting bolt part no. |
|---------------------|------|-----|------------------------|
| C(D)BQ2B50-10DC-H□  | 12.5 | 90  | CQ-M6 x 90L            |
| -15DC-H□            |      | 95  | x 95L                  |
| -20DC-H□            |      | 100 | x 100L                 |
| -25DC-H□            |      | 105 | x 105L                 |
| -50DC-H□            |      | 130 | x 130L                 |
| -75DC-H□            |      | 155 | x 155L                 |
| -100DC-H□           |      | 180 | x 180L                 |
| C(D)BQ2B63-10DC-H□  | 13.5 | 90  | CQ-M8 x 90L            |
| -15DC-H□            |      | 95  | x 95L                  |
| -20DC-H□            |      | 100 | x 100L                 |
| -25DC-H□            |      | 105 | x 105L                 |
| -50DC-H□            |      | 130 | x 130L                 |
| -75DC-H□            |      | 155 | x 155L                 |
| -100DC-H□           |      | 180 | x 180L                 |
| C(D)BQ2B80-25DC-H□  | 12.5 | 135 | CQ-M10 x 135L          |
| -50DC-H□            | 13   | 160 | x 160L                 |
| C(D)BQ2B100-25DC-H□ |      | 145 | CQ-M10 x 145L          |
| -50DC-H□            |      | 170 | x 170L                 |

### With Rod End Lock (R□)

| Cylinder model     | C   | D   | Mounting bolt part no. |
|--------------------|-----|-----|------------------------|
| C(D)BQ2B20-10DC-R□ | 6.5 | 65  | CQ-M5 x 65L            |
| -15DC-R□           |     | 70  | x 70L                  |
| -20DC-R□           |     | 75  | x 75L                  |
| -25DC-R□           |     | 80  | x 80L                  |
| -50DC-R□           |     | 120 | x 120L                 |
| -75DC-R□           |     | 145 | x 145L                 |
| -100DC-R□          |     | 170 | x 170L                 |
| C(D)BQ2B25-10DC-R□ | 8.5 | 70  | CQ-M5 x 70L            |
| -15DC-R□           |     | 75  | x 75L                  |
| -20DC-R□           |     | 80  | x 80L                  |
| -25DC-R□           |     | 85  | x 85L                  |
| -50DC-R□           |     | 120 | x 120L                 |
| -75DC-R□           |     | 145 | x 145L                 |
| -100DC-R□          |     | 170 | x 170L                 |
| C(D)BQ2B32-10DC-R□ | 9   | 70  | CQ-M5 x 70L            |
| -15DC-R□           |     | 75  | x 75L                  |
| -20DC-R□           |     | 80  | x 80L                  |
| -25DC-R□           |     | 85  | x 85L                  |
| -50DC-R□           |     | 110 | x 110L                 |
| -75DC-R□           |     | 135 | x 135L                 |
| -100DC-R□          |     | 160 | x 160L                 |
| C(D)BQ2B40-10DC-R□ | 7.5 | 75  | CQ-M5 x 75L            |
| -15DC-R□           |     | 80  | x 80L                  |
| -20DC-R□           |     | 85  | x 85L                  |
| -25DC-R□           |     | 90  | x 90L                  |
| -50DC-R□           |     | 115 | x 115L                 |
| -75DC-R□           |     | 140 | x 140L                 |
| -100DC-R□          |     | 165 | x 165L                 |

| Cylinder model      | C    | D   | Mounting bolt part no. |
|---------------------|------|-----|------------------------|
| C(D)BQ2B50-10DC-R□  | 12.5 | 80  | CQ-M6 x 80L            |
| -15DC-R□            |      | 85  | x 85L                  |
| -20DC-R□            |      | 90  | x 90L                  |
| -25DC-R□            |      | 95  | x 95L                  |
| -50DC-R□            |      | 120 | x 120L                 |
| -75DC-R□            |      | 145 | x 145L                 |
| -100DC-R□           |      | 170 | x 170L                 |
| C(D)BQ2B63-10DC-R□  | 14.5 | 85  | CQ-M8 x 85L            |
| -15DC-R□            |      | 90  | x 90L                  |
| -20DC-R□            |      | 95  | x 95L                  |
| -25DC-R□            |      | 100 | x 100L                 |
| -50DC-R□            |      | 125 | x 125L                 |
| -75DC-R□            |      | 150 | x 150L                 |
| -100DC-R□           |      | 175 | x 175L                 |
| C(D)BQ2B80-25DC-R□  | 15   | 130 | CQ-M10 x 130L          |
| -50DC-R□            | 15.5 | 155 | x 155L                 |
| C(D)BQ2B100-25DC-R□ |      | 140 | CQ-M10 x 140L          |
| -50DC-R□            |      | 165 | x 165L                 |





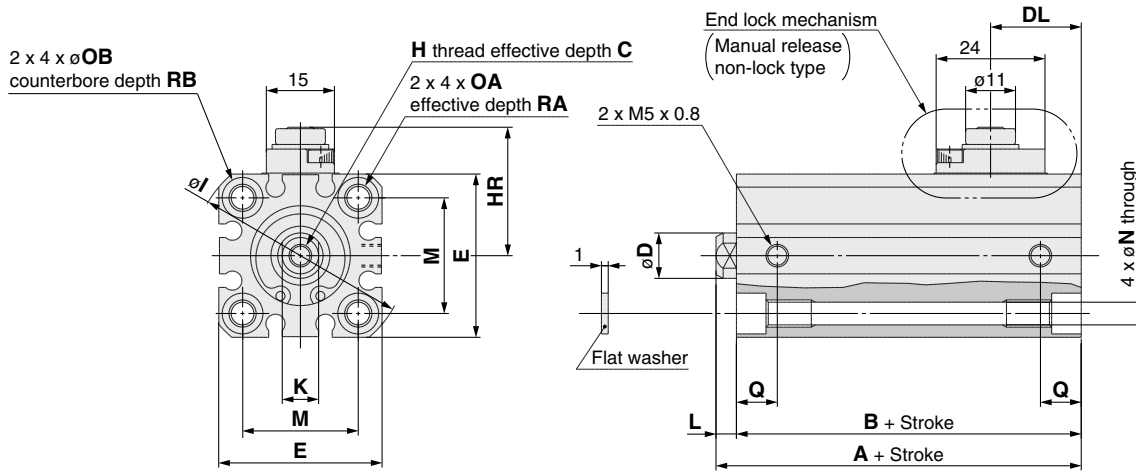
# CBQ2 Series

Bore Size

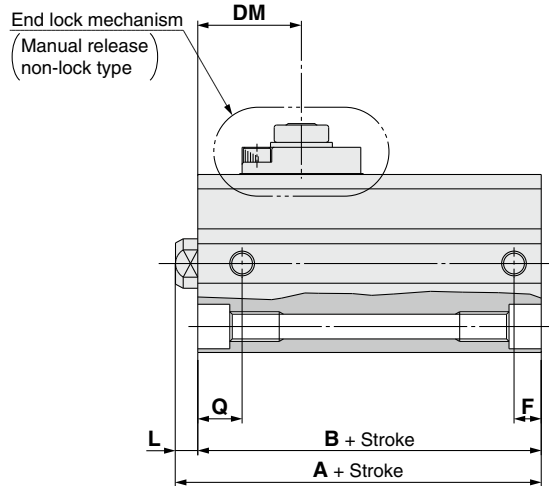
**Ø20, Ø25** With/Without Auto Switch Magnet

Through-hole: **C□BQ2B**

With head end lock



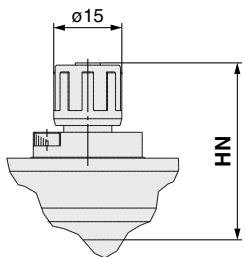
With rod end lock



| Bore size [mm] | Standard stroke | With head end lock |    | With rod end lock |      |     | C  | D  | DL | DM | E  | H        | HR   | I  | K  | L           | M    | N   | OA       | OB | Q  | RA | RB |
|----------------|-----------------|--------------------|----|-------------------|------|-----|----|----|----|----|----|----------|------|----|----|-------------|------|-----|----------|----|----|----|----|
|                |                 | A                  | B  | A                 | B    | F   |    |    |    |    |    |          |      |    |    |             |      |     |          |    |    |    |    |
| 20             | 10, 15, 20, 25  | 65.5               | 61 | 59                | 54.5 | 5.5 | 7  | 10 | 20 | 21 | 36 | M5 x 0.8 | 28.5 | 47 | 8  | 4.5<br>14.5 | 25.5 | 5.4 | M6 x 1.0 | 9  | 9  | 10 | 7  |
|                | 50, 75, 100     | 80.5               | 66 | 80.5              | 66   | 9   |    |    |    |    |    |          |      |    |    |             |      |     |          |    |    |    |    |
| 25             | 10, 15, 20, 25  | 69                 | 64 | 62.5              | 57.5 | 5.5 | 12 | 12 | 21 | 21 | 40 | M6 x 1.0 | 29.5 | 52 | 10 | 5<br>15     | 28   | 5.4 | M6 x 1.0 | 9  | 11 | 10 | 7  |
|                | 50, 75, 100     | 84                 | 69 | 84                | 69   | 11  |    |    |    |    |    |          |      |    |    |             |      |     |          |    |    |    |    |

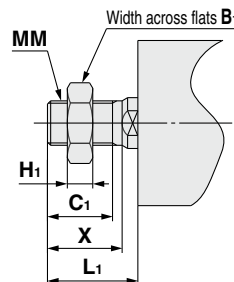
\* For details on the rod end nut and accessory brackets ⇨ p. 26, 27

**End lock mechanism**  
(Manual release lock type)



| Bore size [mm] | HN (Max.) [mm] |
|----------------|----------------|
| 20             | 40             |
| 25             | 41             |

**Rod end male thread**



| Bore size [mm] | Standard stroke | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM         | X    |
|----------------|-----------------|----------------|----------------|----------------|----------------|------------|------|
| 20             | 10, 15, 20, 25  | 13             | 12             | 5              | 18.5<br>28.5   | M8 x 1.25  | 14   |
|                | 50, 75, 100     |                |                |                |                |            |      |
| 25             | 10, 15, 20, 25  | 17             | 15             | 6              | 22.5<br>32.5   | M10 x 1.25 | 17.5 |
|                | 50, 75, 100     |                |                |                |                |            |      |

## Dimensions of Each Mounting Bracket

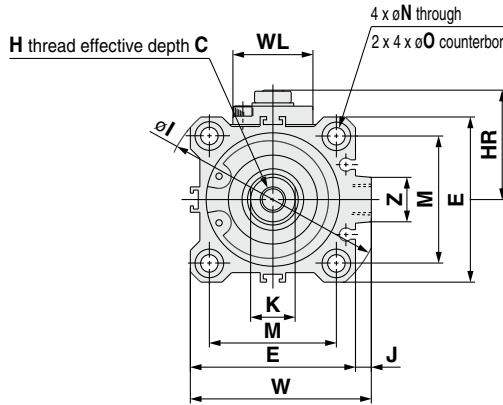
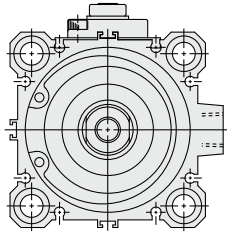
The dimensions of each mounting bracket are the same as those of the standard type, double acting, single rod (except the configuration of the piston rod). Refer to pages 21 to 25.

Bore Size

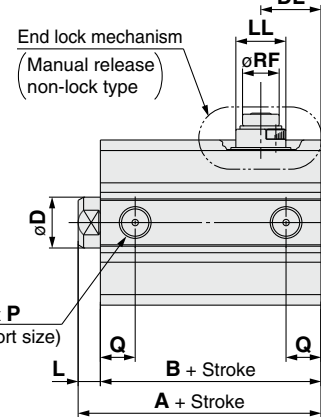
## ø32 to ø100 With/Without Auto Switch Magnet

Standard: **C□BQ2B**

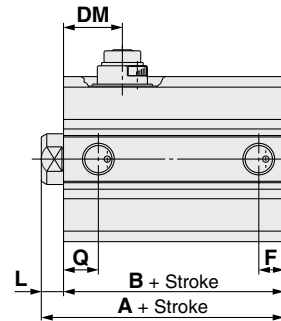
ø63, ø80, ø100



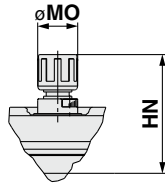
With head end lock



With rod end lock



**End lock mechanism**  
(Manual release lock type)



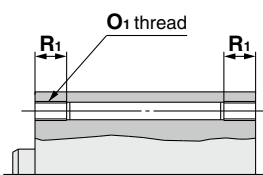
| Bore size [mm] | [mm]      |    |
|----------------|-----------|----|
|                | HN (Max.) | MO |
| 32             | 45        | 15 |
| 40             | 52.5      | 19 |
| 50             | 59        | 19 |
| 63             | 64        | 19 |
| 80             | 76.5      | 23 |
| 100            | 86        | 23 |

| Bore size [mm] | Standard stroke                 | [mm]               |       |      |                   |       |      |      |    |    |      |      |     |           |      |     |     |    |    |    |    |
|----------------|---------------------------------|--------------------|-------|------|-------------------|-------|------|------|----|----|------|------|-----|-----------|------|-----|-----|----|----|----|----|
|                |                                 | With head end lock |       |      | With rod end lock |       |      |      | C  | D  | DL   | DM   | E   | H         | HR   | I   | J   | K  | L  | LL | M  |
|                |                                 | A                  | B     | Q    | A                 | B     | F    | Q    |    |    |      |      |     |           |      |     |     |    |    |    |    |
| 32             | 10, 15, 20<br>25, 50<br>75, 100 | 72.5               | 65.5  | 12.5 | 65                | 58    | 7.5  | 10.5 | 13 | 16 | 25   | 22   | 45  | M8 x 1.25 | 33.5 | 60  | 4.5 | 14 | 7  | 15 | 34 |
| 40             |                                 | 82                 | 75    | 14   | 71.5              | 64.5  | 8    | 11   | 13 | 16 | 29   | 26   | 52  | M8 x 1.25 | 38.5 | 69  | 5   | 14 | 7  | 21 | 40 |
| 50             |                                 | 83.5               | 75.5  | 14   | 73.5              | 65.5  | 10.5 | 10.5 | 15 | 20 | 29.5 | 24   | 64  | M10 x 1.5 | 45   | 86  | 7   | 17 | 8  | 21 | 50 |
| 63             |                                 | 85                 | 77    | 15.5 | 79                | 71    | 10.5 | 15   | 15 | 20 | 28.5 | 25   | 77  | M10 x 1.5 | 50   | 103 | 7   | 17 | 8  | 21 | 60 |
| 80             | 25, 50                          | 121                | 111   | 18   | 113.5             | 103.5 | 12.5 | 16   | 21 | 25 | 45   | 45.5 | 98  | M16 x 2.0 | 62   | 132 | 6   | 22 | 10 | 30 | 77 |
|                | 75, 100                         | 136                | 116   | 19   | 136               | 116   | 19   | 19   |    |    |      |      |     |           |      |     |     |    | 20 |    |    |
| 100            | 25, 50                          | 132.5              | 120.5 | 22   | 125               | 113   | 13   | 23   | 27 | 30 | 48   | 49   | 117 | M20 x 2.5 | 71.5 | 156 | 6.5 | 27 | 12 | 30 | 94 |
|                | 75, 100                         | 147.5              | 125.5 | 23   | 147.5             | 125.5 | 23   | 23   |    |    |      |      |     |           |      |     |     |    | 22 |    |    |

| Bore size [mm] | N   | O                  | P     | R                  | RF | W     | WL | Z  |
|----------------|-----|--------------------|-------|--------------------|----|-------|----|----|
| 32             | 5.5 | 9                  | Rc1/8 | 7                  | 11 | 49.5  | 24 | 14 |
| 40             | 5.5 | 9                  | Rc1/8 | 7                  | 11 | 57    | 24 | 14 |
| 50             | 6.6 | 11                 | Rc1/4 | 8                  | 11 | 71    | 24 | 19 |
| 63             | 9   | 14                 | Rc1/4 | 10.5               | 11 | 84    | 24 | 19 |
| 80             | 11  | 17.5 <sup>*1</sup> | Rc3/8 | 13.5 <sup>*1</sup> | 21 | 104   | 40 | 26 |
| 100            | 11  | 17.5 <sup>*1</sup> | Rc3/8 | 13.5 <sup>*1</sup> | 21 | 123.5 | 40 | 26 |

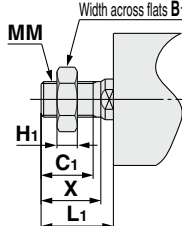
\*1 At the 75 and 100 mm strokes with ø80, ø100, both ends tapped (A) is the standard. Through-hole (B) is not available.

Both ends tapped



| Bore size [mm] | O <sub>1</sub> | R <sub>1</sub> |
|----------------|----------------|----------------|
| 32             | M6 x 1.0       | 10             |
| 40             | M6 x 1.0       | 10             |
| 50             | M8 x 1.25      | 14             |
| 63             | M10 x 1.5      | 18             |
| 80             | M12 x 1.75     | 22             |
| 100            | M12 x 1.75     | 22             |

Rod end male thread



| Bore size [mm] | Standard stroke                 | B <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | MM        | X         |
|----------------|---------------------------------|----------------|----------------|----------------|----------------|-----------|-----------|
| 32             | 10, 15, 20<br>25, 50<br>75, 100 | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5      |
| 40             |                                 | 22             | 20.5           | 8              | 28.5           | M14 x 1.5 | 23.5      |
| 50             |                                 | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5      |
| 63             |                                 | 27             | 26             | 11             | 33.5           | M18 x 1.5 | 28.5      |
| 80             | 25, 50                          |                |                |                |                | 43.5      |           |
|                | 75, 100                         | 32             | 32.5           | 13             |                | 53.5      | M22 x 1.5 |
| 100            | 25, 50                          |                |                |                |                | 43.5      |           |
|                | 75, 100                         | 41             | 32.5           | 16             |                | 53.5      | M26 x 1.5 |

Dimensions of Each Mounting Bracket

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

Standard: **CQ2** (Double Acting, Single Rod), **CQ2W** (Double Acting, Double Rod), **CQ2** (Single Acting, Spring Return-End), **CQ2** (Double Acting, Single Rod), **CQ2** (Double Acting, Single Rod), **CQ2W** (Double Acting, Double Rod), **CQ2S** (Anti-lateral Load), **CQ2** (Double Acting, Single Rod), **CQ2** (Double Acting, Single Rod), **CQ2K** (Double Acting, Double Rod), **CQ2-R/V** (Double Acting, Single Rod), **CQ2-R/V** (Double Acting, Double Rod), **CQ2W-R/V** (Double Acting, Double Rod), **CQ2** (Double Acting, Single Rod), **CQ2** (Double Acting, Single Rod), **CQ2** (Single Acting, Spring Return-End), **CBQ2** (Double Acting, Single Rod), **Auto Switch**, **Made to Order**

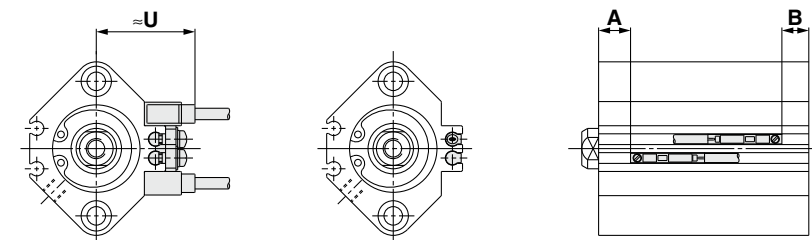
# Compact Cylinder CDQ2 Series Auto Switch Mounting

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

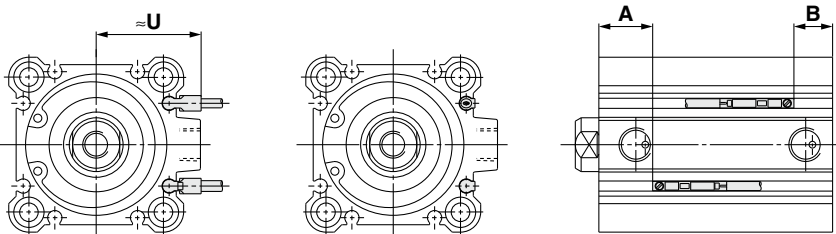
D-M9□  
D-M9□V  
D-M9□W  
D-M9□WV  
D-M9□A  
D-M9□AV  
D-A9□  
D-A9□V

Applicable cylinder series: CDQ2, CDQ2W, CDQ2-S/T (Single acting),  
CDQ2, CDQ2W (Large bore size), CDQ2□S (Anti-lateral load),  
CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod),  
CDQ2□R/□V, CDQ2W□R/□V (Water resistant)

ø12 to ø25

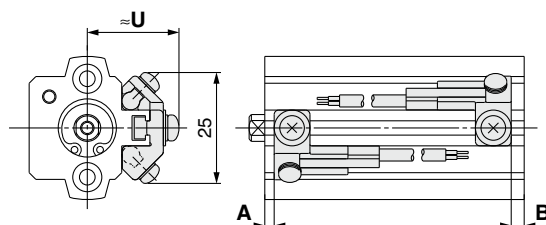


ø32 to ø200

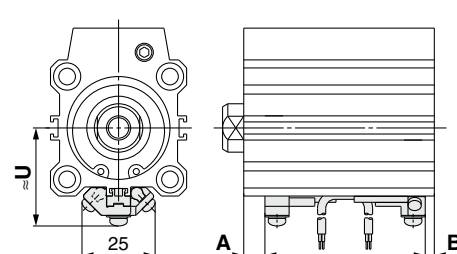


Applicable cylinder series: CDQP2, CDQP2-S/T (Axial piping)

ø12 to ø25

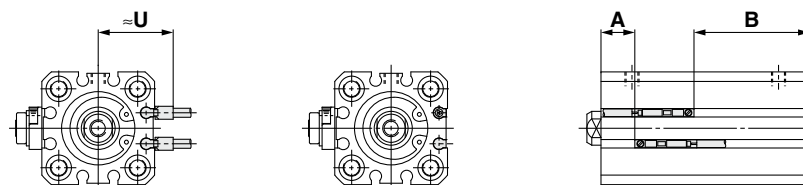


ø32 to ø100

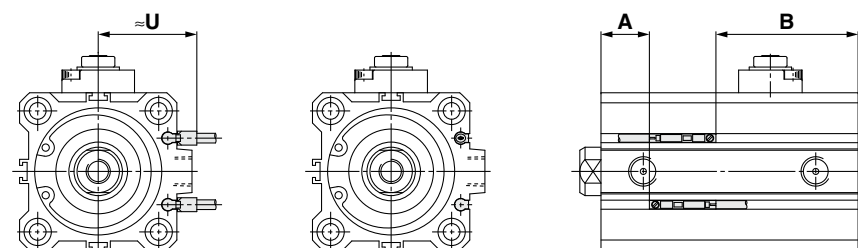


Applicable cylinder series: CDBQ2 (With end lock)

ø20, ø25



ø32 to ø100

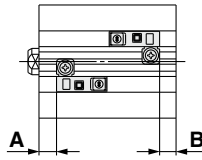
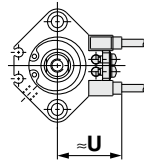


**Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height**

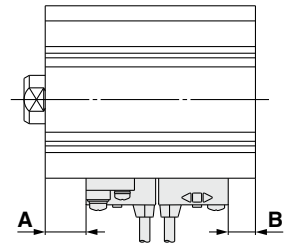
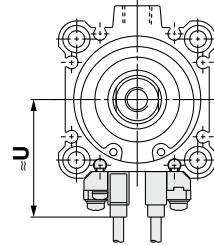
- D-A7□      D-F7□V
- D-A80     D-J79C
- D-A7□H    D-F7□W
- D-A80H    D-J79W
- D-A73C    D-F7□WV
- D-A80C    D-F7BAV
- D-F7□     D-F7BA
- D-F79F    D-F7NT
- D-J79     D-A79W

Applicable cylinder series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)

ø12 to ø25

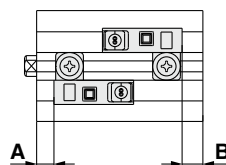
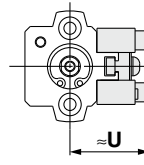


ø32 to ø160

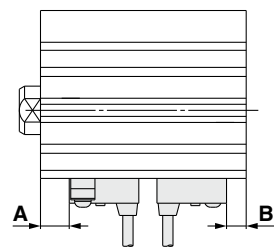
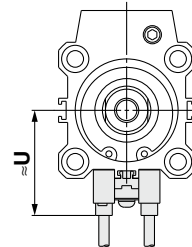


Applicable cylinder series: CDQP2, CDQP2-S/T (Axial piping)

ø12 to ø25

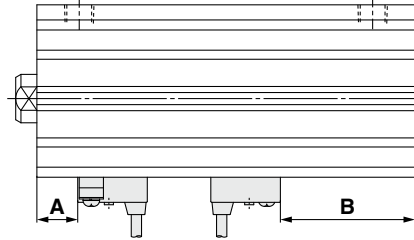
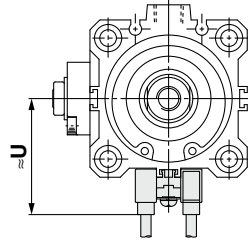


ø32 to ø100



Applicable cylinder series: CDBQ2 (With end lock)

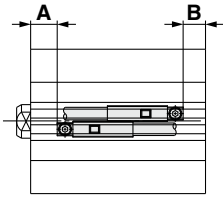
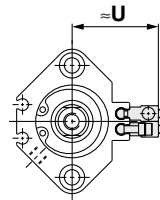
ø32 to ø100



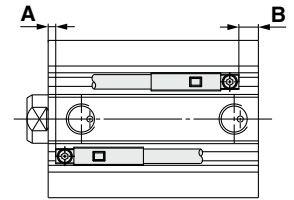
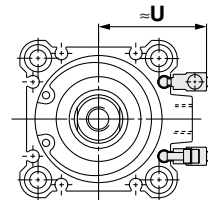
**D-P3DWA**

Applicable cylinder series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)

ø25

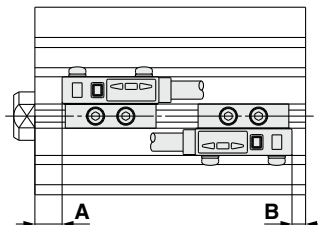
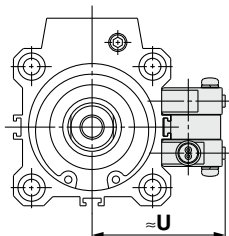


ø32 to ø200

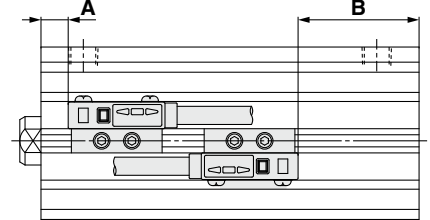
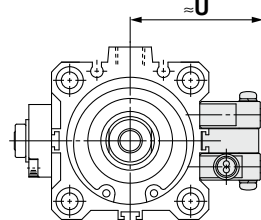


**D-P4DW**

Applicable cylinder series: CDQP2, CDQP2-S/T (Axial piping)  
ø40 to ø100



Applicable cylinder series: CDBQ2 (With end lock)  
ø40 to ø100



|                   |                                   |           |
|-------------------|-----------------------------------|-----------|
| Standard          | Double Acting, Single Rod         | CDQ2      |
| Standard          | Double Acting, Double Rod         | CDQ2W     |
| Standard          | Single Acting, Spring Return, End | CDQ2      |
| Large Bore Size   | Double Acting, Single Rod         | CDQ2      |
| Large Bore Size   | Double Acting, Double Rod         | CDQ2W     |
| Anti-lateral Load | Double Acting, Single Rod         | CDQ2□S    |
| Long Stroke       | Double Acting, Single Rod         | CDQ2      |
| Non-rotating Rod  | Double Acting, Single Rod         | CDQ2K     |
| Non-rotating Rod  | Double Acting, Double Rod         | CDQ2KW    |
| Water Resistant   | Double Acting, Single Rod         | CDQ2-R/V  |
| Water Resistant   | Double Acting, Double Rod         | CDQ2W-R/V |
| Axial Piping      | Double Acting, Single Rod         | CQP2      |
| Axial Piping      | Double Acting, Double Rod         | CQP2      |
| With End Lock     | Double Acting, Single Rod         | CBQ2      |
| Auto Switch       |                                   |           |
| Made to Order     |                                   |           |

# CDQ2 Series

## Auto Switch Proper Mounting Position \* Adjust the auto switch after confirming the operating conditions in the actual setting.

### Applicable Cylinder Series: CDQ2 (Double acting, Single rod), CDQ2-S/T (Single acting) [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |             | D-A9□<br>D-A9□V |            | D-A73<br>D-A80 |             | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |              | D-F7NT     |                | D-A79W   |              | D-P3DWA |      |
|-------------------|---|-------------|-----------------|------------|----------------|-------------|--|--------------|------------|----------------|----------|--------------|---------|------|
|                   | A   | B           | A               | B          | A              | B           | A  | B            | A          | B              | A        | B            | A       | B    |
| Bore size         |   |             |                 |            |                |             |  |              |            |                |          |              |         |      |
| 12                | 7.5   | 8.5<br>(13) | 3.5             | 4.5<br>(9) | 4.5            | 5.5<br>(10) | 5  | 6<br>(10.5)  | 10         | 11<br>(15.5)   | 2        | 3<br>(7.5)   | —       | —    |
| 16                | 10.5<br>(8.5)   | 8<br>(10)   | 6.5<br>(4.5)    | 4<br>(6)   | 7.5<br>(5.5)   | 5<br>(7)    | 8  | 5.5<br>(7.5) | 13<br>(11) | 10.5<br>(12.5) | 5<br>(3) | 2.5<br>(4.5) | —       | —    |
| 20                | 10.5  | 9           | 6.5             | 5          | 7.5            | 6           | 8  | 6.5          | 13         | 11.5           | 5        | 3.5          | —       | —    |
| 25                | 11  | 9.5         | 7               | 5.5        | 8              | 6.5         | 8.5  | 7            | 13.5       | 12             | 5.5      | 4            | 5       | 3.5  |
| 32                | 12  | 9           | 8               | 5          | 9              | 6           | 9.5  | 6.5          | 14.5       | 11.5           | 6.5      | 3.5          | 7.5     | 4.5  |
| 40                | 16  | 11.5        | 12              | 7.5        | 13             | 8.5         | 13.5   | 9            | 18.5       | 14             | 10.5     | 6            | 11.5    | 7    |
| 50                | 14  | 14.5        | 10              | 10.5       | 11             | 11.5        | 11.5   | 12           | 16.5       | 17             | 8.5      | 9            | 9.5     | 10   |
| 63                | 16.5  | 17.5        | 12.5            | 13.5       | 13.5           | 14.5        | 14   | 15           | 19         | 20             | 11       | 12           | 12      | 13   |
| 80                | 19.5  | 22          | 15.5            | 18         | 16.5           | 19          | 17   | 19.5         | 22         | 24.5           | 14       | 16.5         | 15      | 17.5 |
| 100               | 24  | 27          | 20              | 23         | 21             | 24          | 21.5   | 24.5         | 26.5       | 29.5           | 18.5     | 21.5         | 19.5    | 22.5 |

( ): For the single acting, spring extend type  
Excludes the D-P3DW for the CDQ2-S/T

### Applicable Cylinder Series: CDQ2W (Double acting, Double rod) [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |      | D-F7NT |      | D-A79W |      | D-P3DWA |      |
|-------------------|---|------|-----------------|------|----------------|------|--|------|--------|------|--------|------|---------|------|
|                   | A   | B    | A               | B    | A              | B    | A  | B    | A      | B    | A      | B    | A       | B    |
| Bore size         |   |      |                 |      |                |      |  |      |        |      |        |      |         |      |
| 12                | 7.5   | 13   | 3.5             | 9    | 4.5            | 10   | 5  | 10.5 | 10     | 15.5 | 2      | 7.5  | —       | —    |
| 16                | 10.5  | 13.5 | 6.5             | 9.5  | 7.5            | 10.5 | 8  | 11   | 13     | 16   | 5      | 8    | —       | —    |
| 20                | 10.5  | 15.5 | 6.5             | 11.5 | 7.5            | 12.5 | 8  | 13   | 13     | 18   | 5      | 10   | —       | —    |
| 25                | 11  | 16   | 7               | 12   | 8              | 13   | 8.5  | 13.5 | 13.5   | 18.5 | 5.5    | 10.5 | 5       | 10   |
| 32                | 12  | 16.5 | 8               | 12.5 | 9              | 13.5 | 9.5  | 14   | 14.5   | 19   | 6.5    | 11   | 7.5     | 12   |
| 40                | 16  | 22   | 12              | 18   | 13             | 19   | 13.5   | 19.5 | 18.5   | 24.5 | 10.5   | 16.5 | 11.5    | 17.5 |
| 50                | 14  | 24.5 | 10              | 20.5 | 11             | 21.5 | 11.5   | 22   | 16.5   | 27   | 8.5    | 19   | 9.5     | 20   |
| 63                | 16.5  | 23.5 | 12.5            | 19.5 | 13.5           | 20.5 | 14   | 21   | 19     | 26   | 11     | 18   | 12      | 19   |
| 80                | 19.5  | 29.5 | 15.5            | 25.5 | 16.5           | 26.5 | 17   | 27   | 22     | 32   | 14     | 24   | 15      | 25   |
| 100               | 24  | 34.5 | 20              | 30.5 | 21             | 31.5 | 21.5   | 32   | 26.5   | 37   | 18.5   | 29   | 19.5    | 30   |

### Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size) [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C<br>D-F7□/F7□V<br>D-F79F/F7□W<br>D-F7□WV/J79<br>D-J79W/J79C<br>D-F7BA<br>D-F7BAV |    | D-F7NT |    | D-A79W |    | D-P3DWA |      |
|-------------------|---|------|-----------------|------|----------------|------|--|----|--------|----|--------|----|---------|------|
|                   | A   | B    | A               | B    | A              | B    | A  | B  | A      | B  | A      | B  | A       | B    |
| Bore size         |   |      |                 |      |                |      |  |    |        |    |        |    |         |      |
| 125               | 34  | 34   | 30              | 30   | 32.5           | 32.5 | 33   | 33 | 38     | 38 | 30     | 30 | 29.5    | 29.5 |
| 140               | 34  | 34   | 30              | 30   | 32.5           | 32.5 | 33   | 33 | 38     | 38 | 30     | 30 | 29.5    | 29.5 |
| 160               | 38  | 38   | 34              | 34   | 36.5           | 36.5 | 37   | 37 | 42     | 42 | 34     | 34 | 33.5    | 33.5 |
| 180               | 44.5  | 44.5 | 40.5            | 40.5 | —              | —    | —  | —  | —      | —  | —      | —  | 40      | 40   |
| 200               | 47.5  | 47.5 | 43.5            | 43.5 | —              | —    | —  | —  | —      | —  | —      | —  | 43      | 43   |



**Auto Switch Proper Mounting Position** \* Adjust the auto switch after confirming the operating conditions in the actual setting.

