## Compact Cylinder

$\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$, ø125, ø140, ø160, ø180, ø200

## Equipment Downsizing

For more compact attachments and spaces


CQ2 Series

Variations


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



## Mounting Brackets



## Environmentally Resistant Specifications

SMC offers a wide range of models suitable for various applications and operating environments.
This includes models that can be used in environments that the basic model cannot, such as those where coolant liquid, water droplets/splashing, dust, etc., are present. When using in environments where the above are present, it is possible to improve the service life of the product by selecting a model ideal for use in such environments.
$\Rightarrow$ For details, refer to the Web Catalog.

## Dust Resistant

Cylinder with Stable Lubrication Function (Lube-retainer) - Micro-powder environments (10 to $100 \mu \mathrm{~m}$ )

Dust-resistant Actuator (-XC92)

- For use in environments with airborne micro-powder such as ceramic powder, toner powder, paper powder, and metallic powder
With Heavy Duty Scraper (-XC4)
With Coil Scraper (-XC35)
- For use in dusty environments or in environments where die-cast equipment, construction machinery, etc., cause exposure to dirt or sand

Water-resistant Cylinder

## Corrosion Resistant (Stainless Steel)

Rod, Retaining Ring, Rod End Nut Made of Stainless Steel (-XC6)
Double Clevis and Double Knuckle Joint Pins Made of Stainless Steel (-XC27)
Rod End Bracket Made of Stainless Steel

- Single knuckle joint

Double knuckle joint
Rod end nut
Temperature Measures
Heat Resistant/Cold Resistant (-XB6, -XB7, -XB14)


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## Combinations of Standard Products and Made to Order

## CQ2 Series

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

| Series |
| :--- |
| Action/ <br> Type |

## Symbol

| Symbol |  |
| :--- | :--- |
| Standard | Stan |
| D | Buil |
| CQ2 $\square$ H | Air-h |
| 10-, 11- | Clea |
| 25A | Cop |
| 20- | Cop |
| CQ2 $\square M$ | Com <br> func |
| XB6 | Hea |
| XB7 | Cold |
| XB9 | Low |
| XB10 | Inter |
| XB10A | Inter |
| XB13 | Low |
| XB14 | Cylin |
| XC2(A) | Rod |

Specifications

| XC2(A) | Rod end length increased by 10 mm <br> (For foot and flange bracket) |
| :--- | :--- |
| XC4 | With heavy duty scraper |
| XC6(A) | Piston rod/Retaining ring/Rod end nut |


| Applicable bore size |
| :---: |
| $\varnothing 12$ to $\varnothing 100$ |
| ø20 to ø100 |
| ø12 to ø200 |
| ø32 to ø100 |
| $\varnothing 12$ to ø100 |
| $\varnothing 12$ to ø40 |
| ø12 to ø100 |
| $\varnothing 12$ to ø200 |
| ø32 to ø100 |
| $\varnothing 12$ to ø100 |
| $\varnothing 16$ to ø63 |
| $\varnothing 12$ to ø100 |
| ø20 to ø100 |

## Common Specifications

CQ2 Series

| CQ2 $\square \mathbf{S}$ (Anti-lateral load) | $\begin{gathered} \text { CQ2 } \\ \text { (Long stroke) } \end{gathered}$ | CQ2K(Non-rotating rod) |  | CQ2-R/V(Water resistant) |  | $\begin{gathered} \text { CQP2 } \\ \text { (Axial piping) }^{* 10} \end{gathered}$ |  |  | CBQ2 (With end lock)* ${ }^{* 10}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Double acting | Double acting | Double acting |  | Double acting |  | Double acting | Single acting |  | Double acting |  |
| Single rod | Single rod | Single rod | Double rod | Single rod | $\begin{gathered} \text { Double } \\ \text { rod } \end{gathered}$ | Single rod | Single rod/ Spring return | $\begin{array}{\|c} \hline \text { Single rod/ } \\ \text { Spring extend } \end{array}$ | Single rod |  |
| $\varnothing 32$ to $\varnothing 100$ | $\varnothing 32$ to $\varnothing 100$ | $\varnothing 12$ to $\varnothing 63$ |  | 220 to 0100 | 940 to 0100 | ه12 to 0100 | $\varnothing 12$ to $\varnothing 50$ |  | $\varnothing 20$ to $\varnothing 100$ | Symbol |
| - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | Standard |
| $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | D |
| $\bigcirc$ | $\bigcirc$ | - | - | - | - | $\bigcirc$ | - | - | - | CQ2■H |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 10-, 11- |
| $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 25A |
| $\bigcirc$ | $\bigcirc$ | ${ }^{* 2}$ | ${ }^{* 2}$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 20- |
| $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | CQ2■M |
| $\bigcirc$ | $\bigcirc$ | ( | ( ${ }^{\text {a }}$ | $\bigcirc$ | $\bigcirc$ | ( | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XB6 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | ( $)$ | $\bigcirc$ | $\bigcirc$ | - | XB7 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | () | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XB9 |
| ( $)$ | ( $)$ | ()*1 | (0)*1 | ()*6 | ( $)$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | (0) | XB10 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XB10A |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | () | $\bigcirc$ | $\bigcirc$ | - | XB13 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XB14 |
| ( | - | ( | ( | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC2(A) |
| $\bigcirc$ | (0) | - | - | - | - | (0)*4 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC4 |
| ( ) | ( | $\bigcirc$ | $\bigcirc$ | (0) | (0) | ( | ( ) | () | $\bigcirc$ | XC6(A) |
| $\bigcirc$ | $\bigcirc$ | () | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O*5 | XC8 |
| $\bigcirc$ | $\bigcirc$ | ( $)$ | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O*7 | XC9 |
| $\bigcirc$ | $\bigcirc$ | ( $)$ | - | $\bigcirc$ | - | - | - | - | $\bigcirc$ | XC10 |
| $\bigcirc$ | $\bigcirc$ | ( | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC11 |
| ( ) | ( | (0)* | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | ( ) | XC26 |
| ( ) | ( ) | - | - | $\bigcirc$ | - | - | - | - | $\bigcirc$ | XC26 $\square$ |
| ( | © | ( | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC27 |
| $\bigcirc$ | ( ${ }^{\text {a }}$ | - | - | - | - | () | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC35 |
| $\bigcirc$ | ()*8 | ()*8 | ()*8 | $\bigcirc$ | $\bigcirc$ | ( | ( | ( | $\bigcirc$ | XC36 |
| ( | () | ( $)$ | () | ( | ( $)$ | () | () | ( | () | XC85 |
| ( | ( | - | - | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC88 |
| (0) | (0) | - | - | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC89 |
| $\bigcirc$ | $\bigcirc$ | - | - | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC91 |
| $\bigcirc$ | $\bigcirc$ | - | - | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | XC92 |
| - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | - | X144 |
| - | - | - | $\bigcirc$ | - | - | - | - | - | - | X235 |
| (0) | () | $\bigcirc$ | $\bigcirc$ | - | - | () | () | () | $\bigcirc$ | X271 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O*5 | X525 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O*7 | X526 |
| - | - | - | ( | - | $\bigcirc$ | - | - | - | - | X633 |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | X636 |
| ( | - | ( | - | $\bigcirc$ | - | - | - | - | $\bigcirc$ | X1876 |

[^0][^1]
# Compact Cylinder: Standard Double Acting, Single Rod CQ2 Series 

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

## How to Order



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.

| 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 $\mathbf{9}$ for the through-hole type mounting bolt.
* For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions L and $\mathrm{L}_{1}$ ) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by 10 mm (-XC2) cylinder. For details $\Rightarrow$ p. 166

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

| 3 Bore size |
| :--- |
| $\mathbf{1 2}$ 12 mm <br> $\mathbf{1 6}$ 16 mm <br> $\mathbf{2 0}$ 20 mm <br> $\mathbf{2 5}$ 25 mm <br> $\mathbf{3 2}$ 32 mm <br> $\mathbf{4 0}$ 40 mm <br> $\mathbf{5 0}$ 50 mm <br> $\mathbf{6 3}$ 63 mm <br> $\mathbf{8 0}$ 80 mm <br> $\mathbf{1 0 0}$ 100 mm |

4343

| Port thread type |  |  |
| :---: | :---: | :---: |
|  | M thread | $\varnothing 12$ to $\varnothing 25$ |
|  | Rc |  |
| TN | NPT |  |
| TF | G |  |
| F to $\varnothing 100$ |  |  |
| F | Built-in |  |

*1 The bore sizes available with Onetouch fittings are ø32 to ø63. However, they cannot be selected for the airhydro 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.Cylinder stroke (For details on the minimum stroke for auto switch mounting $\Rightarrow$ p. 145)
[mm]

| Bore size | Standard stroke |
| :---: | :--- |
| $\mathbf{1 2 , 1 6}$ | $5,10,15,20,25,30$ |
| $\mathbf{2 0 , 2 5}$ | $5,10,15,20,25,30,35,40,45,50$ |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3 , 8 0} \mathbf{6 0} \mathbf{1 0 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |

* For long strokes exceeding the standard stroke range $\Rightarrow$ p. 72
* For details on the manufacturing of intermediate strokes $\Rightarrow$ p. 10
* The bore sizes available for the air-hydro type are ø20 to $\varnothing 100$.


## 0 <br> Through-hole type mounting bolt

 Nil L Shipped together* Mounting bolt is shipped together with the product only when the mounting bracket is " B " (Through-hole). For details:
Without auto switch magnet $\Rightarrow$ p. 13
With auto switch magnet $\Rightarrow$ p. 14
* When a made-to-order option is selected, the mounting bolt is not shipped together with the product. Please order it separately.
(10 Rod end bracket ( $\Leftrightarrow$ p. p. 26, 27)

| Nil | None |
| :---: | :---: |
| $\mathbf{D}$ | Simple joint A type + Joint |
| $\mathbf{E}$ | Simple joint B type + Joint |
| $\mathbf{V}$ | Single knuckle joint |
| $\mathbf{W}$ | Double knuckle joint |

* Options "D" and "E" must be used in combination with body option (Nil), the rod end female thread, and options " $V$ " and "W" must be used in combination with body option (M), the rod end male thread.
* The applicable bore size for " $D$ " and " $E$ " is $\varnothing 32$ to $\varnothing 100$.
* A knuckle pin is not provided with the single knuckle joint $(\mathrm{V})$. If a pin is required, please order it separately. For details $\Rightarrow$ p. 26
* When a made-to-order option is selected, the rod end bracket cannot be selected. Please order it separately.