**Applicable Cylinder Series: CDQ2□S (Anti-lateral load)** [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |      | D-F7NT |      | D-A79W |      | D-P3DWA |      |
|-------------------|---|------|-----------------|------|----------------|------|--|------|--------|------|--------|------|---------|------|
|                   | A   | B    | A               | B    | A              | B    | A  | B    | A      | B    | A      | B    | A       | B    |
| Bore size 32      | 18  | 13   | 14              | 9    | 15             | 10   | 15.5   | 10.5 | 20.5   | 15.5 | 12.5   | 7.5  | 13.5    | 8.5  |
| 40                | 21.5  | 16   | 17.5            | 12   | 18.5           | 13   | 19   | 13.5 | 24     | 18.5 | 16     | 10.5 | 17      | 11.5 |
| 50                | 19  | 19.5 | 15              | 15.5 | 16             | 16.5 | 16.5   | 17   | 21.5   | 22   | 13.5   | 14   | 14.5    | 15   |
| 63                | 21.5  | 22.5 | 17.5            | 18.5 | 18.5           | 19.5 | 19   | 20   | 24     | 25   | 16     | 17   | 17      | 18   |
| 80                | 24.5  | 27   | 20.5            | 23   | 21.5           | 24   | 22   | 24.5 | 27     | 29.5 | 19     | 21.5 | 20      | 22.5 |
| 100               | 27.5  | 33.5 | 23.5            | 29.5 | 24.5           | 30.5 | 25   | 31   | 30     | 36   | 22     | 28   | 23      | 29   |

**Applicable Cylinder Series: CDQ2 (Long stroke)** [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |      | D-F7NT |      | D-A79W |      | D-P3DWA |      |
|-------------------|---|------|-----------------|------|----------------|------|--|------|--------|------|--------|------|---------|------|
|                   | A   | B    | A               | B    | A              | B    | A  | B    | A      | B    | A      | B    | A       | B    |
| Bore size 32      | 12.5  | 20.5 | 8.5             | 16.5 | 9.5            | 17.5 | 10   | 18   | 15     | 23   | 7      | 15   | 8       | 16   |
| 40                | 16  | 26.5 | 12              | 22.5 | 13             | 23.5 | 13.5   | 24   | 18.5   | 29   | 10.5   | 21   | 11.5    | 22   |
| 50                | 14  | 29.5 | 10              | 25.5 | 11             | 26.5 | 11.5   | 27   | 16.5   | 32   | 8.5    | 24   | 9.5     | 25   |
| 63                | 16.5  | 28.5 | 12.5            | 24.5 | 13.5           | 25.5 | 14   | 26   | 19     | 31   | 11     | 23   | 12      | 24   |
| 80                | 19.5  | 34.5 | 15.5            | 30.5 | 16.5           | 31.5 | 17   | 32   | 22     | 37   | 14     | 29   | 15      | 30   |
| 100               | 22.5  | 41   | 18.5            | 37   | 19.5           | 38   | 20   | 38.5 | 25     | 43.5 | 17     | 35.5 | 18      | 36.5 |

**Applicable Cylinder Series: CDQ2K (Non-rotating rod)** [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |     | D-F7NT |      | D-A79W |     | D-P3DWA |     |
|-------------------|---|------|-----------------|------|----------------|------|--|-----|--------|------|--------|-----|---------|-----|
|                   | A   | B    | A               | B    | A              | B    | A  | B   | A      | B    | A      | B   | A       | B   |
| Bore size 12      | 12.5  | 8.5  | 8.5             | 4.5  | 9.5            | 5.5  | 10   | 6   | 15     | 11   | 7      | 3   | —       | —   |
| 16                | 15.5  | 8    | 11.5            | 4    | 12.5           | 5    | 13   | 5.5 | 18     | 10.5 | 10     | 2.5 | —       | —   |
| 20                | 18.5  | 9    | 14.5            | 5    | 15.5           | 6    | 16   | 6.5 | 21     | 11.5 | 13     | 3.5 | —       | —   |
| 25                | 19  | 9.5  | 15              | 5.5  | 16             | 6.5  | 16.5   | 7   | 21.5   | 12   | 13     | 4   | 13      | 3.5 |
| 32                | 21  | 9    | 17              | 5    | 18             | 6    | 18.5   | 6.5 | 23.5   | 11.5 | 15.5   | 3.5 | 16.5    | 4.5 |
| 40                | 16  | 11.5 | 12              | 7.5  | 13             | 8.5  | 13.5   | 9   | 18.5   | 14   | 10.5   | 6   | 11.5    | 7   |
| 50                | 14  | 14.5 | 10              | 10.5 | 11             | 11.5 | 11.5   | 12  | 16.5   | 17   | 8.5    | 9   | 9.5     | 10  |
| 63                | 16.5  | 17.5 | 12.5            | 13.5 | 13.5           | 14.5 | 14   | 15  | 19     | 20   | 11     | 12  | 12      | 13  |

**Applicable Cylinder Series: CDQ2KW (Non-rotating rod, Double rod)** [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |      | D-A9□<br>D-A9□V |      | D-A73<br>D-A80 |      | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |      | D-F7NT |      | D-A79W |      | D-P3DWA |      |
|-------------------|---|------|-----------------|------|----------------|------|--|------|--------|------|--------|------|---------|------|
|                   | A   | B    | A               | B    | A              | B    | A  | B    | A      | B    | A      | B    | A       | B    |
| Bore size 12      | 13  | 13   | 9               | 9    | 9.5            | 10   | 10   | 10.5 | 15     | 15.5 | 7.5    | 7.5  | —       | —    |
| 16                | 15.5  | 13.5 | 11.5            | 9.5  | 12.5           | 10.5 | 13   | 11   | 18     | 16   | 10     | 8    | —       | —    |
| 20                | 18.5  | 15.5 | 14.5            | 11.5 | 15.5           | 12.5 | 16   | 13   | 21     | 18   | 13     | 10   | —       | —    |
| 25                | 19  | 16   | 15              | 12   | 16             | 13   | 16.5   | 13.5 | 21.5   | 18.5 | 13.5   | 10.5 | 13      | 10   |
| 32                | 21  | 16.5 | 17              | 12.5 | 18             | 13.5 | 18.5   | 14   | 23.5   | 19   | 15.5   | 11   | 16.5    | 12   |
| 40                | 16  | 22   | 12              | 18   | 13             | 19   | 13.5   | 19.5 | 18.5   | 24.5 | 10.5   | 16.5 | 11.5    | 17.5 |
| 50                | 14  | 24.5 | 10              | 20.5 | 11             | 21.5 | 11.5   | 22   | 16.5   | 27   | 8.5    | 19   | 9.5     | 20   |
| 63                | 16.5  | 23.5 | 12.5            | 19.5 | 13.5           | 20.5 | 14   | 21   | 19     | 26   | 11     | 18   | 12      | 19   |

Standard  
Double Acting, Single Rod  
CQ2

Standard  
Double Acting, Double Rod  
CQ2W

Standard  
Single Acting, Spring Return, End  
CQ2

Large Bore Size  
Double Acting, Double Rod  
CQ2W

Anti-lateral Load  
Double Acting, Single Rod  
CQ2□S

Long Stroke  
Double Acting, Single Rod  
CQ2

Non-rotating Rod  
Double Acting, Double Rod  
CQ2KW

Non-rotating Rod  
Double Acting, Single Rod  
CQ2K

Water Resistant  
Double Acting, Single Rod  
CQ2-RV

Water Resistant  
Double Acting, Double Rod  
CQ2W-RV

Axial Piping  
Double Acting, Single Rod  
CQP2

Axial Piping  
Single Acting, Spring Return, End  
CQP2

With End Lock  
Double Acting, Single Rod  
CBQ2

Auto Switch

Made to Order



# CDQ2 Series

## Auto Switch Proper Mounting Position \* Adjust the auto switch after confirming the operating conditions in the actual setting.

Applicable Cylinder Series: CDQ2□R/□V (Water resistant) [mm]

| Auto switch model | D-M9□A<br>D-M9□AV |      | D-F7BA<br>D-F7BAV |      |
|-------------------|-------------------|------|-------------------|------|
|                   | A                 | B    | A                 | B    |
| Bore size         |                   |      |                   |      |
| 20                | 19                | 7.5  | 18                | 6.5  |
| 25                | 19.5              | 8    | 18                | 7    |
| 32                | 22                | 9    | 19.5              | 6.5  |
| 40                | 16                | 11.5 | 13.5              | 9    |
| 50                | 14                | 14.5 | 11.5              | 12   |
| 63                | 16.5              | 17.5 | 14                | 15   |
| 80                | 19.5              | 22   | 17                | 19.5 |
| 100               | 24                | 27   | 21.5              | 24.5 |

Applicable Cylinder Series: CDQ2W□R/□V (Water resistant, Double rod) [mm]

| Auto switch model | D-M9□A<br>D-M9□AV |      | D-F7BA<br>D-F7BAV |      |
|-------------------|-------------------|------|-------------------|------|
|                   | A                 | B    | A                 | B    |
| Bore size         |                   |      |                   |      |
| 40                | 16                | 22   | 13.5              | 19.5 |
| 50                | 14                | 24.5 | 11.5              | 22   |
| 63                | 16.5              | 23.5 | 14                | 21   |
| 80                | 19.5              | 29.5 | 17                | 27   |
| 100               | 24                | 34.5 | 21.5              | 32   |

Applicable Cylinder Series: CDQP2 (Axial piping), CDQP2-S/T (Axial piping, Single acting) [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |              | D-A9□<br>D-A9□V |              | D-A73<br>D-A80 |             | D-A72/A7□H/A80H<br>D-A73C/A80C/F7□<br>D-F79F/J79/F7□V<br>D-J79C/F7□W<br>D-J79W/F7□WV<br>D-F7BAV/F7BA |              | D-F7NT     |                | D-A79W   |              | D-P4DW |      |
|-------------------|---|--------------|-----------------|--------------|----------------|-------------|--|--------------|------------|----------------|----------|--------------|--------|------|
|                   | A   | B            | A               | B            | A              | B           | A  | B            | A          | B              | A        | B            | A      | B    |
| Bore size         |   |              |                 |              |                |             |  |              |            |                |          |              |        |      |
| 12                | 6   | 7<br>(11)    | 2               | 3<br>(7)     | 4.5            | 5.5<br>(10) | 5  | 6<br>(10.5)  | 10         | 11<br>(15.5)   | 2        | 3<br>(7.5)   | —      | —    |
| 16                | 9<br>(7)  | 6.5<br>(8.5) | 5<br>(3)        | 2.5<br>(4.5) | 7.5<br>(5.5)   | 5<br>(7)    | 8<br>(6)   | 5.5<br>(7.5) | 13<br>(11) | 10.5<br>(12.5) | 5<br>(3) | 2.5<br>(4.5) | —      | —    |
| 20                | 9   | 7.5          | 5               | 3.5          | 7.5            | 6.5         | 8  | 7            | 13         | 12             | 5        | 4            | —      | —    |
| 25                | 9.5   | 8            | 5.5             | 4            | 7.5            | 7           | 8  | 7.5          | 13         | 12.5           | 5        | 4.5          | —      | —    |
| 32                | 10.5  | 7.5          | 6.5             | 3.5          | 9              | 6           | 9.5  | 6.5          | 14.5       | 11.5           | 6.5      | 3.5          | —      | —    |
| 40                | 14.5  | 10           | 10.5            | 6            | 13             | 8.5         | 13.5   | 9            | 18.5       | 14             | 10.5     | 6            | 9      | 4.5  |
| 50                | 12.5  | 13           | 8.5             | 9            | 11             | 11.5        | 11.5   | 12           | 16.5       | 17             | 8.5      | 9            | 7      | 7.5  |
| 63                | 15  | 16           | 11              | 12           | 13.5           | 14.5        | 14   | 15           | 19         | 20             | 11       | 12           | 9.5    | 10.5 |
| 80                | 18  | 20.5         | 14              | 16.5         | 17.5           | 18          | 18   | 18.5         | 23         | 23.5           | 15       | 15.5         | 13.5   | 14   |
| 100               | 22.5  | 25.5         | 18.5            | 21.5         | 21             | 24          | 21.5   | 24.5         | 26.5       | 29.5           | 18.5     | 21.5         | 17     | 20   |

( ): For the single acting, spring extend type  
Excludes the D-P4DW for the CDQP2-S/T

**Auto Switch Proper Mounting Position** \* Adjust the auto switch after confirming the operating conditions in the actual setting.

**Applicable Cylinder Series: CDBQ2 (With end lock)** [mm]

| Auto switch model          | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV |                | D-A9□<br>D-A9□V |                | D-A7□<br>D-A80 |                | D-A7□H/A80H<br>D-A73C/A80C<br>D-F7□/F79F/J79<br>D-F7□V/J79C<br>D-F7□W/J79W<br>D-F7□WV/F7BA<br>D-F7BAV/F7NT |                | D-A79W         |                | D-P4DW         |                |
|----------------------------|---|----------------|-----------------|----------------|----------------|----------------|--|----------------|----------------|----------------|----------------|----------------|
|                            | A   | B              | A               | B              | A              | B              | A  | B              | A              | B              | A              | B              |
| <b>20</b> (Head end lock)  | 10<br>(11)  | 39<br>(43)     | 6<br>(7)        | 35<br>(39)     | —              | —              | —  | —              | —              | —              | —              | —              |
| <b>20</b> (Rod end lock)   | 35.5<br>(38)  | 7<br>(16)      | 31.5<br>(34)    | 3<br>(12)      | —              | —              | —  | —              | —              | —              | —              | —              |
| <b>25</b> (Head end lock)  | 12<br>(14)  | 41<br>(43)     | 8<br>(10)       | 37<br>(39)     | —              | —              | —  | —              | —              | —              | —              | —              |
| <b>25</b> (Rod end lock)   | 36<br>(39)  | 9.5<br>(18)    | 32<br>(35)      | 5.5<br>(14)    | —              | —              | —  | —              | —              | —              | —              | —              |
| <b>32</b> (Head end lock)  | 12  | 41.5           | 8               | 37.5           | 9              | 38.5           | 9.5  | 39             | 6.5            | 36             | —              | —              |
| <b>32</b> (Rod end lock)   | 39  | 7              | 35              | 3              | 36             | 4              | 36.5   | 4.5            | 33.5           | 1.5            | —              | —              |
| <b>40</b> (Head end lock)  | 16  | 47             | 12              | 43             | 13             | 44             | 13.5   | 44.5           | 10.5           | 41.5           | 9              | 40             |
| <b>40</b> (Rod end lock)   | 45  | 7.5            | 41              | 3.5            | 42             | 4.5            | 42.5   | 5              | 39.5           | 2              | 38             | 0.5            |
| <b>50</b> (Head end lock)  | 14  | 49.5           | 10              | 45.5           | 11             | 46.5           | 11.5   | 47             | 8.5            | 44             | 7              | 42.5           |
| <b>50</b> (Rod end lock)   | 44.5  | 9              | 40.5            | 5              | 41.5           | 6              | 42   | 6.5            | 39             | 3.5            | 37.5           | 2              |
| <b>63</b> (Head end lock)  | 16.5  | 48.5           | 12.5            | 44.5           | 13.5           | 45.5           | 14   | 46             | 11             | 43             | 9.5            | 41.5           |
| <b>63</b> (Rod end lock)   | 48.5  | 10.5           | 44.5            | 6.5            | 45.5           | 7.5            | 46   | 8              | 43             | 5              | 41.5           | 3.5            |
| <b>80</b> (Head end lock)  | 19.5<br>(24.5)  | 79.5<br>(79.5) | 15.5<br>(20.5)  | 75.5<br>(75.5) | 16.5<br>(21.5) | 76.5<br>(76.5) | 17<br>(22)   | 77<br>(77)     | 14<br>(19)     | 74<br>(74)     | 12.5<br>(17.5) | 72.5<br>(72.5) |
| <b>80</b> (Rod end lock)   | 69.5<br>(69.5)  | 22<br>(34.5)   | 65.5<br>(65.5)  | 18<br>(30.5)   | 66.5<br>(66.5) | 19<br>(31.5)   | 67<br>(67)   | 19.5<br>(32)   | 64<br>(64)     | 16.5<br>(29)   | 62.5<br>(62.5) | 15<br>(27.5)   |
| <b>100</b> (Head end lock) | 24<br>(29)  | 84.5<br>(84.5) | 20<br>(25)      | 80.5<br>(80.5) | 21<br>(26)     | 81.5<br>(81.5) | 21.5<br>(26.5)   | 82<br>(82)     | 18.5<br>(23.5) | 79<br>(79)     | 17<br>(22)     | 77.5<br>(77.5) |
| <b>100</b> (Rod end lock)  | 74<br>(72.5)  | 27<br>(41)     | 70<br>(68.5)    | 23<br>(37)     | 71<br>(69.5)   | 24<br>(38)     | 71.5<br>(70)   | 24.5<br>(38.5) | 68.5<br>(67)   | 21.5<br>(35.5) | 67<br>(65.5)   | 20<br>(34)     |

\* The dimensions in parentheses for ø20 and ø25 are for 50, 75 and 100 mm strokes, and the dimensions in parentheses for ø80 and ø100 are for 75 and 100 mm strokes.

**Auto Switch Mounting Height** \* Adjust the auto switch after confirming the operating conditions in the actual setting.

**Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)** [mm]

| Auto switch model | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V | D-F7□/J79<br>D-F7□W/J79W<br>D-F7BA<br>D-F79F/F7NT<br>D-A7□H/A80H | D-F7□V<br>D-F7□WV<br>D-F7BAV | D-J79C | D-A7□<br>D-A80 | D-A73C<br>D-A80C | D-A79W | D-P3DWA |
|-------------------|------------------------------|--------|--|------------------------------|--------|----------------|------------------|--------|---------|
|                   | U                            | U      | U  | U                            | U      | U              | U                | U      | U       |
| <b>12</b>         | 21.5                         | 19     | 21.5   | 23.5                         | 26.5   | 21             | 27.5             | 24.5   | —       |
| <b>16</b>         | 22.5                         | 20     | 22.5   | 24.5                         | 27.5   | 22             | 28.5             | 25.5   | —       |
| <b>20</b>         | 25                           | 23     | 25.5   | 27.5                         | 30     | 24.5           | 31               | 28     | —       |
| <b>25</b>         | 28                           | 26     | 28   | 30.5                         | 32.5   | 27.5           | 34               | 31     | 33.5    |
| <b>32</b>         | 30                           | 27.5   | 36   | 36.5                         | 39.5   | 34             | 40.5             | 37.5   | 35.5    |
| <b>40</b>         | 32                           | 30     | 38   | 40                           | 42.5   | 37.5           | 43.5             | 40.5   | 38      |
| <b>50</b>         | 37.5                         | 35     | 43.5   | 45                           | 48     | 43             | 49               | 46     | 43      |
| <b>63</b>         | 42.5                         | 40.5   | 48.5   | 50.5                         | 53.5   | 48             | 54.5             | 51.5   | 48      |
| <b>80</b>         | 51                           | 49     | 57   | 59                           | 61.5   | 56.5           | 62.5             | 59.5   | 56.5    |
| <b>100</b>        | 59                           | 57     | 65.5   | 67                           | 70     | 64.5           | 71               | 68     | 65      |

\* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V) type only.

\* Excludes the D-P3DW for the CDQ2-S/T (Single acting)

**Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)** [mm]

| Auto switch model | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V | D-F7□/J79<br>D-F7□W/J79W<br>D-F7BA<br>D-F79F/F7NT<br>D-A7□H/A80H | D-F7□V<br>D-F7□WV<br>D-F7BAV | D-J79C | D-A7□<br>D-A80 | D-A73C<br>D-A80C | D-A79W | D-P3DWA |
|-------------------|------------------------------|--------|--|------------------------------|--------|----------------|------------------|--------|---------|
|                   | U                            | U      | U  | U                            | U      | U              | U                | U      | U       |
| <b>125</b>        | 69.5                         | 67.5   | 76.5   | 79                           | 81     | 75.5           | 82.5             | 78     | 77      |
| <b>140</b>        | 76.5                         | 74.5   | 83.5   | 86                           | 88     | 82.5           | 89.5             | 85     | 84      |
| <b>160</b>        | 85.5                         | 83.5   | 92.5   | 95                           | 97     | 91.5           | 98.5             | 94     | 93      |
| <b>180</b>        | 105.5                        | 103.5  | —  | —                            | —      | —              | —                | —      | 102     |
| <b>200</b>        | 112.5                        | 110.5  | —  | —                            | —      | —              | —                | —      | 110     |

Standard  
Double Acting, Single Rod  
Double Acting, Double Rod  
Single Acting, Spring Return, End  
Double Acting, Single Rod  
Double Acting, Double Rod  
Large Bore Size  
Double Acting, Double Rod  
Anti-lateral Load  
Double Acting, Single Rod  
Double Acting, Double Rod  
Long Stroke  
Double Acting, Single Rod  
Double Acting, Double Rod  
Non-rotating Rod  
Double Acting, Single Rod  
Double Acting, Double Rod  
Water Resistant  
Double Acting, Single Rod  
Double Acting, Double Rod  
Axial Piping  
Single Acting, Spring Return, End  
Double Acting, Single Rod  
With End Lock  
Double Acting, Single Rod  
Auto Switch  
Made to Order

CCQ2  
CCQ2W  
CCQ2  
CCQ2  
CCQ2S  
CCQ2  
CCQ2K  
CCQ2KW  
CCQ2-RV  
CCQ2W-RV  
CCQ2  
CCQ2  
CCBQ2

# CDQ2 Series

## Auto Switch Mounting Height \* Adjust the auto switch after confirming the operating conditions in the actual setting.

### Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping) [mm]

| Auto switch model | D-M9□<br>D-M9□V<br>D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV<br>D-A9□<br>D-A9□V | D-A7□H<br>D-A80H<br>D-F7□<br>D-F79F<br>D-J79<br>D-F7□W<br>D-J79W<br>D-F7BA<br>D-F7NT | D-F7□V<br>D-F7□WV<br>D-F7BAV | D-J79C | D-A7□<br>D-A80 | D-A73C<br>D-A80C | D-A79W | D-P4DW |
|-------------------|--|--|------------------------------|--------|----------------|------------------|--------|--------|
| Bore size         | U  | U  | U                            | U      | U              | U                | U      | U      |
| 12                | 20.5   | 20.5   | 23                           | 26     | 19.5           | 26.5             | 22     | —      |
| 16                | 23.5   | 23.5   | 26                           | 29     | 22.5           | 29.5             | 25     | —      |
| 20                | 25.5   | 25.5   | 28                           | 31     | 24.5           | 31.5             | 27     | —      |
| 25                | 28.5   | 28.5   | 31                           | 34     | 27.5           | 34.5             | 30     | —      |
| 32                | 32.5   | 32.5   | 35                           | 38     | 31.5           | 38.5             | 34     | —      |
| 40                | 36   | 36   | 38.5                         | 41.5   | 35             | 42               | 37.5   | 44     |
| 50                | 42   | 42   | 44.5                         | 47.5   | 41             | 48               | 43.5   | 50     |
| 63                | 48.5   | 48.5   | 51                           | 54     | 47.5           | 54.5             | 50     | 56.5   |
| 80                | 58.5   | 58.5   | 61                           | 64     | 57.5           | 64.5             | 60     | 66.5   |
| 100               | 68.5   | 68.5   | 71                           | 74     | 67.5           | 74.5             | 70     | 76.5   |

\* Excludes the D-P4DW for the CDQP2-S/T (Single acting)

### Applicable Cylinder Series: CDBQ2 (With end lock) [mm]

| Auto switch model | D-M9□V<br>D-M9□WV<br>D-M9□AV | D-A9□V | D-A7□H<br>D-A80H/F7□<br>D-F79F/J79<br>D-F7□W/J79W<br>D-F7BA/F7NT | D-F7□V<br>D-F7□WV<br>D-F7BAV | D-J79C | D-A7□<br>D-A80 | D-A73C<br>D-A80C | D-A79W | D-P4DW |
|-------------------|------------------------------|--------|--|------------------------------|--------|----------------|------------------|--------|--------|
| Bore size         | U                            | U      | U  | U                            | U      | U              | U                | U      | U      |
| 20                | 24.5                         | 22.5   | —  | —                            | —      | —              | —                | —      | —      |
| 25                | 26.5                         | 24.5   | —  | —                            | —      | —              | —                | —      | —      |
| 32                | 29                           | 27     | 32.5   | 35                           | 38     | 31.5           | 38.5             | 34     | —      |
| 40                | 32.5                         | 30.5   | 36   | 38.5                         | 41.5   | 35             | 42               | 37.5   | 44     |
| 50                | 38.5                         | 36.5   | 42   | 44.5                         | 47.5   | 41             | 48               | 43.5   | 50     |
| 63                | 42                           | 40     | 48.5   | 51                           | 54     | 47.5           | 54.5             | 50     | 56.5   |
| 80                | 52                           | 50     | 58.5   | 61                           | 64     | 57.5           | 64.5             | 60     | 66.5   |
| 100               | 62                           | 60     | 68.5   | 71                           | 74     | 67.5           | 74.5             | 70     | 76.5   |

## Minimum Stroke for Auto Switch Mounting \* Adjust the auto switch after confirming the operating conditions in the actual setting.

### Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant), CDQP2, CDQP2-S/-T (Axial piping), CDBQ2 (With end lock) [mm]

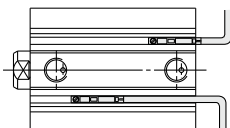
| Number of auto switches | D-M9□V<br>D-F7□V<br>D-J79C | D-A9□V<br>D-A7□<br>D-A80<br>D-A73C<br>D-A80C | D-A9□  | D-M9□WV<br>D-M9□AV*1<br>D-F7□WV<br>D-F7BAV | D-M9□<br>D-F7□<br>D-J79 | D-M9□W<br>D-M9□A*1 | D-A7□H<br>D-A80H | D-A79W | D-F7□W<br>D-J79W<br>D-F7BA<br>D-F79F<br>D-F7NT | D-P3DWA | D-P4DW |
|-------------------------|----------------------------|--|--------|--|-------------------------|--------------------|------------------|--------|--|---------|--------|
| With 1 pc.              | 5                          | 5  | 10 (5) | 10   | 15 (5)                  | 15 (10)            | 15 (5)           | 15     | 20 (10)  | 15      | 15     |
| With 2 pcs.             | 5                          | 10   | 10     | 15   | 15 (5)                  | 15                 | 15 (10)          | 20     | 20 (15)  | 15      | 15     |

\*1 The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V) type only.

### Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size) [mm]

| Number of auto switches | D-M9□<br>D-M9□V<br>D-F7□<br>D-F7□V<br>D-J79<br>D-J79C | D-A9□<br>D-A9□V<br>D-A7□<br>D-A80<br>D-A73C<br>D-A80C<br>D-A7□H<br>D-A80H | D-M9□W<br>D-M9□WV<br>D-M9□A<br>D-M9□AV | D-F7□W<br>D-F7□WV<br>D-J79W<br>D-F7BA<br>D-F7BAV<br>D-F7NT<br>D-F79F<br>D-P3DWA | D-A79W |
|-------------------------|---|---|--|---|--------|
| With 1 pc.              | 5   | 5   | 10                                     | 15  | 15     |
| With 2 pcs.             | 5   | 10  | 15                                     | 20  | 20     |

\* The dimension stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure below.) The auto switch and auto switch mounting bracket are ordered separately.



\* The applicable auto switch for the CDQP2 and CDBQ2 (With end lock) is the D-P4DW type only.

\* Excludes the D-P4DW for the CDQP2-S/T (Single acting)

## Operating Range \* Adjust the auto switch after confirming the operating conditions in the actual setting.

**Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)** [mm]

| Auto switch model  | Bore size |      |      |     |      |      |      |     |      |      |      |      |      |     |      |
|--|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|-----|------|
|  | 12        | 16   | 20   | 25  | 32   | 40   | 50   | 63  | 80   | 100  | 125  | 140  | 160  | 180 | 200  |
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□A(V)*1                               | 3         | 5    | 5.5  | 5.5 | 5    | 5    | 6    | 6.5 | 7    | 7.5  | 7.5  | 8    | 7.5  | 7.5 | 8.5  |
| D-A9□(V)   | 7.5       | 9.5  | 10   | 9   | 9    | 9.5  | 9.5  | 11  | 10.5 | 10.5 | 13.5 | 12.5 | 12   | 13  | 12.5 |
| D-A7□(H)(C)<br>D-A80□(H)(C)  | 9.5       | 12   | 12   | 11  | 10.5 | 11.5 | 11   | 13  | 11.5 | 11.5 | 16.5 | 15   | 14.5 | —   | —    |
| D-A79W   | 13        | 14.5 | 15.5 | 14  | 14   | 15.5 | 14.5 | 17  | 15   | 15.5 | 19.5 | 18   | 17.5 | —   | —    |
| D-F7□(V)<br>D-J79(C)<br>D-F7□W(V)<br>D-F7BA(V)<br>D-F7NT<br>D-F79F | 4.5       | 5.5  | 5    | 5   | 5    | 5    | 5    | 6   | 7    | 8    | 7.5  | 7.5  | 7.5  | —   | —    |
| D-P3DWA  | —         | —    | —    | 5.5 | 6    | 6    | 7    | 7.5 | 7.5  | 7.5  | 8.5  | 8.5  | 9    | 8   | 8.5  |

- \*1 The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V) type only.
- \* Values which include hysteresis are for reference purposes only. They are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.
- \* Excludes the D-P3DW for the CDQ2-S/T (Single acting)

**Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping)** [mm]

| Auto switch model  | Bore size |     |     |    |     |     |     |     |     |      |
|--|-----------|-----|-----|----|-----|-----|-----|-----|-----|------|
|  | 12        | 16  | 20  | 25 | 32  | 40  | 50  | 63  | 80  | 100  |
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□A(V)                                 | 3.5       | 5   | 5   | 5  | 5.5 | 5.5 | 6   | 6.5 | 7   | 7    |
| D-A9□(V)   | 7.5       | 9.5 | 9   | 9  | 9.5 | 9.5 | 8.5 | 11  | 10  | 10.5 |
| D-A7□(H)(C)<br>D-A80□(H)(C)  | 10        | 12  | 12  | 12 | 12  | 11  | 10  | 12  | 12  | 13   |
| D-A79W   | 13        | 13  | 13  | 13 | 13  | 14  | 14  | 16  | 15  | 17   |
| D-F7□(V)<br>D-J79(C)<br>D-F7□W(V)<br>D-F7BA(V)<br>D-F7NT<br>D-F79F | 5.5       | 6   | 5.5 | 5  | 6   | 6   | 6   | 6.5 | 6.5 | 7    |
| D-P4DW   | —         | —   | —   | —  | —   | 5   | 5   | 5   | 5   | 5.5  |

- \* Values which include hysteresis are for reference purposes only. They are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.
- \* Excludes the D-P4DW for the CDQP2-S/T (Single acting)

**Applicable Cylinder Series: CDBQ2 (With end lock)** [mm]

| Auto switch model  | Bore size |     |              |              |              |              |           |                |
|--|-----------|-----|--------------|--------------|--------------|--------------|-----------|----------------|
|  | 20        | 25  | 32           | 40           | 50           | 63           | 80        | 100            |
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□A(V)                                 | 5.5       | 5.5 | 6<br>(5.5)   | 6<br>(5.5)   | 7<br>(6)     | 7.5<br>(6.5) | 8<br>(7)  | 8.5<br>(7)     |
| D-A9□(V)   | 10        | 10  | 9.5<br>(9.5) | 9.5<br>(9.5) | 9.5<br>(8.5) | 11.5<br>(11) | 9<br>(10) | 11.5<br>(10.5) |
| D-A7□(H)(C)<br>D-A80□(H)(C)  | —         | —   | 12           | 11           | 10           | 12           | 12        | 13             |
| D-A79W   | —         | —   | 13           | 14           | 14           | 16           | 15        | 17             |
| D-F7□(V)<br>D-J79(C)<br>D-F7□W(V)<br>D-F7BA(V)<br>D-F7NT<br>D-F79F | —         | —   | 6            | 6            | 6            | 6.5          | 6.5       | 7              |
| D-P4DW   | —         | —   | —            | 5            | 5            | 5            | 5         | 5.5            |

- \* Values which include hysteresis are for reference purposes only. They are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.
- \* The auto switch mounting bracket BQ2-012 is not used for ø32 or more of the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types. The values above indicate the operating range when mounted with the existing auto switch installation groove.
- \* The values in parentheses for ø32 or more of the D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V) types indicate the operating range when the auto switch mounting bracket BQ2-012 is used.

Standard  
Double Acting, Single Rod  
**CQ2**

Standard  
Double Acting, Double Rod  
**CQ2W**

Single Acting, Spring Return, End  
**CQ2**

Large Bore Size  
Double Acting, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2□S**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Single Rod  
**CQ2K**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Water Resistant  
Double Acting, Double Rod  
**CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Axial Piping  
Single Acting, Spring Return, End  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

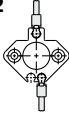

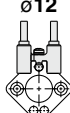
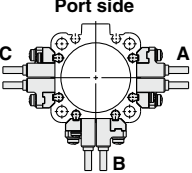
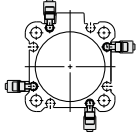
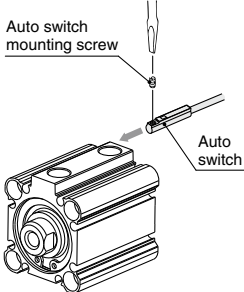
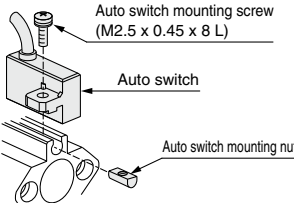
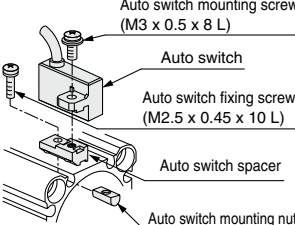
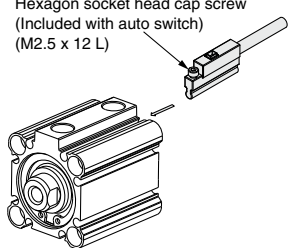
Auto Switch

Made to Order

# CDQ2 Series

## Auto Switch Mounting Brackets/Part Nos.

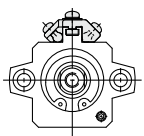
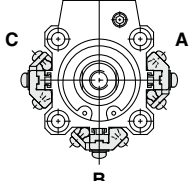
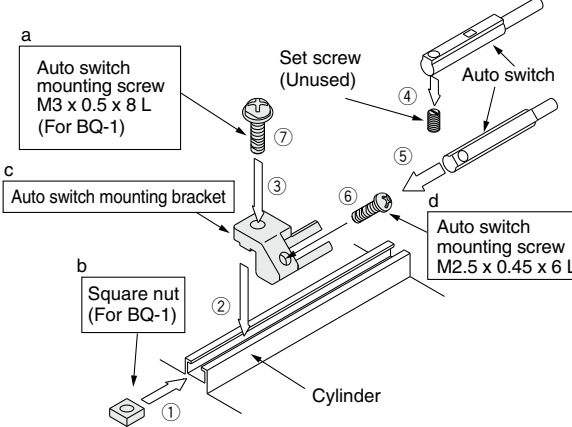
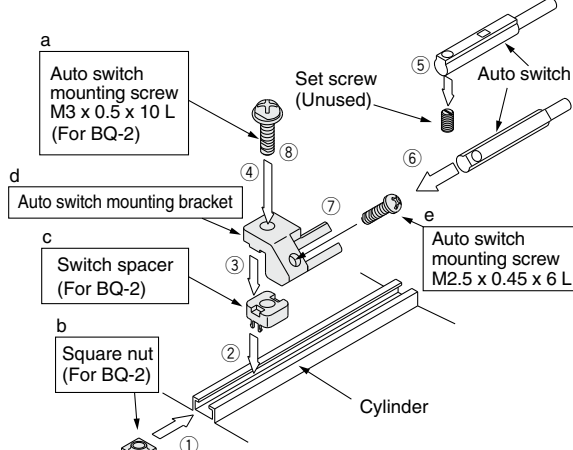
Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)

| Applicable auto switch                                    | D-M9□/M9□V<br>D-M9□W/M9□WV<br>D-M9□A/M9□AV<br>D-A9□/A9□V  | D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV<br>D-F7BA/F7BAV/F79F/F7NT<br>D-A7□/A80/A7□H/A80H/A73C/A80C/A79W  | D-P3DWA   |   |              |           |           |          |              |   |   |   |
|---|---|--|---|---|--------------|-----------|-----------|----------|--------------|---|---|---|
| Bore size [mm]  | ø12 to ø200   | ø12 to ø25   | ø32 to ø160   | ø25 to ø200   |              |           |           |          |              |   |   |   |
| Auto switch mounting bracket part no.                     | —   | BQ4-012  | BQ5-032   | —   |              |           |           |          |              |   |   |   |
| Auto switch mounting brackets fitting parts lineup/Weight | —   | <ul style="list-style-type: none"> <li>Auto switch mounting screw (M2.5 x 8 L)</li> <li>Auto switch mounting nut</li> </ul> Weight: 1.5 g  | <ul style="list-style-type: none"> <li>Auto switch fixing screw (M2.5 x 10 L)</li> <li>Auto switch mounting screw (M3 x 8 L)</li> <li>Auto switch spacer</li> <li>Auto switch mounting nut</li> </ul> Weight: 3.5 g | —   |              |           |           |          |              |   |   |   |
|   |   | When requesting the enclosure of the auto switch mounting brackets (2 pcs.) with the cylinder for shipment, add "-BQ" to the end of the cylinder model number. Standard model no. +BQ Example) CDQ2B32-30DZ-BQ/CDQ2B32-30DZ-BQ-XC4 (Made to order) |   |   |              |           |           |          |              |   |   |   |
| Auto switch mounting surface                              | Surfaces with auto switch mounting slot<br>ø12  ø16 to ø25    | Auto switch mounting rail side only<br>ø12    | A/B/C side except port side<br>  | Surfaces with auto switch mounting slot<br> |              |           |           |          |              |   |   |   |
| Mounting of auto switch                                   |  <p>Auto switch mounting screw</p> <p>Auto switch</p> <ul style="list-style-type: none"> <li>When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm.</li> </ul> <p><b>Tightening torque for auto switch mounting screw [N·m]</b></p> <table border="1"> <thead> <tr> <th>Auto switch model</th> <th>Tightening torque</th> </tr> </thead> <tbody> <tr> <td>D-M9□(V)</td> <td rowspan="3">0.05 to 0.15</td> </tr> <tr> <td>D-M9□W(V)</td> </tr> <tr> <td>D-M9□A(V)</td> </tr> <tr> <td>D-A9□(V)</td> <td>0.10 to 0.20</td> </tr> </tbody> </table> | Auto switch model  | Tightening torque   | D-M9□(V)  | 0.05 to 0.15 | D-M9□W(V) | D-M9□A(V) | D-A9□(V) | 0.10 to 0.20 | <ol style="list-style-type: none"> <li>Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position.</li> <li>Engage the ridge on the auto switch mounting arm with the recess in the cylinder tube rail, and slide it to the position of the nut.</li> <li>Gently screw the auto switch mounting screw into the thread of the auto switch mounting nut through the mounting hole on the auto switch mounting arm.</li> <li>Confirm where the mounting position is, and tighten the auto switch mounting screw to fix the auto switch. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m.</li> <li>The detection position can be changed under the conditions in step ③.</li> </ol>  <p>Auto switch mounting screw (M2.5 x 0.45 x 8 L)</p> <p>Auto switch</p> <p>Auto switch mounting nut</p> | <ol style="list-style-type: none"> <li>Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position.</li> <li>With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut.</li> <li>Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole.</li> <li>Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer.</li> <li>Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m.</li> <li>Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m.</li> <li>The detection position can be changed under the conditions in step ⑤.</li> </ol>  <p>Auto switch mounting screw (M3 x 0.5 x 8 L)</p> <p>Auto switch</p> <p>Auto switch fixing screw (M2.5 x 0.45 x 10 L)</p> <p>Auto switch spacer</p> <p>Auto switch mounting nut</p> | <ol style="list-style-type: none"> <li>Insert the mounting bracket into the mating groove of the cylinder tube.</li> <li>Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12 L).</li> <li>If the detecting position is changed, go back to step ①.</li> </ol> <ul style="list-style-type: none"> <li>Ensure that the auto switch is covered with the mating groove to protect the auto switch.</li> <li>The tightening torque for the hexagon socket head cap screw (M2.5 x 12 L) is 0.2 to 0.3 N·m.</li> </ul>  <p>Hexagon socket head cap screw (Included with auto switch) (M2.5 x 12 L)</p> |
| Auto switch model   | Tightening torque   |  |   |   |              |           |           |          |              |   |   |   |
| D-M9□(V)  | 0.05 to 0.15  |  |   |   |              |           |           |          |              |   |   |   |
| D-M9□W(V)   |   |  |   |   |              |           |           |          |              |   |   |   |
| D-M9□A(V)   |   |  |   |   |              |           |           |          |              |   |   |   |
| D-A9□(V)  | 0.10 to 0.20  |  |   |   |              |           |           |          |              |   |   |   |

\* Auto switch mounting bracket and auto switch are enclosed with the cylinder for shipment. For an environment that needs the water-resistant auto switch, select the D-M9□A(V) type. Auto switch mounting bracket for the D-F7BA(V) type uses BQ4-012 and BQ5-032 normal specifications (metal screw).  
 \* The applicable auto switches for the CDQ2□R/□V (water resistant) are the D-M9□A(V) type.  
 \* The applicable auto switches for the CDQ2-S/T (single acting) are those except for the D-P3DW type.

## Auto Switch Mounting Brackets/Part Nos.

**Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping)**

| Applicable auto switch                                   | <b>D-M9□/M9□V</b><br><b>D-M9□W/M9□WV</b><br><b>D-M9□A/M9□AV</b><br><b>D-A9□/A9□V</b>  |  |
|--|---|--|
| Bore size [mm]   | <b>ø12 to ø25</b>   | <b>ø32 to ø100</b>   |
| Auto switch mounting bracket part no.                    | ① BQ-1<br>② BQ2-012<br>Two types of auto switch mounting brackets are used as a set.  | ① BQ-2<br>② BQ2-012<br>Two types of auto switch mounting brackets are used as a set.   |
| Auto switch mounting bracket fitting parts lineup/Weight | ① BQ-1<br>• Cross recessed round head screw (M3 x 8 L)<br>• Square nut (M3 x 0.5)<br>Weight: 1.5 g<br>② BQ2-012<br>• Cross recessed round head screw (M2.5 x 6 L)<br>• Auto switch mounting bracket<br>Weight: 5 g  | ① BQ-2<br>• Cross recessed round head screw (M3 x 10 L)<br>• Square nut (M3 x 0.5)<br>• Switch spacer<br>Weight: 1.5 g<br>② BQ2-012<br>• Cross recessed round head screw (M2.5 x 6 L)<br>• Auto switch mounting bracket<br>Weight: 5 g   |
| Auto switch mounting surface                             | Auto switch mounting rail side only<br>  | A/B/C side<br>   |
| Mounting of auto switch                                  |  <p>                     • BQ-1 is a set of a and b shown above.<br/>                     • BQ2-012 is a set of c and d shown above.                 </p> <ol style="list-style-type: none"> <li>① Insert the square nut for BQ-1 in the switch mounting rail and set it at the approximate auto switch mounting position.</li> <li>② Fit the convex part of the auto switch mounting bracket arm over the concave part of the rail, and slide the arm to the nut position.</li> <li>③ Push the auto switch mounting screw (M3 for BQ-1) lightly into the square nut through the hole of the auto switch mounting arm.</li> <li>④ Remove the set screw (M2.5) attached to the auto switch.</li> <li>⑤ Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.</li> <li>⑥ Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to 0.2 N·m)</li> <li>⑦ Secure the auto switch mounting screw ③ after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to 0.7 N·m)</li> <li>⑧ Modify the detecting position while the auto switch is secured at the position of ③ in the figure.</li> </ol> |  <p>                     • BQ-2 is a set of a, b, and c shown above.<br/>                     • BQ2-012 is a set of d and e shown above.                 </p> <ol style="list-style-type: none"> <li>① Insert the square nut for BQ-2 in the switch mounting rail and set it at the approximate auto switch mounting position.</li> <li>② Fit the protruding part of the switch mounting spacer over the concave part of the rail, and slide the spacer to the nut position.</li> <li>③ Fit the convex part of the auto switch mounting bracket arm over the concave part of the switch spacer.</li> <li>④ Turn the auto switch mounting screw (M3 for BQ-2) lightly into the square nut through the mounting holes of the auto switch mounting arm and switch spacer.</li> <li>⑤ Remove the set screw (M2.5) attached to the auto switch.</li> <li>⑥ Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.</li> <li>⑦ Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to 0.2 N·m)</li> <li>⑧ Secure the auto switch mounting screw ④ after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to 0.7 N·m)</li> <li>⑨ Modify the detecting position while the auto switch is secured at the position of ④ in the figure.</li> </ol> |

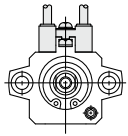
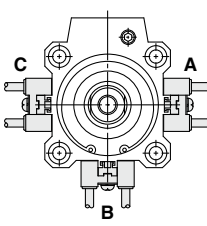
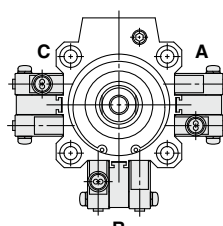
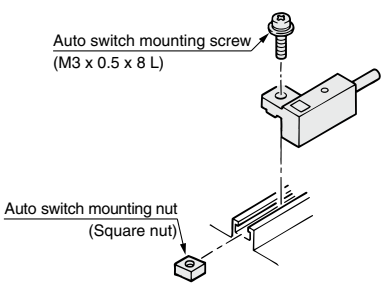
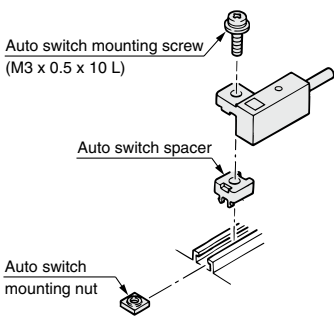
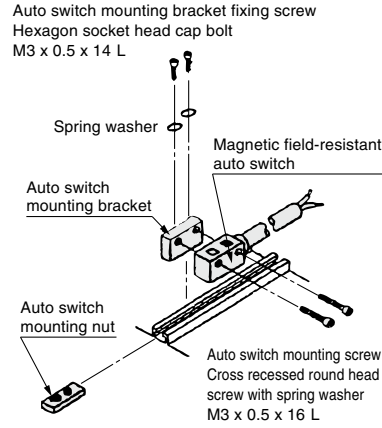
|                   |                                       |                      |
|-------------------|---------------------------------------|----------------------|
| Standard          | Double Acting, Single Rod             | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod             | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return, Extend  | <b>CQ2</b>           |
| Standard          | Single Acting, Spring Return, Retract | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Single Rod             | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod             | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod             | <b>CQ2S</b>          |
| Anti-lateral Load | Double Acting, Double Rod             | <b>CQ2W</b>          |
| Long Stroke       | Double Acting, Single Rod             | <b>CQ2</b>           |
| Long Stroke       | Double Acting, Double Rod             | <b>CQ2W</b>          |
| Non-rotating Rod  | Double Acting, Single Rod             | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod             | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod             | <b>CQ2-RV</b>        |
| Water Resistant   | Double Acting, Double Rod             | <b>CQ2W-RV</b>       |
| Axial Piping      | Double Acting, Single Rod             | <b>CQP2</b>          |
| Axial Piping      | Double Acting, Double Rod             | <b>CQP2W</b>         |
| Axial Piping      | Single Acting, Spring Return, Extend  | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, Retract | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod             | <b>CBQ2</b>          |
| With End Lock     | Double Acting, Double Rod             | <b>CBQ2W</b>         |
| Auto Switch       |                                       | <b>Auto Switch</b>   |
| Made to Order     |                                       | <b>Made to Order</b> |



# CDQ2 Series

## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping)

| Applicable auto switch                                   | D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV<br>D-F7BA/F7BAV/F79F/F7NT<br>D-A7□/A80/A7□H/A80H/A73C/A80C/A79W   |   | D-P4DW   |
|--|---|---|--|
| Bore size [mm]   | ø12 to ø25  | ø32 to ø100   | ø40 to ø100  |
| Auto switch mounting bracket part no.                    | BQ-1  | BQ-2  | BQP1-050   |
| Auto switch mounting bracket fitting parts lineup/Weight | <ul style="list-style-type: none"> <li>• Cross recessed round head screw (M3 x 8 L)</li> <li>• Square nut (M3 x 0.5)</li> <li>Weight: 1.5 g</li> </ul>  | <ul style="list-style-type: none"> <li>• Cross recessed round head screw (M3 x 10 L)</li> <li>• Square nut (M3 x 0.5)</li> <li>• Switch spacer</li> <li>Weight: 1.5 g</li> </ul>  | <ul style="list-style-type: none"> <li>• Cross recessed round head screw (M3 x 16 L)</li> <li>• Hexagon socket head cap screw (M3 x 14 L)</li> <li>• Auto switch mounting nut</li> <li>• Auto switch mounting bracket</li> <li>Weight: 16 g</li> </ul>   |
| Auto switch mounting surface                             | Auto switch mounting rail side only   | A/B/C side  | A/B/C side   |
|  |    |    |   |
| Mounting of auto switch                                  |  <p>Auto switch mounting screw (M3 x 0.5 x 8 L)</p> <p>Auto switch mounting nut (Square nut)</p> <ol style="list-style-type: none"> <li>Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.</li> <li>Fit the convex part of auto switch mounting arm into the concave part of auto switch mounting rail. Then slide the switch over the nut.</li> <li>Push the auto switch mounting screw lightly into the mounting nut through the hole of auto switch mounting arm.</li> <li>After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7 N·m.)</li> <li>Modification of the detecting position should be made in the condition of ③.</li> </ol> |  <p>Auto switch mounting screw (M3 x 0.5 x 10 L)</p> <p>Auto switch spacer</p> <p>Auto switch mounting nut</p> <ol style="list-style-type: none"> <li>Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.</li> <li>Fit the convex part of auto switch mounting arm into the concave part of auto switch spacer. Then slide the switch over the nut.</li> <li>Push the auto switch mounting screw lightly into the mounting nut through the holes of the auto switch mounting arm and auto switch spacer.</li> <li>After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7 N·m.)</li> <li>Modification of the detecting position should be made in the condition of ③.</li> </ol> |  <p>Auto switch mounting bracket fixing screw<br/>Hexagon socket head cap bolt<br/>M3 x 0.5 x 14 L</p> <p>Spring washer</p> <p>Auto switch mounting bracket</p> <p>Magnetic field-resistant auto switch</p> <p>Auto switch mounting nut</p> <p>Auto switch mounting screw<br/>Cross recessed round head screw with spring washer<br/>M3 x 0.5 x 16 L</p> <ol style="list-style-type: none"> <li>Mount the auto switch mounting bracket onto the auto switch mounting nut by tightening bracket fixing screw lightly through the mounting hole on the top of bracket.</li> <li>Insert the auto switch mounting bracket assembly (bracket + nut) into the mounting groove and set it at the auto switch mounting position.</li> <li>Push the auto switch mounting screw lightly into the auto switch through the auto switch mounting hole to secure.</li> <li>After reconfirming the detecting position, tighten the mounting screw to secure the auto switch mounting bracket and the auto switch. (Tightening torque should be 0.5 to 0.7 N·m.)</li> </ol> |

### [Stainless Steel Mounting Screw Kit]

The following stainless steel mounting screw kit (with nuts) is available. Use it in accordance with the operating environment. (Since auto switch spacer (for BQ-2) is not included, order BQ-2 separately.)

BBA2: For D-A7/A8/F7/J7 types

The above stainless steel screws are used when a cylinder is shipped with the D-F7BA/F7BAV auto switches.

When only one auto switch is shipped independently, the BBA2 is attached.

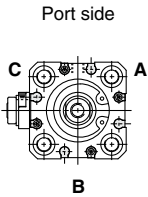
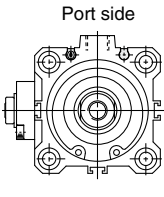
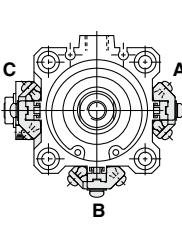
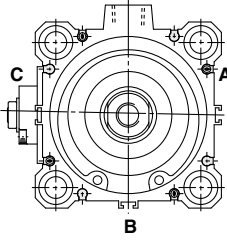
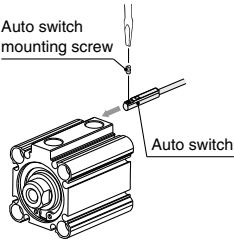
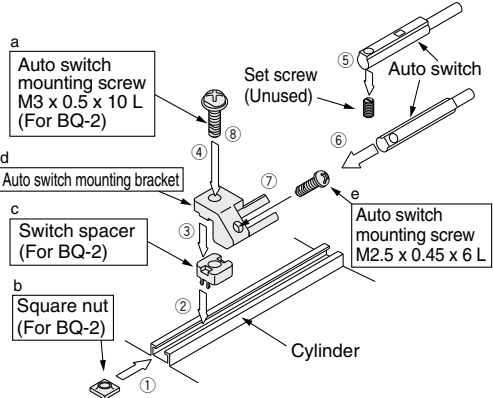
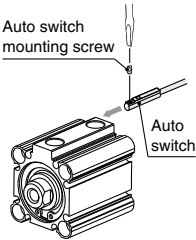
\* Refer to the **Web Catalog** for details on the BBA2.

\* When the D-M9□A(V) type is mounted, order auto switch mounting brackets BQ2-012S, BQ-2, and the stainless steel mounting screw kit BBA2 separately.



## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDBQ2 (With end lock)

| Applicable auto switch                                   | <b>D-M9□/M9□V</b><br><b>D-M9□W/M9□WV</b><br><b>D-M9□A/M9□AV</b><br><b>D-A9□/A9□V</b>  |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
|--|---|--|--|---|-----------------|--------------|------------------|------------------|-----------------|--------------|---|---|-------------------|-------------------|-----------------|--------------|------------------|------------------|-----------------|
| Bore size [mm]   | ø20, ø25  | ø32, ø40, ø50  |  | ø63, ø80, ø100  |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| Auto switch mounting bracket part no.                    | —   | —  | ① BQ-2<br>② BQ2-012<br>Two types of auto switch mounting brackets are used as a set.   | —   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| Auto switch mounting bracket fitting parts lineup/Weight | —   | —  | ① BQ-2<br>• Cross recessed round head screw (M3 x 10 L)<br>• Square nut (M3 x 0.5)<br>• Switch spacer<br>Weight: 1.5 g<br>② BQ2-012<br>• Cross recessed round head screw (M2.5 x 6 L)<br>• Auto switch mounting bracket<br>Weight: 5 g | —   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| Auto switch mounting surface                             | Port/A/B/C side   | Port side  | A/B/C side   | Port/A/B/C side   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
|  |   |  |   |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| Mounting of auto switch                                  |    |  |    |  |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
|  | <p>• When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm.</p> <p><b>Tightening torque for auto switch mounting screw [N·m]</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Auto switch model</th> <th>Tightening torque</th> </tr> </thead> <tbody> <tr> <td><b>D-M9□(V)</b></td> <td rowspan="3" style="text-align: center;">0.05 to 0.15</td> </tr> <tr> <td><b>D-M9□W(V)</b></td> </tr> <tr> <td><b>D-M9□A(V)</b></td> </tr> <tr> <td><b>D-A9□(V)</b></td> <td style="text-align: center;">0.10 to 0.20</td> </tr> </tbody> </table> |  | Auto switch model  | Tightening torque   | <b>D-M9□(V)</b> | 0.05 to 0.15 | <b>D-M9□W(V)</b> | <b>D-M9□A(V)</b> | <b>D-A9□(V)</b> | 0.10 to 0.20 | <p>• BQ-2 is a set of a, b, and c shown above.<br/>                     • BQ2-012 is a set of d and e shown above.</p> <ol style="list-style-type: none"> <li>① Insert the square nut for BQ-2 in the switch mounting rail and set it at the approximate auto switch mounting position.</li> <li>② Fit the protruding part of the switch mounting spacer over the concave part of the rail, and slide the spacer to the nut position.</li> <li>③ Fit the convex part of the auto switch mounting bracket arm over the concave part of the switch spacer.</li> <li>④ Turn the auto switch mounting screw (M3 for BQ-2) lightly into the square nut through the mounting holes of the auto switch mounting arm and switch spacer.</li> <li>⑤ Remove the set screw (M2.5) attached to the auto switch.</li> <li>⑥ Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.</li> <li>⑦ Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to 0.2 N·m)</li> <li>⑧ Secure the auto switch mounting screw ④ after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to 0.7 N·m)</li> <li>⑨ Modify the detecting position while the auto switch is secured at the position of ④ in the figure.</li> </ol> | <p>• When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm.</p> <p><b>Tightening torque for auto switch mounting screw [N·m]</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Auto switch model</th> <th>Tightening torque</th> </tr> </thead> <tbody> <tr> <td><b>D-M9□(V)</b></td> <td rowspan="3" style="text-align: center;">0.05 to 0.15</td> </tr> <tr> <td><b>D-M9□W(V)</b></td> </tr> <tr> <td><b>D-M9□A(V)</b></td> </tr> <tr> <td><b>D-A9□(V)</b></td> <td style="text-align: center;">0.10 to 0.20</td> </tr> </tbody> </table> | Auto switch model | Tightening torque | <b>D-M9□(V)</b> | 0.05 to 0.15 | <b>D-M9□W(V)</b> | <b>D-M9□A(V)</b> | <b>D-A9□(V)</b> |
| Auto switch model  | Tightening torque   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□(V)</b>  | 0.05 to 0.15  |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□W(V)</b>   |   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□A(V)</b>   |   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-A9□(V)</b>  | 0.10 to 0.20  |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| Auto switch model  | Tightening torque   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□(V)</b>  | 0.05 to 0.15  |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□W(V)</b>   |   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-M9□A(V)</b>   |   |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |
| <b>D-A9□(V)</b>  | 0.10 to 0.20  |  |  |   |                 |              |                  |                  |                 |              |   |   |                   |                   |                 |              |                  |                  |                 |

### [Stainless Steel Mounting Screw Kit]

The following stainless steel mounting screw kit (with nuts) is available. Use it in accordance with the operating environment. (Since auto switch spacer (for BQ-2) is not included, order BQ-2 separately.)

BBA2: For D-A7/A8/F7/J7 types

The above stainless steel mounting screws are used when a cylinder is shipped with the D-F7BA/F7BAV water-resistant auto switches.

When only one auto switch is shipped independently, the BBA2 is attached.

\* Refer to the **Web Catalog** for details on the BBA2.

\* When mounting D-M9□A(V) on a port other than the ports for ø32, ø40, and ø50, order auto switch mounting brackets BQ2-012S, BQ-2, and the stainless steel screw kit BBA2 separately.

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Single Acting, Spring Return, Double Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2S**

Long Stroke Double Acting, Single Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

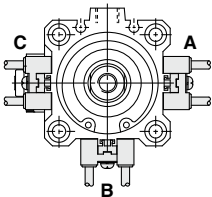
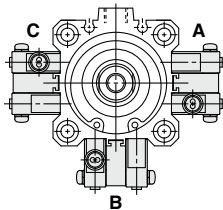
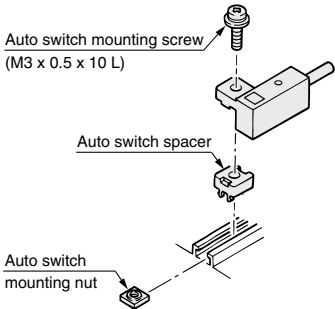
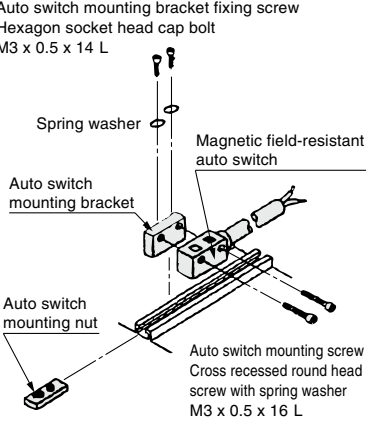
Axial Piping Double Acting, Single Rod **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch **Made to Order**

## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDBQ2 (With end lock)

| Applicable auto switch                                   | D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV<br>D-F7BA/F7BAV/F79F/F7NT<br>D-A7□/A80/A7□H/A80H/A73C/A80C/A79W  | D-P4DW   |
|--|--|--|
| Bore size [mm]   | ø32 to ø100  | ø40 to ø100  |
| Auto switch mounting bracket part no.                    | BQ-2   | BQP1-050   |
| Auto switch mounting bracket fitting parts lineup/Weight | <ul style="list-style-type: none"> <li>• Cross recessed round head screw (M3 x 10 L)</li> <li>• Square nut (M3 x 0.5)</li> <li>• Switch spacer</li> <li>Weight: 1.5 g</li> </ul>   | <ul style="list-style-type: none"> <li>• Cross recessed round head screw (M3 x 16 L)</li> <li>• Hexagon socket head cap screw (M3 x 14 L)</li> <li>• Auto switch mounting nut</li> <li>• Auto switch mounting bracket</li> <li>Weight: 16 g</li> </ul>   |
| Auto switch mounting surface                             | <p>A/B/C side</p>   | <p>A/B/C side</p>   |
| Mounting of auto switch                                  |  <ol style="list-style-type: none"> <li>Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.</li> <li>Fit the convex part of auto switch mounting arm into the concave part of auto switch spacer. Then slide the switch over the nut.</li> <li>Push the auto switch mounting screw lightly into the mounting nut through the holes of the auto switch mounting arm and auto switch spacer.</li> <li>After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7 N·m.)</li> <li>Modification of the detecting position should be made in the condition of ③.</li> </ol> |  <p>Auto switch mounting bracket fixing screw<br/>Hexagon socket head cap bolt<br/>M3 x 0.5 x 14 L</p> <p>Spring washer</p> <p>Magnetic field-resistant auto switch</p> <p>Auto switch mounting bracket</p> <p>Auto switch mounting nut</p> <p>Auto switch mounting screw<br/>Cross recessed round head screw with spring washer<br/>M3 x 0.5 x 16 L</p> <ol style="list-style-type: none"> <li>Mount the auto switch mounting bracket onto the auto switch mounting nut by tightening bracket fixing screw lightly through the mounting hole on the top of bracket.</li> <li>Insert the auto switch mounting bracket assembly (bracket + nut) into the mounting groove and set it at the auto switch mounting position.</li> <li>Push the auto switch mounting screw lightly into the auto switch through the auto switch mounting hole to secure.</li> <li>After reconfirming the detecting position, tighten the mounting screw to secure the auto switch mounting bracket and the auto switch. (Tightening torque should be 0.5 to 0.7 N·m.)</li> </ol> |

### [Stainless Steel Mounting Screw Kit]

The following stainless steel mounting screw kit (with nuts) is available. Use it in accordance with the operating environment. (Since auto switch spacer (for BQ-2) is not included, order BQ-2 separately.)

BBA2: For D-A7/A8/F7/J7 types

The above stainless steel mounting screws are used when a cylinder is shipped with the D-F7BA/F7BAV water-resistant auto switches.

When only one auto switch is shipped independently, the BBA2 is attached.

\* Refer to the **Web Catalog** for details on the BBA2.

\* When mounting D-M9□A(V) on a port other than the ports for ø32, ø40, and ø50, order auto switch mounting brackets BQ2-012S, BQ-2, and the stainless steel screw kit BBA2 separately.

Other than the applicable auto switches listed in “How to Order,” the following auto switches are also mountable. Refer to the **Web Catalog** for detailed specifications.

**Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2□S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2□R/□V, CDQ2W□R/□V (Water resistant)**

| Auto switch type   | Model              | Electrical entry          | Features                                   | Applicable bore size |
|--------------------|--------------------|---------------------------|--|----------------------|
| <b>Reed</b>        | D-A72              | Grommet (Perpendicular)   | —  | ø12 to ø160          |
|                    | D-A73              |                           | —  |                      |
|                    | D-A80              |                           | Without indicator light                    |                      |
|                    | D-A79W             |                           | Diagnostic indication (2-color indicator)  |                      |
|                    | D-A73C             | Connector (Perpendicular) | —  |                      |
|                    | D-A80C             |                           | Without indicator light                    |                      |
|                    | D-A72H             |                           | —  |                      |
|                    | D-A73H, A76H       | Grommet (In-line)         | —  |                      |
|                    | D-A80H             |                           | Without indicator light                    |                      |
| <b>Solid state</b> | D-F7NV, F7PV, F7BV | Grommet (Perpendicular)   | —  |                      |
|                    | D-F7NWW, F7BWW     |                           | Diagnostic indication (2-color indicator)  |                      |
|                    | D-F7BAV            |                           | Water resistant (2-color indicator)        |                      |
|                    | D-J79C             | Connector (Perpendicular) | —  |                      |
|                    | D-F79, F7P, J79    | Grommet (In-line)         | —  |                      |
|                    | D-F79W, F7PW, J79W |                           | Diagnostic indication (2-color indicator)  |                      |
|                    | D-F7BA             |                           | Water resistant (2-color indicator)        |                      |
|                    | D-F79F             |                           | With diagnostic output (2-color indicator) |                      |
|                    | D-F7NT             |                           | With timer                                 |                      |
|                    |                    |                           |  |                      |

- \* With pre-wired connector is also available for solid state auto switches. For details, refer to the **Web Catalog**.
- \* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to the **Web Catalog**.
- \* Trimmer auto switch (D-F7K) and heat-resistant solid state auto switch (D-F7NJ) are not available.

**Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping), CDBQ2 (With end lock)**

| Auto switch type   | Model              | Electrical entry        | Features                                  | Applicable bore size                         |
|--------------------|--------------------|-------------------------|---|--|
| <b>Reed</b>        | D-A73              | Grommet (Perpendicular) | —   | ø12 to ø100                                  |
|                    | D-A80              |                         | Without indicator light                   |  |
|                    | D-A73H, A76H       | Grommet (In-line)       | —   |  |
|                    | D-A80H             |                         | Without indicator light                   |  |
| <b>Solid state</b> | D-F7NV, F7PV, F7BV | Grommet (Perpendicular) | —   |  |
|                    | D-F7NWW, F7BWW     |                         | Diagnostic indication (2-color indicator) |  |
|                    | D-F7BAV            |                         | Water resistant (2-color indicator)       |  |
|                    | D-F79, F7P, J79    | Grommet (In-line)       | —   |  |
|                    | D-F79W, F7PW, J79W |                         | Diagnostic indication (2-color indicator) |  |
|                    | D-F7BA             |                         | Water resistant (2-color indicator)       |  |
|                    | D-F7NT             |                         | With timer                                |  |
|                    | D-P5DW             |                         | Grommet (In-line)                         | Magnetic field resistant (2-color indicator) |
|                    |                    |                         | ø40 to ø100                               |  |

- \* With pre-wired connector is also available for solid state auto switches. For details, refer to the **Web Catalog**.
- \* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to the **Web Catalog**.
- \* Excludes the D-P4DW for the CDQP2-S/T (Single acting)
- \* When using a magnetic field-resistant solid state auto switch D-P3DW type, please contact SMC separately. (Applicable bore size: ø32 to ø100)
- \* Heat-resistant solid state auto switch (D-F7NJ) is not applicable.
- \* Regarding the D-P5DW, please contact SMC separately.

Standard

Double Acting, Single Rod

**CQ2**

Standard

Double Acting, Double Rod

**CQ2W**

Standard

Single Acting, Spring Return, End

**CQ2**

Large Bore Size

Double Acting, Single Rod

**CQ2**

Large Bore Size

Double Acting, Double Rod

**CQ2W**

Anti-lateral Load

Double Acting, Single Rod

**CQ2□S**

Long Stroke

Double Acting, Single Rod

**CQ2**

Non-rotating Rod

Double Acting, Single Rod

**CQ2K**

Non-rotating Rod

Double Acting, Double Rod

**CQ2KW**

Water Resistant

Double Acting, Single Rod

**CQ2-R/V**

Water Resistant

Double Acting, Double Rod

**CQ2W-R/V**

Axial Piping

Double Acting, Single Rod

**CQP2**

Axial Piping

Single Acting, Spring Return, End

**CQP2**

With End Lock

Double Acting, Single Rod

**CBQ2**

Auto Switch

**Auto Switch**

Made to Order

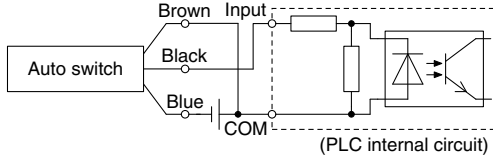
**Made to Order**

# Prior to Use

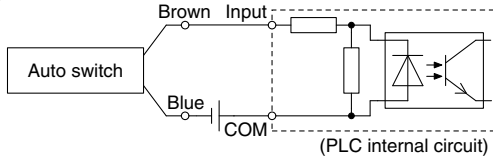
## Auto Switch Connections and Examples

### Sink Input Specifications

#### 3-wire, NPN

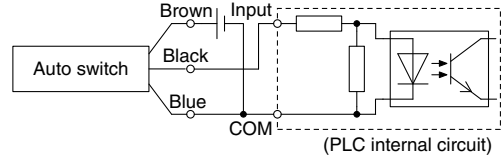


#### 2-wire

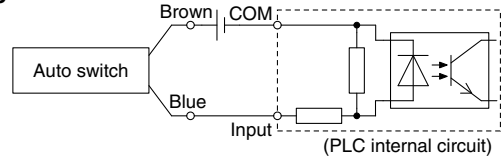


### Source Input Specifications

#### 3-wire, PNP



#### 2-wire

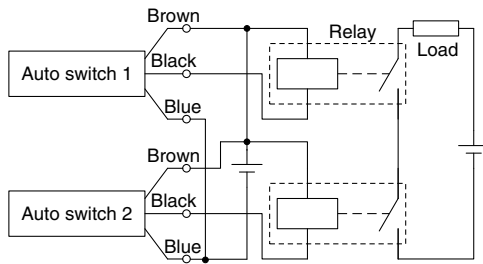


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

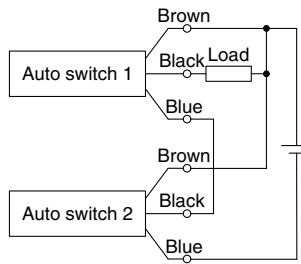
### Examples of AND (Series) and OR (Parallel) Connections

\* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid. Depending on the operating environment, the product may not operate properly.

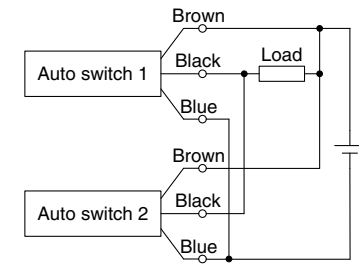
#### 3-wire AND connection for NPN output (Using relays)



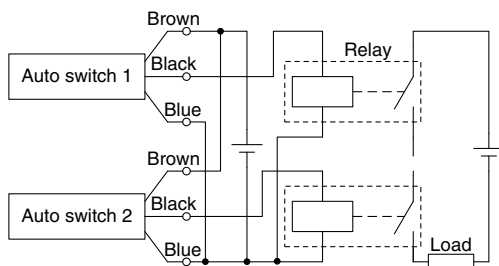
#### (Performed with auto switches only)



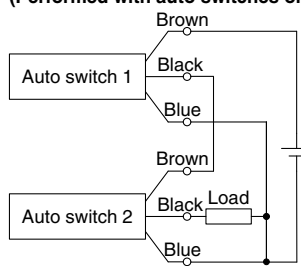
#### 3-wire OR connection for NPN output



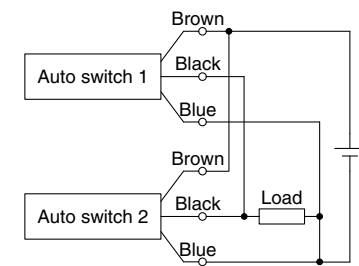
#### 3-wire AND connection for PNP output (Using relays)



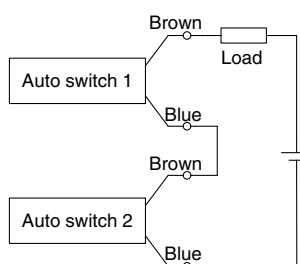
#### (Performed with auto switches only)



#### 3-wire OR connection for PNP output



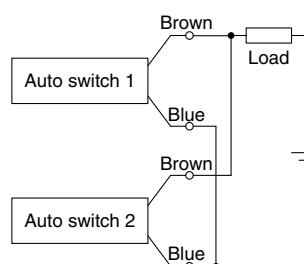
#### 2-wire AND connection



When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state. Auto switches with a load voltage less than 20 V cannot be used.