## Compact Cylinder：Standard <br> Double Acting，Single Rod

12 Number of auto switc｜

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

（13）Made to order common specifications
For details $\Rightarrow$ p． 9

## 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
For details on auto switch mounting $\Rightarrow$ 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．

## Proposals for Improving Water and Dust－resistance

SMC offers a wide range of models suitable for various operating environments．This includes models that can be used in environments that the basic model cannot，such as those where coolant liquid，water droplets／splashing，dust，etc．， are present．
For details，refer to the Web Catalog．
－Water－resistant cylinder
－Cylinder with Stable Lubrication Function（Lube－retainer）
－Dust resistant cylinder

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

| Type | Special function | Electrical entry |  | Wiring （Output） | Load voltage |  |  | Auto switch model |  | Lead wire length［m］ |  |  |  |  | Pre－wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In－line | $\begin{array}{\|c\|} \hline 0.5 \\ \text { (Nil) } \end{array}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{gathered} 3 \\ (\mathrm{~L}) \end{gathered}$ | $\begin{gathered} 5 \\ (Z) \end{gathered}$ | None （N） |  |  |  |
|  |  | Grommet | Yes | 3－wire（NPN） | 24 V | 5 V ， | － | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | circ | Relay， PLC |
|  |  |  |  | 3－wire（PNP） |  | 12 V |  | M9PV | M9P | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BV | M9B | － | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | － |  |
|  | Diagnostic indication （2－color indicator） |  |  | 3－wire（NPN） |  | 5 V ， |  | M9NWV | M9NW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | C circuit |  |
|  |  |  |  | 3－wire（PNP） |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BWV | M9BW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | － |  |
|  |  |  |  | 3－wire（NPN） |  | 5 V ， |  | M9NAV＊1 | M9NA＊1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | IC circuit |  |
|  | （2－color indicator） |  |  | 3－wire（PNP） |  | 12 V |  | M9PAV＊1 | M9PA＊1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BAV＊1 | M9BA＊1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | － |  |
|  | Magnetic field resistant （2－color indicator） |  |  | 2－wire（Non－polar） |  | － |  | － | P3DWA | $\bigcirc$ | － | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline \text { No } \\ \hline \end{array}$ | （NPN $\begin{aligned} & \text { 3－wirive } \\ & \text { equivalent }\end{aligned}$ | － | 5 V | － | A96V | A96 | $\bigcirc$ | － | $\bigcirc$ | － | － | － | IC circuit | － |
| $\stackrel{\text { ¢ }}{\text { ¢ }}$ | － |  |  | 2－wire | 24 V | 12 V | 100 V | A93V＊2 | A93 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | － | － | Relay， |
| － |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V or less | A90V | A90 | $\bigcirc$ | － | $\bigcirc$ | － | － | － | IC circuit | PLC |

＊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（ $\Delta$ 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 | ＊Solid state auto switches marked with＂○＂are produced upo |
| :---: | :---: | :---: | :---: |
|  | $1 \mathrm{~m} \quad . . . . . . . . ~ M ~$ | （Example）M9NWM | ＊The D－P3DWA type is only available in sizes ø25 to $\varnothing 100$ ． |
|  | 3 m ．．．．．．．．L | （Example）M9NWL |  |
|  | 5 m ．．．．．．．．．Z | （Example）M9NWZ |  |

[^2]
## CQ2 Series

| Symbol | Without cushion |
| :---: | :---: |
| Made to Order | Made to Order Common Specifications (For details $\triangleleft$ p. 155 to 188) |
| Symbol | Specifications |
| -XA $\square$ | Change of rod end shape |
| -XB6 | Heat-resistant cylinder ( -10 to $150^{\circ} \mathrm{C}$ ) w/o auto switch only* |
| -XB7 | Cold-resistant cylinder ( -40 to $70^{\circ} \mathrm{C}$ ) w/o auto switch only |
| -XB9 | Low-speed cylinder ( 10 to $50 \mathrm{~mm} / \mathrm{s}$ ) |
| -XB10 | Intermediate stroke (Using exclusive |
| -XB10A | Intermediate stroke (Spacer-installed type) |
| -XB13 | Low-speed cylinder ( 5 to $50 \mathrm{~mm} / \mathrm{s}$ ) |
| -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 pindouble knuckej jint pin and flat washers |
| -XC26 $\square$ | Double clevis width/Double knuckle width $12.5 \mathrm{~mm}, 16.5 \mathrm{~mm}$, or 19.5 mm : With double clevis and double knuckle joint |
| -XC27 | Double clevis pin/Double knuckle joint pin materia: Stainess steel 304 |
| -XC35 | With coil scraper |
| -XC36 | With boss on rod end |
| -XC85 | Grease for food processing equipment |
| -XC88 |  |
| -XC89 | Spatereresistant coil scraper, Lub-eretainer, Grease for weding (Piston rod: S445C) |
| -XC91 | Spatter-resistant coil scraper, Grease for welding (Piston rod: S45C) |
| -XC92 | Dust-resistant actuator |
| -X144 | Special port location, with auto switch |
| -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 <br> For details, refer to the Web Catalog

* Stainless steel accessories are also available. For details $\Rightarrow$ 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.

## $\triangle$ Precautions

Specifications
Pneumatic type

| Bore size [mm] |  | 12 | 16 | 20 | 25 | 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 |  | 0.07 MPa |  | 0.05 MPa |  |  |  |  |  |  |  |
| Ambient and fluid temperatures |  | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |  |  |
| Lubrication |  | Not required (Non-lube) |  |  |  |  |  |  |  |  |  |
| Piston speed |  | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |  |  |
| Cushion |  | Without cushion or With rubber bumper |  |  |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 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 |
| Stroke length tolerance |  | ${ }_{0}^{+1.0 \mathrm{~mm} * 1}$ |  |  |  |  |  |  |  |  |  |

*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 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |  |  |  |
| Fluid | Turbine oil* ${ }^{\text {1 }}$ |  |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |  |
| Minimum operating pressure | 0.18 MPa |  |  | 0.1 MPa |  |  |  |  |
| Ambient and fluid temperatures | 5 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |  |  |
| Piston speed | 5 to $50 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |  |
| Stroke length tolerance | $\begin{aligned} & +1.0 \mathrm{~mm} \\ & 0 \end{aligned}$ |  |  |  |  |  |  |  |

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

## Mounting Bracket Part Nos.

| Bore size [mm] |  | Foot*1 | $\underset{\text { Compact }}{\text { fort }}$ | 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.
$\varnothing 12$ to $\varnothing 25$ :

- 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)
$\varnothing 32$ to $\varnothing 100$ :
- 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) $\Rightarrow$ p. 21 to 27
* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).


## Compact Cylinder: Standard <br> Double Acting, Single Rod <br> CQ2 Series

## Manufacturing of Intermediate Strokes

Strokes are available in 1 mm increments.
As 3 different patterns are available, be sure to double-check the body dimensions before selecting.
For the air-hydro type, only (3) the exclusive body type "-XB10" is applicable.
How to Order: 57 mm stroke


## 1. Spacer-installed type 1

A spacer is installed on the standard stroke body ( indication). (Excludes the air-hydro type)
The © indicates the selectable stroke range.


Ordering example

| Part no. | CQ2B50-57DZ |
| :---: | :---: |
| Description | - Uses a standard stroke ( 75 mm ) tube. <br> - Makes 57 mm stroke with 18 mm spacer inside. <br> - The $B$ dimension is 115.5 mm . $B=40.5+75$ |

## 2. Spacer-installed type 2

A spacer is installed on the exclusive body (O indication). The overall length is shorter than that of the spacer-installed type 1.
(Excludes the air-hydro type)
The © indicates the selectable stroke range. (Strokes with the indication are not selectable.)
The - indicates strokes supported by the spacer-installed type 1.


Ordering example

| Part no. | CQ2B50-57DZ-XB10A |
| :---: | :---: |
| Description | - Uses an exclusive tube ( 60 mm stroke) in "3". <br> - Makes 57 mm stroke with 3 mm spacer inside. <br> - The $B$ dimension is 100.5 mm . $B=40.5+60$ |

## 3. Exclusive body type

-XB10
A made-to-order exclusive body for specified strokes is also available. The overall length can be made shorter than that of spacerinstalled types 1 and 2.

## Ordering example

| Bore size $[\mathrm{mm}]$ | Stroke range |
| :---: | :---: |
| $\mathbf{1 2 , 1 6}$ | 6 to 29 |
| $\mathbf{2 0}, \mathbf{2 5}$ | 6 to 49 |
| $\mathbf{3 2 , \mathbf { 4 0 }}$ | 6 to 99 |
| $\mathbf{5 0}$ to $\mathbf{1 0 0}$ | 11 to 99 |

* In the case of exclusive body type with ø32 to $\varnothing 100(-$ XB10 ) with the stroke length exceeding 50 mm , reference values of the longitudinal dimension ( $\mathrm{A} /$ B dimension) will be the same as those with auto switch magnet.
For details $\Rightarrow$ p. 162

| Part no. | CQ2B50-57DZ-XB10 |  |
| :---: | :---: | :---: |
| Description | - Makes 57 mm stroke tube. <br> - The B dimension is 97.5 mm . $B=40.5+57$ |  |

## CQ2 Series

## Allowable Kinetic Energy

## Load Mass and Piston Speed

[J]

| Bore size [mm] | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

Kinetic energy $\mathrm{E}[\mathrm{J}]=\frac{(\mathrm{m} 1+\mathrm{m} 2) \mathrm{V}^{2}}{2}$
$\begin{array}{lc}\text { m1: Mass of cylinder movable parts } & {[\mathrm{kg}]} \\ \mathrm{m2}: \text { Load mass } & {[\mathrm{kg}]} \\ \mathrm{V} \text { : Piston speed } & {[\mathrm{m} / \mathrm{s}]}\end{array}$
Mass of Cylinder Movable Parts: Without Auto Switch Magnet [g]

| Bore <br> size <br> $[\mathrm{mm}]$ | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 5 | 6 | 7 | 8 | 10 | 11 | - | - | - | - | - | - |
| $\mathbf{1 6}$ | 9 | 11 | 13 | 15 | 17 | 19 | - | - | - | - | - | - |
| $\mathbf{2 0}$ | 15 | 18 | 21 | 24 | 27 | 31 | 34 | 37 | 40 | 44 | - | - |
| $\mathbf{2 5}$ | 24 | 28 | 33 | 37 | 42 | 46 | 51 | 55 | 60 | 64 | - | - |
| $\mathbf{3 2}$ | 45 | 52 | 60 | 68 | 76 | 84 | 92 | 100 | 107 | 115 | 170 | 209 |
| $\mathbf{4 0}$ | 64 | 72 | 80 | 88 | 96 | 104 | 112 | 119 | 127 | 135 | 190 | 229 |
| $\mathbf{5 0}$ | - | 117 | 129 | 141 | 153 | 166 | 178 | 190 | 202 | 214 | 300 | 361 |
| $\mathbf{6 3}$ | - | 153 | 165 | 177 | 190 | 202 | 214 | 226 | 239 | 251 | 337 | 398 |
| $\mathbf{8 0}$ | - | 270 | 289 | 308 | 327 | 347 | 366 | 385 | 404 | 423 | 557 | 653 |
| $\mathbf{1 0 0}$ | - | 487 | 515 | 543 | 570 | 598 | 625 | 653 | 681 | 708 | 901 | 1038 |


| $\begin{gathered} \text { Bore } \\ \text { Bize } \\ \text { ism] } \\ \hline \end{gathered}$ | Cylinder stroke [mm] |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 |  |
| 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 | 26 | 278 | 290 | 303 | 315 | 327 | 339 | 352 | 413 | 47 |
| 80 | - | 433 | 453 | 472 | 491 | 510 | 530 | 549 | 568 | 587 | 683 | 778 |
| 100 | - | 741 | 768 | 796 | 823 | 851 | 879 | 906 | 934 | 962 | 1099 |  |

Additional Mass of Cylinder Movable Parts
[g]

| Bore size [mm] |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rod end <br> male <br> 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 | $\mathbf{- 7}$ | -9 | -18 | -31 | -56 |  |

Calculation: (Example) CDQ2B32-20DCMZ

- Basic mass: CDQ2B32-20DZ….......... 101 g
- Additional mass: Rod end male thread $\cdots \cdots . .43 \mathrm{~g}$ With rubber bumper $\cdots \cdots \cdots \cdot-3 \mathrm{~g}$

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



Weight

## Without Auto Switch Magnet

| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | 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 |