Example) Load voltage at ON  
 Power supply voltage: 24 VDC  
 Internal voltage drop: 4 V  
 Load voltage at ON = Power supply voltage –  
 Internal voltage drop x 2 pcs.  
 = 24 V x 4 V x 2 pcs.  
 = 16 V

#### 2-wire OR connection



(Solid state)  
 When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed)  
 Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

Example) Load voltage at OFF  
 Leakage current: 1 mA  
 Load impedance: 3 kΩ  
 Load voltage at OFF = Leakage current x 2 pcs. x  
 Load impedance  
 = 1 mA x 2 pcs. X 3 kΩ  
 = 6 V

# CQ2 Series

## Simple Specials/Made to Order Common Specifications



Please contact SMC for detailed specifications, delivery times, and prices.

**Simple Specials** The following special specifications can be ordered as a simplified Made-to-Order. Please contact your local sales representative for more details.

| Symbol     | Specifications          | CQ2 (Standard) |            |                              |                              | CQ2 (Large bore size) |            |
|------------|-------------------------|----------------|------------|------------------------------|------------------------------|-----------------------|------------|
|            |                         | Double acting  |            | Single acting                |                              | Double acting         |            |
|            |                         | Single rod     | Double rod | Single rod/<br>Spring return | Single rod/<br>Spring extend | Single rod            | Double rod |
| -XA1 to 30 | Change of rod end shape | ●              | ●          | ●                            |                              | ●                     | ●          |

### Made to Order Common Specifications

| Symbol  | Specifications   | CQ2 (Standard) |            |                              |                              | CQ2 (Large bore size) |            |
|---------|--|----------------|------------|------------------------------|------------------------------|-----------------------|------------|
|         |  | Double acting  |            | Single acting                |                              | Double acting         |            |
|         |  | Single rod     | Double rod | Single rod/<br>Spring return | Single rod/<br>Spring extend | Single rod            | Double rod |
| -XB6    | Heat-resistant cylinder (-10 to 150°C)*4   | ●              | ●          |                              |                              |                       |            |
| -XB7    | Cold-resistant cylinder (-40 to 70°C)  | ●              | ●          |                              |                              |                       |            |
| -XB9    | Low-speed cylinder (10 to 50 mm/s)   | ●              | ●          |                              |                              |                       |            |
| -XB10   | Intermediate stroke (Using exclusive body)   | ●              | ●          | ●                            |                              | ●                     | ●          |
| -XB10A  | Intermediate stroke (Spacer-installed type)*3  | ●              |            |                              |                              |                       |            |
| -XB13   | Low-speed cylinder (5 to 50 mm/s)  | ●              | ●          |                              |                              |                       |            |
| -XB14   | Cylinder with heat-resistant auto switch*2, 4  | ●              |            |                              |                              |                       |            |
| -XC2(A) | Rod end length increased by 10 mm (For foot and flange bracket)  | ●              | ●          | ●                            | ●                            |                       |            |
| -XC4    | With heavy duty scraper  | ●              | ●          |                              |                              |                       |            |
| -XC6(A) | Piston rod/Retaining ring/Rod end nut material: 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   | ●              |            |                              |                              |                       |            |
| -XC26   | With split pins for double clevis pin/double knuckle joint pin and flat washers                                    | ●              |            | ●                            | ●                            |                       |            |
| -XC26□  | Double clevis width/Double knuckle width 12.5 mm, 16.5 mm, or 19.5 mm: With double clevis and double knuckle joint | ●              |            | ●                            | ●                            |                       |            |
| -XC27   | Double clevis pin/Double knuckle joint pin material: Stainless steel 304   | ●              |            | ●                            | ●                            |                       |            |
| -XC35   | With coil scraper  | ●              | ●          |                              |                              |                       |            |
| -XC36   | With boss on rod end   | ●              | ●          | ●                            | ●                            |                       |            |
| -XC85   | Grease for food processing equipment   | ●              | ●          | ●                            | ●                            | ●                     | ●          |
| -XC88   | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)                | ●              |            |                              |                              |                       |            |
| -XC89   | Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)                               | ●              |            |                              |                              |                       |            |
| -XC91   | Spatter-resistant coil scraper, Grease for welding (Piston rod: S45C)  | ●              |            |                              |                              |                       |            |
| -XC92   | Dust-resistant actuator  | ●              |            |                              |                              |                       |            |
| -X144   | Special port location  | ●              | ●          | ●                            | ●                            |                       |            |
| -X202   | Same full length dimension as the CQ1 series   | ●              |            | ●                            | ●                            |                       |            |
| -X203   | Same L dimension from the rod cover as the CQ1 series  | ●              |            | ●                            | ●                            |                       |            |
| -X235   | Special rod end for double rod cylinder  |                | ●          |                              |                              |                       | ●          |
| -X271   | Fluororubber seals*4   | ●              | ●          | ●                            | ●                            | ●                     | ●          |
| -X293   | Same full length dimension as the CQ1W series  |                | ●          |                              |                              |                       |            |
| -X525   | Long stroke for adjustable extension stroke cylinder (-XC8)  | ●              |            |                              |                              |                       |            |
| -X526   | Long stroke for adjustable retraction stroke cylinder (-XC9)   | ●              |            |                              |                              |                       |            |
| -X633   | Intermediate stroke for double rod cylinder  |                | ●          |                              |                              |                       | ●          |
| -X636   | Long stroke for dual stroke single rod cylinder  | ●              |            |                              |                              |                       |            |
| -X1876  | Cylinder tube: With concave boss on head end   | ●              |            | ●                            | ●                            |                       |            |

\*1 ø12 to ø32: Special product, for ø40 to ø63 only \*2 The body shape is the same as the existing product. \*3 For ø32 to ø100 only

# Simple Specials/Made to Order Common Specifications **CQ2 Series**

| CQ2□S<br>(Anti-lateral load)<br>Double acting |  | CQ2<br>(Long stroke)<br>Double acting |  | CQ2K<br>(Non-rotating rod)<br>Double acting |            | CQ2-R/V<br>(Water resistant)<br>Double acting |            | CQP2<br>(Axial piping)*2 |                              |                              | CBQ2<br>(With end lock)*2 |  | Page | Symbol     |
|---|--|---------------------------------------|--|---|------------|---|------------|--------------------------|------------------------------|------------------------------|---------------------------|--|------|------------|
| Single rod                                    |  | Single rod                            |  | Single rod                                  | Double rod | Single rod                                    | Double rod | Double acting            | Single acting                |                              | Single rod                |  |      |            |
|   |  |                                       |  |   |            |   |            | Single rod               | Single rod/<br>Spring return | Single rod/<br>Spring extend |                           |  | 157  | -XA1 to 30 |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  |      |            |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 161  | -XB6       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 161  | -XB7       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 161  | -XB9       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 162  | -XB10      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 164  | -XB10A     |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 164  | -XB13      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 165  | -XB14      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 166  | -XC2(A)    |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 167  | -XC4       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 168  | -XC6(A)    |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 169  | -XC8       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 170  | -XC9       |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 171  | -XC10      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 172  | -XC11      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 174  | -XC26      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 175  | -XC26□     |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 176  | -XC27      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 176  | -XC35      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 177  | -XC36      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 177  | -XC85      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 178  | -XC88      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 178  | -XC89      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 178  | -XC91      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 179  | -XC92      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 179  | -X144      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 180  | -X202      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 182  | -X203      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 183  | -X235      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 183  | -X271      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 184  | -X293      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 185  | -X525      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 186  | -X526      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 186  | -X633      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 187  | -X636      |
|   |  |                                       |  |   |            |   |            |                          |                              |                              |                           |  | 188  | -X1876     |

\*4 Excludes the air-hydro type \*5 The standard model can be used for the type with boss on the rod end (-XC36).

|                   |                                      |          |
|-------------------|--------------------------------------|----------|
| Standard          | Double Acting, Single Rod            | CQ2      |
|                   | Double Acting, Double Rod            | CQ2W     |
|                   | Single Acting, Spring Return, Extend | CQ2      |
| Large Bore Size   | Double Acting, Single Rod            | CQ2      |
|                   | Double Acting, Double Rod            | CQ2W     |
| Anti-lateral Load | Double Acting, Single Rod            | CQ2□S    |
| Long Stroke       | Double Acting, Single Rod            | CQ2      |
| Non-rotating Rod  | Double Acting, Single Rod            | CQ2K     |
|                   | Double Acting, Double Rod            | CQ2KW    |
| Water Resistant   | Double Acting, Single Rod            | CQ2-R/V  |
|                   | Double Acting, Double Rod            | CQ2W-R/V |
| Axial Piping      | Double Acting, Single Rod            | CQP2     |
|                   | Single Acting, Spring Return, Extend | CQP2     |
| With End Lock     | Double Acting, Single Rod            | CBQ2     |
| Auto Switch       |                                      |          |
| Made to Order     |                                      |          |

# CQ2 Series Simple Specials

The following changes are dealt with through the Simple Specials System.

Please contact your local sales representative for more details.

## 1 CQ2 (ø12 to ø25): Change of Rod End Shape

### Applicable Series

| Description         |              | Model            | Action   | Symbol for change of rod end shape   |
|---------------------|--------------|------------------|--|--|
| CQ2<br>(ø12 to ø25) | Standard     | CQ2              | Double acting, Single rod<br>Single acting (Spring return)*1 | XA1, XA2, XA6<br>XA7, XA11<br>XA17, XA18                                   |
|                     |              | CQ2W             | Double acting, Double rod                                    |  |
|                     | Axial piping | CQP2             | Double acting, Single rod<br>Single acting (Spring return)*1 |  |
|                     |              | Non-rotating rod | CQ2K   | Double acting, Single rod<br>Double acting, Double rod (Non-rotating side) |
|                     | CQ2KW        |                  | Double acting, Double rod (Round rod side)                   | XA1, XA2, XA6, XA7<br>XA11, XA17, XA18                                     |

\*1 A single acting, spring extend type is available as a special order.

### Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with "\*" will be as follows to the rod diameter (D).  
Enter any special dimension you require.  
ø12, ø16 → D-1 mm ø20, ø25 → D-2 mm
- In the case of a double rod, fill in the dimension when the rod is retracted.
- When changing the rod end shape on both sides, fill in the construction specification sheets for the left side (piston rod A) and for the right side (piston rod B) respectively.  
Selected model (Example) **CQ2WB32-10DZ-XA7A18**  
Use an XA7 specification sheet for the left side (piston rod A) and an XA18 specification sheet for the right side (piston rod B).
- For the XA17 and XA18, the male thread diameter cannot be the same as the piston rod external diameter.
- Please contact SMC separately for piston rod end pattern part numbers other than those in the table to the left or for other manufacturing requirements.
- The rod end nut is not included if the H1 dimension is changed from the standard product.

|                           |                           |                           |                          |
|---------------------------|---------------------------|---------------------------|--------------------------|
| <p>Symbol: <b>A1</b></p>  | <p>Symbol: <b>A2</b></p>  | <p>Symbol: <b>A6</b></p>  | <p>Symbol: <b>A7</b></p> |
| <p>Symbol: <b>A11</b></p> | <p>Symbol: <b>A17</b></p> | <p>Symbol: <b>A18</b></p> |                          |



Symbol

**-XA1/2/6/7/11/17/18**

**Conditions of Manufacture**

| Change of rod end shape/Symbol | Single rod type | Double rod type                            |  |
|--------------------------------|-----------------|--|--|
| <b>XA1</b>                     | For $\phi 12$   | $\phi M$ : 3 mm or more 5 mm or less       | $\phi M$ : $\phi 5$ mm or less             |
|                                | $\phi 16$       | $\phi M$ : 3 mm or more 7 mm or less       | $\phi M$ : $\phi 7$ mm or less             |
|                                | $\phi 20$       | $\phi M$ : 4 mm or more 8 mm or less       | $\phi M$ : $\phi 8$ mm or less             |
|                                | $\phi 25$       | $\phi M$ : 4 mm or more 10 mm or less      | $\phi M$ : $\phi 10$ mm or less            |
| <b>XA2</b>                     | For $\phi 12$   | $\phi J$ : 4 mm or more, W1: 6 mm or less  | $\phi J$ : 3 mm or more, W1: 6 mm or less  |
|                                | $\phi 16$       | $\phi J$ : 4 mm or more, W1: 6 mm or less  | $\phi J$ : 4 mm or more, W1: 6 mm or less  |
|                                | $\phi 20$       | $\phi J$ : 5 mm or more, W1: 11 mm or less | $\phi J$ : 5 mm or more, W1: 11 mm or less |
|                                | $\phi 25$       | $\phi J$ : 6 mm or more, W1: 13 mm or less | $\phi J$ : 6 mm or more, W1: 13 mm or less |
| <b>XA6</b>                     | For $\phi 12$   | H: M4 or less                              | H: M4 or less                              |
|                                | $\phi 16$       | H: M6 or less                              | H: M6 or less                              |
|                                | $\phi 20$       | H: M6 or less                              | H: M6 or less                              |
|                                | $\phi 25$       | H: M8 or less                              | H: M8 or less                              |
| <b>XA7</b>                     | For $\phi 12$   | H: M4 or less                              | H: M4 or less                              |
|                                | $\phi 16$       | H: M5 or less                              | H: M5 or less                              |
|                                | $\phi 20$       | H: M6 or less                              | H: M6 or less                              |
|                                | $\phi 25$       | H: M8 or less                              | H: M8 or less                              |
| <b>XA11</b>                    | For $\phi 12$   | SR3 mm only                                | SR3 mm or more                             |
|                                | $\phi 16$       | SR4 mm only                                | SR4 mm or more                             |
|                                | $\phi 20$       | SR5 mm only                                | SR5 mm or more                             |
|                                | $\phi 25$       | SR6 mm only                                | SR6 mm or more                             |
| <b>XA17</b>                    | For $\phi 12$   | H: M5 or more, X: 20 mm or less            | H: M5 or less                              |
|                                | $\phi 16$       | H: M6 or more, X: 22.5 mm or less          | H: M6 or less                              |
|                                | $\phi 20$       | H: M8 or more, X: 26.5 mm or less          | H: M8 or less                              |
|                                | $\phi 25$       | H: M10 or more, X: 33 mm or less           | H: M10 or less                             |
| <b>XA18</b>                    | For $\phi 12$   | H: M5 or more, X: 20 mm or less            | H: M5 or less                              |
|                                | $\phi 16$       | H: M6 or more, X: 22.5 mm or less          | H: M6 or less                              |
|                                | $\phi 20$       | H: M8 or more, X: 26.5 mm or less          | H: M8 or less                              |
|                                | $\phi 25$       | H: M10 or more, X: 33 mm or less           | H: M10 or less                             |

|                   |                                   |  |
|-------------------|-----------------------------------|--|
| Standard          | Double Acting, Single Rod         | <b>CQ2</b>                                   |
| Standard          | Double Acting, Double Rod         | <b>CQ2W</b>                                  |
| Standard          | Single Acting, Spring Return, End | <b>CQ2</b>                                   |
| Large Bore Size   | Double Acting, Single Rod         | <b>CQ2</b>                                   |
| Large Bore Size   | Double Acting, Double Rod         | <b>CQ2W</b>                                  |
| Anti-lateral Load | Double Acting, Single Rod         | <b>CQ2</b> <input type="checkbox"/> <b>S</b> |
| Anti-lateral Load | Double Acting, Double Rod         | <b>CQ2</b> <input type="checkbox"/> <b>S</b> |
| Long Stroke       | Double Acting, Single Rod         | <b>CQ2</b>                                   |
| Long Stroke       | Double Acting, Double Rod         | <b>CQ2</b>                                   |
| Non-rotating Rod  | Double Acting, Single Rod         | <b>CQ2K</b>                                  |
| Non-rotating Rod  | Double Acting, Double Rod         | <b>CQ2KW</b>                                 |
| Water Resistant   | Double Acting, Single Rod         | <b>CQ2-R/V</b>                               |
| Water Resistant   | Double Acting, Double Rod         | <b>CQ2W-R/V</b>                              |
| Axial Piping      | Double Acting, Single Rod         | <b>CQP2</b>                                  |
| Axial Piping      | Double Acting, Double Rod         | <b>CQP2</b>                                  |
| Axial Piping      | Single Acting, Spring Return, End | <b>CQP2</b>                                  |
| With End Lock     | Double Acting, Single Rod         | <b>CBQ2</b>                                  |
| With End Lock     | Double Acting, Double Rod         | <b>CBQ2</b>                                  |
| Auto Switch       |                                   | <b>Auto Switch</b>                           |
| Made to Order     |                                   | <b>Made to Order</b>                         |

# CQ2 Series Simple Specials

The following changes are dealt with through the Simple Specials System.

Please contact your local sales representative for more details.

## 1 CQ2 (ø32 to ø100)/CQ2 Large Bore Size (ø125 to ø200): Change of Rod End Shape

| Description       | Model        | Action   | Symbol for change of rod end shape          |
|-------------------|--------------|--|---|
| Standard          | <b>CQ2</b>   | Double acting, Single rod<br>Single acting (Spring return) <sup>*1</sup> | XA1 to 23<br>XA26 to 30                     |
|                   | <b>CQ2W</b>  | Double acting, Double rod  |   |
| Axial piping      | <b>CQP2</b>  | Double acting, Single rod  |   |
|                   |              | Single acting (Spring return)  |   |
| Anti-lateral load | <b>CQ2□S</b> | Double acting, Single rod  |   |
| Long stroke       | <b>CQ2</b>   | Double acting, Single rod  |   |
| Non-rotating rod  | <b>CQ2K</b>  | Double acting, Single rod  | XA1, XA2, XA6<br>XA10 to XA14<br>XA19, XA21 |
|                   | <b>CQ2KW</b> | Double acting, Double rod<br>(Non-rotating side)                         | XA1 to 23<br>XA26 to 30                     |
|                   |              | Double acting, Double rod<br>(Round rod side)                            |   |
| Large bore size   | <b>CQ2</b>   | Double acting, Single rod  |   |
|                   | <b>CQ2W</b>  | Double acting, Double rod  |   |

\*1 A single acting, spring extend type is available as a special order.

### Precautions

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with “\*” will be the rod diameter (D) – 2 mm. Enter any special dimension you require.
- In the case of a double rod, fill in the dimension when the rod is retracted.
- When changing the rod end shape on both sides, fill in the construction specification sheets for the left side (piston rod A) and for the right side (piston rod B) respectively.  
Selected model (Example) **CQ2WB32-10DZ-XA7A18**  
Use an XA7 specification sheet for the left side (piston rod A) and an XA18 specification sheet for the right side (piston rod B).
- The rod end nut is not included if the H1 dimension is changed from the standard product.

|                       |                        |                        |                        |
|-----------------------|------------------------|------------------------|------------------------|
| <b>Symbol: A1</b><br> | <b>Symbol: A2</b><br>  | <b>Symbol: A3</b><br>  | <b>Symbol: A4</b><br>  |
| <b>Symbol: A5</b><br> | <b>Symbol: A6</b><br>  | <b>Symbol: A7</b><br>  | <b>Symbol: A8</b><br>  |
| <b>Symbol: A9</b><br> | <b>Symbol: A10</b><br> | <b>Symbol: A11</b><br> | <b>Symbol: A12</b><br> |

Symbol  
**-XA1 to XA23/-XA26 to XA30**

|                           |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|---------------------------|
| <p>Symbol: <b>A13</b></p> | <p>Symbol: <b>A14</b></p> | <p>Symbol: <b>A15</b></p> | <p>Symbol: <b>A16</b></p> |
| <p>Symbol: <b>A17</b></p> | <p>Symbol: <b>A18</b></p> | <p>Symbol: <b>A19</b></p> | <p>Symbol: <b>A20</b></p> |
| <p>Symbol: <b>A21</b></p> | <p>Symbol: <b>A22</b></p> | <p>Symbol: <b>A23</b></p> | <p>Symbol: <b>A26</b></p> |
| <p>Symbol: <b>A27</b></p> | <p>Symbol: <b>A28</b></p> | <p>Symbol: <b>A29</b></p> | <p>Symbol: <b>A30</b></p> |

|                   |  |                |
|-------------------|--|----------------|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>     |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>    |
| Standard          | Single Acting, Spring Return, Single Rod | <b>CQ2</b>     |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2W</b>    |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>     |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>    |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2</b>     |
| Anti-lateral Load | Double Acting, Double Rod                | <b>CQ2S</b>    |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>     |
| Long Stroke       | Double Acting, Double Rod                | <b>CQ2S</b>    |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2K</b>    |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2KW</b>   |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-RV</b>  |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-RV</b> |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>    |
| Axial Piping      | Double Acting, Double Rod                | <b>CQP2</b>    |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>    |
| With End Lock     | Double Acting, Double Rod                | <b>CBQ2</b>    |
| Auto Switch       | Double Acting, Single Rod                | <b>CQ2</b>     |
| Auto Switch       | Double Acting, Double Rod                | <b>CQ2W</b>    |



## 1 Heat-resistant Cylinder (−10 to 150°C)

Symbol

**-XB6**

The seal material and grease used in this air cylinder have been changed so that it can be used at temperatures between −10 up to 150°C.

| Description      | Model        | Action                    | Note   |
|------------------|--------------|---------------------------|--|
| Compact cylinder | <b>CQ2</b>   | Double acting, Single rod | Excludes models with a rubber bumper or auto switch magnet |
|                  | <b>CQ2W</b>  | Double acting, Double rod |  |
| Axial piping     | <b>CQP2</b>  | Double acting, Single rod | Excludes the air-hydro type                                |
| Non-rotating rod | <b>CQ2K</b>  | Double acting, Single rod | Excludes models with a rubber bumper or auto switch magnet |
|                  | <b>CQ2KW</b> | Double acting, Double rod |  |

- \* Operate without lubrication from a pneumatic system lubricator.
- \* Please contact SMC for details on the maintenance intervals for this cylinder as they differ from those of the standard cylinder.
- \* In principle, it is impossible to make a heat-resistant cylinder with a built-in magnet or with an auto switch. But, as for the one with an auto switch, and the heat-resistant cylinder with a heat-resistant auto switch, since it will be differed depending on the series, please contact SMC.
- \* Piston speed ranges from 50 to 500 mm/s
- \* Please contact SMC for models with a rubber bumper.

### How to Order



### Specifications

|   |                           |
|---|---------------------------|
| <b>Ambient temperature range</b>                          | −10°C to 150°C            |
| <b>Seal material</b>                                      | Fluororubber              |
| <b>Grease</b>   | Heat-resistant grease     |
| <b>Specifications other than the above and dimensions</b> | Same as the standard type |

### ⚠ Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

## 2 Cold-resistant Cylinder (−40 to 70°C)

Symbol

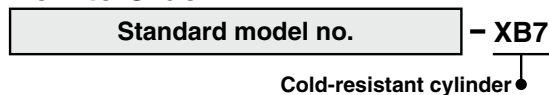
**-XB7**

The seal material and grease used in this air cylinder have been changed so that it can be used even at lower temperature down to −40°C.

| Description      | Model       | Action                    | Note  |
|------------------|-------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod | Applicable to $\phi 12$ to $\phi 40$<br>Excludes models with a rubber bumper, auto switch magnet, or mounting bracket |
|                  | <b>CQ2W</b> | Double acting, Double rod |   |
| Axial piping     | <b>CQP2</b> | Double acting, Single rod |   |

- \* Operate without lubrication from a pneumatic system lubricator.
- \* Use dry air which is suitable for heatless air dryer, etc., not to cause the moisture to be frozen.
- \* Please contact SMC for details on the maintenance intervals for this cylinder as they differ from those of the standard cylinder.
- \* Mounting auto switch is impossible.
- \* Please contact SMC for models with a rubber bumper.

### How to Order



### Specifications

|  |                           |
|--|---------------------------|
| <b>Ambient temperature range</b>           | −40°C to 70°C             |
| <b>Seal material</b>                       | Low nitrile rubber        |
| <b>Grease</b>                              | Cold-resistant grease     |
| <b>Auto switch</b>                         | Not mountable             |
| <b>Dimensions</b>                          | Same as the standard type |
| <b>Specifications other than the above</b> | Same as the standard type |

### ⚠ Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

## 3 Low-speed Cylinder (10 to 50 mm/s)

Symbol

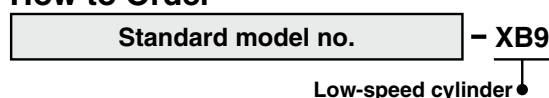
**-XB9**

Stick-slip phenomenon can be prevented, and smooth operation can be achieved even at lower driving speeds between 10 to 50 mm/s.

| Description      | Model       | Action                    | Note |
|------------------|-------------|---------------------------|------|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod |      |
|                  | <b>CQ2W</b> | Double acting, Double rod |      |
| Axial piping     | <b>CQP2</b> | Double acting, Single rod |      |

- \* Operate without lubrication from a pneumatic system lubricator.

### How to Order



### Specifications

|  |                           |
|--|---------------------------|
| <b>Piston speed</b>                        | 10 to 50 mm/s             |
| <b>Dimensions</b>                          | Same as the standard type |
| <b>Specifications other than the above</b> | Same as the standard type |

### ⚠ Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

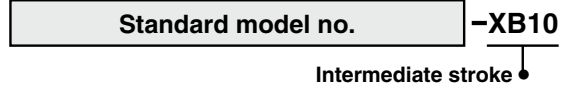
Symbol  
**-XB10**

**4 Intermediate Stroke (Using exclusive body)**

Cylinder which can reduce the mounting space by using an exclusive body which does not use a spacer to achieve that the full length dimension could be shortened when an intermediate stroke other than the standard stroke is required

| Description       | Model           | Action   | Note                      |
|-------------------|-----------------|--|---------------------------|
| Compact cylinder  | <b>CQ2</b>      | Double acting, Single rod<br>Single acting (Spring return) |                           |
|                   | <b>CQ2W</b>     | Double acting, Double rod                                  |                           |
| Non-rotating rod  | <b>CQ2K</b>     | Double acting, Single rod                                  | Applicable to ø40 to ø63  |
|                   | <b>CQ2KW</b>    | Double acting, Double rod                                  |                           |
| Large bore size   | <b>CQ2</b>      | Double acting, Single rod                                  |                           |
|                   | <b>CQ2W</b>     | Double acting, Double rod                                  |                           |
| Long stroke       | <b>CQ2</b>      | Double acting, Single rod                                  |                           |
| Anti-lateral load | <b>CQ2□S</b>    | Double acting, Single rod                                  |                           |
| Water resistant   | <b>CQ2-R/V</b>  | Double acting, Single rod                                  | Applicable to ø40 to ø100 |
|                   | <b>CQ2W-R/V</b> | Double acting, Double rod                                  |                           |
| With end lock     | <b>CBQ2</b>     | Double acting, Single rod                                  |                           |

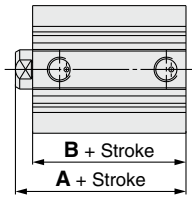
**How to Order**



**Specifications: Same as those of the standard type**

**Dimensions** The A and B dimensions shown below are the same as those of the standard type. (Shown for reference purposes)

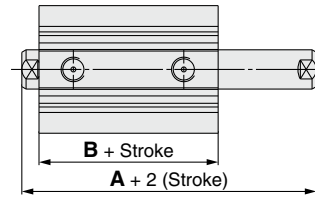
**Double acting, Single rod/Standard**



[mm]

| Bore size [mm] | Single rod type      |                    |                      |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | A                    |                    | B                    |                    |                              |
|                | 49 mm stroke or less | 51 to 99 mm stroke | 49 mm stroke or less | 51 to 99 mm stroke |                              |
| <b>12</b>      | 20.5 (31.5)          | —                  | 17 (28)              | —                  | 6 to 29                      |
| <b>16</b>      | 22 (34)              | —                  | 18.5 (30.5)          | —                  |                              |
| <b>20</b>      | 24 (36)              | —                  | 19.5 (31.5)          | —                  |                              |
| <b>25</b>      | 27.5 (37.5)          | —                  | 22.5 (32.5)          | —                  | 6 to 49                      |
| <b>32</b>      | 30 (40)              | 40 (40)            | 23 (33)              | 33 (33)            | 6 to 99                      |
| <b>40</b>      | 36.5 (46.5)          | 46.5 (46.5)        | 29.5 (39.5)          | 39.5 (39.5)        |                              |
| <b>50</b>      | 38.5 (48.5)          | 48.5 (48.5)        | 30.5 (40.5)          | 40.5 (40.5)        |                              |
| <b>63</b>      | 44 (54)              | 54 (54)            | 36 (46)              | 46 (46)            | 11 to 99                     |
| <b>80</b>      | 53.5 (63.5)          | 63.5 (63.5)        | 43.5 (53.5)          | 53.5 (53.5)        |                              |
| <b>100</b>     | 65 (75)              | 75 (75)            | 53 (63)              | 63 (63)            |                              |

**Double acting, Double rod/Standard**



[mm]

| Bore size [mm] | Double rod type      |                    |                      |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | A                    |                    | B                    |                    |                              |
|                | 49 mm stroke or less | 51 to 99 mm stroke | 49 mm stroke or less | 51 to 99 mm stroke |                              |
| <b>12</b>      | 32.2 (39.4)          | —                  | 25.2 (32.4)          | —                  | 6 to 29                      |
| <b>16</b>      | 33 (43)              | —                  | 26 (36)              | —                  |                              |
| <b>20</b>      | 35 (47)              | —                  | 26 (38)              | —                  |                              |
| <b>25</b>      | 39 (49)              | —                  | 29 (39)              | —                  | 6 to 49                      |
| <b>32</b>      | 44.5 (54.5)          | 54.5 (54.5)        | 30.5 (40.5)          | 40.5 (40.5)        | 6 to 99                      |
| <b>40</b>      | 54 (64)              | 64 (64)            | 40 (50)              | 50 (50)            |                              |
| <b>50</b>      | 56.5 (66.5)          | 66.5 (66.5)        | 40.5 (50.5)          | 50.5 (50.5)        |                              |
| <b>63</b>      | 58 (68)              | 68 (68)            | 42 (52)              | 52 (52)            | 11 to 99                     |
| <b>80</b>      | 71 (81)              | 81 (81)            | 51 (61)              | 61 (61)            |                              |
| <b>100</b>     | 84.5 (94.5)          | 94.5 (94.5)        | 60.5 (70.5)          | 70.5 (70.5)        |                              |

**Single acting, Spring return**

[mm]

| Bore size [mm] | Single rod type (Single acting/Spring return) |             | Applicable stroke range [mm] |
|----------------|---|-------------|------------------------------|
|                | A   | B           |                              |
| <b>12</b>      | 20.5 (31.5)                                   | 17 (28)     | 6 to 9                       |
| <b>16</b>      | 22 (34)                                       | 18.5 (30.5) |                              |
| <b>20</b>      | 24 (36)                                       | 19.5 (31.5) |                              |
| <b>25</b>      | 27.5 (37.5)                                   | 22.5 (32.5) | 6 to 9                       |
| <b>32</b>      | 30 (40)                                       | 23 (33)     | 6 to 9                       |
| <b>40</b>      | 36.5 (46.5)                                   | 29.5 (39.5) |                              |
| <b>50</b>      | 38.5 (48.5)                                   | 30.5 (40.5) |                              |

- \* ( ): Dimensions with auto switch magnet
- \* Other dimensions are the same as those of the standard type.
- \* Applicable stroke available in 1 mm increments

Standard  
Double Acting, Single Rod  
**CQ2**

Double Acting, Double Rod  
**CQ2W**

Single Acting, Spring Return-End  
**CQ2**

Large Bore Size  
Double Acting, Single Rod  
**CQ2**

Double Acting, Double Rod  
**CQ2W**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2□S**

Long Stroke  
Double Acting, Single Rod  
**CQ2K**

Double Acting, Single Rod  
**CQ2K**

Non-rotating Rod  
Double Acting, Single Rod  
**CQ2K**

Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Double Acting, Double Rod  
**CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Single Acting, Spring Return-End  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

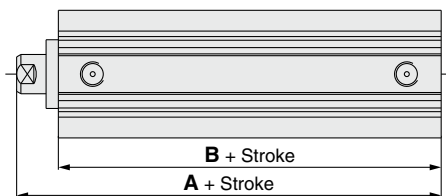
Auto Switch

Made to Order

## 5 Intermediate Stroke (Using exclusive body)

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)

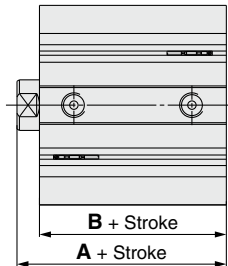
**Double acting, Single rod/  
Long stroke**



| Bore size [mm] | Single rod type (Long stroke) |      | Applicable stroke range [mm] |
|----------------|-------------------------------|------|------------------------------|
|                | A                             | B    |                              |
| 32             | 62.5                          | 45.5 | 101 to 299                   |
| 40             | 72                            | 55   |                              |
| 50             | 73.5                          | 55.5 |                              |
| 63             | 75                            | 57   |                              |
| 80             | 86                            | 66   |                              |
| 100            | 97.5                          | 75.5 |                              |

\* Dimensions other than those above are the same as those of the standard type.  
\* Applicable stroke available in 1 mm increments

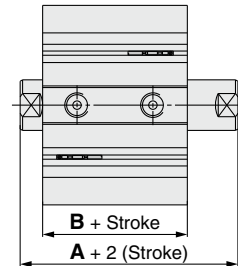
**Double acting, Single rod/  
Large bore**



| Bore size [mm] | Single rod type |     | Applicable stroke range [mm] |
|----------------|-----------------|-----|------------------------------|
|                | A               | B   |                              |
| 125            | 99              | 83  | 11 to 299                    |
| 140            | 99              | 83  |                              |
| 160            | 108             | 91  |                              |
| 180            | 119             | 102 |                              |
| 200            | 126             | 109 |                              |

\* Dimensions other than those above are the same as those of the standard type.  
\* Applicable stroke available in 1 mm increments

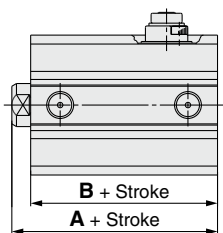
**Double acting, Double rod/  
Large bore**



| Bore size [mm] | Double rod type |     | Applicable stroke range [mm] |
|----------------|-----------------|-----|------------------------------|
|                | A               | B   |                              |
| 125            | 115             | 83  | 11 to 299                    |
| 140            | 115             | 83  |                              |
| 160            | 125             | 91  |                              |
| 180            | 136             | 102 |                              |
| 200            | 143             | 109 |                              |

\* Dimensions other than those above are the same as those of the standard type.  
\* Applicable stroke available in 1 mm increments

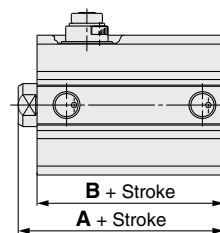
**Double acting, Single rod/End lock  
With head side locking**



| Bore size [mm] | A                    |                    | B                    |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | 24 mm stroke or less | 26 to 99 mm stroke | 24 mm stroke or less | 26 to 99 mm stroke |                              |
| 20             | 65.5                 | 80.5               | 61                   | 66                 | 6 to 99                      |
| 25             | 69                   | 84                 | 64                   | 69                 |                              |
| 32             | 72.5                 | 86                 | 65.5                 | 70                 |                              |
| 40             | 82                   | 92                 | 75                   | 80                 |                              |
| 50             | 83.5                 | 97.5               | 75.5                 | 80.5               |                              |
| 63             | 85                   | 102.5              | 77                   | 82                 |                              |

| Bore size [mm] | A                    |                    | B                    |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | 49 mm stroke or less | 51 to 99 mm stroke | 49 mm stroke or less | 51 to 99 mm stroke |                              |
| 80             | 121                  | 136                | 111                  | 116                | 6 to 99                      |
| 100            | 132.5                | 147.5              | 120.5                | 125.5              |                              |

**Double acting, Single rod/End lock  
With rod side locking**



| Bore size [mm] | A                    |                    | B                    |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | 24 mm stroke or less | 26 to 99 mm stroke | 24 mm stroke or less | 26 to 99 mm stroke |                              |
| 20             | 59                   | 80.5               | 54.5                 | 66                 | 6 to 99                      |
| 25             | 62.5                 | 84                 | 57.5                 | 69                 |                              |
| 32             | 65                   | 86                 | 58                   | 70                 |                              |
| 40             | 71.5                 | 92                 | 64.5                 | 76                 |                              |
| 50             | 73.5                 | 97.5               | 65.5                 | 76.5               |                              |
| 63             | 79                   | 102.5              | 71                   | 77                 |                              |

| Bore size [mm] | A                    |                    | B                    |                    | Applicable stroke range [mm] |
|----------------|----------------------|--------------------|----------------------|--------------------|------------------------------|
|                | 49 mm stroke or less | 51 to 99 mm stroke | 49 mm stroke or less | 51 to 99 mm stroke |                              |
| 80             | 113.5                | 136                | 103.5                | 116                | 6 to 99                      |
| 100            | 125                  | 147.5              | 113                  | 125.5              |                              |





## 7 Cylinder with Heat-resistant Auto Switch

A heat-resistant, compact cylinder which can mount a heat-resistant auto switch (Max. 150°C)

### Applicable Series

| Description      | Model | Action                    | Note  |
|------------------|-------|---------------------------|---|
| Compact cylinder | CQ2   | Double acting, Single rod | Applicable to $\phi 16$ to $\phi 63$<br>Excludes models with a rubber bumper<br>Excludes the air-hydro type |

### Specifications

|   |                                     |
|---|-------------------------------------|
| <b>Ambient and fluid temperature range</b>  | 0 to 150°C                          |
| <b>Seal material</b>                        | Fluororubber                        |
| <b>Grease</b>                               | Heat-resistant grease               |
| <b>Min. stroke for auto switch mounting</b> | 15 (Same for both 1 pc. and 2 pcs.) |
| <b>Specifications other than the above</b>  | Same as the standard type           |

For the detailed specifications of auto switches, refer to the **Web Catalog**.