## Additional Weight

|  | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 19 | 45 | 45 |
| Rod end male thread | 1.5 | 3 |  | 12 | 26 | 27 | 53 | 53 | 12 | 175 |
|  |  |  |  |  | 17 | 17 | 32 |  | 49 |  |
| With boss on head end | 0.7 | 1.3 | 2 | 3 |  | 7 | 13 | 25 | 45 |  |
| With rubber bumper |  |  | -2 | -3 | -3 | -7 | -9 | -18 | -31 | -56 |
| Built-in One-touch fittings |  |  |  |  | 12 | 12 | 21 | 21 |  |  |
| Foot (Including mounting bolts) | 50 |  | 50 | 175 | 120 | 138 | 219 |  | 589 |  |
| Compact foot (Including mounting boits) | 37 |  |  |  |  | 109 |  |  | 492 |  |
| Rod flange (Including mounting bolts) | 57 |  | 139 | 61 |  |  |  |  | 056 |  |
| Head flange (Incududing mounting bolts) | 54 | 65 | 133 | 152 | 165 | 198 | 348 | 534 | 1017 | 13 |
|  |  |  |  |  |  |  |  |  |  |  |

Calculation: (Example) CQ2D32-20DCMZ

- Basic weight: CQ2B32-20DZ 184 g
- Additional weight: Both ends tapped 184 g

|  |
| :---: |
|  |  |
|  |  |

## Additional Weight

| m | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped |  | 1 | 3 | 3 | 6 | 6 | 6 | 19 | 45 | 45 |
| Rod end male thread | 1.5 | 3 | 6 | 12 | 26 | 27 | 53 | 53 | 120 | 175 |
|  |  | 2 |  |  | 17 | 17 | 32 |  | 49 |  |
| With boss on head end | 0.7 | 1.3 | 2 | 3 |  | 7 | 13 | 25 | 45 | 96 |
| With rubber bumper |  | 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 | 29 | 589 |  |
| Compact foot (lncluding mounting botis) | 30 | 8 |  |  |  | 109 |  |  | 492 |  |
| Rod flange (Including mounting bolts) | 54 |  | 131 | 53 | 180 |  | 373 | 559 | 1056 |  |
| Head flange (Including mounting bolts) | 52 | 63 | 124 | 144 |  | 198 | 348 | 534 | 1017 |  |
| Doube clevis (nduvingain, retaingng ings, olis) |  |  |  |  |  |  |  |  |  |  |

Calculation: (Example) CDQ2D32-20DCMZ

- Basic weight: CQ2B32-20DZ
- Additional weight: Both ends tapped Rod end male thread 241 g 6 g

With rubber bumper 43 g $\frac{438 \mathrm{~g}}{}$

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

With Auto Switch Magnet

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke $[\mathrm{mm}]$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |  |  |  |
|  | 43 | 49 | 55 | 61 | 67 | 73 | - | - | - | - | - | - |  |  |  |
| $\mathbf{1 6}$ | 64 | 71 | 79 | 87 | 95 | 102 | - | - | - | - | - | - |  |  |  |
| $\mathbf{2 0}$ | 94 | 106 | 118 | 131 | 143 | 155 | 167 | 179 | 191 | 203 | - | - |  |  |  |
| $\mathbf{2 5}$ | 134 | 149 | 164 | 180 | 195 | 210 | 226 | 241 | 256 | 272 | - | - |  |  |  |
| $\mathbf{3 2}$ | 182 | 202 | 222 | 241 | 261 | 281 | 300 | 320 | 340 | 359 | 459 | 558 |  |  |  |
| $\mathbf{4 0}$ | 269 | 290 | 312 | 333 | 355 | 376 | 398 | 420 | 441 | 463 | 575 | 687 |  |  |  |
| $\mathbf{5 0}$ | - | 455 | 488 | 521 | 554 | 587 | 620 | 653 | 686 | 719 | 891 | 1062 |  |  |  |
| $\mathbf{6 3}$ | - | 627 | 665 | 703 | 741 | 779 | 817 | 855 | 893 | 931 | 1129 | 1326 |  |  |  |
| $\mathbf{8 0}$ | - | 1162 | 1222 | 1282 | 1342 | 1403 | 1463 | 1524 | 1584 | 1644 | 1941 | 2237 |  |  |  |
| $\mathbf{1 0 0}$ | - | 1966 | 2047 | 2127 | 2208 | 2288 | 2368 | 2449 | 2529 | 2610 | 3018 | 3426 |  |  |  |

## 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 $\Rightarrow$ p. 14

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


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2B12-5D | 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 |
| CQ2B16-5D | 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 |
| CQ2B20-5D | 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 | $\times 70 \mathrm{~L}$ |
| CQ2B25-5D | 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 | $\times 70 \mathrm{~L}$ |
| -50D |  | 75 | x 75L |
| CQ2B32-5DZ | 9 | 30 | CQ-M5 x 30L |
| -10DZ |  | 35 | x 35L |
| -15DZ |  | 40 | x 40L |
| -20DZ |  | 45 | x 45L |
| -25DZ |  | 50 | x 50L |
| -30DZ |  | 55 | x 55L |
| -35DZ |  | 60 | x 60L |
| -40DZ |  | 65 | x 65L |
| -45DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -50DZ |  | 75 | $\times 75 \mathrm{~L}$ |
| -55DZ-XB10 |  | 90 | x 90L |
| -60DZ-XB10 |  | 95 | x 95L |
| -65DZ-XB10 |  | 100 | x 100L |
| -70DZ-XB10 |  | 105 | x 105L |
| -75DZ |  | 110 | x 110L |
| -80DZ-XB10 |  | 115 | x 115L |
| -85DZ-XB10 |  | 120 | x 120L |
| -90DZ-XB10 |  | 125 | x 125L |
| -95DZ-XB10 |  | 130 | x 130L |
| -100DZ |  | 135 | x 135L |


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2B40-5DZ | 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 |
| -55DZ-XB10 |  | 95 | x 95L |
| -60DZ-XB10 |  | 100 | $\times 100 \mathrm{~L}$ |
| -65DZ-XB10 |  | 105 | x 105L |
| -70DZ-XB10 |  | 110 | $\times 110 \mathrm{~L}$ |
| -75DZ |  | 115 | $\times 115 \mathrm{~L}$ |
| -80DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -85DZ-XB10 |  | 125 | x 125L |
| -90DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -95DZ-XB10 |  | 135 | x 135L |
| -100DZ |  | 140 | x 140L |
| CQ2B50-10DZ | 12.5 | 45 | CQ-M6 x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DZ |  | 55 | x 55L |
| -25DZ |  | 60 | x 60L |
| -30DZ |  | 65 | x 65L |
| -35DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| -55DZ-XB10 |  | 100 | $\times 100 \mathrm{~L}$ |
| -60DZ-XB10 |  | 105 | x 105L |
| -65DZ-XB10 |  | 110 | x 110L |
| -70DZ-XB10 |  | 115 | x 115L |
| -75DZ |  | 120 | x 120L |
| -80DZ-XB10 |  | 125 | $\times 125 \mathrm{~L}$ |
| -85DZ-XB10 |  | 130 | x 130L |
| -90DZ-XB10 |  | 135 | x 135L |
| -95DZ-XB10 |  | 140 | $\times 140 \mathrm{~L}$ |
| -100DZ |  | 145 | x 145L |
| CQ2B63-10DZ | 14.5 | 50 | CQ-M8 x 50L |
| -15DZ |  | 55 | x 55L |
| -20DZ |  | 60 | x 60L |
| -25DZ |  | 65 | x 65L |
| -30DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 75 | x 75L |
| -40DZ |  | 80 | x 80L |
| -45DZ |  | 85 | x 85L |
| -50DZ |  | 90 | x 90L |
| -55DZ-XB10 |  | 105 | $\times 105 \mathrm{~L}$ |
| -60DZ-XB10 |  | 110 | $\times 110 \mathrm{~L}$ |
| -65DZ-XB10 |  | 115 | x 115L |
| -70DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -75DZ |  | 125 | $\times 125 \mathrm{~L}$ |
| -80DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -85DZ-XB10 |  | 135 | $\times 135 \mathrm{~L}$ |
| -90DZ-XB10 |  | 140 | $\times 140 \mathrm{~L}$ |
| -95DZ-XB10 |  | 145 | $\times 145 \mathrm{~L}$ |
| -100DZ |  | 150 | x 150L |


| Cylinder model | C | D | M ounting bolt part n . |
| :---: | :---: | :---: | :---: |
| CQ2B80-10DZ | 15 | 55 | CQ-M10 x 55L |
| -15DZ |  | 60 | x60L |
| -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 |
| -55DZ-XB10 |  | 110 | $\times 110 \mathrm{~L}$ |
| -60DZ-XB10 |  | 115 | x 115L |
| -65DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -70DZ-XB10 |  | 125 | x 125L |
| -75DZ |  | 130 | $\times 130 \mathrm{~L}$ |
| -80DZ-XB10 |  | 135 | x 135L |
| -85DZ-XB10 |  | 140 | x 140L |
| -90DZ-XB10 |  | 145 | $\times 145 \mathrm{~L}$ |
| -95DZ-XB10 |  | 150 | $\times 150 \mathrm{~L}$ |
| -100DZ |  | 155 | x 155L |
| CQ2B100-10DZ | 15.5 | 65 | CQ-M10 x 65L |
| -15DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DZ |  | 75 | x 75L |
| -25DZ |  | 80 | x 80L |
| -30DZ |  | 85 | x 85L |
| -35DZ |  | 90 | x 90L |
| -40DZ |  | 95 | x 95L |
| -45DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -50DZ |  | 105 | x 105L |
| -55DZ-XB10 |  | 120 | x 120L |
| -60DZ-XB10 |  | 125 | $\times 125 \mathrm{~L}$ |
| -65DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -70DZ-XB10 |  | 135 | $\times 135 \mathrm{~L}$ |
| -75DZ |  | 140 | $\times 140 \mathrm{~L}$ |
| -80DZ-XB10 |  | 145 | x 145L |
| -85DZ-XB10 |  | 150 | $\times 150 \mathrm{~L}$ |
| -90DZ-XB10 |  | 155 | $\times 155 \mathrm{~L}$ |
| -95DZ-XB10 |  | 160 | $\times 160 \mathrm{~L}$ |
| -100DZ |  | 165 | x 165L |

## 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 $\Rightarrow$ p. 13
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 n . |
| :---: | :---: | :---: | :---: |
| CDQ2B12-5DZ | 5.5 | 35 | CQ-M3 $\times$ 35L |
| -10DZ |  | 40 | x 40L |
| -15DZ |  | 45 | x 45L |
| -20DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -25DZ |  | 55 | x 55L |
| -30DZ |  | 60 | $\times 60 \mathrm{~L}$ |
| CDQ2B16-5DZ | 8 | 40 | CQ-M3 x 40L |
| -10DZ |  | 45 | x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DZ |  | 55 | x 55L |
| -25DZ |  | 60 | $\times 60 \mathrm{~L}$ |
| -30DZ |  | 65 | x 65L |
| CDQ2B20-5DZ | 10.5 | 40 | CQ-M5 x 40L |
| -10DZ |  | 45 | x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -25DZ |  | 60 | x60L |
| -30DZ |  | 65 | x 65L |
| -35DZ |  | 70 | x 70L |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| CDQ2B25-5DZ | 9.5 | 40 | CQ-M5 x 40L |
| -10DZ |  | 45 | x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DZ |  | 55 | x 55L |
| -25DZ |  | 60 | x60L |
| -30DZ |  | 65 | x 65L |
| -35DZ |  | 70 | x 70L |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| CDQ2B32-5DZ | 9 | 40 | CQ-M5 x 40L |
| -10DZ |  | 45 | x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DZ |  | 55 | x 55L |
| -25DZ |  | 60 | x60L |
| -30DZ |  | 65 | x 65L |
| -35DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| -55DZ-XB10 |  | 90 | x 90L |
| -60DZ-XB10 |  | 95 | x 95L |
| -65DZ-XB10 |  | 100 | x 100L |
| -70DZ-XB10 |  | 105 | $\times 105 \mathrm{~L}$ |
| -75DZ |  | 110 | $\times 110 \mathrm{~L}$ |
| -80DZ-XB10 |  | 115 | x 115L |
| -85DZ-XB10 |  | 120 | x 120L |
| -90DZ-XB10 |  | 125 | x 125L |
| -95DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -100DZ |  | 135 | x 135L |


| Cylinder model | C | D | Mounting bolt part n . |
| :---: | :---: | :---: | :---: |
| CDQ2B40-5DZ | 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 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 75 | x 75L |
| -40DZ |  | 80 | x 80L |
| -45DZ |  | 85 | x 85L |
| -50DZ |  | 90 | x 90L |
| -55DZ-XB10 |  | 95 | x 95L |
| -60DZ-XB10 |  | 100 | $\times 100 \mathrm{~L}$ |
| -65DZ-XB10 |  | 105 | x 105L |
| -70DZ-XB10 |  | 110 | x 110L |
| -75DZ |  | 115 | $\times 115 \mathrm{~L}$ |
| -80DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -85DZ-XB10 |  | 125 | x 125L |
| -90DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -95DZ-XB10 |  | 135 | x 135L |
| -100DZ |  | 140 | x 140L |
| CDQ2B50-10DZ | 12.5 | 55 | CQ-M6 x 55L |
| -15DZ |  | 60 | x60L |
| -20DZ |  | 65 | x 65L |
| -25DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -30DZ |  | 75 | x 75L |
| -35DZ |  | 80 | x 80L |
| -40DZ |  | 85 | x 85L |
| -45DZ |  | 90 | x 90L |
| -50DZ |  | 95 | x 95L |
| -55DZ-XB10 |  | 100 | x 100L |
| -60DZ-XB10 |  | 105 | x 105L |
| -65DZ-XB10 |  | 110 | $\times 110 \mathrm{~L}$ |
| -70DZ-XB10 |  | 115 | $\times 115 \mathrm{~L}$ |
| -75DZ |  | 120 | $\times 120 \mathrm{~L}$ |
| -80DZ-XB10 |  | 125 | x 125L |
| -85DZ-XB10 |  | 130 | x 130L |
| -90DZ-XB10 |  | 135 | x 135L |
| -95DZ-XB10 |  | 140 | $\times 140 \mathrm{~L}$ |
| -100DZ |  | 145 | x 145L |
| CDQ2B63-10DZ | 14.5 | 60 | CQ-M8 x 60L |
| -15DZ |  | 65 | x 65L |
| -20DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -25DZ |  | 75 | x 75L |
| -30DZ |  | 80 | x 80L |
| -35DZ |  | 85 | x 85L |
| -40DZ |  | 90 | x 90L |
| -45DZ |  | 95 | x 95L |
| -50DZ |  | 100 | x 100L |
| -55DZ-XB10 |  | 105 | x 105L |
| -60DZ-XB10 |  | 110 | x 110L |
| -65DZ-XB10 |  | 115 | $\times 115 \mathrm{~L}$ |
| -70DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -75DZ |  | 125 | x 125L |
| -80DZ-XB10 |  | 130 | x 130L |
| -85DZ-XB10 |  | 135 | $\times 135 \mathrm{~L}$ |
| -90DZ-XB10 |  | 140 | $\times 140 \mathrm{~L}$ |
| -95DZ-XB10 |  | 145 | x 145L |
| -100DZ |  | 150 | x 150L |


| Cylinder model | C | D | Mounting bolt pat no. |
| :---: | :---: | :---: | :---: |
| CDQ2B80-10DZ | 15 | 65 | CQ-M10 $\times 65 \mathrm{~L}$ |
| -15DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DZ |  | 75 | $\times 751$ |
| -25DZ |  | 80 | $\times 80 \mathrm{~L}$ |
| -30DZ |  | 85 | $\times 85 \mathrm{~L}$ |
| -35DZ |  | 90 | $\times 90 \mathrm{~L}$ |
| -40DZ |  | 95 | $\times 95 \mathrm{~L}$ |
| -45DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -50DZ |  | 105 | $\times 105 \mathrm{~L}$ |
| -55DZ-XB10 |  | 110 | $\times 110 \mathrm{~L}$ |
| -60DZ-XB10 |  | 115 | $\times 115 \mathrm{~L}$ |
| -65DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -70DZ-XB10 |  | 125 | $\times 125 \mathrm{~L}$ |
| -75DZ |  | 130 | $\times 130 \mathrm{~L}$ |
| -80DZ-XB10 |  | 135 | $\times 135 \mathrm{~L}$ |
| -85DZ-XB10 |  | 140 | $\times 140 \mathrm{~L}$ |
| -90DZ-XB10 |  | 145 | $\times 145 \mathrm{~L}$ |
| -95DZ-XB10 |  | 150 | $\times 150 \mathrm{~L}$ |
| -100DZ |  | 155 | $\times 155 \mathrm{~L}$ |
| CDQ2B100-10DZ | 15.5 | 75 | CQ-M10 $\times 75 \mathrm{~L}$ |
| -15DZ |  | 80 | $\times 80 \mathrm{~L}$ |
| -20DZ |  | 85 | x 85L |
| -25DZ |  | 90 | $\times 90 \mathrm{~L}$ |
| -30DZ |  | 95 | $\times 95 \mathrm{~L}$ |
| -35DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -40DZ |  | 105 | $\times 105 \mathrm{~L}$ |
| -45DZ |  | 110 | $\times 110 \mathrm{~L}$ |
| -50DZ |  | 115 | $\times 115 \mathrm{~L}$ |
| -55DZ-XB10 |  | 120 | $\times 120 \mathrm{~L}$ |
| -60DZ-XB10 |  | 125 | $\times 125 \mathrm{~L}$ |
| -65DZ-XB10 |  | 130 | $\times 130 \mathrm{~L}$ |
| -70DZ-XB10 |  | 135 | $\times 135 \mathrm{~L}$ |
| -75DZ |  | 140 | $\times 140 \mathrm{~L}$ |
| -80DZ-XB10 |  | 145 | $\times 145 \mathrm{~L}$ |
| -85DZ-XB10 |  | 150 | $\times 150 \mathrm{~L}$ |
| -90DZ-XB10 |  | 155 | $\times 155 \mathrm{~L}$ |
| -95DZ-XB10 |  | 160 | $\times 160 \mathrm{~L}$ |
| -100DZ |  | 165 | $\times 165 \mathrm{~L}$ |

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 |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | 032 to 0100, Hard chrome plating |
| $\mathbf{4}$ | Collar | Aluminum alloy | $\varnothing 12$ to $\varnothing 40$, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$ to of100, Chromated, Painted |
| $\mathbf{5}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{6}$ | Bushing | Bearing alloy | For $\varnothing 50$ or more only |
| $\mathbf{7}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{8}$ | Bumper A | Urethane | Pneumatic type only |

## Replacement Parts/Seal Kit

## Pneumatic Type

| Bore size $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ2B12-PS |  |
| $\mathbf{1 6}$ | CQ2B16-PS |  |
| $\mathbf{2 0}$ | CQ2B20-PS |  |
| $\mathbf{2 5}$ | CQ2B25-PS |  |
| $\mathbf{3 2}$ | CQ2B32-PS | Set of nos. (12), (13), (14) |
| $\mathbf{4 0}$ | CQ2B40-PS |  |
| $\mathbf{5 0}$ | CQ2B50-PS |  |
| $\mathbf{6 3}$ | CQ2B63-PS |  |
| $\mathbf{8 0}$ | CQ2B80-PS |  |
| $\mathbf{1 0 0}$ | 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)

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{9}$ | Bumper B | Urethane | Pneumatic type only |
| $\mathbf{1 0}$ | Centering location ring | Aluminum alloy | $\varnothing 20$ to $\varnothing 100$, Hard anodized |
| $\mathbf{1 1}$ | One-touch fitting | - | $\varnothing 32$ to $\varnothing 63$ |
| $\mathbf{1 2}$ | Piston seal | NBR |  |
| $\mathbf{1 3}$ | Rod seal | NBR |  |
| $\mathbf{1 4}$ | Gasket | NBR |  |
| $\mathbf{1 5}$ | Magnet | - |  |

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: Standard <br> Double Acting, Single Rod <br> CQ2 Series

Compact Cylinder with Stable Lubrication Function (Lube-retainer)


Specifications

| Bore size $[\mathrm{mm}]$ | $\mathbf{3 2 , 4 0}, \mathbf{5 0 , 6 3}, \mathbf{8 0}, \mathbf{1 0 0}$ |
| :--- | :---: |
| Action | Double acting, Single rod |
| Min. operating pressure | 0.1 MPa |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |
| 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.)
$\varnothing 32$ to $\varnothing 100$


Rod end male thread


| [mm] |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Bore size | T | T1 | C1 | X |
| 32 | 22 | 1 | 20.5 | 23.5 |
| 40 | 28 | 1 | 20.5 | 23.5 |
| 50 | 35 | 2 | 24 | 26.5 |
| 63 | 35 | 2 | 24 | 26.5 |
| 80 | - | - | 32.5 | 35.5 |
| 100 | - | - | 32.5 | 35.5 |
| The mounting dimensions of the mounting bracket are the same as the standard model. |  |  |  |  |

[^3]
## CQ2 Series

Bore Size

## $\varnothing 12$ to $\varnothing 25$ without Auto Switch Magnet

## Through-hole: CQ2B



|  | $[\mathrm{cmm}]$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathbf{m m}]$ | Stroke range <br> $[\mathrm{mm}]$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{F}$ | $\mathbf{H}$ | $\mathbf{I}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{Q}$ | $\mathbf{Z}$ |
| $\mathbf{1 2}$ | 5 to 30 | 20.5 | 17 | 6 | 6 | 25 | 5 | $\mathrm{M} 3 \times 0.5$ | 32 | 5 | 3.5 | 15.5 | 3.5 | 6.5 depth 3.5 | 7.5 | - |
| $\mathbf{1 6}$ | 5 to 30 | 22 | 18.5 | 8 | 8 | 29 | 5.5 | $\mathrm{M} 4 \times 0.7$ | 38 | 6 | 3.5 | 20 | 3.5 | 6.5 depth 3.5 | 8 | 10 |
| $\mathbf{2 0}$ | 5 to 50 | 24 | 19.5 | 7 | 10 | 36 | 5.5 | $\mathrm{M} 5 \times 0.8$ | 47 | 8 | 4.5 | 25.5 | 5.5 | 9 depth 7 | 8 | 10 |
| $\mathbf{2 5}$ | 5 to 50 | 27.5 | 22.5 | 12 | 12 | 40 | 5.5 | $\mathrm{M} 6 \times 1.0$ | 52 | 10 | 5 | 28 | 5.5 | 9 depth 7 | 9 | 10 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ 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 $\Rightarrow$ p. 10


## Both ends tapped

|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |


|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{G}$ | Th9 |
| $\mathbf{1 2}$ | 1.5 | $15_{-0.043}^{0}$ |
| $\mathbf{1 6}$ | 1.5 | $20_{-0.052}^{-0}$ |
| $\mathbf{2 0}$ | 2 | $13_{-0.043}^{0}$ |
| $\mathbf{2 5}$ | 2 | $15_{-0.043}^{0}$ |