### How to Order

Standard model no. — **M9NJL** — **XB14**

#### Auto switch

| Symbol      | Output |
|-------------|--------|
| <b>M9NJ</b> | NPN    |
| <b>M9PJ</b> | PNP    |
| <b>F7NJ</b> | NPN    |

Number of auto switches

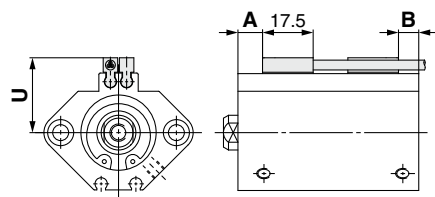
Cylinder with heat-resistant auto switch

\* Lead wire length symbols  
3 m ..... L (Example) M9NJL  
5 m ..... Z (Example) M9NJZ

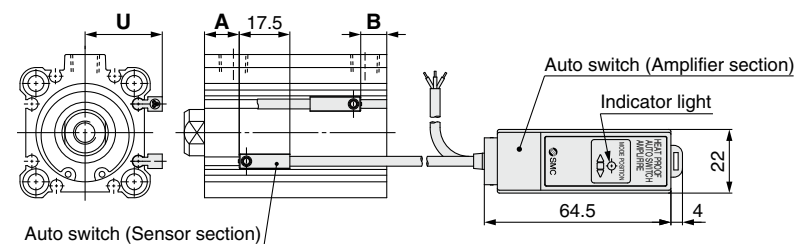
## Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height

### D-M9□J

$\phi 16$  to  $\phi 25$

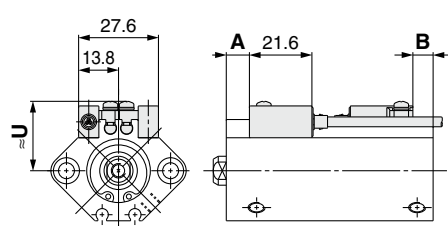


$\phi 32$  to  $\phi 63$

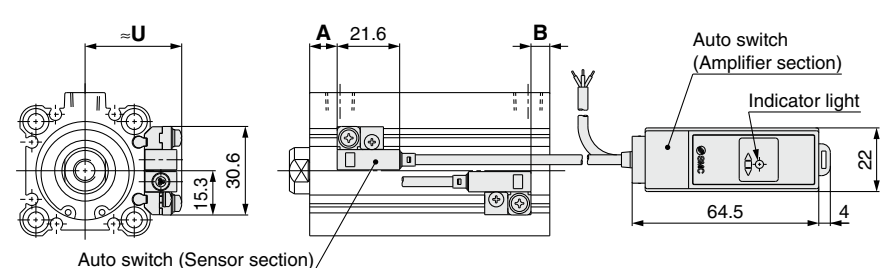


### D-F7NJ

$\phi 16$  to  $\phi 25$



$\phi 32$  to  $\phi 63$



| Auto switch model | [mm]   |      |      |        |     |      |
|-------------------|--------|------|------|--------|-----|------|
|                   | D-M9□J |      |      | D-F7NJ |     |      |
| Bore size         | A      | B    | U    | A      | B   | U    |
| 16                | 9.5    | 7    | 21   | 8      | 5.5 | 22.5 |
| 20                | 9.5    | 8.5  | 23.5 | 8      | 7   | 25.5 |
| 25                | 9.5    | 9    | 27   | 8      | 7.5 | 28   |
| 32                | 11     | 8    | 29   | 9.5    | 6.5 | 36   |
| 40                | 15     | 10.5 | 31   | 13.5   | 9   | 38   |
| 50                | 13     | 13.5 | 36   | 11.5   | 12  | 43.5 |
| 63                | 15.5   | 16.5 | 41.5 | 14     | 15  | 48.5 |

### Operating Range [mm]

| Auto switch model | Bore size [mm] |     |     |    |     |    |    |
|-------------------|----------------|-----|-----|----|-----|----|----|
|                   | 16             | 20  | 25  | 32 | 40  | 50 | 63 |
| D-M9□J            | 4.5            | 4.5 | 4.5 | 5  | 4.5 | 5  | 5  |
| D-F7NJ            | 4.5            | 4.5 | 4.5 | 5  | 4.5 | 5  | 5  |

\* Since the operating range is provided as a guideline at room temperature, it cannot be guaranteed. It may change substantially depending on the ambient environment.

### Auto Switch Mounting Bracket Part Nos.

| Auto switch model | Bore size [mm] |    |    |          |    |    |    |
|-------------------|----------------|----|----|----------|----|----|----|
|                   | 16             | 20 | 25 | 32       | 40 | 50 | 63 |
| D-F7NJ(L)Z        | BQ4-012        |    |    | BQJ2-032 |    |    |    |

### Auto Switch Mounting Bracket Weight

| Mounting bracket part no. | Weight [g] |
|---------------------------|------------|
| BQ4-012                   | 1.5        |
| BQJ2-032                  | 3.6        |

\* Adjust the auto switch after confirming the operating conditions in the actual setting.

\* The dimensions of the cylinder body are equivalent to those of the standard type, double acting, single rod of the CDQ2 series.

\* Auto switches are shipped in the same package as the product but do not come assembled for protection purposes. Assemble them by referring to the A and B dimensions for mounting position shown above.

\* The tightening torque for the auto switch mounting M3 screw is 0.5 to 0.7 N·m.

Symbol

**8 Rod End Length Increased by 10 mm (For foot and flange bracket)**

**-XC2(A)**

**XC2:** The rod end length (L dimension) of the cylinder for mounting a foot, compact foot, or rod flange is 10 mm longer than that of the standard product.

| Description       | Model        | Action                               | Note             |
|-------------------|--------------|--------------------------------------|------------------|
| Compact cylinder  | <b>CQ2</b>   | Double acting, Single rod            | Foot, Rod flange |
|                   | <b>CQ2</b>   | Single acting (Spring return/extend) | Foot, Rod flange |
|                   | <b>CQ2W</b>  | Double acting, Double rod            | Foot             |
| Non-rotating rod  | <b>CQ2K</b>  | Double acting, Single rod            | Foot, Rod flange |
|                   | <b>CQ2KW</b> | Double acting, Double rod            | Foot             |
| Anti-lateral load | <b>CQ2□S</b> | Double acting, Single rod            | Foot, Rod flange |

**XC2A:** The rod end length (L dimension) of the cylinder for mounting a double rod type flange is 10 mm longer than that of the standard product. (On one side only)

| Description      | Model        | Action                    | Note   |
|------------------|--------------|---------------------------|--------|
| Compact cylinder | <b>CQ2W</b>  | Double acting, Double rod | Flange |
| Non-rotating rod | <b>CQ2KW</b> | Double acting, Double rod | Flange |

**How to Order**

C(D)Q2A Standard model no. - **XC2(A)**

● Rod end length increased by 10 mm (For foot and flange bracket)

|              |   |
|--------------|---|
| <b>-XC2</b>  | For foot and single rod type rod flange |
| <b>-XC2A</b> | For double rod type flange              |

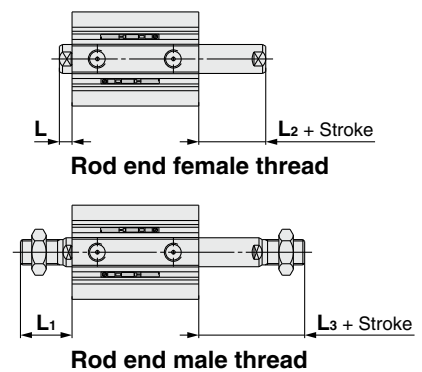
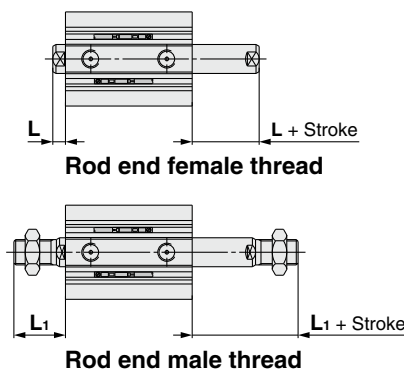
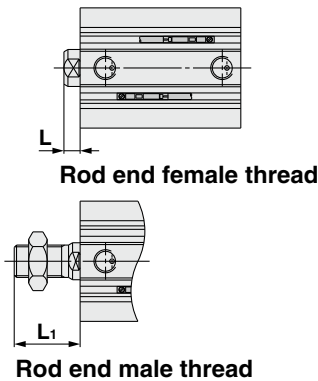
**Specifications: Same as those of the standard type**

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)

**Double acting, Single rod (-XC2)**

**Double acting, Double rod (-XC2)**

**Double acting, Double rod (-XC2A)**



**XC2: Standard, Anti-lateral load, Non-rotating rod** [mm]

| Bore size [mm] | Applicable series          |                  | Female thread |      | Male thread |  |
|----------------|----------------------------|------------------|---------------|------|-------------|--|
|                | Standard Anti-lateral load | Non-rotating rod | L             | L1   |             |  |
| 12             | ○                          | —                | 13.5          | 24   |             |  |
| 16             | ○                          | —                | 13.5          | 25.5 |             |  |
| 20             | ○                          | —                | 14.5          | 28.5 |             |  |
| 25             | ○                          | —                | 15            | 32.5 |             |  |
| 32             | ○                          | —                | 17            | 38.5 |             |  |
| 40             | ○                          | ○                | 17            | 38.5 |             |  |
| 50             | ○                          | ○                | 18            | 43.5 |             |  |
| 63             | ○                          | ○                | 18            | 43.5 |             |  |
| 80             | ○                          | —                | 20            | 53.5 |             |  |
| 100            | ○                          | —                | 22            | 53.5 |             |  |

**XC2A: Standard, Non-rotating rod** [mm]

| Bore size [mm] | Applicable series |                  | Female thread |     | Male thread |      |
|----------------|-------------------|------------------|---------------|-----|-------------|------|
|                | Standard          | Non-rotating rod | L             | L2  | L1          | L3   |
| 12             | ○                 | —                | 13.5          | 3.5 | 24          | 14   |
| 16             | ○                 | —                | 13.5          | 3.5 | 25.5        | 15.5 |
| 20             | ○                 | —                | 14.5          | 4.5 | 28.5        | 18.5 |
| 25             | ○                 | —                | 15            | 5   | 32.5        | 22.5 |
| 32             | ○                 | —                | 17            | 7   | 38.5        | 28.5 |
| 40             | ○                 | ○                | 17            | 7   | 38.5        | 28.5 |
| 50             | ○                 | ○                | 18            | 8   | 43.5        | 33.5 |
| 63             | ○                 | ○                | 18            | 8   | 43.5        | 33.5 |
| 80             | ○                 | —                | 20            | 10  | 53.5        | 43.5 |
| 100            | ○                 | —                | 22            | 12  | 53.5        | 43.5 |

**XC2: CQ2 Single acting**

| Bore size | End shape<br>Action<br>Stroke | Female thread |               |      |    | Male thread |               |      |      |
|-----------|-------------------------------|---------------|---------------|------|----|-------------|---------------|------|------|
|           |                               | L             |               |      |    | L1          |               |      |      |
|           |                               | All strokes   | Spring extend |      |    | All strokes | Spring extend |      |      |
|           |                               |               | 5             | 10   | 20 |             | 5             | 10   | 20   |
| 12        |                               | 13.5          | 18.5          | 23.5 | —  | 24          | 29            | 34   | —    |
| 16        |                               | 13.5          | 18.5          | 23.5 | —  | 25.5        | 30.5          | 35.5 | —    |
| 20        |                               | 14.5          | 19.5          | 24.5 | —  | 28.5        | 33.5          | 38.5 | —    |
| 25        |                               | 15            | 20            | 25   | —  | 32.5        | 37.5          | 42.5 | —    |
| 32        |                               | 17            | 22            | 27   | —  | 38.5        | 43.5          | 48.5 | —    |
| 40        |                               | 17            | 22            | 27   | —  | 38.5        | 43.5          | 48.5 | —    |
| 50        |                               | 18            | —             | 28   | 38 | 43.5        | —             | 53.5 | 63.5 |

Standard Double Acting, Single Rod **CQ2**  
 Standard Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return/Extend **CQ2**  
 Large Bore Size Double Acting, Double Rod **CQ2W**  
 Double Acting, Single Rod **CQ2**  
 Anti-lateral Load Double Acting, Single Rod **CQ2□S**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return/Extend **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch  
 Made to Order

## 9 With Heavy Duty Scraper

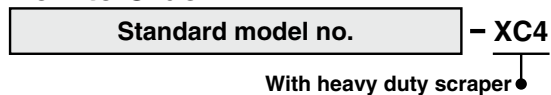
With the heavy duty scraper on the wiper ring, this cylinder is suitable for use in environments where die-cast equipment, construction machinery or industrial vehicles are exposed to dirt or sand, or in environments with significant amounts of dust.

| Description      | Model       | Action                    | Note                                  |
|------------------|-------------|---------------------------|---------------------------------------|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod | Applicable to $\phi 20$ to $\phi 100$ |
|                  | <b>CQ2W</b> | Double acting, Double rod | Applicable to $\phi 40$ to $\phi 100$ |
| Axial piping     | <b>CQP2</b> | Double acting, Single rod | Applicable to $\phi 32$ to $\phi 100$ |
| Long stroke      | <b>CQ2</b>  | Double acting, Single rod |                                       |

### Specifications

|                                     |                           |
|-------------------------------------|---------------------------|
| Minimum operating pressure          | 0.08 MPa                  |
| Specifications other than the above | Same as the standard type |

### How to Order



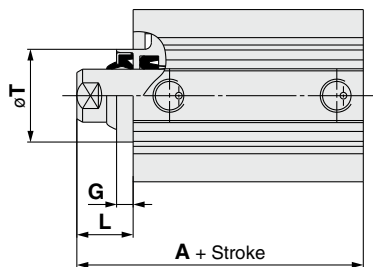
### Caution

**Do not replace heavy duty scrapers.**

- Since heavy duty scrapers are press-fit, do not replace the cover only, but rather the entire rod cover assembly.

### Dimensions (Dimensions other than those below are the same as those of the standard type.)

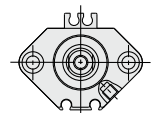
#### Double acting, Single rod



- \* ( ): Dimensions with auto switch magnet
- \* Relation between bore size 20 to 32 piping port and mounting holes is as the following diagram.
- \* Please contact SMC for bore size 20 to 32 with both ends tapped and mounting brackets.



Without auto switch magnet  
Bore size: 20 to 32

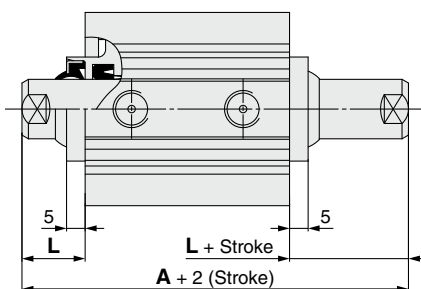


With auto switch magnet  
Bore size: 20, 25

With auto switch magnet  
Bore size: 32

| Bore size<br>[mm] | A                    |                   |                      | G                     |                       | L                     |                      | T  |
|-------------------|----------------------|-------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|----|
|                   | 50 mm stroke or less | 75, 100 mm stroke | 125 to 300 mm stroke | 100 mm stroke or less | 125 mm stroke or more | 100 mm stroke or less | 125 to 300 mm stroke |    |
| <b>20</b>         | 34 (46)              | —                 | —                    | —                     | —                     | 4.5                   | —                    | —  |
| <b>25</b>         | 37.5 (47.5)          | —                 | —                    | —                     | —                     | 5                     | —                    | —  |
| <b>32</b>         | 40 (50)              | 50                | 67.5                 | —                     | —                     | 7                     | 12                   | —  |
| <b>40</b>         | 46.5 (56.5)          | 56.5              | 77                   | 5                     | 10                    | 17                    | 22                   | 28 |
| <b>50</b>         | 48.5 (58.5)          | 58.5              | 78.5                 | 5                     | 10                    | 18                    | 23                   | 35 |
| <b>63</b>         | 54 (64)              | 64                | 80                   | 5                     | 10                    | 18                    | 23                   | 35 |
| <b>80</b>         | 63.5 (73.5)          | 73.5              | 91                   | 5                     | 10                    | 20                    | 25                   | 43 |
| <b>100</b>        | 75 (85)              | 85                | 102.5                | 5                     | 10                    | 22                    | 27                   | 59 |

#### Double acting, Double rod



| Bore size<br>[mm] | A                    |                   | L  |
|-------------------|----------------------|-------------------|----|
|                   | 50 mm stroke or less | 75, 100 mm stroke |    |
| <b>40</b>         | 74 (84)              | 84                | 17 |
| <b>50</b>         | 76.5 (86.5)          | 86.5              | 18 |
| <b>63</b>         | 78 (88)              | 88                | 18 |
| <b>80</b>         | 91 (101)             | 101               | 20 |
| <b>100</b>        | 104.5 (114.5)        | 114.5             | 22 |

**10** Piston Rod/Retaining Ring/Rod End Nut Material: Stainless Steel

Symbol  
**-XC6(A)**

Suitable for cases in which rust is likely to be generated due to immersion in water or in which corrosion is likely to occur.

| Description                          | Model           | Action  |
|--------------------------------------|-----------------|---|
| Compact cylinder                     | <b>CQ2</b>      | Double acting, Single rod<br>Single acting (Spring return/extend) |
|                                      | <b>CQ2W</b>     | Double acting, Double rod   |
| Axial piping<br>(Centralized piping) | <b>CQP2</b>     | Double acting, Single rod   |
|                                      |                 | Single acting (Spring return/extend)                              |
| Long stroke                          | <b>CQ2</b>      | Double acting, Single rod   |
| Anti-lateral load                    | <b>CQ2□S</b>    | Double acting, Single rod   |
| Water resistant                      | <b>CQ2-R/V</b>  | Double acting, Single rod   |
|                                      | <b>CQ2W-R/V</b> | Double acting, Double rod   |

**Specifications**

|   |   |
|---|---|
| <b>Parts changed to stainless steel</b> | Retaining ring, Piston rod, Rod end nut |
|---|---|

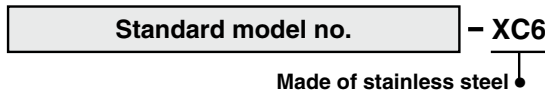
|   |                           |
|---|---------------------------|
| <b>Specifications other than the above and dimensions</b> | Same as the standard type |
|---|---------------------------|

\* The rod end nut is also made of stainless steel for the rod end male thread type.

**Stainless steel rod end brackets (single knuckle joint, double knuckle joint) are also available.**

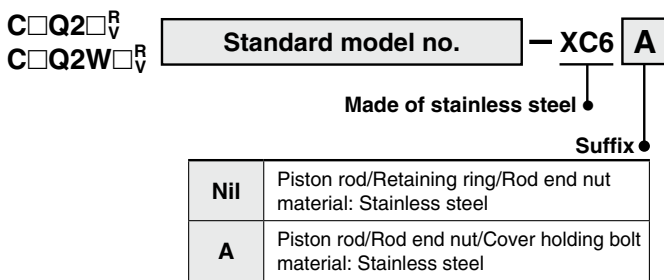
For details ⇨ p. 26

**How to Order**

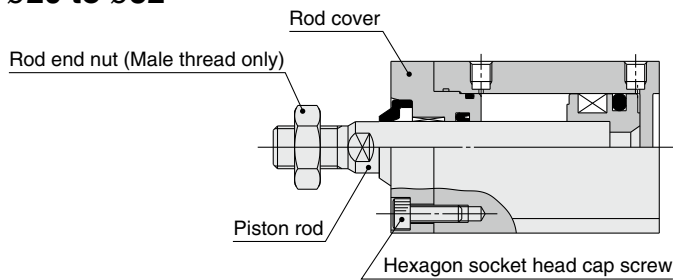


| Description     | Model                    | Action                    |
|-----------------|--------------------------|---------------------------|
| Water resistant | <b>CQ2□<sup>R</sup></b>  | Double acting, Single rod |
|                 | <b>CQ2W□<sup>R</sup></b> | Double acting, Double rod |

**How to Order**



ø20 to ø32



**Specifications**

|   |                          |   |
|---|--------------------------|---|
| <b>Parts changed to stainless steel</b> | <b>XC6</b>               | Retaining ring, Piston rod, Rod end nut     |
|   | <b>XC6A<sup>*1</sup></b> | Piston rod, Rod end nut, Cover holding bolt |

|   |                           |
|---|---------------------------|
| <b>Specifications other than the above and dimensions</b> | Same as the standard type |
|---|---------------------------|

\* -XC6A is only applicable to ø20, ø25, and ø32 of the double acting, single rod type.

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return/Extend **CQP2**

Large Bore Size Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2□S**  
 Double Acting, Double Rod **CQ2□S**

Long Stroke Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2**

Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**  
 Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return/Extend **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

Auto Switch

Made to Order

## 11 Adjustable Stroke Cylinder/Adjustable Extension Type

Adjusts the extending stroke with the stroke-adjusting mechanism equipped in the head side (After adjusting the stroke, the double-side cushion type becomes a single-side cushion type.)

| Description      | Model       | Action                       | Note   |
|------------------|-------------|------------------------------|--|
| Compact cylinder | <b>CQ2</b>  | Double acting,<br>Single rod | Excludes models with a rubber bumper or mounting bracket |
| Non-rotating rod | <b>CQ2K</b> | Double acting,<br>Single rod | Excludes models with a rubber bumper or mounting bracket |
| Air-hydro type   | <b>CQ2H</b> | Double acting,<br>Single rod | Excludes models with a mounting bracket                  |

### How to Order

Standard model no. **-XC8**

Adjustable stroke cylinder/Adjustable extension type

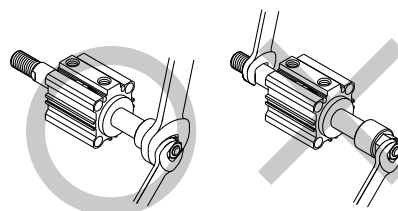
### Specifications

|                                     |                           |
|-------------------------------------|---------------------------|
| Stroke adjustment range [mm]        | 0 to 10                   |
| Specifications other than the above | Same as the standard type |

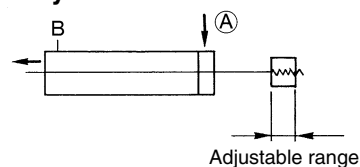
### Precautions

#### ⚠ Warning

1. When the cylinder is operating, if something gets caught between the stopper bracket for adjusting the stroke and the cylinder body, it could cause bodily injury or damage the peripheral equipment. Therefore, take preventive measures as necessary, such as installing a protective cover.
2. To adjust the stroke, make sure to secure the wrench flats of the stopper bracket with a wrench, etc., before loosening the lock nut. If the lock nut is loosened without securing the stopper bracket first, be aware that the area that joins the load to the piston rod or the area in which the piston rod is joined with the load side and the stopper bracket side could loosen first. This may cause an accident or malfunction.

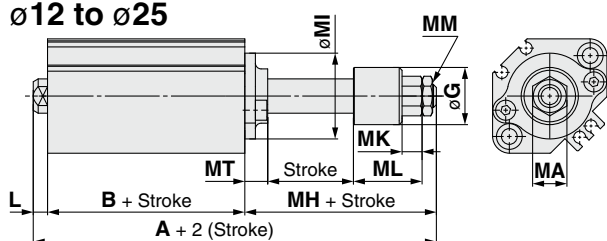


### Symbol

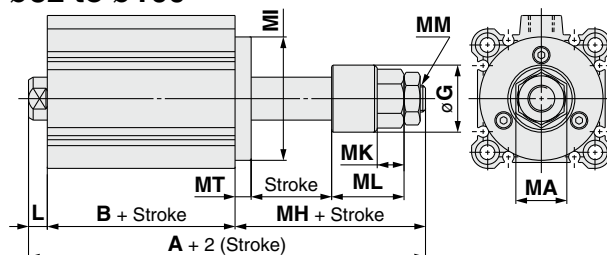


### Dimensions (Dimensions other than those below are the same as those of the standard type.)

#### ø12 to ø25



#### ø32 to ø100



| Bore size [mm] | [mm]          |             |     |    |    |    |           |            |     |      |    |
|----------------|---------------|-------------|-----|----|----|----|-----------|------------|-----|------|----|
|                | A             | B           | L   | MH | MT | MA | MI        | MM         | MK  | ML   | øG |
| <b>12</b>      | 57.7 (64.9)   | 25.2 (32.4) | 3.5 | 29 | 5  | 8  | □25 (ø15) | M4 x 0.7   | 5.5 | 20   | 14 |
| <b>16</b>      | 58.5 (68.5)   | 26 (36)     | 3.5 | 29 | 5  | 10 | □28 (ø20) | M5 x 0.8   | 5.5 | 20   | 14 |
| <b>20</b>      | 67.5 (79.5)   | 26 (38)     | 4.5 | 37 | 8  | 12 | □36 (ø25) | M6 x 1     | 7   | 24   | 20 |
| <b>25</b>      | 71 (81)       | 29 (39)     | 5   | 37 | 8  | 12 | □40 (ø30) | M6 x 1     | 7   | 24   | 20 |
| <b>32</b>      | 78.5 (88.5)   | 30.5 (40.5) | 7   | 41 | 6  | 17 | ø38       | M8 x 1.25  | 9   | 28.5 | 25 |
|                | 88.5          | 40.5        |     |    |    |    |           |            |     |      |    |
| <b>40</b>      | 88 (98)       | 40 (50)     | 7   | 41 | 6  | 19 | ø46       | M10 x 1.25 | 10  | 27   | 25 |
|                | 98            | 50          |     |    |    |    |           |            |     |      |    |
| <b>50</b>      | 100.5 (110.5) | 40.5 (50.5) | 8   | 52 | 8  | 24 | ø57       | M14 x 1.5  | 13  | 31   | 35 |
|                | 110.5         | 50.5        |     |    |    |    |           |            |     |      |    |
| <b>63</b>      | 102 (112)     | 42 (52)     | 8   | 52 | 10 | 24 | ø68       | M14 x 1.5  | 13  | 31   | 35 |
|                | 112           | 52          |     |    |    |    |           |            |     |      |    |
| <b>80</b>      | 125 (135)     | 51 (61)     | 10  | 64 | 12 | 32 | ø90       | M20 x 1.5  | 16  | 40   | 45 |
|                | 135           | 61          |     |    |    |    |           |            |     |      |    |
| <b>100</b>     | 138.5 (148.5) | 60.5 (70.5) | 12  | 66 | 14 | 32 | ø110      | M20 x 1.5  | 16  | 40   | 45 |
|                | 148.5         | 70.5        |     |    |    |    |           |            |     |      |    |

\* ( ): Dimensions with auto switch magnet

\* The symbol is X525 for the long stroke type. ⇨ p. 185

## 12 Adjustable Stroke Cylinder/Adjustable Retraction Type

Symbol  
**-XC9**

The retract stroke of the cylinder can be adjusted by the adjustment bolt.

| Description      | Model       | Action                       | Note   |
|------------------|-------------|------------------------------|--|
| Compact cylinder | <b>CQ2</b>  | Double acting,<br>Single rod | Excludes models with a rubber bumper or mounting bracket |
| Non-rotating rod | <b>CQ2K</b> | Double acting,<br>Single rod | Excludes models with a rubber bumper or mounting bracket |

### How to Order

Standard model no. **-XC9**

Adjustable stroke cylinder/Adjustable retraction type

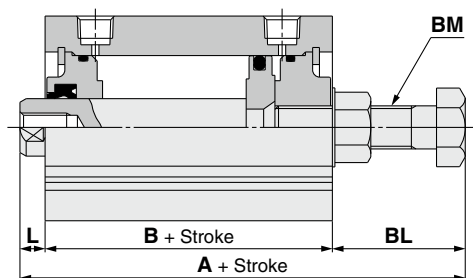
(After adjusting the stroke, the double-side cushion type becomes a single-side cushion type. CQ2 is without cushion.)

### Specifications

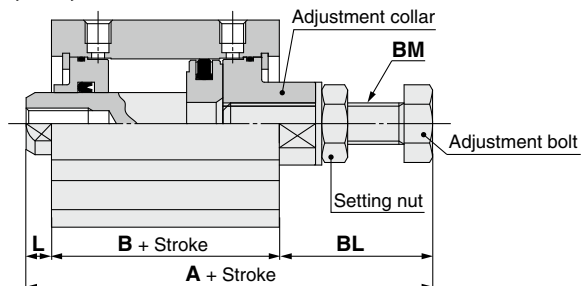
|                                     |                           |
|-------------------------------------|---------------------------|
| Stroke adjustment range [mm]        | 0 to 10                   |
| Specifications other than the above | Same as the standard type |

### Dimensions (Dimensions other than those below are the same as those of the standard type.)

ø12, ø16, ø40 to ø100



ø20, ø25, ø32



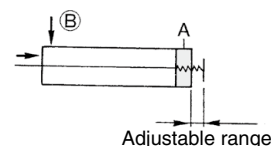
\* When securing the adjustment bolt, clamp the width across flats of the adjustment collar with a tool, such as a spanner and tighten the setting nut with a tool, such as other spanner to secure the bolt firmly.

### Precautions

#### Warning

- When air is supplied to the cylinder, if the stroke adjustment bolt is loosened in excess of the allowable stroke adjustment amount, be aware that the stroke adjustment bolt could fly off or air could be discharged, which could injure personnel or damage the peripheral equipment.
- Adjust the stroke when the cylinder is not pressurized. If it is adjusted while in a pressurized state, the seal of the adjustment section could become deformed, leading to air leakage.

#### Symbol



| Bore size [mm] | A             | B           | L   | BL   | BM        |
|----------------|---------------|-------------|-----|------|-----------|
| 12             | 52 (59.2)     | 25.2 (32.4) | 3.5 | 23.3 | M5 x 0.8  |
| 16             | 53 (63)       | 26 (36)     | 3.5 | 23.5 | M6 x 1    |
| 20             | 61 (73)       | 26 (38)     | 4.5 | 30.5 | M8 x 1.25 |
| 25             | 63.5 (73.5)   | 29 (39)     | 5   | 29.5 | M8 x 1.25 |
| 32             | 65.5 (75.5)   | 30.5 (40.5) | 7   | 28   | M8 x 1.25 |
| 40             | 84 (94)       | 40 (50)     | 7   | 37   | M12 x 1.5 |
| 50             | 84.5 (94.5)   | 40.5 (50.5) | 8   | 36   | M12 x 1.5 |
| 63             | 88.5 (98.5)   | 42 (52)     | 8   | 38.5 | M16 x 1.5 |
| 80             | 109.5 (119.5) | 51 (61)     | 10  | 48.5 | M20 x 1.5 |
| 100            | 125 (135)     | 60.5 (70.5) | 12  | 52.5 | M24 x 1.5 |

\* ( ): Dimensions with auto switch magnet

\* The symbol is X526 for the long stroke type. ⇨ p. 186

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return, End **CQ2**  
 Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2S**  
 Double Acting, Single Rod **CQ2**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Double Acting, Single Rod **CQ2K**  
 Non-rotating Rod Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-RV**  
 Double Acting, Double Rod **CQ2W-RV**  
 Axial Piping Double Acting, Single Rod **CQP2**  
 Single Acting, Spring Return, End **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch **Auto Switch**  
 Made to Order



## 13 Dual Stroke Cylinder/Double Rod Type

2 cylinders are integrated into 1 in a back-to-back configuration allowing for the cylinder stroke to be controlled in three steps.

| Description      | Model       | Action                    | Note                                    |
|------------------|-------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod | Excludes models with a mounting bracket |
| Non-rotating rod | <b>CQ2K</b> | Double acting, Single rod | Excludes models with a mounting bracket |
| Air-hydro type   | <b>CQ2H</b> | Double acting, Single rod | Excludes models with a mounting bracket |

### Specifications

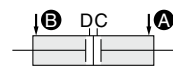
| Bore size [mm]                             | Max. manufacturable stroke [mm] |
|--|---------------------------------|
| <b>12, 16</b>                              | 60 (Max. 30 on one side)        |
| <b>20, 25</b>                              | 100 (Max. 50 on one side)       |
| <b>32, 40</b>                              | 200 (Max. 100 on one side)      |
| <b>50 to 100</b>                           | 200 (Max. 100 on one side)      |
| <b>Specifications other than the above</b> | Same as the standard type       |

### How to Order

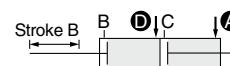
**CQ2B** Bore size - Stroke S<sub>1</sub> + Stroke S<sub>2</sub> **D(C)(M)(Z)** - **XC10**  
Dual stroke cylinder

### Symbol

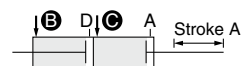
Function



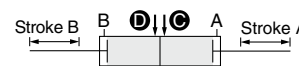
When air pressure is supplied to ports **A** and **B**, both strokes A and B retract.



When air pressure is supplied to ports **A** and **D**, stroke B is operated.



When air pressure is supplied to ports **B** and **C**, stroke A is operated.

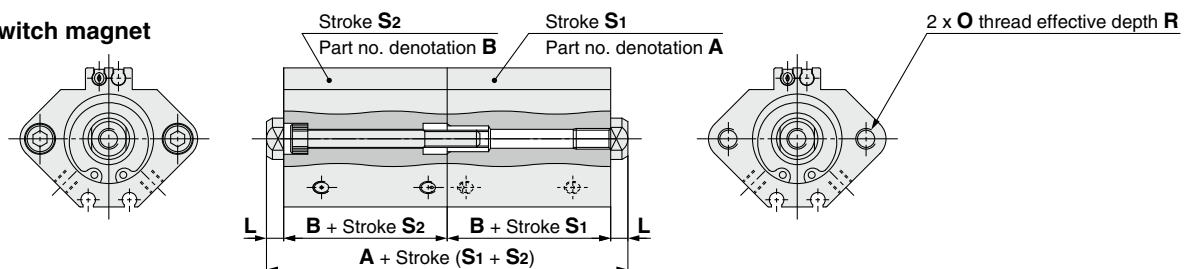


When air pressure is supplied to ports **C** and **D**, both strokes A and B are operated.