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

## Rod end male thread



|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 17 | 15 | 6 | $22.5 \mathrm{M} 10 \times 1.25$ | 17.5 |  |

## Compact Cylinder: Standard <br> Double Acting, Single Rod <br> CQ2 Series

## Bore Size

## $\varnothing 12$ to $\varnothing 25$ with Auto Switch Magnet

Through-hole: CDQ2B


| Bore size [mm] | Stroke range [mm] | A | B | C | D | E | EA | EB | F | H | K | L | M | N | 0 | Q | S | U | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | 5 to 30 | 31.5 | 28 | 6 | 6 | 33 | - | - | 6.5 | M3 $\times 0.5$ | 5 | 3.5 | 22 | 3.5 | 6.5 depth 3.5 | 11 | 27.5 | 14 | 25 |
| 16 | 5 to 30 | 34 | 30.5 | 8 | 8 | 37 | 13.2 | 6.6 | 5.5 | M $4 \times 0.7$ | 6 | 3.5 | 28 | 3.5 | 6.5 depth 3.5 | 10 | 29.5 | 15 | 29 |
| 20 | 5 to 50 | 36 | 31.5 | 7 | 10 | 47 | 13.6 | 6.8 | 5.5 | M5 x 0.8 | 8 | 4.5 | 36 | 5.5 | 9 depth 7 | 8 | 35.5 | 18 | 36 |
| 25 | 5 to 50 | 37.5 | 32.5 | 12 | 12 | 52 | 13.6 | 6.8 | 5.5 | M6x 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 $\Rightarrow$ 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 $\Rightarrow$ p. 10
* For the auto switch proper mounting position and mounting height $\leftrightharpoons$ p. 139 to 145

Both ends tapped


|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{1}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |

With boss on head end


## Rod end male thread

| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |

## CQ2 Series

Bore Size

## Ø32 to Ø50 With/Without Auto Switch Magnet

## Through-hole: CDQ2B



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


| Bore size [mm] | 0 | Q | W | Z | * For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27 <br> * The external dimensions with rubber bumper are same as those of the standard, as shown above <br> * For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 10 <br> The spacer-installed type (Standard, -XB10A) and the exclusive body type (-XB10) are available. <br> * For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | 9 depth 7 | 10 | 49.5 | 14 |  |
| 40 | 9 depth 7 | 12.5 | 57 | 15 |  |
| 50 | 11 depth 8 | 10.5 | 71 | 19 |  |

## Both ends tapped



With boss on head end
[mm]

| Bore size <br> $[\mathrm{mm}]$ | Th9 |
| :---: | :---: |
| $\mathbf{3 2}$ | $21_{-0.052}^{-0}$ |
| $\mathbf{4 0}$ | $28_{-0.052}^{-0}$ |
| $\mathbf{5 0}$ | $35_{-0.062}$ |

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


## Rod end male thread



Built-in One-touch fittings


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


## Compact Cylinder: Standard <br> Double Acting, Single Rod <br> CQ2 Series

## Bore Size

## $\varnothing 63$ to $\varnothing 100$ with/Without Auto Switch Magnet

Through-hole: CDQ2B


| Bore size [mm] | Stroke range [mm] | Without auto switch magne |  | With auto switch magnet |  | C | D | E | F | H | J | K | L | M | N | 0 | P | Q | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | A | B |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 63 | 10 to 50 75,100 | 44 | 36 | 54 | 46 | 15 | 20 | 77 | 10.5 | M10 x 1.5 | 7 | 17 | 8 | 60 | 9 | 14 depth 10.5 | 1/4 | 15 | 84 | 19 |
| 80 | 10 to 50 | 53.5 | 43.5 | 63.5 | 53.5 | 21 | 25 | 98 | 12.5 | M16 x 2.0 | 6 | 22 | 10 | 77 | 11 | 17.5 depth 13.5 | 3/8 | 16 | 104 | 25 |
| 100 | 10 to 50 | 65 | 53 | 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 $\Rightarrow$ 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 $\Rightarrow$ p. 10
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |
| $\mathbf{8 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |
| $\mathbf{1 0 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |


|  | $[\mathrm{mm}]$ |
| :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | Th9 |
| $\mathbf{6 3}$ | $35_{-0.062}^{-}$ |
| $\mathbf{8 0}$ | $43_{-0.062}$ |
| $\mathbf{1 0 0}$ | $59_{-0.074}^{-}$ |

With boss on rod end: Option (Suffix

Rod end male thread


Built-in One-touch fittings: ø63


## CQ2 Series

## Accessory Brackets

## Mounting Brackets

## Foot

$\varnothing 12$ to $\varnothing 25$ With auto switch magnet CQ－LZ $\square \square$


Hexagon socket
head cap screw（Accessory）


Rod end male thread


Rod end male thread

＊1 The foot bracket cannot be retrofitted for through－hole mounting（B）．
＊2 This shows the piston rod in the retracted state．For the single acting，spring extend type（ $C \square Q 2 \square T$ ），the length of the product will increase with the length of the stroke due to the spring force．
＊BS indicates the overall length of the cylinder tube to be used．

| $\begin{gathered} \begin{array}{c} \text { Bore size } \\ {[\mathrm{mm}]} \\ \hline \end{array} ⿳ ⺈ ⿴ 囗 十 一 \text {. } \end{gathered}$ | Part no． | A | A1 | L | $L_{1}$ | LA | LA1 | LD | LG | LH | LJ | LS | LT | LX | LY | LZ | X | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | $\begin{aligned} & \hline \text { CQ-L012 } \\ & \hline \text { CQ-LZ12 } \\ & \hline \end{aligned}$ | $\mathrm{BS}+18.3$ | BS＋ 28.8 | 13.5 | 24 | 19.5 | 30 | 4.5 | 2.8 | 17 | － | BS－12 | 2 | 34 | 29.5 | 44 | 8 | 4.5 |
| 16 | $\begin{aligned} & \hline \text { CQ-L016 } \\ & \hline \text { CQ-LZ16 } \\ & \hline \end{aligned}$ | 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 |
| 20 | $\begin{aligned} & \text { CQ-LO2O } \\ & \hline \text { CQ-LZ20 } \\ & \hline \end{aligned}$ | $B S+21.7$ | 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 |
| 25 | $\begin{gathered} \text { CQ-LO25 } \\ \hline \text { CQ-LZ25 } \\ \hline \end{gathered}$ | 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 |
| 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 $\Rightarrow$ p．26， 27

## Mounting Brackets

## Compact foot

$\varnothing 12$ to $\varnothing 25$
With auto switch magnet Without auto switch magnet CQ-LCZ $\square \square$

*1 The compact foot bracket cannot be retrofitted for through-hole mounting (B).
*2 This shows the piston rod in the retracted state. For the single acting, spring extend type (CDQ2 $\square$ ), the length of the product will increase with the length of the stroke due to the spring force.

* BS indicates the overall length of the cylinder tube to be used.
ø32 to $\varnothing 100$

$\varnothing 63$ to $\varnothing 100$


Rod end male thread

mm]

| $\begin{gathered} \hline \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | Part no. | A | A1 | L | L1 | LA | LA1 | LD | LH | LJ | LS | LT | LX | LY | LZ | X | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | $\begin{gathered} \hline \text { CQ-LC012 } \\ \hline \text { CQ-LCZ12 } \end{gathered}$ | 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 |
| 16 | $\begin{aligned} & \hline \text { CQ-LC016 } \\ & \hline \text { CQ-LCZ16 } \\ & \hline \end{aligned}$ | 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 |
| 20 | CQ-LCO20 | 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 |
| 25 | $\begin{aligned} & \text { CQ-LC025 } \\ & \hline \text { CQ-LCZ25 } \\ & \hline \end{aligned}$ | 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 |
| 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 |

## CQ2 Series

## Mounting Brackets

Rod flange


Rod end male thread


## Head flange



Rod end male thread

*1 The flange bracket cannot be retrofitted for through-hole mounting (B). *2 This shows the piston rod in the retracted state. For the single acting, spring extend type (CDQ2■T), the length of the product will increase with the length of the stroke due to the spring force.

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

| Bore size <br> $[\mathbf{m m}]$ | Part no. | $\mathbf{A}$ | $\mathbf{A}_{\mathbf{1}}$ | $\mathbf{A} \mathbf{2}$ | $\mathbf{A}_{\mathbf{3}}$ | FD | FT | FV | FX | FZ | $\mathbf{L}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{2}}$ | $\mathbf{L}_{\mathbf{3}}$ | $\mathbf{M}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ-F012 | $\mathrm{BS}+13.5$ | $\mathrm{BS}+24$ | $\mathrm{BS}+9$ | $\mathrm{BS}+19.5$ | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 | 3.5 | 14 | - |
| $\mathbf{1 6}$ | CQ-F016 | $\mathrm{BS}+13.5$ | $\mathrm{BS}+25.5$ | $\mathrm{BS}+9$ | $\mathrm{BS}+21$ | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 | 3.5 | 15.5 | - |
| $\mathbf{2 0}$ | CQ-F020 | $\mathrm{BS}+14.5$ | $\mathrm{BS}+28.5$ | $\mathrm{BS}+12.5$ | $\mathrm{BS}+26.5$ | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 | 4.5 | 18.5 | - |
| $\mathbf{2 5}$ | CQ-F025 | $\mathrm{BS}+15$ | $\mathrm{BS}+32.5$ | $\mathrm{BS}+13$ | $\mathrm{BS}+30.5$ | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 | 5 | 22.5 | - |
| $\mathbf{3 2}$ | CQ-F032 | $\mathrm{BS}+17$ | $\mathrm{BS}+38.5$ | $\mathrm{BS}+15$ | $\mathrm{BS}+36.5$ | 5.5 | 8 | 48 | 56 | 65 | 17 | 38.5 | 7 | 28.5 | 34 |
| $\mathbf{4 0}$ | CQ-F040 | $\mathrm{BS}+17$ | $\mathrm{BS}+38.5$ | $\mathrm{BS}+15$ | $\mathrm{BS}+36.5$ | 5.5 | 8 | 54 | 62 | 72 | 17 | 38.5 | 7 | 28.5 | 40 |
| $\mathbf{5 0}$ | CQ-F050 | $\mathrm{BS}+18$ | $\mathrm{BS}+43.5$ | $\mathrm{BS}+17$ | $\mathrm{BS}+42.5$ | 6.6 | 9 | 67 | 76 | 89 | 18 | 43.5 | 8 | 33.5 | 50 |
| $\mathbf{6 3}$ | CQ-F063 | $\mathrm{BS}+18$ | $\mathrm{BS}+43.5$ | $\mathrm{BS}+17$ | $\mathrm{BS}+42.5$ | 9 | 9 | 80 | 92 | 108 | 18 | 43.5 | 8 | 33.5 | 60 |
| $\mathbf{8 0}$ | CQ-F080 | $\mathrm{BS}+20$ | $\mathrm{BS}+53.5$ | $\mathrm{BS}+21$ | $\mathrm{BS}+54.5$ | 11 | 11 | 99 | 116 | 134 | 20 | 53.5 | 10 | 43.5 | 77 |
| $\mathbf{1 0 0}$ | CQ-F100 | $\mathrm{BS}+22$ | $\mathrm{BS}+53.5$ | $\mathrm{BS}+23$ | $\mathrm{BS}+54.5$ | 11 | 11 | 117 | 136 | 154 | 22 | 53.5 | 12 | 43.5 | 94 |

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


## Mounting Brackets

## Double clevis


*1 The double clevis bracket cannot be retrofitted for through-hole mounting (B).
*2 This shows the piston rod in the retracted state. For the single acting, spring extend type ( $C D Q 2 \square T$ ), the length of the product will increase with the length of the stroke due to the spring force.

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

| Bore size [mm] | Part no. | A | A1 | CB | CD | CT | CU | CW | CX | CZ | F | L | L1 | 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 |

[^4]
## CQ2 Series

## Mounting Brackets

## Double clevis pivot bracket

$\varnothing 12$ to $\varnothing 25$



Rod end male thread

$\varnothing 32$ to $\varnothing 100$


## Rod end male thread


*1 This shows the piston rod in the retracted state. For the single acting, spring extend type (CDQ2 $\square$ ), the length of the product will increase with the length of the stroke due to the spring force.

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

| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | Part no. | A | $\mathrm{A}_{1}$ | C | CD | CL | CT | CW | CX | $\square \mathrm{E}$ | L | L1 | $\square \mathbf{M}$ | 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 | $100^{\circ}$ | M $4 \times 10 \mathrm{~L}$ | 30 |
| 16 | CQ-C016 | BS +18.5 | $\mathrm{BS}+30.5$ | 6 | 5 | 21 | 4 | 15 | 6.5 | 28 | 3.5 | 15.5 | 20 | 4.5 | $100^{\circ}$ | M $4 \times 10 \mathrm{~L}$ | 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 | $80^{\circ}$ | M6 $\times 12 \mathrm{~L}$ | 86 |
| 25 | CQ-C025 | BS + 25 | $\mathrm{BS}+42.5$ | 7 | 10 | 30 | 5 | 20 | 10 | 40 | 5 | 22.5 | 28 | 6.6 | $90^{\circ}$ | 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 | $80^{\circ}$ | 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 | $80^{\circ}$ | M6x 14 L | 147 |
| 50 | CQ-C050 | BS +36 | BS +61.5 | 9 | 14 | 42 | 7 | 28 | 22 | 64 | 8 | 33.5 | 50 | 9 | $80^{\circ}$ | 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 | $60^{\circ}$ | 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 | $70^{\circ}$ | M12 $\times 25 \mathrm{~L}$ | 884 |
| 100 | CQ-C100 | BS + 57 | BS + 88.5 | 17 | 22 | 67 | 13 | 45 | 32 | 117 | 12 | 43.5 | 94 | 13.5 | $70^{\circ}$ | M12 30 L | 1516 |

[^5]
## Single Knuckle Joint

| I-G012, I-G016 | I-G04, I-G05 |
| :--- | :--- |
| I-G02, I-G03 | I-G08, I-G10 |



Material: Carbon stee Surface treatment: Nickel plating


Material: Cast iron
Surface treatment: Zinc chromated
[mm]

| Bore size [mm] | Part no. | A | $\mathrm{A}_{1}$ | $\mathrm{E}_{1}$ | $L_{1}$ | MM | ${ }^{R} \mathbf{R}_{1}$ | $\mathbf{U}_{1}$ | ND ${ }_{\text {H10 }}$ | NX | Weight <br> [g] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | I-G012 | 21.5 | 6 | $\square 10$ | 16 | M5 x 0.8 | 6.3 | 7 | $5^{+0.048}$ | $5{ }^{-0.4}$ | 9 |
| 16 | I-G016 | 32 | 8 | $\square 12$ | 25 | M6 x 1 | 8.1 | 14 | $5_{0}^{+0.048}$ | $6.4_{-0.3}^{-0.1}$ | 9 |
| 20 | I-G02 | 34 | 8.5 | $\square 16$ | 25 | M8 x 1.25 | 10.3 | 11.5 | $8{ }_{0}^{+0.058}$ | $8^{-0.4}$ | 8 |
| 25 | I-G0 | 41 | 10.5 | $\square 20$ | 30 | M10 $\times 1.25$ | 12.8 | 14 | $10^{+0.058}$ | $10^{-0.2}$ | 70 |
| 32, 40 | I-G04 | 42 | 14 | ø22 | 30 | M14 $\times 1.5$ | 12 | 14 | $10^{+0.058}$ | $18_{-0.5}^{-0.3}$ | 75 |
| 50, 63 | I-G05 | 56 | 18 | ø28 | 40 | $\mathrm{M} 18 \times 1.5$ | 16 | 20 | $14^{+0.070}$ | $22^{-0.5}$ | 163 |
| 80 | I-G08 | 71 | 21 | ø38 | 50 | $\mathrm{M} 22 \times 1.5$ | 21 | 27 | $18{ }_{0}^{+0.070}$ | $28_{-0.5}^{-0.3}$ | 370 |
| 100 | I-G10 | 79 | 21 | ø44 | 55 | M26 x 1.5 | 24 | 31 | $22^{+0.084}$ | $32^{-0.5}$ | 544 |

Knuckle Pin (Common with double clevis pin)


Material: Carbon steel
[mm]

| Bore size [mm] | Part no. | Dd9 | L | d | L1 | m | t | Applicable retaining ring | Weight <br> [g] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | IY-G012 | $5_{-0.060}^{-0.030}$ | 14.6 | 4.8 | 10.2 | 1.5 | 0.7 | Type C5 for axis | 2 |
| 16 | IY-J015 | $5^{-0.0 .030}$ | 16.6 | 4.8 | 12.2 | 1.5 | 0.7 | Type C5 for axis | 3 |
| 20 | IY-G02 | $8{ }_{-0.076}^{-0.040}$ | 21 | 7.6 | 16.2 | 1.5 | 0.9 | Type C8 for axis | 8 |
| 25 | IY-G03 | $10_{-0.076}^{-0.040}$ | 25.6 | 9.6 | 20.2 | 1.55 | 1.15 | Type C10 for axis | 16 |
| 32, 40 | IY-G04 | $10_{-0.076}^{-0.000}$ | 41.6 | 9.6 | 36.2 | 1.55 | 1.15 | Type C10 for axis | 25 |
| 50,63 | IY-G05 | $14_{-0.093}^{-0.090}$ | 50.6 | 13.4 | 44.2 | 2.05 | 1.15 | Type C14 for axis | 60 |
| 80 | IY-G08 | $18_{-0.093}^{-0.090}$ | 64 | 17 | 56.2 | 2.55 | 1.35 | Type C18 for axis | 126 |
| 100 | IY-G10 | $22_{-0.117}^{-0.065}$ | 72 | 21 | 64.2 | 2.55 | 1.35 | Type C22 for axis | 212 |

* Type C retaining rings for axis are included.

Double Knuckle Joint

| Y-G012, Y-G016 | Y-G04, Y-G05 |
| :--- | :--- |
| Y-G02, Y-G03 | Y-G08, Y-G10 |



Material: Carbon steel
Surface treatment: Nickel plating


Material: Cast iron
Surface treatment: Zinc chromated
[mm]

| $\begin{aligned} & \hline \text { Bre size } \\ & {[\mathrm{mm}]} \\ & \hline \end{aligned}$ | Part no. | A | $A_{1}$ | $\mathrm{E}_{1}$ | $L_{1}$ | MM | ${ }^{\text {R }}$ R1 | $\mathrm{U}_{1}$ | ND ${ }_{\text {н10 }}$ | NX | Nz | L | Appicable pin partno | $\begin{aligned} & \text { Veight } \\ & {[g]} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | Y-G012 | 21.5 | 6 | $\square 10$ | 16 | M5 0.8 | 6.3 | 7 | $5_{0}^{+0.048}$ | $5_{+0.2}^{+0.4}$ | 10 | 4.6 | IY-G012 | 11 |
| 16 | Y-G016 | 28 | 11 | 12 | 21 | M6 x 1 | 8.1 | 10 | $5^{+0.048}$ | $6.5{ }_{+0}^{+0}$ | 12 | 16.6 | IY-J015 | 11 |
| 20 | Y-G02 | 34 | 8.5 | $\square 16$ | 25 | M8 x 1.25 | 10.3 | 11.5 | $8^{+0.058}$ | $8^{+0.4}$ | 16 | 21 | IY-G02 | 45 |
| 25 | Y-G03 | 41 | 10.5 | 20 | 30 | M10 1.25 | 12.8 | 14 | $10_{0}^{+0.058}$ | $10^{+0.2}$ | 20 | 25.6 | IY-G03 | 86 |
| 32, 40 | Y-G04 | 42 | 16 | 022 | 30 | M14 $\times 1.5$ | 12 | 14 | $10^{+0.058}$ | $18{ }_{\text {to. }}^{0.5}$ | 36 | 41.6 | IY-G04 | 121 |
| 50, 63 | Y-G05 | 56 | 20 | 028 | 40 | M18 $\times 1.5$ | 16 | 20 | $14_{0}^{+0.070}$ | $22^{+0.5}$ | 44 | 50.6 | IY-G05 | 253 |
| 80 | Y-G08 | 71 | 23 | 038 | 50 | M22 $\times 1.5$ | 21 | 27 | $18^{+0.070}$ | $28^{+0.5}$ | 56 | 64 | IY-G08 | 568 |
| 100 | Y-G10 | 79 | 24 | 044 | 55 | M26 x 1.5 | 24 | 31 | $22^{+0.084}$ | $32^{+0.5}$ | 64 | 72 | IY-G10 | 838 |

* Knuckle pin and retaining rings are included.

Rod End Nut


Material: Carbon steel Surface treatment: Zinc chromated ( $\varnothing 12$ to $\varnothing 100$ ) Nickel plating (ø125 to ø200)

| Bore size <br> $[\mathrm{mm}]$ | Part no. | $\mathbf{d}$ | $\mathbf{H}$ | $\mathbf{B}$ | $\mathbf{C}$ | Weight <br> $[\mathrm{g}]$ |
| :---: | :--- | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | NTJ-015A | $\mathrm{M} 5 \times 0.8$ | 4 | 8 | 9.2 | 1 |
| $\mathbf{1 6}$ | NT-015A | $\mathrm{M} 6 \times 1$ | 5 | 10 | 11.5 | 2 |
| $\mathbf{2 0}$ | NT-02 | $\mathrm{M} 8 \times 1.25$ | 5 | 13 | 15.0 | 4 |
| $\mathbf{2 5}$ | NT-03 | $\mathrm{M} 10 \times 1.25$ | 6 | 17 | 19.6 | 8 |
| $\mathbf{3 2 , 4 0}$ | NT-04 | $\mathrm{M} 14 \times 1.5$ | 8 | 22 | 25.4 | 17 |
| $\mathbf{5 0 , 6 3}$ | NT-05 | $\mathrm{M} 18 \times 1.5$ | 11 | 27 | 31.2 | 32 |
| $\mathbf{8 0}$ | NT-08 | $\mathrm{M} 22 \times 1.5$ | 13 | 32 | 37.0 | 49 |
| $\mathbf{1 0 0}$ | NT-10 | $\mathrm{M} 26 \times 1.5$ | 16 | 41 | 47.3 | 116 |
| $\mathbf{1 2 5 , 1 4 0}$ | NT-12 | $\mathrm{M} 30 \times 1.5$ | 18 | 46 | 53.1 | 160 |
| $\mathbf{1 6 0 , 1 8 0 , \mathbf { 2 0 0 }}$ | NT-16 | $\mathrm{M} 36 \times 1.5$ | 21 | 55 | 63.5 | 230 |



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

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

| Bore size $[\mathrm{mm}]$ | Single knuckle joint | Double knuckle joint* | Knuckle joint pin | Rod end nut |
| :---: | :---: | :---: | :---: | :---: |
| $\mathbf{2 0}$ | I-G02SUS | Y-G02SUS | IY-G02SUS | NT-02SUS |
| $\mathbf{2 5}$ | I-G03SUS | Y-G03SUS | IY-G03SUS | NT-03SUS |
| $\mathbf{3 2 , 4 0}$ | I-G04SUS | Y-G04SUS | IY-G04SUS | NT-G04SUS |
| $\mathbf{5 0 , 6 3}$ | I-G05SUS | Y-G05SUS | IY-G05SUS | NT-05SUS |
| $\mathbf{8 0}$ | I-G08SUS | Y-G08SUS | IY-G08SUS | NT-08SUS |
| $\mathbf{1 0 0}$ | I-G10SUS | Y-G10SUS | IY-G10SUS | NT-10SUS |

[^6]
## CQ2 Series

Simple Joint (CQ2): ø32 to ø100
Joint/Mounting Bracket (Type A/B) Part Nos.

| Bore size <br> $[\mathrm{mm}]$ | Joint | Type A mounting <br> bracket | Type B mounting <br> bracket |
| :---: | :---: | :---: | :---: |
| $\mathbf{3 2 , 4 0}$ | YU-03 | YA-03 | YB-03 |
| $\mathbf{5 0 , 6 3}$ | YU-05 | YA-05 | YB-05 |
| $\mathbf{8 0}$ | YU-08 | YA-08 | YB-08 |
| $\mathbf{1 0 0}$ | $Y U-10$ | YA-10 | YB-10 |

<Ordering>
Joints are not included with type A or B mounting brackets.
Order them separately.
(Example)
Bore size $\varnothing 40 \quad$ Part no.