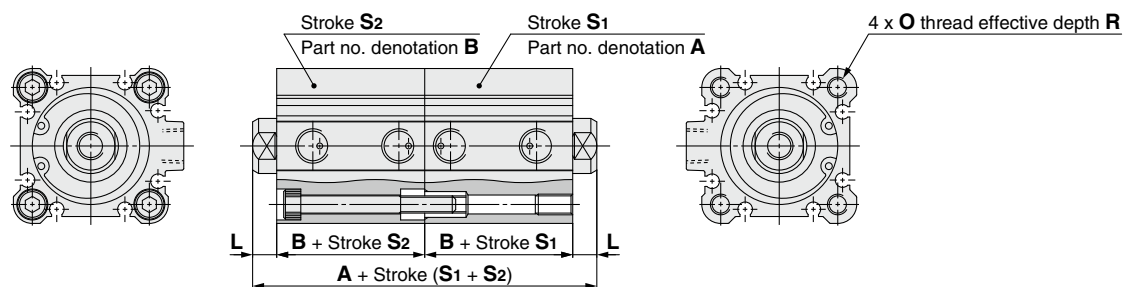
### Dimensions (Dimensions other than those below are the same as those of the standard type.)

ø12 to ø25

With auto switch magnet



\* In the case of bore sizes ø12 to ø25 with an auto switch, port directions are different.



\* Secure the body with the threaded portion at the tip of the piston rod on both sides or with the cylinder tube on the stroke S<sub>1</sub> side tapped.  
\* Please contact SMC for the through-hole type and models with a mounting bracket.

| Bore size [mm] | A   |  |  | B                        |                       | L   | O          | R  |
|----------------|---|--|--|--------------------------|-----------------------|-----|------------|----|
|                | 50 <sup>st</sup> or less for both S <sub>1</sub> and S <sub>2</sub> | Combination of 50 <sup>st</sup> or less, 75, 100 <sup>st</sup> | 75, 100 <sup>st</sup> for both S <sub>1</sub> and S <sub>2</sub> | 50 <sup>st</sup> or less | 75, 100 <sup>st</sup> |     |            |    |
| <b>12</b>      | 41 (63)   | —  | —  | 17 (28)                  | —                     | 3.5 | M4 x 0.7   | 7  |
| <b>16</b>      | 44 (68)   | —  | —  | 18.5 (30.5)              | —                     | 3.5 | M4 x 0.7   | 7  |
| <b>20</b>      | 48 (72)   | —  | —  | 19.5 (31.5)              | —                     | 4.5 | M6 x 1.0   | 10 |
| <b>25</b>      | 55 (75)   | —  | —  | 22.5 (32.5)              | —                     | 5   | M6 x 1.0   | 10 |
| <b>32</b>      | 60 (80)   | 70 (80)  | 80 (80)  | 23 (33)                  | 33 (33)               | 7   | M6 x 1.0   | 10 |
| <b>40</b>      | 73 (93)   | 83 (93)  | 93 (93)  | 29.5 (39.5)              | 39.5 (39.5)           | 7   | M6 x 1.0   | 10 |
| <b>50</b>      | 77 (97)   | 87 (97)  | 97 (97)  | 30.5 (40.5)              | 40.5 (40.5)           | 8   | M8 x 1.25  | 14 |
| <b>63</b>      | 88 (108)  | 98 (108)   | 108 (108)  | 36 (46)                  | 46 (46)               | 8   | M10 x 1.5  | 18 |
| <b>80</b>      | 107 (127)   | 117 (127)  | 127 (127)  | 43.5 (53.5)              | 53.5 (53.5)           | 10  | M12 x 1.75 | 22 |
| <b>100</b>     | 130 (150)   | 140 (150)  | 150 (150)  | 53 (63)                  | 63 (63)               | 12  | M12 x 1.75 | 22 |

\* ( ): Dimensions with auto switch

\* Applicable stroke available in 5 mm increments



Symbol  
**-XC11**

## 14 Dual Stroke Cylinder/Single Rod Type

Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.

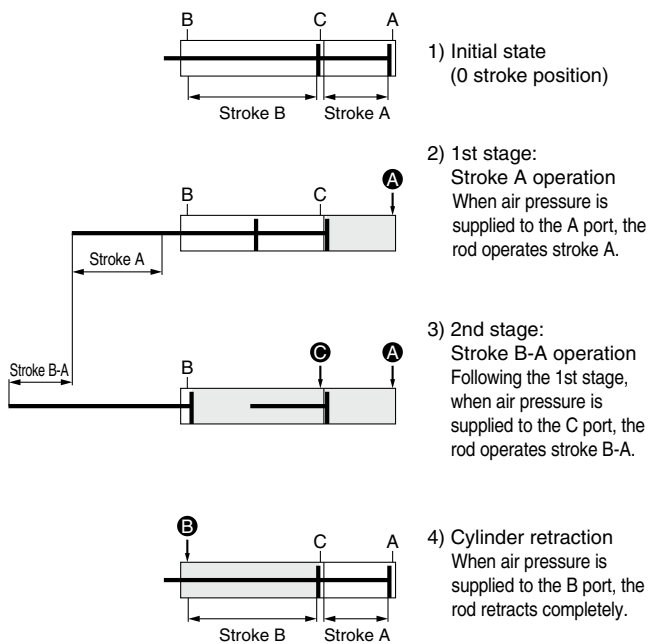
| Description      | Model       | Action                    | Note                                    |
|------------------|-------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod | Excludes models with a mounting bracket |
| Non-rotating rod | <b>CQ2K</b> | Double acting, Single rod | Excludes models with a mounting bracket |
| Air-hydro type   | <b>CQ2H</b> | Double acting, Single rod | Excludes models with a mounting bracket |

**Specifications: Same as those of the standard type**

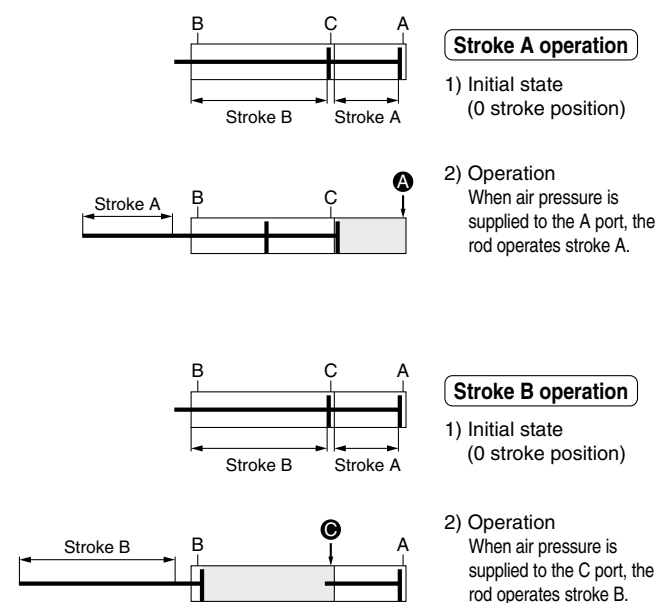
### How to Order

**CQ2B** Bore size - Stroke S<sub>1</sub> + Stroke S<sub>2</sub>-S<sub>1</sub> **D(C)(M)(Z) - XC11**  
Dual stroke cylinder/Single rod type

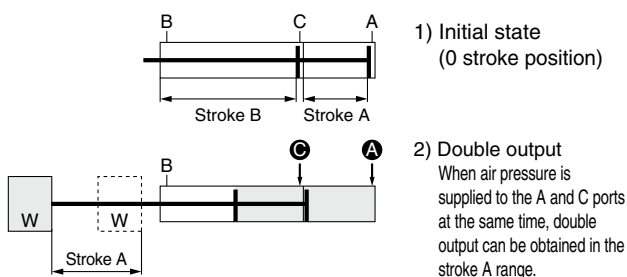
#### Functional description of dual stroke cylinder



#### Stroke A and stroke B can be operated individually.



#### Double output is possible.



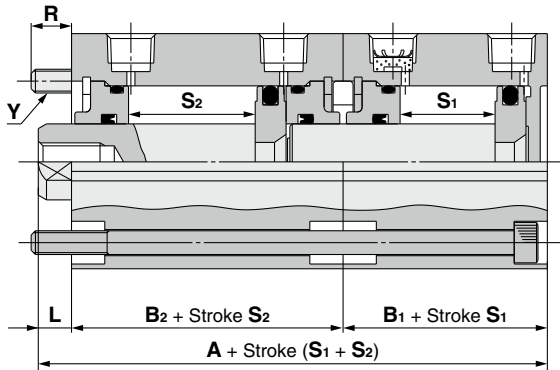
#### Precautions

- ⚠ Caution**
- Do not supply air until the cylinder is fixed with the attached bolt.
  - If air is supplied before securing the cylinder, the cylinder could lurch, posing a risk of bodily injury or damage to the peripheral equipment.

|                   |  |                      |
|-------------------|--|----------------------|
| Standard          | Double Acting, Single Rod                | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod                | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return, Single Rod | <b>CQ2</b>           |
| Standard          | Single Acting, Spring Return, Double Rod | <b>CQ2W</b>          |
| Large Bore Size   | Double Acting, Single Rod                | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod                | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod                | <b>CQ2S</b>          |
| Long Stroke       | Double Acting, Single Rod                | <b>CQ2</b>           |
| Long Stroke       | Double Acting, Double Rod                | <b>CQ2W</b>          |
| Non-rotating Rod  | Double Acting, Single Rod                | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod                | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod                | <b>CQ2-RV</b>        |
| Water Resistant   | Double Acting, Double Rod                | <b>CQ2W-RV</b>       |
| Axial Piping      | Double Acting, Single Rod                | <b>CQP2</b>          |
| Axial Piping      | Double Acting, Double Rod                | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, Single Rod | <b>CQP2</b>          |
| Axial Piping      | Single Acting, Spring Return, Double Rod | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod                | <b>CBQ2</b>          |
| With End Lock     | Double Acting, Double Rod                | <b>CBQ2</b>          |
| Auto Switch       |  | <b>Auto Switch</b>   |
| Made to Order     |  | <b>Made to Order</b> |

## 14 Dual Stroke Cylinder/Single Rod Type

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



\* This cylinder includes mounting bolts to secure the cylinder.

| Bore size [mm] | A             | B <sub>1</sub> | B <sub>2</sub> | L   | R          | Y         | Stroke Both S <sub>1</sub> and S <sub>2</sub> |
|----------------|---------------|----------------|----------------|-----|------------|-----------|---|
| <b>12</b>      | 45.7 (63.9)   | 17 (28)        | 25.2 (32.4)    | 3.5 | 8.3 (8.1)  | M3 x 0.5  | 5 to 30                                       |
| <b>16</b>      | 48 (70)       | 18.5 (30.5)    | 26 (36)        | 3.5 | 9 (7)      |           |   |
| <b>20</b>      | 50 (74)       | 19.5 (31.5)    | 26 (38)        | 4.5 | 11.5 (7.5) | M5 x 0.8  | 5 to 50                                       |
| <b>25</b>      | 56.5 (76.5)   | 22.5 (32.5)    | 29 (39)        | 5   | 10.5       |           |   |
| <b>32</b>      | 60.5 (80.5)   | 23 (33)        | 30.5 (40.5)    | 7   | 8.5        |           |   |
| <b>40</b>      | 76.5 (96.5)   | 29.5 (39.5)    | 40 (50)        | 7   | 7.5        | M8 x 1    | 10 to 50                                      |
| <b>50</b>      | 79 (99)       | 30.5 (40.5)    | 40.5 (50.5)    | 8   | 12         |           |   |
| <b>63</b>      | 86 (106)      | 36 (46)        | 42 (52)        | 8   | 12.5       | M10 x 1.5 |   |
| <b>80</b>      | 104.5 (124.5) | 43.5 (53.5)    | 51 (61)        | 10  | 19         |           |   |
| <b>100</b>     | 125.5 (145.5) | 53 (63)        | 60.5 (70.5)    | 12  | 15         |           |   |

\* ( ): Dimensions with auto switch magnet

\* The symbol is X636 for the long stroke type. ⇨ p. 187

**15 With Split Pins for Double Clevis Pin/Double Knuckle Joint Pin and Flat Washers**

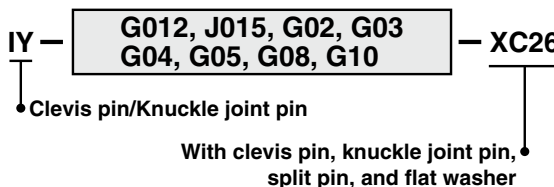
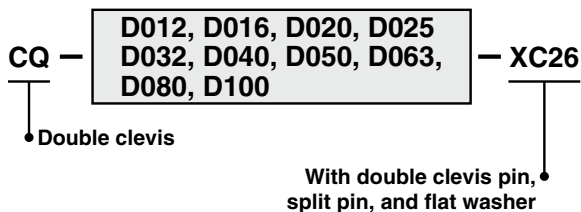
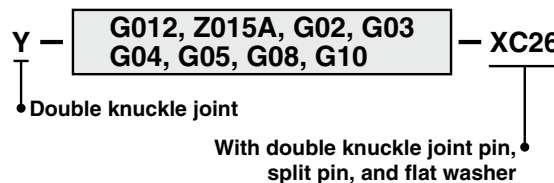
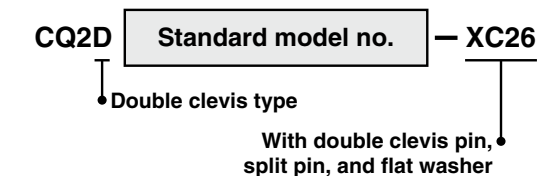
Symbol  
**-XC26**

A pin for double clevis or double knuckle joint has been changed to a split pin, and split pins and flat washers have been added.

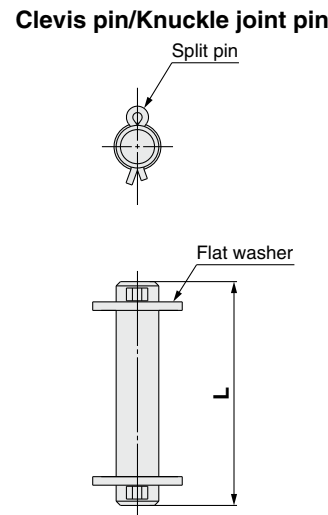
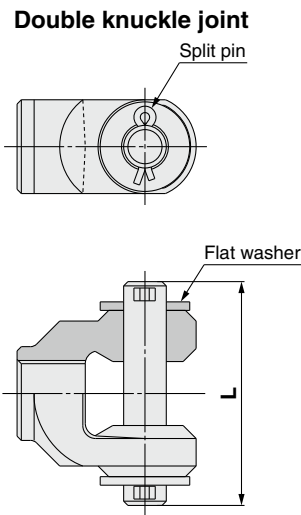
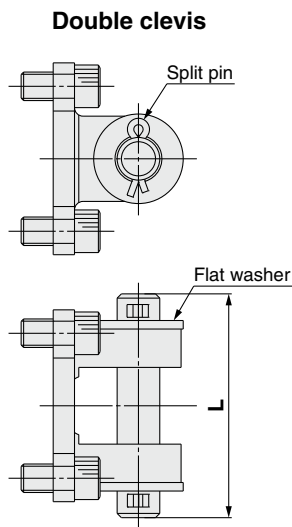
| Description       | Model | Action                               | Note                            |
|-------------------|-------|--------------------------------------|---------------------------------|
| Compact cylinder  | CQ2   | Double acting, Single rod            | Double clevis (D) mounting only |
|                   |       | Single acting (Spring return/extend) |                                 |
| Long stroke       | CQ2   | Double acting, Single rod            |                                 |
| Non-rotating rod  | CQ2K  | Double acting, Single rod            |                                 |
| Anti-lateral load | CQ2□S | Double acting, Single rod            |                                 |
| With end lock     | CBQ2  | Double acting, Single rod            |                                 |

**Specifications:**  
Same as those of the standard type

**How to Order**



**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



\* Body mounting bolts, pin, split pins, and flat washers are included.

\* A pin, split pins, and flat washers are included.

\* Split pins and flat washers are included.

| Bore size [mm] | Double clevis | Double knuckle joint | Clevis pin<br>Knuckle joint pin | L [mm] |
|----------------|---------------|----------------------|---------------------------------|--------|
| 12             | CQ-D012-XC26  | Y-G012-XC26          | IY-G012-XC26                    | 21     |
| 16             | CQ-D016-XC26  | Y-Z015A-XC26         | IY-J015-XC26                    | 23     |
| 20             | CQ-D020-XC26  | Y-G02-XC26           | IY-G02-XC26                     | 31     |
| 25             | CQ-D025-XC26  | Y-G03-XC26           | IY-G03-XC26                     | 36.5   |
| 32             | CQ-D032-XC26  | Y-G04-XC26           | IY-G04-XC26                     | 52.5   |
| 40             | CQ-D040-XC26  |                      |                                 |        |
| 50             | CQ-D050-XC26  | Y-G05-XC26           | IY-G05-XC26                     | 66     |
| 63             | CQ-D063-XC26  |                      |                                 |        |
| 80             | CQ-D080-XC26  | Y-G08-XC26           | IY-G08-XC26                     | 78     |
| 100            | CQ-D100-XC26  | Y-G10-XC26           | IY-G10-XC26                     | 86     |

Standard Double Acting, Double Rod CQ2

Standard Double Acting, Single Rod CQ2

Standard Double Acting, Spring Return/Extend CQ2

Large Bore Size Double Acting, Double Rod CQ2W

Large Bore Size Double Acting, Single Rod CQ2

Anti-lateral Load Double Acting, Single Rod CQ2□S

Long Stroke Double Acting, Single Rod CQ2

Long Stroke Double Acting, Double Rod CQ2K

Non-rotating Rod Double Acting, Double Rod CQ2KW

Non-rotating Rod Double Acting, Single Rod CQ2-RV

Water Resistant Double Acting, Double Rod CQ2W-RV

Water Resistant Double Acting, Single Rod CQ2-RV

Axial Piping Double Acting, Single Rod CQP2

Axial Piping Double Acting, Double Rod CQP2

With End Lock Double Acting, Single Rod CBQ2

Auto Switch

Made to Order

# CQ2 Series

Symbol

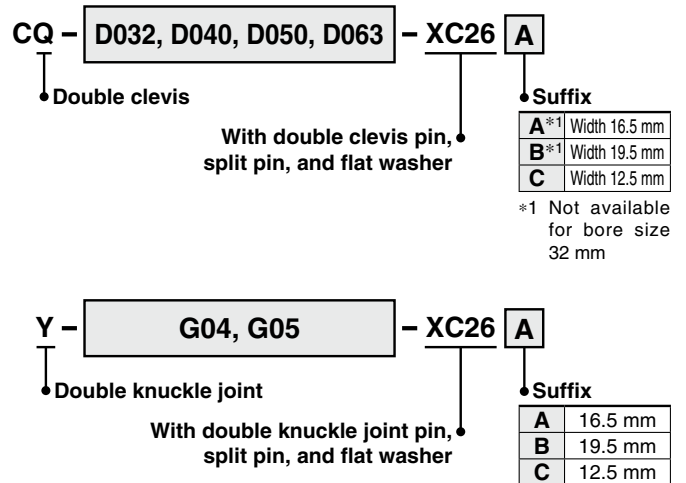
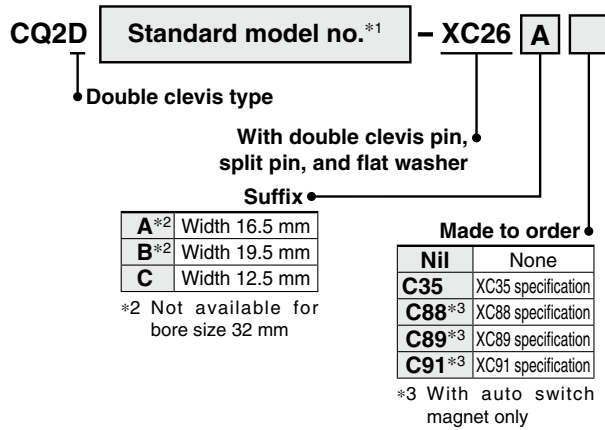
**16** Double Clevis Width 12.5 mm, 16.5 mm, or 19.5 mm: With Double Clevis and Double Knuckle Joint **-XC26**   

3 different double clevis widths and double knuckle joint widths are selectable: 12.5 mm, 16.5 mm, or 19.5 mm

| Description       | Model         | Action                       | Note  |
|-------------------|---------------|------------------------------|---|
| Compact cylinder  | <b>CQ2</b>    | Double acting,<br>Single rod | Applicable to $\phi 32$ to $\phi 63$<br>Double clevis (D) mounting only |
| Long stroke       | <b>CQ2</b>    |                              |   |
| Anti-lateral load | <b>CQ2</b> □S |                              |   |

**Specifications:**  
Same as those of the standard type

## How to Order

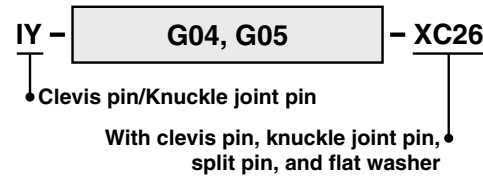


\*1 Can be ordered with a rod end bracket (double knuckle joint)

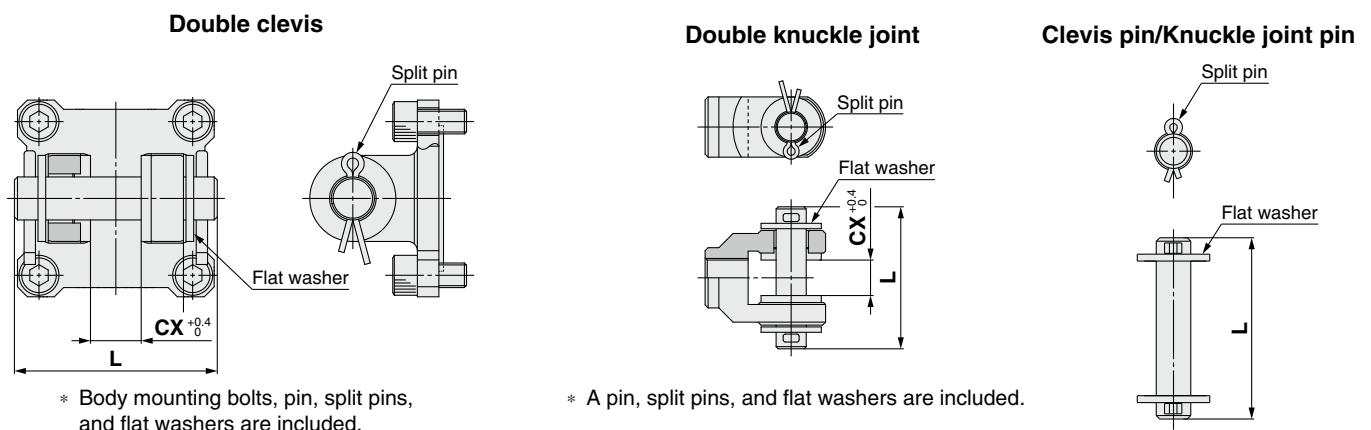
## Applicable Made to Order Options

| Series            | Made to order |      |      |      |
|-------------------|---------------|------|------|------|
|                   | XC35          | XC88 | XC89 | XC91 |
| Compact cylinder  | ●             | ●    | ●    | —    |
| Long stroke       | ●             | ●    | ●    | ●    |
| Anti-lateral load | —             | —    | ●    | ●    |

\* For details on XC35 ⇨ p. 176  
For details on XC88, 89, and 91 ⇨ p. 178



## Dimensions (Dimensions other than those below are the same as those of the standard type.)



| Bore size [mm] |               |                      | [mm]                            |             |      |      |    |
|----------------|---------------|----------------------|---------------------------------|-------------|------|------|----|
|                | Double clevis | Double knuckle joint | Clevis pin<br>Knuckle joint pin | CX          | L    |      |    |
| <b>32</b>      | CQ-D032-XC26C | Y-G04-XC26C          | IY-G04-XC26                     | 12.5        | 52.5 |      |    |
|                | CQ-D040-XC26A | Y-G04-XC26A          |                                 | 16.5        |      |      |    |
| <b>40</b>      | CQ-D040-XC26B | Y-G04-XC26B          |                                 | 19.5        |      |      |    |
|                | CQ-D040-XC26C | Y-G04-XC26C          |                                 | 12.5        |      |      |    |
| <b>50</b>      | CQ-D050-XC26A | Y-G05-XC26A          |                                 | IY-G05-XC26 |      | 16.5 | 66 |
|                | CQ-D050-XC26B | Y-G05-XC26B          |                                 |             |      | 19.5 |    |
|                | CQ-D050-XC26C | Y-G05-XC26C          | 12.5                            |             |      |      |    |
| <b>63</b>      | CQ-D063-XC26A | Y-G05-XC26A          | 16.5                            |             |      |      |    |
|                | CQ-D063-XC26B | Y-G05-XC26B          | 19.5                            |             |      |      |    |
|                | CQ-D063-XC26C | Y-G05-XC26C          | 12.5                            |             |      |      |    |

\* Split pins and flat washers are included.

**17 Double Clevis Pin/Double Knuckle Joint Pin Material: Stainless Steel 304** **Symbol**  
**-XC27**

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the retaining ring has been changed to stainless steel.

| Description       | Model        | Action  |
|-------------------|--------------|---|
| Compact cylinder  | <b>CQ2</b>   | Double acting, Single rod*1<br>Single acting (Spring return/extend)*1 |
| Long stroke       | <b>CQ2</b>   | Double acting, Single rod   |
| Anti-lateral load | <b>CQ2□S</b> | Double acting, Single rod   |
| Non-rotating rod  | <b>CQ2K</b>  | Double acting, Single rod   |

\*1 Excludes cylinders with double knuckle joint bracket in How to Order

**Stainless steel rod end brackets (single knuckle joint, double knuckle joint) and accessories (rod end nut) are also available.**

For details ⇨ p. 26

**How to Order**

**CQ2D** Standard model no. **-XC27**

↓ Double clevis type      Double clevis pin made of stainless steel ↓

**Y** - G012, Z015A, G02, G03, G04, G05, G08, G10 **-XC27**

↓ Double knuckle joint      Double knuckle joint pin made of stainless steel ↓

**IY** - G012\*1, G02, G03, G04, G05, G08, G10 **-XC27**

↓ Clevis pin/ Knuckle pin      Clevis pin Knuckle pin made of stainless steel ↓

\*1 Stainless steel specification for IY-J015 (ø16 knuckle pin) is IY-J015SUS.

**Specifications**

|                                     |   |
|-------------------------------------|---|
| Mounting type                       | Double clevis type (D), double knuckle joint only |
| Pin and retaining ring material     | Stainless steel 304                               |
| Specifications other than the above | Same as the standard type                         |

**18 With Coil Scraper** **Symbol**  
**-XC35**

Removes frost, ice, weld spatter, cutting chips, etc. adhered to the piston rod, protecting the seals.

| Description      | Model       | Action                    | Note   |
|------------------|-------------|---------------------------|--|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod | Applicable to ø32 to ø100  |
|                  | <b>CQ2W</b> | Double acting, Double rod | Applicable to ø32 to ø100  |
| Axial piping     | <b>CQP2</b> | Double acting, Single rod | Applicable to ø32 to ø100<br>Excludes models with a mounting bracket |
| Long stroke      | <b>CQ2</b>  | Double acting, Single rod | Applicable to ø32 to ø100  |

**How to Order**

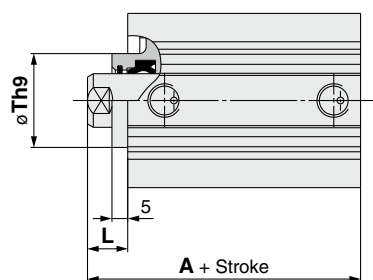
Standard model no. **-XC35**

↓ With coil scraper ↓

**Specifications: Same as those of the standard type**

**Dimensions (Dimensions other than those below are the same as those of the standard type.)**

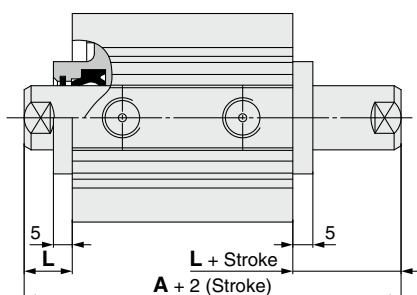
**Double acting, Single rod**



| Bore size [mm] | A                    |                   |                      |                       | L                    |                                    | T |
|----------------|----------------------|-------------------|----------------------|-----------------------|----------------------|------------------------------------|---|
|                | 50 mm stroke or less | 75, 100 mm stroke | 125 to 300 mm stroke | 100 mm stroke or less | 125 to 300 mm stroke | [mm]                               |   |
| <b>32</b>      | 35 (45)              | 45                | 62.5                 | 12                    | 17                   | 23 <sup>+0</sup> <sub>-0.052</sub> |   |
| <b>40</b>      | 41.5 (51.5)          | 51.5              | 72                   | 12                    | 17                   | 28 <sup>+0</sup> <sub>-0.052</sub> |   |
| <b>50</b>      | 43.5 (53.5)          | 53.5              | 73.5                 | 13                    | 18                   | 35 <sup>+0</sup> <sub>-0.062</sub> |   |
| <b>63</b>      | 49 (59)              | 59                | 75                   | 13                    | 18                   | 35 <sup>+0</sup> <sub>-0.062</sub> |   |
| <b>80</b>      | 58.5 (68.5)          | 68.5              | 86                   | 15                    | 20                   | 43 <sup>+0</sup> <sub>-0.062</sub> |   |
| <b>100</b>     | 70 (80)              | 80                | 97.5                 | 17                    | 22                   | 59 <sup>+0</sup> <sub>-0.074</sub> |   |

\* ( ): Dimensions with auto switch magnet

**Double acting, Double rod**



| Bore size [mm] | A                    |                   | L    |
|----------------|----------------------|-------------------|------|
|                | 50 mm stroke or less | 75, 100 mm stroke | [mm] |
| <b>32</b>      | 54.5 (64.5)          | 64.5              | 12   |
| <b>40</b>      | 64 (74)              | 74                | 12   |
| <b>50</b>      | 66.5 (76.5)          | 76.5              | 13   |
| <b>63</b>      | 68 (78)              | 78                | 13   |
| <b>80</b>      | 81 (91)              | 91                | 15   |
| <b>100</b>     | 94.5 (104.5)         | 104.5             | 17   |

\* ( ): Dimensions with auto switch magnet

Standard Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Single Acting, Spring Return/Extend **CQ2**  
 Large Bore Size Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Anti-lateral Load Double Acting, Single Rod **CQ2□S**  
 Double Acting, Double Rod **CQ2W**  
 Long Stroke Double Acting, Single Rod **CQ2**  
 Double Acting, Double Rod **CQ2W**  
 Non-rotating Rod Double Acting, Single Rod **CQ2K**  
 Double Acting, Double Rod **CQ2KW**  
 Water Resistant Double Acting, Single Rod **CQ2-R/V**  
 Double Acting, Double Rod **CQ2W-R/V**  
 Axial Piping Single Acting, Spring Return/Extend **CQP2**  
 Double Acting, Single Rod **CQP2**  
 With End Lock Double Acting, Single Rod **CBQ2**  
 Auto Switch **Auto Switch**  
 Made to Order

## 19 With Boss on Rod End

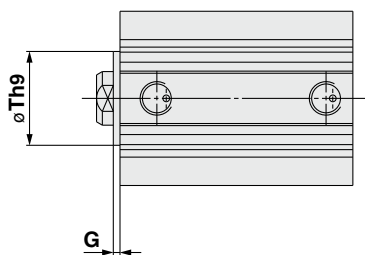
Symbol  
**-XC36**

Cylinder with boss on rod end

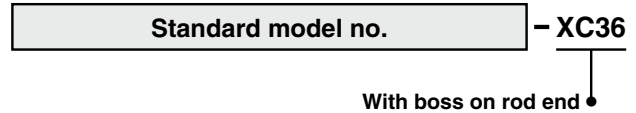
| Description        | Model        | Action  |
|--------------------|--------------|---|
| Compact cylinder   | <b>CQ2</b>   | Double acting, Single rod<br>Single acting (Spring return/extend) |
|                    | <b>CQ2W</b>  | Double acting, Double rod   |
| Long stroke*1      | <b>CQ2</b>   | Double acting, Single rod   |
| Non-rotating rod*1 | <b>CQ2K</b>  | Double acting, Single rod   |
|                    | <b>CQ2KW</b> | Double acting, Double rod   |
| Axial piping       | <b>CQP2</b>  | Double acting, Single rod   |
|                    |              | Single acting (Spring return/extend)                              |

- \*1 The standard model can be used for long strokes and non-rotating rod types (single rod or double rod).
- \* For the double rod type, it comes with boss for both sides.
- \* Excludes models with a mounting bracket
- \* Excludes ø125 or more

### Dimensions (Dimensions other than those below are the same as those of the standard type.)



### How to Order



**Specifications:**  
Same as those of the standard type

| Bore size [mm] | Th9                               | G   |
|----------------|-----------------------------------|-----|
| 12             | 15 <sup>0</sup> <sub>-0.043</sub> | 1.5 |
| 16             | 20 <sup>0</sup> <sub>-0.052</sub> | 1.5 |
| 20             | 13 <sup>0</sup> <sub>-0.043</sub> | 2   |
| 25             | 15 <sup>0</sup> <sub>-0.043</sub> | 2   |
| 32             | 21 <sup>0</sup> <sub>-0.052</sub> | 2   |
| 40             | 28 <sup>0</sup> <sub>-0.052</sub> | 2   |
| 50             | 35 <sup>0</sup> <sub>-0.062</sub> | 2   |
| 63             | 35 <sup>0</sup> <sub>-0.062</sub> | 2   |
| 80             | 43 <sup>0</sup> <sub>-0.062</sub> | 2   |
| 100            | 59 <sup>0</sup> <sub>-0.074</sub> | 2   |

## 20 Grease for Food Processing Equipment

Symbol  
**-XC85**

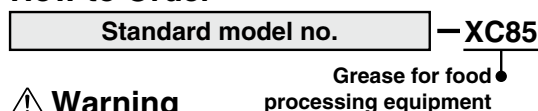
Food grade grease (certified by NSF-H1) is used.

| Description       | Model           | Action                               |
|-------------------|-----------------|--------------------------------------|
| Compact cylinder  | <b>CQ2</b>      | Double acting, Single rod            |
|                   | <b>CQ2</b>      | Single acting (Spring return/extend) |
|                   | <b>CQ2W</b>     | Double acting, Double rod            |
| Large bore size   | <b>CQ2</b>      | Double acting, Single rod            |
|                   | <b>CQ2W</b>     | Double acting, Double rod            |
| Long stroke       | <b>CQ2</b>      | Double acting, Single rod            |
| Non-rotating rod  | <b>CQ2K</b>     | Double acting, Single rod            |
|                   | <b>CQ2KW</b>    | Double acting, Double rod            |
| Water resistant   | <b>CQ2-R/V</b>  | Double acting, Single rod            |
|                   | <b>CQ2W-R/V</b> | Double acting, Double rod            |
| Axial piping      | <b>CQP2</b>     | Double acting, Single rod            |
|                   |                 | Single acting (Spring return/extend) |
| Anti-lateral load | <b>CQ2□S</b>    | Double acting, Single rod            |
| With end lock     | <b>CBQ2</b>     | Double acting, Single rod            |

### Specifications

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| <b>Grease</b>                       | Grease for food processing equipment |
| <b>Dimensions</b>                   | Same as the standard type            |
| Specifications other than the above | Same as the standard type            |

### How to Order



### Warning Precautions

Be aware that smoking cigarettes, etc., after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