- Type A mounting bracket ..............YA-03
- Joint..............................................YU-03


## Allowable Eccentricity

Allowable Eccentricity

| Bore size $[\mathrm{mm}]$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Eccentricity tolerance | $\pm 1$ |  |  |  |  |  |  | $\pm 1.5$ | $\pm 2$ |
| Axial direction backlash | 0.5 |  |  |  |  |  |  |  |  |

## Type A Mounting Bracket



Joint



# Compact Cylinder: Standard Double Acting, Double Rod CQ2W Series 

 $ø 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$How to Order


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.

| Mounting |  |
| :---: | :---: |
| B | Through-hole |
| A | Both ends tapped |
| L | Foot |
| LC | Compact foot |
| F | 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 $\Rightarrow$ p. 34
* For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions L and L1) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by 10 mm (-XC2) cylinder.
For details $\Rightarrow$ p. 166

*1 The bore sizes available for the air-hydro type are ø20 to $\varnothing 100$.

| 3 $\mathbf{y}$ Bore size |
| :--- |
| $\mathbf{1 2}$ 12 mm <br> $\mathbf{1 6}$ 16 mm <br> $\mathbf{2 0}$ 20 mm <br> $\mathbf{2 5}$ 25 mm <br> $\mathbf{3 2}$ 32 mm <br> $\mathbf{4 0}$ 40 mm <br> $\mathbf{5 0}$ 50 mm <br> $\mathbf{6 3}$ 63 mm <br> $\mathbf{8 0}$ 80 mm <br> $\mathbf{1 0 0}$ 100 mm |

(4) Port thread type

| Nil | M thread | $\varnothing 12$ to $\varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc |  |
| TN | NPT | $ø 3$ to $\varnothing 100$ |
| TF | G |  |
| F | Built-in One-touch fittings*1 |  |

*1 The bore sizes available with Onetouch fittings are ø32 to ø63. However, they cannot be selected for the airhydro 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 $\Rightarrow$ p. 145
[mm]

| Bore size | Standard stroke |
| :---: | :--- |
| $\mathbf{1 2 , 1 6}$ | $5,10,15,20,25,30$ |
| $\mathbf{2 0 , 2 5}$ | $5,10,15,20,25,30,35,40,45,50$ |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3} \mathbf{4 0}, \mathbf{1 0 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 31
* The bore sizes available for the air-hydro type are ø20 to $\varnothing 100$.


## Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{C}$ | With rubber bumper*1 |
| $\mathbf{M}$ | 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

| $\mathbf{Z}$ | $\varnothing 12$ to $\varnothing 25$ | 2 surfaces |
| :---: | :---: | :---: |
|  | $\varnothing 32$ to $\varnothing 100$ | 4 surfaces |



## 9 <br> Auto switch

Nil Without auto switch

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

10 Number of auto switches

| Nil | 2 |
| :---: | :---: |
| S | 1 |
| $\mathbf{n}$ | 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) CDQ2WL32-25DZ

For details on auto switch mounting $\Rightarrow$ 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.

## 11 Made to order common specifications <br> For details $\Rightarrow$ p. 31

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

| Type | Special function | $\begin{gathered} \text { Electrical } \\ \text { entry } \end{gathered}$ |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{gathered} \hline 0.5 \\ \text { (Nil) } \end{gathered}$ | $\left\|\begin{array}{c} 1 \\ (\mathrm{M}) \end{array}\right\|$ | $\begin{array}{\|c} 3 \\ (L) \end{array}$ | $\begin{array}{\|c} 5 \\ (Z) \end{array}$ | $\begin{aligned} & \text { None } \\ & (\mathrm{N}) \end{aligned}$ |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | circuit | Relay, PLC |
|  | - |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | $\bullet$ | $\bullet$ | - | 0 | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | - | - | - | 0 | - | 0 | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3 -wire (NPN) |  | 5 V , |  | M9NWV | M9NW | $\bullet$ | $\bullet$ | - | 0 | - | $\bigcirc$ | C circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bullet$ | $\bullet$ | - | 0 | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | $\bullet$ | $\bullet$ | - | 0 | - | $\bigcirc$ |  |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA* ${ }^{\text {+ }}$ | $\bigcirc$ | $\bigcirc$ | $\bullet$ | 0 | - | $\bigcirc$ | IC circuit |  |
|  | (2-color indicator) |  |  | 3 -wire (PNP) |  | 12 V |  | M9PAV* ${ }^{\text {¹ }}$ | M9PA** | $\bigcirc$ | $\bigcirc$ | - | 0 | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA** | 0 | 0 | $\bullet$ | 0 | - | $\bigcirc$ |  |  |
|  | Magneio fiod resistant |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bullet$ | - | $\bullet$ | $\bullet$ | - | $\bigcirc$ |  |  |
|  |  | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline N_{0} \\ \hline \end{array}$ |  | - | 5 V | - | A96V | A96 | $\bullet$ | - | $\bullet$ | - | - | - | IC circuit | - |
| 휸흐응 | - |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | - | - | $\bullet$ | $\bullet$ | - | - | - | Relay, |
|  |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V orless | A90V | A90 | - | - | $\bullet$ | - | - | - | IC circuit | PLC |

[^7]
## CQ2W Series

## Symbol

Without cushion


Made to Order Common Specifications
(For details $\Rightarrow$ p. 155 to 188)

| Symbol | Specifications |
| :--- | :--- |
| -XA | Change of rod end shape |
| -XB6 | Heat-resistant cylinder ( -10 to $150^{\circ} \mathrm{C}$ ) <br> w/o auto switch only*1 |
| -XB7 | Cold-resistant cylinder ( $\left(40\right.$ to $70^{\circ} \mathrm{C}$ ) <br> w/o auto switch only |
| -XB9 | Low-speed cylinder (10 to $50 \mathrm{~mm} / \mathrm{s}$ ) |
| -XB10 | Intermediate stroke (Using exclusive body) |
| -XB13 | Low-speed cylinder (5 to $50 \mathrm{~mm} / \mathrm{s}$ ) |
| -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 |
| -X633 | Intermediate stroke for double rod cylinder |

*1 Excludes the air-hydro type

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


## Specifications

Pneumatic type

| Bore size [mm] |  | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action |  | Double acting, Double rod |  |  |  |  |  |  |  |  |  |
| Fluid |  | Air |  |  |  |  |  |  |  |  |  |
| Proof pressure |  | 1.5 MPa |  |  |  |  |  |  |  |  |  |
| Maximum operating pressure |  | 1.0 MPa |  |  |  |  |  |  |  |  |  |
| Minimum operating pressure |  | 0.07 MPa |  | 0.05 MPa |  |  |  |  |  |  |  |
| Ambient and fluid temperatures |  | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |  |  |
| Lubrication |  | Not required (Non-lube) |  |  |  |  |  |  |  |  |  |
| Piston speed |  | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |  |  |
| Cushion |  | Without cushion or With rubber bumper |  |  |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 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 |
| Stroke length tolerance |  | ${ }_{0}^{+1.0} \mathrm{~mm}^{* 1}$ |  |  |  |  |  |  |  |  |  |

*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 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Double rod |  |  |  |  |  |  |  |
| Fluid | Turbine oil*1 |  |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |  |
| Minimum operating pressure | 0.18 MPa |  |  | 0.1 MPa |  |  |  |  |
| Ambient and fluid temperatures | 5 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |  |  |
| Piston speed | 5 to $50 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |  |
| Stroke length tolerance | ${ }_{0}^{+1.0 ~ m m}$ |  |  |  |  |  |  |  |

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

## Manufacturing of Intermediate Strokes

| Type | A spacer is installed in the standard stroke body. ( 5 mm increments) |  | A spacer is installed in the standard stroke body. <br> ( 1 mm increments) |  | Exclusive body (-XB10) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Part no. | Refer to "How to Order" for the standard model number. ( $\leftrightharpoons$ p. 29 ) |  | Suffix "-X633" (p. 186) to the end of standard model number. ( $\leftrightharpoons>$ p. 29) |  | Suffix "-XB10" to the end of standard model number. ( $\leftrightharpoons$ p. 29) |  |
| 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 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 | 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 |
| Example | Part no.: CQ2WB50-65DZ CQ2WB50-75DZ with 10 mm width spacer inside The B dimension is 125.5 mm . |  | Part no.: CQ2WB50-72DZ-X633 CQ2WB50-75DZ with 3 mm width spacer inside The B dimension is 125.5 mm . |  | Part no.: CQ2WB50-65DZ-XB10 Makes 65 mm stroke tube. 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 $\varnothing 32$ to $\varnothing 100$ (-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.