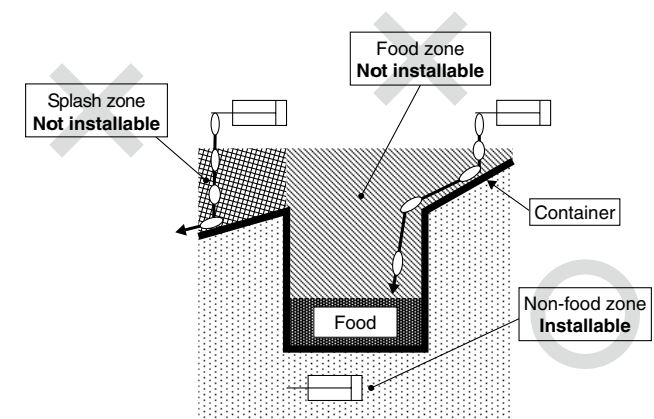
<Not installable>

Food zone.....An environment where food which will be sold as merchandize, directly touches the cylinder's components

Splash zone.....An environment where food which will not be sold as merchandize, directly touches the cylinder's components

<Installable>

Non-food zone.....An environment where there is no contact with food



- \* Avoid using this product in the food zone. (Refer to the figure above.)
- \* When the product is used in an area of liquid splash, or a water resistant function is required for the product, please consult SMC.
- \* Operate without lubrication from a pneumatic system lubricator.
- \* Use the following grease pack for the maintenance work. GR-H-010 (Grease: 10 g)
- \* Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

**21 Spatter-resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: Stainless steel 304) **-XC88****

**22 Spatter-resistant Coil Scraper, Lube-retainer, Grease for Welding (Piston rod: S45C) **-XC89****

Reduces spatter adhesion and improves durability by the use of the coil scraper, Lube-retainer and grease for welding

**23 Spatter-resistant Coil Scraper, Grease for Welding (Piston rod: S45C) **-XC91****

With coil scraper and grease for welding

| Series | Description       | Model | Action                    | Note                         | XC88 | XC89 | XC91 |
|--------|-------------------|-------|---------------------------|------------------------------|------|------|------|
| CQ2    | Compact cylinder  | CQ2   | Double acting, Single rod | With auto switch magnet only | ●    | ●    | ●    |
|        | Long stroke       | CQ2   | Double acting, Single rod |                              | ●    | ●    | —    |
|        | Anti-lateral load | CQ2□S | Double acting, Single rod |                              | ●    | ●    | —    |

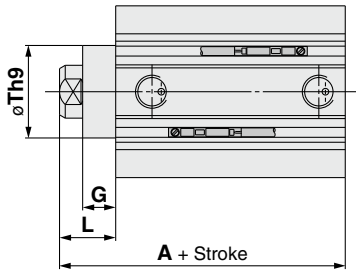
### How to Order

CDQ2 Standard model no. — **XC89**

Spatter-resistant rod material

|             |                     |
|-------------|---------------------|
| <b>XC88</b> | Stainless steel 304 |
| <b>XC89</b> | S45C                |
| <b>XC91</b> | S45C                |

### Dimensions



| Bore size [mm] | XC88, 89 |             |                   |    |    |                                   | XC91 |   |    |                                   |
|----------------|----------|-------------|-------------------|----|----|-----------------------------------|------|---|----|-----------------------------------|
|                | A        |             |                   | G  | L  | Th9                               | A    | G | L  | Th9                               |
|                | Standard | Long stroke | Anti-lateral load |    |    |                                   |      |   |    |                                   |
| 32             | 50       | 67.5        | 60                | 10 | 17 | 23 <sup>0</sup> <sub>-0.052</sub> | 45   | 5 | 12 | 23 <sup>0</sup> <sub>-0.052</sub> |
| 40             | 56.5     | 77          | 66.5              | 10 | 17 | 28 <sup>0</sup> <sub>-0.052</sub> | 51.5 | 5 | 12 | 28 <sup>0</sup> <sub>-0.052</sub> |
| 50             | 58.5     | 78.5        | 68.5              | 10 | 18 | 35 <sup>0</sup> <sub>-0.062</sub> | 53.5 | 5 | 13 | 35 <sup>0</sup> <sub>-0.062</sub> |
| 63             | 64       | 80          | 74                | 10 | 18 | 35 <sup>0</sup> <sub>-0.062</sub> | 59   | 5 | 13 | 35 <sup>0</sup> <sub>-0.062</sub> |
| 80             | 73.5     | 91          | 83.5              | 10 | 20 | 43 <sup>0</sup> <sub>-0.062</sub> | 68.5 | 5 | 15 | 43 <sup>0</sup> <sub>-0.062</sub> |
| 100            | 85       | 102.5       | 95                | 10 | 22 | 59 <sup>0</sup> <sub>-0.074</sub> | 80   | 5 | 17 | 59 <sup>0</sup> <sub>-0.074</sub> |

### Specifications

| Part no.     | Piston rod material (Hard chrome plating) |                     | Coil scraper | Lube-retainer | Grease for welding |
|--------------|---|---------------------|--------------|---------------|--------------------|
|              | S45C                                      | Stainless steel 304 |              |               |                    |
| <b>-XC88</b> | —   | ●                   | ●            | ●             | ●                  |
| <b>-XC89</b> | ●   | —                   | ●            | ●             | ●                  |
| <b>-XC91</b> | ●   | —                   | ●            | —             | ●                  |

\* Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

Specifications other than the above Same as the standard type

Standard Double Acting, Single Rod **CQ2**

Standard Double Acting, Double Rod **CQ2W**

Standard Sing Acting, Sing Ham-Ext **CQ2**

Standard Sing Acting, Sing Ham-Ext **CQ2**

Large Bore Size Double Acting, Single Rod **CQ2**

Large Bore Size Double Acting, Double Rod **CQ2W**

Anti-lateral Load Double Acting, Single Rod **CQ2□S**

Long Stroke Double Acting, Single Rod **CQ2**

Long Stroke Double Acting, Double Rod **CQ2W**

Non-rotating Rod Double Acting, Single Rod **CQ2K**

Non-rotating Rod Double Acting, Double Rod **CQ2KW**

Water Resistant Double Acting, Single Rod **CQ2-R/V**

Water Resistant Double Acting, Double Rod **CQ2W-R/V**

Axial Piping Double Acting, Single Rod **CQP2**

Axial Piping Sing Acting, Sing Ham-Ext **CQP2**

With End Lock Double Acting, Single Rod **CBQ2**

With End Lock Double Acting, Double Rod **CBQ2W**

Auto Switch **Auto Switch**

Made to Order



## 24 Dust-resistant Actuator

Symbol  
**-XC92**

For use in environments with airborne micro-powder (20 to 30 μm or less) such as ceramic powder, toner powder, paper powder, and metallic powder (Excludes weld spatter) 4 times stronger than the standard model

| Description      | Model      | Action                    | Note                      |
|------------------|------------|---------------------------|---------------------------|
| Compact cylinder | <b>CQ2</b> | Double acting, Single rod | Applicable to ø32 to ø100 |

### Specifications

|                                     |                           |
|-------------------------------------|---------------------------|
| Min. operating pressure             | 0.1 MPa                   |
| Specifications other than the above | Same as the standard type |

### How to Order

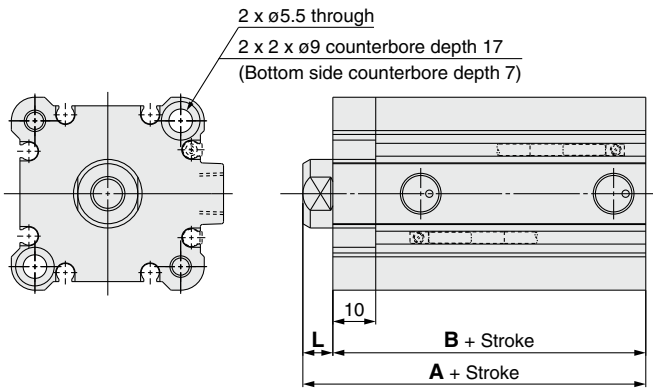
Standard model no. — **XC92**

Dust-resistant actuator

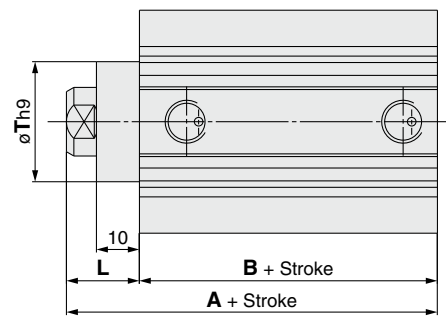
- \* Auto switch is applicable for CDQ2 only.
- \* Body option with rear slip fit is not available.

### Dimensions (Dimensions other than those below are the same as those of the standard type.)

ø32



ø40 to ø100



[mm]

| Bore size<br>[mm] | A                   |                  | B                   |                  | L  | T  |
|-------------------|---------------------|------------------|---------------------|------------------|----|----|
|                   | Without auto switch | With auto switch | Without auto switch | With auto switch |    |    |
| <b>32</b>         | 40 (50)             | 50               | 33 (43)             | 43               | 7  | —  |
| <b>40</b>         | 46.5 (56.5)         | 56.5             | 29.5 (39.5)         | 39.5             | 17 | 28 |
| <b>50</b>         | 48.5 (58.5)         | 58.5             | 30.5 (40.5)         | 40.5             | 18 | 35 |
| <b>63</b>         | 54 (64)             | 64               | 36 (46)             | 46               | 18 | 35 |
| <b>80</b>         | 63.5 (73.5)         | 73.5             | 43.5 (53.5)         | 53.5             | 20 | 43 |
| <b>100</b>        | 75 (85)             | 85               | 53 (63)             | 63               | 22 | 59 |

\* Dimensions inside ( ) are for 75, 100 st.

## 25 Special Port Location

Symbol  
**-X144**

This type is available for changing port location. (Only for ø12 to ø25 with auto switch magnet)

| Description      | Model       | Action                               | Note                     |
|------------------|-------------|--------------------------------------|--------------------------|
| Compact cylinder | <b>CQ2</b>  | Double acting, Single rod            | Applicable to ø12 to ø25 |
|                  |             | Single acting (Spring return/extend) |                          |
|                  | <b>CQ2W</b> | Double acting, Double rod            |                          |

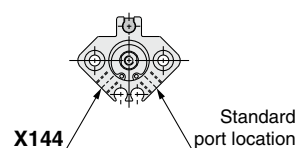
### How to Order

Standard model no. — **X144** **B**

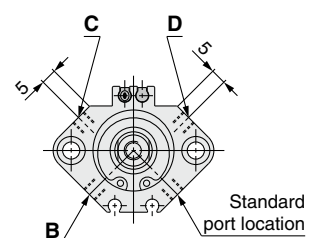
Special port location

In the case of CDQ2□20, 25,  
specify the port location with  
B, C, and D.

ø12, ø16



ø20, ø25



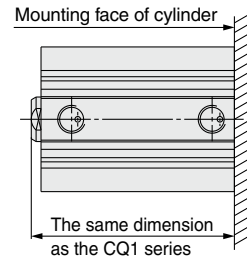
Specifications: Same as those of the standard type

Symbol  
**-X202**

**26** Same Full Length Dimension as the CQ1 Series

For the single rod cylinder of the CQ2 series, the A dimension (from the head face to the rod end) and the rod end female thread size are the same as those of the CQ1 series (previous model).

| Description      | Model | Action                               | Note   |
|------------------|-------|--------------------------------------|--|
| Compact cylinder | CQ2   | Double acting, Single rod            | Applicable to $\phi 12$ , $\phi 20$ , $\phi 32$ , $\phi 40$ , $\phi 50$ , $\phi 63$ , $\phi 80$ , and $\phi 100$ |
|                  |       | Single acting (Spring return/extend) | Applicable to $\phi 12$ , $\phi 20$ , $\phi 32$ , $\phi 40$ , and $\phi 50$                                      |



Standard model no. — X202

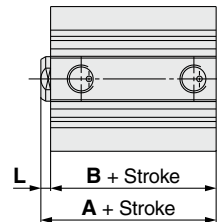
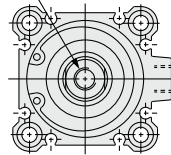
**Specifications: Same as those of the standard type**

- \* As sizes  $\phi 16$  and  $\phi 25$  are new, they are not applicable.
- \* Strokes except mentioned below are available as standard products.

**Dimensions (Without auto switch magnet)** (Dimensions other than those below are the same as those of the standard type.)

**Double acting, Single rod: Female thread**

H thread effective depth C



| Symbol   | Bore size   |           | $\phi 12$ |             | $\phi 20$ |            | $\phi 32$ |             | $\phi 40$ |           | $\phi 50$ |           | $\phi 63$ |           | $\phi 80$ |  | $\phi 100$ |  |
|----------|-------------|-----------|-----------|-------------|-----------|------------|-----------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|------------|--|
|          | Stroke [mm] |           |           |             |           |            |           |             |           |           |           |           |           |           |           |  |            |  |
| <b>A</b> | 25.5        | 23(25)    | 28        | 26.5 (28.5) | 31.5      | 33         | 38        | 34          | 39        | 39.5      | 44.5      | 47        | 52        | 56.5      | 61.5      |  |            |  |
| <b>B</b> | 22          | 19.5      | 24.5      | 23          | 28        | 29.5       | 34.5      | 30.5        | 35.5      | 36        | 41        | 43.5      | 48.5      | 53        | 58        |  |            |  |
| <b>L</b> | 3.5         | 3.5 (5.5) | 3.5       | 3.5 (5.5)   | 3.5       | 3.5        | 3.5       | 3.5         | 3.5       | 3.5       | 3.5       | 3.5       | 3.5       | 3.5       | 3.5       |  |            |  |
| <b>H</b> | M3 x 0.5    | M5 x 0.8  |           | M6 x 1.0*1  |           | M6 x 1.0*1 |           | M8 x 1.25*1 |           | M10 x 1.5 |           | M16 x 2.0 |           | M20 x 2.5 |           |  |            |  |
| <b>C</b> | 6           | 7         |           | 9*1         |           | 11*1       |           | 13*1        |           | 15        |           | 21        |           | 27        |           |  |            |  |

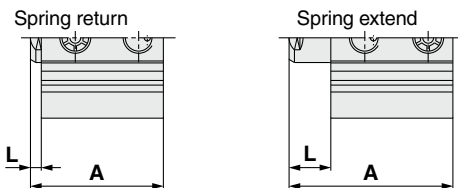
\*1 The H/C dimensions of  $\phi 32$ ,  $\phi 40$ , and  $\phi 50$  are different from those of the CQ2 series model. \* ( ): Stroke 10 mm

**75 st, 100 st**

| Symbol   | Bore size |      | $\phi 32$ |     | $\phi 40$ |      | $\phi 50$ |      | $\phi 63$ |  | $\phi 80$ |  | $\phi 100$ |  |
|----------|-----------|------|-----------|-----|-----------|------|-----------|------|-----------|--|-----------|--|------------|--|
|          | Stroke    |      |           |     |           |      |           |      |           |  |           |  |            |  |
| <b>A</b> | 75        | 100  | 36.5      | 43  | 44        | 49.5 | 57        | 66.5 |           |  |           |  |            |  |
| <b>B</b> | 33        | 39.5 | 40.5      | 46  | 53.5      | 63   |           |      |           |  |           |  |            |  |
| <b>L</b> | 3.5       | 3.5  | 3.5       | 3.5 | 3.5       | 3.5  |           |      |           |  |           |  |            |  |

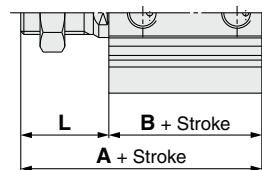
\* The H/C dimensions are the same as above.

**Single acting (Spring return/extend)**



| Action                       | Bore size |        | $\phi 20$ |      | $\phi 32$ |     | $\phi 40$ |      | $\phi 50$ |  |
|------------------------------|-----------|--------|-----------|------|-----------|-----|-----------|------|-----------|--|
|                              | Stroke    | Symbol |           |      |           |     |           |      |           |  |
| Single acting, Spring return | <b>A</b>  | 28     | 35        | 31.5 | 38.5      | 38  | 43        | 44   | 54        |  |
|                              | <b>L</b>  | 3.5    | 5.5       | 3.5  | 5.5       | 3.5 | 3.5       |      |           |  |
| Single acting, Spring extend | <b>A</b>  | 33     | 45        | 36.5 | 48.5      | 43  | 53        | 54   | 74        |  |
|                              | <b>L</b>  | 8.5    | 15.5      | 8.5  | 15.5      | 8.5 | 13.5      | 13.5 | 23.5      |  |

**Double acting, Single rod: Rod end male thread**



| Symbol   | Bore size |      | $\phi 12$ |        | $\phi 20$ |        | $\phi 32$ |        | $\phi 40$ |        | $\phi 50$ |        | $\phi 63$ |        | $\phi 80$ |        | $\phi 100$ |  |
|----------|-----------|------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|------------|--|
|          | Stroke    |      |           |        |           |        |           |        |           |        |           |        |           |        |           |        |            |  |
| <b>A</b> | 15, 25    | 10   | 15, 25    | 35, 45 | 10        | 15, 25 | 35, 45    | 35, 45 | 35, 45    | 35, 45 | 35, 45    | 35, 45 | 35, 45    | 35, 45 | 35, 45    | 35, 45 | 35, 45     |  |
| <b>B</b> | 36        | 40   | 43        | 53.5   | 56.5      | 63     | 69        | 74.5   | 92        | 101.5  |           |        |           |        |           |        |            |  |
| <b>L</b> | 22        | 19.5 | 24.5      | 23     | 28        | 34.5   | 35.5      | 41     | 48.5      | 58     |           |        |           |        |           |        |            |  |
| <b>L</b> | 14        | 20.5 | 18.5      | 30.5   | 28.5      | 28.5   | 33.5      | 33.5   | 43.5      | 43.5   |           |        |           |        |           |        |            |  |

Standard Double Acting, Single Rod CQ2

Standard Double Acting, Double Rod CQ2W

Large Bore Size Double Acting, Double Rod CQ2W

Anti-lateral Load Double Acting, Single Rod CQ2S

Long Stroke Double Acting, Single Rod CQ2

Non-rotating Rod Double Acting, Single Rod CQ2K

Water Resistant Double Acting, Double Rod CQ2W-RV

Water Resistant Double Acting, Single Rod CQ2-RV

Axial Piping Single Acting, Spring Return/Extend CQP2

With End Lock Double Acting, Single Rod CBQ2

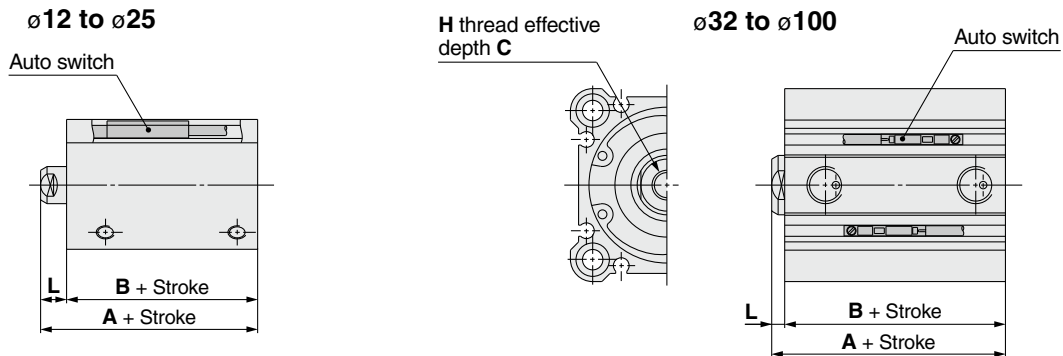
Auto Switch

Made to Order

## 26 Same Full Length Dimension as the CQ1 Series

**Dimensions (With auto switch magnet)** (Dimensions other than those below are the same as those of the standard type.)

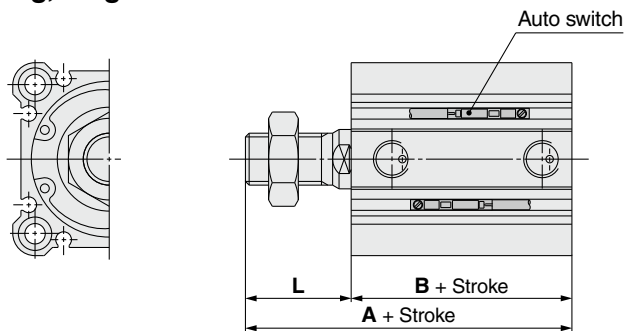
### Double acting, Single rod: Female thread



| Symbol   | Bore size   |  | ø12      |                         | ø20              |                                 | ø32                 |                                 | ø40                 |                                 | ø50              |                                 | ø63              |                                 | ø80              |                                 | ø100             |                                 |                  |
|----------|-------------|--|----------|-------------------------|------------------|---------------------------------|---------------------|---------------------------------|---------------------|---------------------------------|------------------|---------------------------------|------------------|---------------------------------|------------------|---------------------------------|------------------|---------------------------------|------------------|
|          | Stroke [mm] |  | 15, 25   | 5, 10, 20<br>30, 40, 50 | 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 5, 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 5, 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 15, 25<br>35, 45 | 10, 20, 30<br>40, 50, 75<br>100 | 15, 25<br>35, 45 |
| <b>A</b> |             |  | 36.5     | 38.5                    | 43.5             | 36.5                            | 41.5                | 43                              | 48                  | 44                              | 49               | 49.5                            | 54.5             | 57                              | 62               | 66.5                            | 71.5             |                                 |                  |
| <b>B</b> |             |  | 33       | 31.5                    | 36.5             | 33                              | 38                  | 39.5                            | 44.5                | 40.5                            | 45.5             | 46                              | 51               | 53.5                            | 58.5             | 63                              | 68               |                                 |                  |
| <b>L</b> |             |  | 3.5      | 7                       | 7                | 3.5                             | 3.5                 | 3.5                             | 3.5                 | 3.5                             | 3.5              | 3.5                             | 3.5              | 3.5                             | 3.5              | 3.5                             | 3.5              |                                 |                  |
| <b>H</b> |             |  | M3 x 0.5 | M5 x 0.8                |                  | M6 x 1.0*1                      |                     | M6 x 1.0*1                      |                     | M8 x 1.25*1                     |                  | M10 x 1.5                       |                  | M16 x 2.0                       |                  | M20 x 2.5                       |                  |                                 |                  |
| <b>C</b> |             |  | 6        | 7                       |                  | 9*1                             |                     | 11*1                            |                     | 13*1                            |                  | 15                              |                  | 21                              |                  | 27                              |                  |                                 |                  |

\*1 The H/C dimensions of ø32, ø40, and ø50 are different from those of the CQ2 series model.

### Double acting, Single rod: Rod end male thread



| Symbol   | Bore size   |  | ø12    |                           | ø20              |                     | ø32                 |                  | ø40              |                  | ø50              |                  | ø63              |                  | ø80              |                  | ø100             |                  |
|----------|-------------|--|--------|---------------------------|------------------|---------------------|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|          | Stroke [mm] |  | 15, 25 | 5, 10<br>20, 30<br>40, 50 | 15, 25<br>35, 45 | 5, 15, 25<br>35, 45 | 5, 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 | 15, 25<br>35, 45 |
| <b>A</b> |             |  | 47     | 53.5                      | 58.5             | 66.5                | 73                  | 79               | 84.5             | 102              | 111.5            |                  |                  |                  |                  |                  |                  |                  |
| <b>B</b> |             |  | 33     | 31.5                      | 36.5             | 38                  | 44.5                | 45.5             | 51               | 58.5             | 68               |                  |                  |                  |                  |                  |                  |                  |
| <b>L</b> |             |  | 14     | 22                        | 22               | 28.5                | 28.5                | 33.5             | 33.5             | 43.5             | 43.5             |                  |                  |                  |                  |                  |                  |                  |

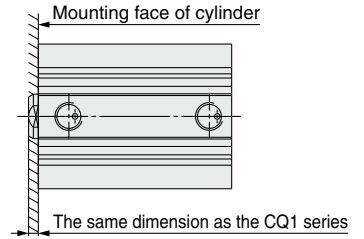
**27** Same L Dimension from the Rod Cover as the CQ1 Series

Symbol  
**-X203**

For the single rod cylinder of the CQ2 series, the L dimension (from the rod face to the rod end) and the rod end female thread size are the same as the CQ1 series (previous model).

| Description      | Model | Action                               | Note   |
|------------------|-------|--------------------------------------|--|
| Compact cylinder | CQ2   | Double acting, Single rod            | Female thread only<br>Applicable to $\phi 20$ , $\phi 32$ , ( $\phi 40$ ), ( $\phi 50$ ), ( $\phi 63$ ), ( $\phi 80$ ), and ( $\phi 100$ ) |
|                  |       | Single acting (Spring return/extend) | Female thread only<br>Applicable to $\phi 20$ , $\phi 32$ , ( $\phi 40$ ), and ( $\phi 50$ )   |

- \* The rod end male thread type is selectable for the standard type of the CQ2 series.
- \* As sizes  $\phi 16$  and  $\phi 25$  are new, they are not applicable.
- \* ( ): Same dimensions as those of the -X202



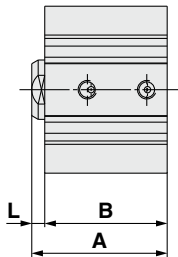
Standard model no. **- X203**

Specifications: Same as those of the standard type

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)

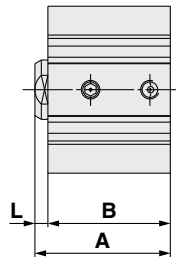
**CQ2B<sup>20</sup>/<sub>32</sub>-10D(C)Z**

Double acting, Single rod



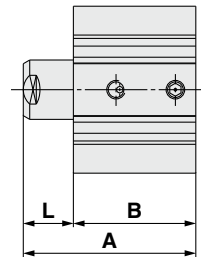
| Symbol   | Bore size |           |
|----------|-----------|-----------|
|          | $\phi 20$ | $\phi 32$ |
| <b>A</b> | 33        | 36.5      |
| <b>B</b> | 29.5      | 33        |
| <b>L</b> | 3.5       | 3.5       |

Single acting, Spring return



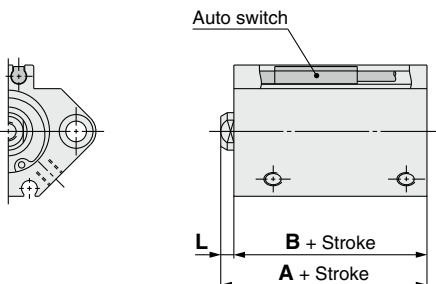
| Symbol   | Bore size |           |
|----------|-----------|-----------|
|          | $\phi 20$ | $\phi 32$ |
| <b>A</b> | 33        | 36.5      |
| <b>B</b> | 29.5      | 33        |
| <b>L</b> | 3.5       | 3.5       |

Single acting, Spring extend



| Symbol   | Bore size |           |
|----------|-----------|-----------|
|          | $\phi 20$ | $\phi 32$ |
| <b>A</b> | 43        | 46.5      |
| <b>B</b> | 29.5      | 33        |
| <b>L</b> | 13.5      | 13.5      |

**CDQ2B20-□D(C)Z**



| Symbol   | Bore size     |           |
|----------|---------------|-----------|
|          | $\phi 20$     | $\phi 32$ |
| <b>A</b> | Stroke 5, 10  | 15, 25    |
|          | Stroke 20, 30 | 35, 45    |
| <b>B</b> | Stroke 40, 50 | 35, 45    |
|          | Stroke 5, 10  | 15, 25    |
| <b>L</b> | Stroke 20, 30 | 35, 45    |
|          | Stroke 40, 50 | 35, 45    |

Standard  
Double Acting, Single Rod  
**CQ2**

Double Acting, Double Rod  
**CQ2W**

Single Acting, Spring Return/Extend  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Double Acting, Single Rod  
**CQ2**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
Double Acting, Single Rod  
**CQ2K**

Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Double Acting, Double Rod  
**CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Single Acting, Spring Return/Extend  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch  
**Auto Switch**

Made to Order

## 28 Special Rod End for Double Rod Cylinder

A male thread is used at one piston rod end and a female thread is used at the other end for the double rod cylinder.

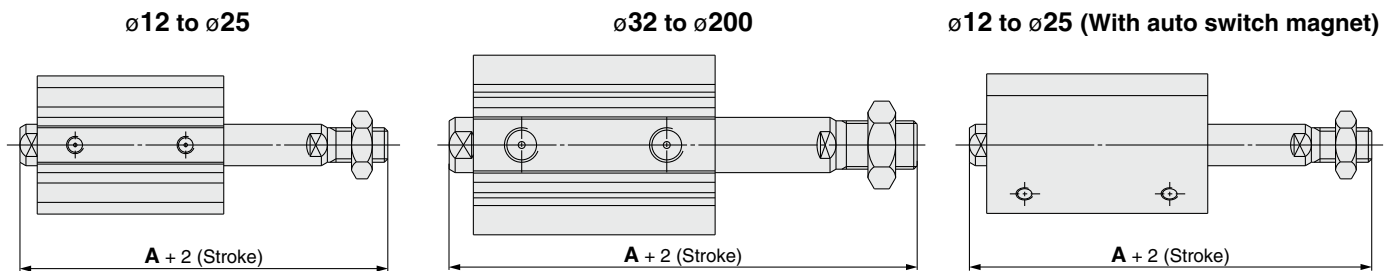
| Description      | Model       | Action                       | Note   |
|------------------|-------------|------------------------------|--|
| Compact cylinder | <b>CQ2W</b> | Double acting,<br>Double rod | Foot, compact foot, and flange only<br>Excludes body option M (Rod end male thread) and the air-hydro type |
| Large bore size  | <b>CQ2W</b> | Double acting,<br>Double rod | Excludes body option M (Rod end male thread)   |

Standard model no. — **X235**

● Piston rod end  
Male thread, Female thread

Specifications: Same as those of the standard type

Dimensions (Dimensions other than those below are the same as those of the standard type.)



| Bore size [mm] | A                    |                      |
|----------------|----------------------|----------------------|
|                | 50 mm stroke or less | 75 mm stroke or more |
| <b>12</b>      | 42.7 (49.9)          | —                    |
| <b>16</b>      | 45 (55)              | —                    |
| <b>20</b>      | 49 (61)              | —                    |
| <b>25</b>      | 56.5 (66.5)          | —                    |
| <b>32</b>      | 66 (76)              | 76                   |
| <b>40</b>      | 75.5 (85.5)          | 85.5                 |
| <b>50</b>      | 82 (92)              | 92                   |
| <b>63</b>      | 83.5 (93.5)          | 93.5                 |

| Bore size [mm] | A                    |                      |
|----------------|----------------------|----------------------|
|                | 50 mm stroke or less | 75 mm stroke or more |
| <b>80</b>      | 104.5 (114.5)        | 114.5                |
| <b>100</b>     | 116 (126)            | 126                  |
| <b>125</b>     | 157                  |                      |
| <b>140</b>     | 157                  |                      |
| <b>160</b>     | 172                  |                      |
| <b>180</b>     | 183                  |                      |
| <b>200</b>     | 190                  |                      |

\* ( ): Dimensions with auto switch

## 29 Fluororubber Seals

The material of the seals has been changed to fluororubber.

| Description       | Model        | Action                               | Note   |
|-------------------|--------------|--------------------------------------|--|
| Compact cylinder  | <b>CQ2</b>   | Double acting, Single rod            | With rubber bumper: The bumper material cannot be changed to fluororubber. Excludes the air-hydro type |
|                   | <b>CQ2</b>   | Single acting (Spring return/extend) |  |
|                   | <b>CQ2W</b>  | Double acting, Double rod            |  |
| Large bore size   | <b>CQ2</b>   | Double acting, Single rod            |  |
|                   | <b>CQ2W</b>  | Double acting, Double rod            |  |
| Long stroke       | <b>CQ2</b>   | Double acting, Single rod            |  |
| Anti-lateral load | <b>CQ2□S</b> | Double acting, Single rod            |  |
| Axial piping      | <b>CQP2</b>  | Double acting, Single rod            |  |
|                   | <b>CQP2</b>  | Single acting (Spring return/extend) |  |

Standard model no. — **X271**

● Fluororubber seals

Specifications: Same as those of the standard type

**30** Same Full Length Dimension as the CQ1W Series

Symbol  
**-X293**

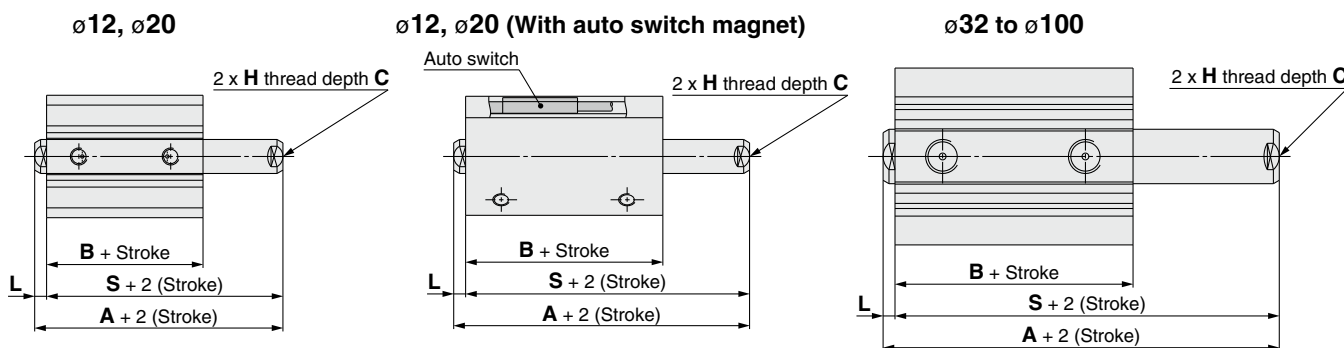
| Description      | Model       | Action                    | Note   |
|------------------|-------------|---------------------------|--|
| Compact cylinder | <b>CQ2W</b> | Double acting, Double rod | Excludes models with a mounting bracket, body option M (Rod end male thread), and the air-hydro type |

Standard model no. — **X293**

The same dimension as the CQ1W

Specifications: Same as those of the standard type

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



**Without Auto Switch Magnet**

| Bore size<br>Stroke<br>(mm) | 12       |          | 20       |        | 32     |        | 40     |        | 50        |           | 63        |           | 80      |         | 100       |           |
|-----------------------------|----------|----------|----------|--------|--------|--------|--------|--------|-----------|-----------|-----------|-----------|---------|---------|-----------|-----------|
|                             | 5        | 10       | 5        | 15     | 5      | 10, 20 | 15     | 5, 10  | 15        | 10, 20    | 15        | 10, 20    | 15      | 10, 20  | 15        | 10, 20    |
| Symbol                      | 10       | 20       | 15       | 5      | 5      | 30, 40 | 35     | 20, 30 | 25        | 30, 40    | 35        | 30, 40    | 35      | 30, 40  | 35        | 30, 40    |
| <b>A</b>                    | 33       | 33       | 38       | 37     | 38     | 43     | 46.5   | 51.5   | 47.5      | 52.5      | 53        | 58        | 60.5    | 65.5    | 70        | 75        |
| <b>B</b>                    | 25.2     | 26       | 31       | 30.5   | 30.5   | 35.5   | 40     | 45     | 40.5      | 45.5      | 42        | 47        | 51      | 56      | 60.5      | 65.5      |
| <b>L</b>                    | 3.5      | 3.5      | 3.5      | 3.5    | 3.5    | 3.5    | 3.5    | 3.5    | 3.5       | 3.5       | 3.5       | 3.5       | 3.5     | 3.5     | 3.5       | 3.5       |
| <b>S</b>                    | 29.5     | 29.5     | 34.5     | 33.5   | 34.5   | 39.5   | 43     | 48     | 44        | 49        | 49.5      | 54.5      | 57      | 62      | 66.5      | 71.5      |
| <b>H</b>                    | M3 x 0.5 | M5 x 0.8 | M5 x 0.8 | M6 x 1 | M6 x 1 | M6 x 1 | M6 x 1 | M6 x 1 | M8 x 1.25 | M8 x 1.25 | M10 x 1.5 | M10 x 1.5 | M16 x 2 | M16 x 2 | M20 x 2.5 | M20 x 2.5 |
| <b>C</b>                    | 6        | 7        | 7        | 9      | 9      | 9      | 9      | 9      | 13        | 13        | 15        | 15        | 21      | 21      | 27        | 27        |

**With Auto Switch Magnet**

| Bore size<br>Stroke<br>(mm) | 12       |          | 20       |        | 32     |        | 40     |           | 50        |           | 63        |         | 80      |           | 100       |  |
|-----------------------------|----------|----------|----------|--------|--------|--------|--------|-----------|-----------|-----------|-----------|---------|---------|-----------|-----------|--|
|                             | 5        | 10       | 15       | 10     | 5      | 10     | 5      | 10        | 15        | 10        | 15        | 10      | 15      | 10        | 15        |  |
| Symbol                      | 20       | 30       | 25       | 20     | 15     | 30     | 25     | 20        | 15        | 20        | 30        | 20      | 25      | 20        | 30        |  |
| <b>A</b>                    | 40       | 47       | 52       | 48     | 53     | 56.5   | 61.5   | 57.5      | 62.5      | 63        | 68        | 70.5    | 75.5    | 80        | 85        |  |
| <b>B</b>                    | 32.4     | 38       | 43       | 40.5   | 45.5   | 50     | 55     | 50.5      | 55.5      | 52        | 57        | 61      | 66      | 70.5      | 75.5      |  |
| <b>L</b>                    | 3.5      | 3.5      | 3.5      | 3.5    | 3.5    | 3.5    | 3.5    | 3.5       | 3.5       | 3.5       | 3.5       | 3.5     | 3.5     | 3.5       | 3.5       |  |
| <b>S</b>                    | 36       | 43.5     | 48.5     | 44.5   | 49.5   | 53     | 58     | 54        | 59        | 59.5      | 64.5      | 67      | 72      | 76.5      | 81.5      |  |
| <b>H</b>                    | M3 x 0.5 | M5 x 0.8 | M5 x 0.8 | M6 x 1 | M6 x 1 | M6 x 1 | M6 x 1 | M8 x 1.25 | M8 x 1.25 | M10 x 1.5 | M10 x 1.5 | M16 x 2 | M16 x 2 | M20 x 2.5 | M20 x 2.5 |  |
| <b>C</b>                    | 6        | 7        | 7        | 9      | 9      | 9      | 9      | 13        | 13        | 15        | 15        | 21      | 21      | 27        | 27        |  |

Standard  
Double Acting, Single Rod  
**CQ2**

Standard  
Double Acting, Double Rod  
**CQ2W**

Standard  
Single Acting, Spring Return, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Single Rod  
**CQ2**

Large Bore Size  
Double Acting, Double Rod  
**CQ2W**

Anti-lateral Load  
Double Acting, Single Rod  
**CQ2S**

Long Stroke  
Double Acting, Single Rod  
**CQ2**

Long Stroke  
Double Acting, Double Rod  
**CQ2W**

Non-rotating Rod  
Double Acting, Single Rod  
**CQ2K**

Non-rotating Rod  
Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
Double Acting, Single Rod  
**CQ2-R/V**

Water Resistant  
Double Acting, Double Rod  
**CQ2W-R/V**

Axial Piping  
Double Acting, Single Rod  
**CQP2**

Axial Piping  
Single Acting, Spring Return, Single Rod  
**CQP2**

With End Lock  
Double Acting, Single Rod  
**CBQ2**

Auto Switch

Made to Order

## 31 Long Stroke for Adjustable Extension Stroke Cylinder (-XC8)

| Description      | Model      | Action                    | Note                                    |
|------------------|------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b> | Double acting, Single rod | Excludes models with a mounting bracket |

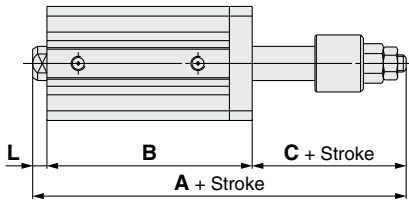
Standard model no. — **X525**

• Long stroke for -XC8

Specifications: Same as those of the standard type

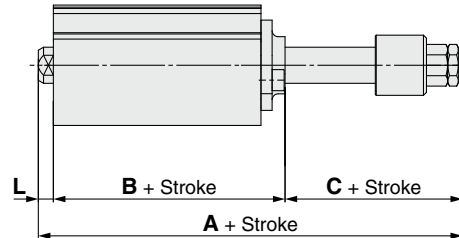
### Dimensions (Dimensions other than those below are the same as those of the standard type.)

∅12 to ∅25 (Without auto switch magnet)

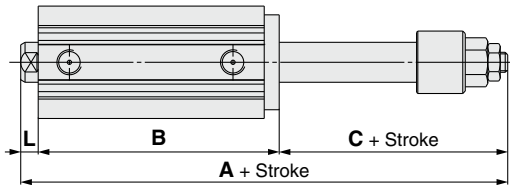


\* Only the through-hole mounting type is available.

∅12 to ∅25 (With auto switch magnet)



∅32 to ∅100



∅12, ∅16

| Bore size | Symbol<br>Stroke | A     |       |       |       | B     |       |       |       | C  | L   | Applicable stroke |
|-----------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|----|-----|-------------------|
|           |                  | 35 st | 40 st | 45 st | 50 st | 35 st | 40 st | 45 st | 50 st |    |     |                   |
| <b>12</b> |                  | 99.9  | 104.9 | 109.9 | 114.9 | 72.4  | 77.4  | 82.4  | 87.4  | 24 | 3.5 | 35, 40            |
| <b>16</b> |                  | 104.5 | 109.9 | 114.9 | 119.5 | 77    | 82    | 87    | 92    | 24 | 3.5 | 45, 50            |

∅20 to ∅100

| Bore size  | Symbol<br>Stroke | A           |              |               |               |               |               | B           |              |               |               |               |               | C  | L   | Applicable stroke |
|------------|------------------|-------------|--------------|---------------|---------------|---------------|---------------|-------------|--------------|---------------|---------------|---------------|---------------|----|-----|-------------------|
|            |                  | 55 to 75 st | 80 to 100 st | 105 to 125 st | 130 to 150 st | 155 to 175 st | 180 to 200 st | 55 to 75 st | 80 to 100 st | 105 to 125 st | 130 to 150 st | 155 to 175 st | 180 to 200 st |    |     |                   |
| <b>20</b>  |                  | 155.5       | 180.5        | —             | —             | —             | —             | 122         | 147          | —             | —             | —             | —             | 29 | 4.5 | 55 to 100         |
| <b>25</b>  |                  | 156         | 181          | —             | —             | —             | —             | 122         | 147          | —             | —             | —             | —             | 29 | 5   |                   |
| <b>32</b>  |                  | —           | —            | 213.5         | 238.5         | 263.5         | 288.5         | —           | —            | 171.5         | 196.5         | 221.5         | 246.5         | 35 | 7   | 105 to 200        |
| <b>40</b>  |                  | —           | —            | 223           | 248           | 273           | 298           | —           | —            | 181           | 206           | 231           | 256           | 35 | 7   |                   |
| <b>50</b>  |                  | —           | —            | 235.5         | 260.5         | 285.5         | 310.5         | —           | —            | 183.5         | 208.5         | 233.5         | 258.5         | 44 | 8   |                   |
| <b>63</b>  |                  | —           | —            | 237           | 262           | 287           | 312           | —           | —            | 187           | 212           | 237           | 262           | 42 | 8   |                   |
| <b>80</b>  |                  | —           | —            | 260           | 285           | 310           | 335           | —           | —            | 198           | 223           | 248           | 273           | 52 | 10  |                   |
| <b>100</b> |                  | —           | —            | 273.5         | 298.5         | 323.5         | 348.5         | —           | —            | 209.5         | 234.5         | 259.5         | 284.5         | 52 | 12  |                   |

\* The dimensions are the same with or without an auto switch magnet.

\* Applicable stroke available in 5 mm increments



**32 Long Stroke for Adjustable Retraction Stroke Cylinder (-XC9)**

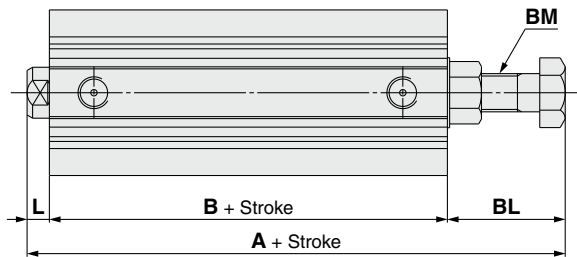
Symbol  
**-X526**

| Description      | Model      | Action                    | Note                                    |
|------------------|------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b> | Double acting, Single rod | Excludes models with a mounting bracket |

Standard model no. — **X526**

Specifications: Same as those of the standard type  
 • Long stroke for -XC9

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



| Bore size | Symbol | A           | B    | L   | BL          | BM        | Applicable stroke |
|-----------|--------|-------------|------|-----|-------------|-----------|-------------------|
| 12        |        | 59.2 (56.4) | 32.4 | 3.5 | 23.3 (20.5) | M5 x 0.8  | 35, 40, 45, 50    |
| 16        |        | 64          | 37   | 3.5 | 23.5        | M6 x 1.0  |                   |
| 20        |        | 74          | 39   | 4.5 | 30.5        | M8 x 1.25 |                   |
| 25        |        | 73.5        | 39   | 5   | 29.5        | M8 x 1.25 | 75, 100           |
| 32        |        | 75.5        | 40.5 | 7   | 28          | M8 x 1.25 |                   |
| 40        |        | 94          | 50   | 7   | 37          | M12 x 1.5 | 125, 150          |
| 50        |        | 94.5        | 50.5 | 8   | 36          | M12 x 1.5 |                   |
| 63        |        | 98.5        | 52   | 8   | 38.5        | M16 x 1.5 |                   |
| 80        |        | 119.5       | 61   | 10  | 48.5        | M20 x 1.5 | 175, 200          |
| 100       |        | 135         | 70.5 | 12  | 52.5        | M24 x 1.5 |                   |

\* ( ): Dimensions with auto switch magnet  
 \* Intermediate strokes (available in 5 mm increments) are available with a spacer. The dimensions are the same as those of 75, 100, 125, 150, 175, 200 mm strokes.

**33 Intermediate Stroke for Double Rod Cylinder**

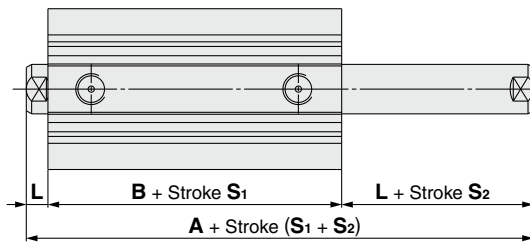
Symbol  
**-X633**

| Description      | Model        | Action                    | Note                                    |
|------------------|--------------|---------------------------|---|
| Compact cylinder | <b>CQ2W</b>  | Double acting, Double rod | Excludes models with a mounting bracket |
| Large bore size  | <b>CQ2W</b>  |                           |   |
| Non-rotating rod | <b>CQ2KW</b> |                           |   |

Standard model no. — **X633**

Specifications: Same as those of the standard type

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



| Bore size | Symbol | C(D)Q2W     |             | C(D)Q2KW    |             | L   | Stroke S1   | Stroke S2                            |
|-----------|--------|-------------|-------------|-------------|-------------|-----|---|--------------------------------------|
|           |        | A           | B           | A           | B           |     |   |                                      |
| 12        |        | 32.2 (39.4) | 25.2 (32.4) | 37.2 (44.4) | 30.2 (37.4) | 3.5 | 5 to 30 mm stroke, 5 mm increments  | 6 to 29 mm stroke, 1 mm increments   |
| 16        |        | 33 (43)     | 26 (36)     | 38 (48)     | 31 (41)     | 3.5 |   |                                      |
| 20        |        | 35 (47)     | 26 (38)     | 43 (55)     | 34 (46)     | 4.5 | 5 to 50 mm stroke, 5 mm increments  | 6 to 49 mm stroke, 1 mm increments   |
| 25        |        | 39 (49)     | 29 (39)     | 47 (57)     | 37 (47)     | 5   |   |                                      |
| 32        |        | 44.5 (54.5) | 30.5 (40.5) | 53.5 (63.5) | 39.5 (49.5) | 7   | For 5 to 50 mm stroke: 5 mm increments<br>For 50 to 100 mm stroke: 25 mm increments   | 6 to 99 mm stroke, 1 mm increments   |
| 40        |        | 54 (64)     | 40 (50)     | 54 (64)     | 40 (50)     | 7   |   |                                      |
| 50        |        | 56.5 (66.5) | 40.5 (50.5) | 56.5 (66.5) | 40.5 (50.5) | 8   | For 10 to 50 mm stroke: 5 mm increments<br>For 50 to 100 mm stroke: 25 mm increments  | 11 to 99 mm stroke, 1 mm increments  |
| 63        |        | 58 (68)     | 42 (52)     | 58 (68)     | 42 (52)     | 8   |   |                                      |
| 80        |        | 71 (81)     | 51 (61)     | —           | —           | 10  |   |                                      |
| 100       |        | 84.5 (94.5) | 60.5 (70.5) | —           | —           | 12  | For 10 to 50 mm stroke: 10 mm increments<br>For 50 to 200 mm stroke: 25 mm increments<br>For 200 to 300 mm stroke: 50 mm increments | 15 to 295 mm stroke, 5 mm increments |
| 125       |        | 115         | 83          | —           | —           | 16  |   |                                      |
| 140       |        | 115         | 83          | —           | —           | 16  |   |                                      |
| 160       |        | 125         | 91          | —           | —           | 17  |   |                                      |
| 180       |        | 136         | 102         | —           | —           | 17  |   |                                      |
| 200       |        | 143         | 109         | —           | —           | 17  |   |                                      |

\* ( ): Dimensions with auto switch magnet  
 \* Installing a spacer inside the standard cylinder tube, stroke S1 has 5 mm increments for controlling intermediate strokes in 1 mm increments. Example) In the case of CDQ2WB40-18DZ, stroke S1 is 20 mm and stroke S2 is 18 mm.  
 \* For ø40 to ø100 cylinders with bumper, please consult with SMC.  
 \* For ø32 to ø100 cylinders, the dimensions of the 75 and 100 mm strokes are the same as those of the dimensions with auto switch in the brackets.

Standard  
 Double Acting, Double Rod  
**CQ2W**  
 Single Acting, Single Rod  
**CQ2**

Large Bore Size  
 Double Acting, Double Rod  
**CQ2W**  
 Double Acting, Single Rod  
**CQ2**

Anti-lateral Load  
 Double Acting, Single Rod  
**CQ2S**

Long Stroke  
 Double Acting, Single Rod  
**CQ2**

Non-rotating Rod  
 Double Acting, Double Rod  
**CQ2KW**

Water Resistant  
 Double Acting, Double Rod  
**CQ2W-RV**  
 Double Acting, Single Rod  
**CQ2-RV**

Axial Piping  
 Double Acting, Single Rod  
**CQP2**  
 Single Acting, Single Rod  
**CQP2**

With End Lock  
 Double Acting, Single Rod  
**CBQ2**

Auto Switch

Made to Order

## 34 Long Stroke for Dual Stroke Single Rod Cylinder

| Description      | Model      | Action                    | Note  |
|------------------|------------|---------------------------|---|
| Compact cylinder | <b>CQ2</b> | Double acting, Single rod | Excludes the both ends tapped type and models with a mounting bracket |

**C□Q2B** **Bore size** – **Stroke S<sub>1</sub>** + **Stroke S<sub>2</sub>–S<sub>1</sub>** **D (C)(M)(Z) – X636**

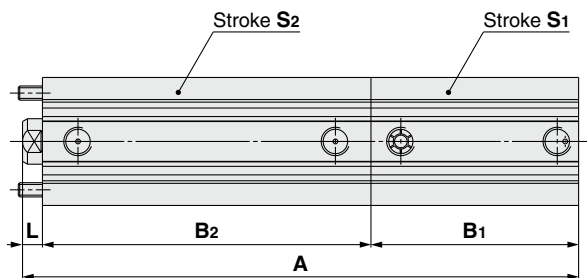
• Long stroke for -XC11

**Specifications: Same as those of the standard type**

### Applicable Strokes [mm]

| Bore size   | Stroke                               |
|-------------|--------------------------------------|
| ø12, ø16    | Stroke S <sub>2</sub> : Up to 50 mm  |
| ø20 to ø100 | Stroke S <sub>2</sub> : Up to 100 mm |

### Dimensions (Dimensions other than those below are the same as those of the standard type.)



#### Bore Size: ø12, ø16 [mm]

| Symbol<br>Bore size | A  | B <sub>1</sub>                         | B <sub>2</sub>                  | L   | Stroke range   |                |
|---------------------|--|--|---------------------------------|-----|----------------|----------------|
|                     |  |  |                                 |     | S <sub>1</sub> | S <sub>2</sub> |
| ø12                 | 52.9 (63.9)<br>+ Stroke (S <sub>1</sub> + S <sub>2</sub> ) | 17 (28)<br>+ Stroke S <sub>1</sub>     | 32.4<br>+ Stroke S <sub>2</sub> | 3.5 | 5 to 30        | 35 to 50       |
| ø16                 | 58 (70)<br>+ Stroke (S <sub>1</sub> + S <sub>2</sub> )     | 18.5 (30.5)<br>+ Stroke S <sub>1</sub> | 36<br>+ Stroke S <sub>2</sub>   | 3.5 | 5 to 30        | 35 to 50       |

#### Bore Size: ø20, ø25 [mm]

| Symbol<br>Bore size | A  |  | B <sub>1</sub>                         | B <sub>2</sub>        |           | L   | Stroke range   |                |
|---------------------|--|--|--|-----------------------|-----------|-----|----------------|----------------|
|                     | Stroke S <sub>2</sub>                    |  |  | Stroke S <sub>2</sub> |           |     | S <sub>1</sub> | S <sub>2</sub> |
|                     | 55 to 75                                 | 80 to 100                                |  | 55 to 75              | 80 to 100 |     |                |                |
| ø20                 | 137 (149)<br>+ Stroke S <sub>1</sub>     | 162 (174)<br>+ Stroke S <sub>1</sub>     | 19.5 (31.5)<br>+ Stroke S <sub>1</sub> | 113                   | 138       | 4.5 | 5 to 50        | 55 to 100      |
| ø25                 | 141.5 (151.5)<br>+ Stroke S <sub>1</sub> | 166.5 (176.5)<br>+ Stroke S <sub>1</sub> | 22.5 (32.5)<br>+ Stroke S <sub>1</sub> | 114                   | 139       | 5   | 5 to 50        | 55 to 100      |

#### Bore Size: ø32 to ø100 [mm]

| Symbol<br>Bore size | A  |          |  |          |           | B <sub>1</sub>                         |          |           | B <sub>2</sub>        |           | L  | Stroke range   |                |
|---------------------|--|----------|--|----------|-----------|--|----------|-----------|-----------------------|-----------|----|----------------|----------------|
|                     | Stroke S <sub>2</sub> 55 to 75           |          | Stroke S <sub>2</sub> 80 to 100          |          |           | Stroke S <sub>1</sub>                  |          |           | Stroke S <sub>2</sub> |           |    | S <sub>1</sub> | S <sub>2</sub> |
|                     | Stroke S <sub>1</sub>                    |          | Stroke S <sub>1</sub>                    |          |           | ≤ 50                                   | 55 to 75 | 80 to 100 | 55 to 75              | 80 to 100 |    |                |                |
|                     | ≤ 50                                     | 55 to 75 | ≤ 50                                     | 55 to 75 | 80 to 100 |  |          |           |                       |           |    |                |                |
| ø32                 | 145.4 (155.5)<br>+ Stroke S <sub>1</sub> | 230.5    | 170.5 (180.5)<br>+ Stroke S <sub>1</sub> | 255.5    | 280.5     | 23 (33)<br>+ Stroke S <sub>1</sub>     | 108      | 133       | 115.5                 | 140.5     | 7  | 5 to 100       | 55 to 100      |
| ø40                 | 161.5 (171.5)<br>+ Stroke S <sub>1</sub> | 246.5    | 186.5 (196.5)<br>+ Stroke S <sub>1</sub> | 271.5    | 296.5     | 29.5 (39.5)<br>+ Stroke S <sub>1</sub> | 114.5    | 139.5     | 125                   | 150       | 7  | 5 to 100       | 55 to 100      |
| ø50                 | 164 (174)<br>+ Stroke S <sub>1</sub>     | 249      | 189 (199)<br>+ Stroke S <sub>1</sub>     | 274      | 299       | 30.5 (40.5)<br>+ Stroke S <sub>1</sub> | 115.5    | 140.5     | 125.5                 | 150.5     | 8  | 10 to 100      | 55 to 100      |
| ø63                 | 171 (181)<br>+ Stroke S <sub>1</sub>     | 256      | 196 (206)<br>+ Stroke S <sub>1</sub>     | 281      | 306       | 36 (46)<br>+ Stroke S <sub>1</sub>     | 121      | 146       | 127                   | 152       | 8  | 10 to 100      | 55 to 100      |
| ø80                 | 189.5 (199.5)<br>+ Stroke S <sub>1</sub> | 274.5    | 214.5 (224.5)<br>+ Stroke S <sub>1</sub> | 299.5    | 324.5     | 43.5 (53.5)<br>+ Stroke S <sub>1</sub> | 128.5    | 153.5     | 136                   | 161       | 10 | 10 to 100      | 55 to 100      |
| ø100                | 210.5 (220.5)<br>+ Stroke S <sub>1</sub> | 295.5    | 235.5 (245.5)<br>+ Stroke S <sub>1</sub> | 320.5    | 345.5     | 53 (63)<br>+ Stroke S <sub>1</sub>     | 138      | 163       | 145.5                 | 170.5     | 12 | 10 to 100      | 55 to 100      |

\* ( ): Dimensions with auto switch magnet

\* Applicable stroke: Available in 5 mm increments

Symbol  
**-X1876**

**35** Cylinder Tube: With Concave Boss on Head End

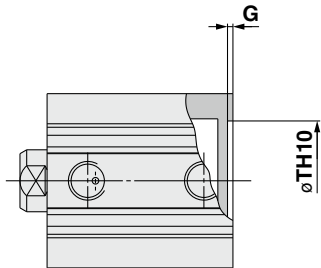
| Description       | Model        | Action                               | Note                                  |
|-------------------|--------------|--------------------------------------|---------------------------------------|
| Compact cylinder  | <b>CQ2</b>   | Double acting, Single rod            | Applicable to $\phi 32$ to $\phi 100$ |
|                   |              | Single acting (Spring return/extend) | Applicable to $\phi 32$ to $\phi 50$  |
| Non-rotating rod  | <b>CQ2K</b>  | Double acting, Single rod            | Applicable to $\phi 32$ to $\phi 63$  |
| Anti-lateral load | <b>CQ2□S</b> | Double acting, Single rod            |                                       |

Standard model no. — **X1876**

Specifications:  
Same as those of the standard type

• With concave boss on head end

**Dimensions** (Dimensions other than those below are the same as those of the standard type.)



| Bore size [mm] | TH10   | G   |
|----------------|--|-----|
| <b>32</b>      | 30.9 $\begin{smallmatrix} +0.100 \\ 0 \end{smallmatrix}$ | 1.4 |
| <b>40</b>      | 39.3 $\begin{smallmatrix} +0.100 \\ 0 \end{smallmatrix}$ | 1.3 |
| <b>50</b>      | 48.7 $\begin{smallmatrix} +0.100 \\ 0 \end{smallmatrix}$ | 2.1 |
| <b>63</b>      | 61.5 $\begin{smallmatrix} +0.120 \\ 0 \end{smallmatrix}$ | 2.4 |
| <b>80</b>      | 78.3 $\begin{smallmatrix} +0.120 \\ 0 \end{smallmatrix}$ | 2.7 |
| <b>100</b>     | 98.9 $\begin{smallmatrix} +0.140 \\ 0 \end{smallmatrix}$ | 2.8 |

|                   |                                     |                      |
|-------------------|-------------------------------------|----------------------|
| Standard          | Double Acting, Single Rod           | <b>CQ2</b>           |
| Standard          | Double Acting, Double Rod           | <b>CQ2W</b>          |
| Standard          | Single Acting, Spring Return/Extend | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Single Rod           | <b>CQ2</b>           |
| Large Bore Size   | Double Acting, Double Rod           | <b>CQ2W</b>          |
| Anti-lateral Load | Double Acting, Single Rod           | <b>CQ2□S</b>         |
| Anti-lateral Load | Double Acting, Double Rod           | <b>CQ2□SW</b>        |
| Long Stroke       | Double Acting, Single Rod           | <b>CQ2</b>           |
| Long Stroke       | Double Acting, Double Rod           | <b>CQ2W</b>          |
| Non-rotating Rod  | Double Acting, Single Rod           | <b>CQ2K</b>          |
| Non-rotating Rod  | Double Acting, Double Rod           | <b>CQ2KW</b>         |
| Water Resistant   | Double Acting, Single Rod           | <b>CQ2-R/V</b>       |
| Water Resistant   | Double Acting, Double Rod           | <b>CQ2W-R/V</b>      |
| Axial Piping      | Double Acting, Single Rod           | <b>CQP2</b>          |
| Axial Piping      | Double Acting, Double Rod           | <b>CQP2W</b>         |
| Axial Piping      | Single Acting, Spring Return/Extend | <b>CQP2</b>          |
| With End Lock     | Double Acting, Single Rod           | <b>CBQ2</b>          |
| With End Lock     | Double Acting, Double Rod           | <b>CBQ2W</b>         |
| Auto Switch       |                                     | <b>Auto Switch</b>   |
| Made to Order     |                                     | <b>Made to Order</b> |



## CQ2 Series

# Specific Product Precautions 1

Be sure to read this before handling the products. For safety instructions, actuator, and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### <Precautions for each series>

#### Mounting

### ⚠ Caution

The CQ2 series compact cylinders are designed to create compact mechanical equipment and promote space saving. Thus, if it is used in the same manner as existing cylinders such as tie-rod cylinders, it may degrade the performance. Pay sufficient attention to the operating conditions when using.

#### 1. Allowable lateral load

Lateral load that can apply to the piston rod end is limited. If a cylinder is used with a lateral load over the limit, it may cause air leakage due to abnormal friction of seals, galling of cylinder tubes and pistons, or abnormal friction of the bearing part. The lateral load applied to the piston rod must be within the allowable range indicated in this catalog. When the load exceeds the limit, use a double rod cylinder, install a guide, or change the bore size to suit the load in order to make the load within the allowable range. As a standard product, an anti-lateral load type cylinder that is resistant to approx. 2 times more than the existing compact CQ2 series is also available (page 65).

#### 2. Connection with a workpiece

When a workpiece is mounted on the piston rod end, connect them aligning the center of piston rod and a workpiece. If they are off-center, lateral load is generated and phenomena mentioned in (1) may occur. In order not to apply the off-center load, use of a floating joint or simple joint is recommended.

#### 3. Simultaneous use of multiple cylinders

It is difficult to control the speed of pneumatic cylinders. The following conditions cause speed change: change in supply pressure, load, temperature and lubrication, performance difference of each cylinder, deterioration of each part over time, etc. A speed controller can be used to control the speed of multiple cylinders simultaneously for a short period of time, but depending on conditions, it may not work as desired. If multiple cylinders cannot operate simultaneously, unreasonable force is applied to the piston rod because cylinder positions may not be the same. This may cause abnormal friction of seals and bearings, and galling of cylinder tubes and pistons. Do not use an application to operate several cylinders simultaneously by adjusting cylinder speed. If this is inevitable, use a high rigid guide against load, so that the cylinder is not damaged even when the each cylinder output is slightly different.

### <Precautions for each series>

#### 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 a 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.

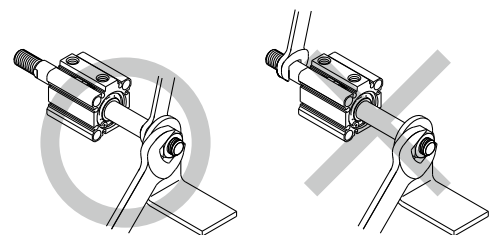
### <Precautions for double rod cylinders>

#### Mounting

### ⚠ Warning

1. Do not apply 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.

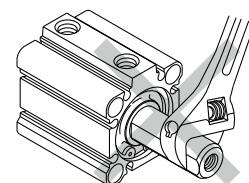
Install or remove loads while the piston rod width across flat is secured. Do not fix the other side of the piston rod width across flat and apply reverse torque.



### <Precautions for non-rotating rod cylinders>

#### Mounting

1. Install or remove loads while the piston rod width across flat is secured.





## CQ2 Series

# Specific Product Precautions 2

Be sure to read this before handling the products. For safety instructions, actuator, and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### <Precautions for non-rotating rod cylinders>

#### Mounting

#### 2. Using a non-rotating rod cylinder

Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod. If rotational torque is applied, the non-rotating guide will deform, causing a loss of non-rotating accuracy. Use the table below as a guide for the allowable rotational torque ranges.

| Allowable rotational torque | 12   | 16   | 20   | 25   | 32   | 40   | 50   | 63   |
|-----------------------------|------|------|------|------|------|------|------|------|
| N·m or less                 | 0.04 | 0.15 | 0.20 | 0.25 | 0.44 | 0.44 | 0.44 | 0.44 |

Operate the cylinder in such a way that the load to the piston rod is always applied in the axial direction.

#### 3. 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 in a way that prevents the tightening torque from being applied to the non-rotating guide.

### <Precautions for water-resistant cylinders>

#### Handling Precautions

## ⚠ Caution

- If there is a possibility of liquid splashing on cylinder fittings, use insert fittings, self-align fittings, steel piping, etc. Consider the compatibility of liquid components and piping materials before using.
- When selecting seals, generally use NBR (nitrile rubber) seals with liquids that do not contain chlorine and sulfur, and use FKM (fluoro rubber) seals with liquids that contain chlorine and sulfur. However, depending on the type and the brand of liquid (such as coolant liquid) that splashes on the cylinder, the operating life of seals may be reduced dramatically.

#### Examples of coolant liquid

Shimiron, PA-O-5 (Daido Chemical Industry Co., Ltd.) (NBR seals)  
 Noritake Cool, AFG-S (Noritake Co., Ltd.) (NBR seals)  
 Yushiroken, S-46S (Yushiro Chemical Industry Co., Ltd.) (NBR seals)  
 Yushiroken, EC-50-T3 (Yushiro Chemical Industry Co., Ltd.) (NBR seals)  
 Yushiron Oil, No. 23 (Yushiro Chemical Industry Co., Ltd.) (FKM seals)  
 Daphne Cut, Hs-1 (Idemitsu Kosan Co., Ltd.) (FKM seals)

#### 3. When the cylinder is exposed to dust or sand, or is used in a place where liquid from the piston rod splashes, use the heavy-duty scraper (-XC4) type.

### <Precautions for axial piping type cylinders>

#### Mounting/Removal

- Do not remove the hexagon socket head set screw on the side of the rod.
  - Be aware that if the hexagon socket head set screw is removed with compressed air supplied to the cylinder, an internal steel ball could fly out or the compressed air could be discharged, leading to injury to humans or damage to peripheral equipment.

### <Precautions for compact cylinders with end lock>

#### Pneumatic Circuit

## ⚠ Caution

#### 1. Do not use 3-position solenoid valves.

Avoid use in combination with 3-position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.

#### 2. Back pressure is required for releasing the lock.

Before starting operation, be sure to control the system so that air is supplied to the side without the lock mechanism as shown in the figure below. There is a possibility that the lock may not be released. (Refer to the section on releasing the lock.)

#### 3. Release the lock for mounting or adjusting the cylinder.

If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.

#### 4. Operate with a load ratio of 50% or less.

If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.

#### 5. Do not operate multiple cylinders in synchronization.

Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.

#### 6. Use a speed controller with meter-out control.

Lock cannot be released occasionally by meter-in control.

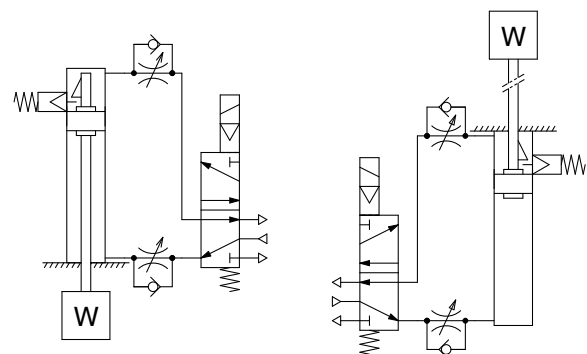
#### 7. Be sure to operate completely to the cylinder stroke end on the side with the lock.

If the cylinder piston does not reach the end of stroke, locking and unlocking may not be possible.

#### 8. Adjust the position of an auto switch, so that it could work at the both positions where it is distanced from the stroke and a backlash (2 mm).

When a 2-color indicator switch is adjusted for green indication at the stroke end, it may change to red for the backlash return, but this is not abnormal.

#### 9. Basic circuit



With head end lock

With rod end lock



## CQ2 Series

# Specific Product Precautions 3

Be sure to read this before handling the products. For safety instructions, actuator, and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### <Precautions for compact cylinders with end lock>

#### Operating Pressure

#### ⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for releasing the lock.

#### Exhaust Speed

#### ⚠ Caution

1. When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some time due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the EXH port of the solenoid valve.

#### Releasing the Lock

#### ⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Also, it is very dangerous because the piston rod will be rushed to move.

### <Precautions for compact cylinders with end lock>

#### Manual Release

#### ⚠ Caution

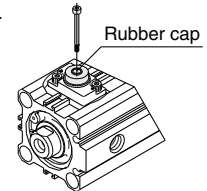
##### 1. Manual release (Non-lock type)

Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

Thread sizes, pulling forces and strokes are as shown below.

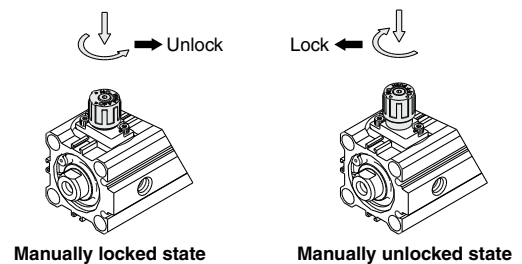
| Bore size [mm] | Thread size                | Pulling force [N] | Stroke [mm] |
|----------------|----------------------------|-------------------|-------------|
| 20, 25, 32     | M2.5 x 0.45 x 25 L or more | 4.9               | 2           |
| 40, 50, 63     | M3 x 0.5 x 30 L or more    | 10                | 3           |
| 80, 100        | M5 x 0.8 x 40 L or more    | 24.5              | 3           |

Remove the bolt for normal operation.  
It can cause lock malfunction or faulty release.



##### 2. Manual release (Lock type)


While pushing the M/O knob, turn it 90° counterclockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼ OFF mark on the M/O knob. When locking is desired, turn the M/O knob clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on the M/O knob. The correct position is confirmed by a click sound “click”. If not confirmed, locking is not done.







## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

\*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots – Safety.  
etc.

### Warning

#### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

#### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

#### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

#### 1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.  
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.  
If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

#### \*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.  
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

#### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

### Revision History

**Edition B** \* The body shape of the large bore size cylinder has been changed.  
\* The -XB10A has been added to the standard type, double acting, single rod.  
\* Number of pages has been decreased from 228 to 216. OS

**Edition C** \* The double rod type water-resistant cylinder has been added.  
\* Dimensions pages for products with a mounting bracket have been collected.  
\* The compact foot type has been added to mounting brackets.

**Edition C** \* The compact cylinder with stable lubrication function (Lube-retainer) has been added.  
\* Stainless steel brackets (single knuckle joint, double knuckle joint, and rod end nut) have been added.  
\* The XB14 (With heat-resistant auto switch) has been added.  
\* Part numbers for products with a rod end bracket and/or a mounting bolt have been added.  
\* Number of pages has been decreased from 216 to 196. YQ

## Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.