## $\triangle$ Precautions

Mounting Bracket Part Nos.

| Bore size [mm] | Foot*1 | Compact foot*1 | Flange |
| :---: | :---: | :---: | :---: |
| 12 Without auto switch magnet | CQ-L012 | CQ-LC012 | CQ-F012 |
| 12 With auto switch magnet | CQ-LZ12 | CQ-LCZ12 |  |
| 16 Without auto switch magnet | CQ-L016 | CQ-LC016 | CQ-F016 |
| 16 With auto switch magnet | CQ-LZ16 | CQ-LCZ16 |  |
| 20 Without auto switch magnet | CQ-L020 | CQ-LC020 | CQ-F020 |
| 20 With auto switch magnet | CQ-LZ20 | CQ-LCZ20 |  |
| 25 Without auto switch magnet | CQ-L025 | CQ-LC025 | CQ-F025 |
| 25 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. $\varnothing 12$ to $\varnothing 25$ :
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)
$\varnothing 32$ to $\varnothing 100$ :

- 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) $\Rightarrow$ 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



## Theoretical Output

| Bore size <br> $[\mathrm{mm}]$ | Operating pressure [MPa] |  |  |
| :---: | :---: | :---: | :---: |
|  | 0.3 | 0.5 | 0.7 |
| $\mathbf{1 2}$ | 25 | 42 | 59 |
| 16 | 45 | 75 | 106 |
| 20 | 71 | 118 | 165 |
| 25 | 113 | 189 | 264 |
| $\mathbf{3 2}$ | 181 | 302 | 422 |
| 40 | 317 | 528 | 739 |
| 50 | 495 | 825 | 1150 |
| $\mathbf{6 3}$ | 841 | 1400 | 1960 |
| 80 | 1360 | 2270 | 3170 |
| 100 | 2140 | 3570 | 5000 |

With Auto Switch Magnet


## CQ2W Series

Weight

| Without Auto Switch Magnet |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

Additional Weight
Additional Weight

| Bore size [mm] |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 0 0}$ |  |  |  |  |  |  |  |  |  |  |
| Both ends tapped | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 19 | 45 | 45 |
| Rod end <br> male thread | Male thread | 3 | 6 | 12 | 24 | 52 | 54 | 106 | 106 | 240 |
|  | Nut | 2 | 4 | 8 | 16 | 34 | 34 | 64 | 64 | 98 |
| 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 (ndududingmountingbotis) | 39 | 50 | 122 | 143 | 110 | 124 | 197 | 259 | 531 | 818 |
| Flange (Incududing 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] |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | $\mathbf{1}$ | 1 | 3 | 3 | 6 | 6 | 6 | 19 | 45 | 45 |  |
| Rod end <br> male thread | Male thread |  |  |  |  |  |  |  |  |  |  | 3

Calculation: (Example) CDQ2WF32-20DCMZ

- Basic weight: CDQ2WB32-20DZ ...................... 306 g
- Additional weight: Both ends tapped 06 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.


| 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 | $\times 70 \mathrm{~L}$ |
| -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. |
| :--- | :--- | :--- | :--- |



| 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 | $\times 70 \mathrm{~L}$ |
| -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 | $\times 70 \mathrm{~L}$ |
| -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 $\times 65 \mathrm{~L}$ |
| -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 |

## CQ2W Series

Construction

## Without auto switch magnet



With auto switch magnet


Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod A | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 100$, Hard chrome plating |
| $\mathbf{4}$ | Piston rod B | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 100$, Hard chrome plating |
| $\mathbf{5}$ | Collar | Aluminum alloy | $\varnothing 12$ to $\varnothing 40$, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$ to $\varnothing 100$, Chromated, Painted |
| $\mathbf{6}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{7}$ | Bushing | Bearing alloy | For $\varnothing 50$ or more only |
| $\mathbf{8}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{9}$ | Bumper | Urethane | Pneumatic type only |
| $\mathbf{1 0}$ | One-touch fitting | - | $\boxed{2} 2$ to $\varnothing 63$ |
| $\mathbf{1 1}$ | Rod seal | NBR |  |
| $\mathbf{1 2}$ | Piston seal | NBR |  |
| $\mathbf{1 3}$ | Tube gasket | NBR |  |
| $\mathbf{1 4}$ | Magnet | - |  |

## Replacement Parts/Seal Kit

## Pneumatic Type

| Bore size [mm] | Kit no. | Contents |
| :---: | :---: | :---: |
| 12 | CQ2WB12-PS | Set of nos. (11), (12), (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 (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)


## With rubber bumper



Built-in One-touch fittings 10


Air-hydro Type

| Bore size $[\mathrm{mm}]$ | Kit no. |  |
| :---: | :---: | :---: |
| $\mathbf{2 0}$ | CQ2WBH20-PS |  |
| $\mathbf{2 5}$ | CQ2WBH25-PS |  |
| $\mathbf{3 2}$ | CQ2WBH32-PS |  |
| $\mathbf{4 0}$ | CQ2WBH40-PS |  |
| $\mathbf{5 0}$ | CQ2WBH50-PS |  |
| $\mathbf{6 3}$ | CQ2WBH63-PS |  |
| $\mathbf{8 0}$ | CQ2WBH80-PS |  |
| $\mathbf{1 0 0}$ | CQ2WBH100-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: Standard Double Acting, Double Rod <br> CQ2W Series

## Bore Size

## $\varnothing 12$ to $\varnothing 25$ without Auto Switch Magnet

Through-hole: CQ2WB


| $[\mathrm{Mm}]$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size $[\mathrm{mm}]$ | Stroke range $[\mathrm{mm}]$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{I}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{Q}$ | $\mathbf{Z}$ |
| $\mathbf{1 2}$ | 5 to 30 | 32.2 | 25.2 | 6 | 6 | 25 | $\mathrm{M} 3 \times 0.5$ | 32 | 5 | 3.5 | 15.5 | 3.5 | 6.5 depth 3.5 | 10 | - |
| $\mathbf{1 6}$ | 5 to 30 | 33 | 26 | 8 | 8 | 29 | $\mathrm{M} 4 \times 0.7$ | 38 | 6 | 3.5 | 20 | 3.5 | 6.5 depth 3.5 | 10 | 10 |
| $\mathbf{2 0}$ | 5 to 50 | 35 | 26 | 7 | 10 | 36 | $\mathrm{M} 5 \times 0.8$ | 47 | 8 | 4.5 | 25.5 | 5.5 | 9 depth 7 | 8 | 10 |
| $\mathbf{2 5}$ | 5 to 50 | 39 | 29 | 12 | 12 | 40 | $\mathrm{M} 6 \times 1.0$ | 52 | 10 | 5 | 28 | 5.5 | 9 depth 7 | 9 | 10 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ 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



| $[\mathrm{mm}]$ |  |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | $\mathbf{7}$ |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |

Rod end male thread


| $[\mathbf{m m}]$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathbf{m m}]$ | $\mathbf{A}_{\mathbf{1}}$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 53.2 | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 57 | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 63 | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 74 | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |

## CQ2W Series

## Bore Size

## $\varnothing 12$ to $\varnothing 25$ With Auto Switch Magnet

Through-hole: CDQ2WB

$\varnothing 12$

| $[\mathrm{Amm}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore Size $[\mathrm{mm}]$ | Stroke range $[\mathrm{mm}]$ | A | B | C | D | E | EA | EB | $\mathbf{H}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{Q}$ | $\mathbf{S}$ | $\mathbf{U}$ | $\mathbf{V}$ |
| $\mathbf{1 2}$ | 5 to 30 | 39.4 | 32.4 | 6 | 6 | 33 | - | - | $\mathrm{M} 3 \times 0.5$ | 5 | 3.5 | 22 | 3.5 | 6.5 depth 3.5 | 10.5 | 27.5 | 14 | 25 |
| $\mathbf{1 6}$ | 5 to 30 | 43 | 36 | 8 | 8 | 37 | 13.2 | 6.6 | $\mathrm{M} 4 \times 0.7$ | 6 | 3.5 | 28 | 3.5 | 6.5 depth 3.5 | 10 | 29.5 | 15 | 29 |
| $\mathbf{2 0}$ | 5 to 50 | 47 | 38 | 7 | 10 | 47 | 13.6 | 6.8 | $\mathrm{M} 5 \times 0.8$ | 8 | 4.5 | 36 | 5.5 | 9 depth 7 | 8 | 35.5 | 18 | 36 |
| $\mathbf{2 5}$ | 5 to 50 | 49 | 39 | 12 | 12 | 52 | 13.6 | 6.8 | $\mathrm{M} 6 \times 1.0$ | 10 | 5 | 40 | 5.5 | 9 depth 7 | 9 | 40.5 | 21 | 40 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ 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 $\Rightarrow$ p. 139 to 145

Both ends tapped


|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore Size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{1}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |

## Rod end male thread



| Bore Size <br> $[\mathrm{mm}]$ | $\mathbf{A}_{\mathbf{1}}$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | 60.4 | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 67 | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 75 | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 84 | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |

## Bore Size

## $\varnothing 32$ to $\varnothing 50$ with/Without Auto Switch Magnet

Through-hole: CDQ2WB



Both ends tapped


Built-in One-touch fittings
3

|  | $[\mathrm{mm}]$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{Z}_{\mathbf{1}}$ | $\mathbf{P}_{\mathbf{1}}$ | $\mathbf{V}$ | $\mathbf{W}_{\mathbf{1}}$ |
| $\mathbf{3 2}$ | 13 | 6 | 36.5 | 59 |
| $\mathbf{4 0}$ | 13 | 6 | 40.5 | 66 |
| $\mathbf{5 0}$ | 16 | 8 | 50 | 82 |

* The dimensions of the $\varnothing 32$ 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



| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | Stroke range [mm] | Without auto switch magnet |  |  | With auto switch magnet |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A1 |  |  | A1 |  |
| 32 | 5 to 50 | 87.5 |  |  | 97.5 |  |
|  | 75,100 |  | 97.5 |  |  |  |
| 40 | 5 to 50 |  | 97 |  | 107 |  |
|  | 75,100 |  | 107 |  |  |  |
| 50 | 10 to 50 | $\frac{107.5}{117.5}$ |  |  | 117.5 |  |
|  | 75,100 |  |  |  |  |  |
| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | B1 | $\mathrm{C}_{1}$ | $\mathrm{H}_{1}$ | L1 | MM | X |
| 32 | 22 | 20.5 | 8 | 28.5 | M14 x 1.5 | 23.5 |
| 40 | 22 | 20.5 | 8 | 28.5 | M14 $\times 1.5$ | 23.5 |
| 50 | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |

## CQ2W Series

## Bore Size

## Ø63 to Ø 100 With/Without Auto Switch Magnet

Through-hole: CDQ2WB


| 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 $[\mathrm{mm}]$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{J}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{P}$ | $\mathbf{Q}$ | $\mathbf{W}$ | $\mathbf{Z}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{6 3}$ | 15 | 20 | 77 | $\mathrm{M} 10 \times 1.5$ | 7 | 17 | 8 | 60 | 9 | 14 depth 10.5 | $1 / 4$ | 15.5 | 84 | 19 |
| $\mathbf{8 0}$ | 21 | 25 | 98 | $\mathrm{M} 16 \times 2.0$ | 6 | 22 | 10 | 77 | 11 | 17.5 depth 13.5 | $3 / 8$ | 18 | 104 | 25 |
| $\mathbf{1 0 0}$ | 27 | 30 | 117 | $\mathrm{M} 20 \times 2.5$ | 6.5 | 27 | 12 | 94 | 11 | 17.5 depth 13.5 | $3 / 8$ | 22 | 123.5 | 25 |

er details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
[mm] * 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 $\Rightarrow$ p. 139 to 145

## Both ends tapped



| $[\mathrm{mm}]$ |  |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |
| $\mathbf{8 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |
| $\mathbf{1 0 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |

Built-in One-touch fittings: Ø63


## Rod end male thread



|  |  |  | [mm] |  |
| :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | Stroke range <br> $[\mathrm{mm}]$ | Without auto switch magnet | With auto switch magnet |  |
|  | 10 to 50 | $\mathbf{\mathbf { A } _ { 1 }}$ | $\mathbf{A}_{\mathbf{1}}$ |  |
|  | 75,100 | 119 | 119 |  |
| $\mathbf{8 0}$ | 10 to 50 | 138 |  |  |
|  | 75,100 | 148 | 157.5 |  |
| $\mathbf{1 0 0}$ | 10 to 50 | 147.5 |  |  |
|  | 75,100 | 157.5 |  |  |


| $[\mathrm{mm}]$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |  |
| $\mathbf{6 3}$ | 27 | 26 | 11 | 33.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |  |
| $\mathbf{8 0}$ | 32 | 32.5 | 13 | 43.5 | $\mathrm{M} 22 \times 1.5$ | 35.5 |  |
| $\mathbf{1 0 0}$ | 41 | 32.5 | 16 | 43.5 | $\mathrm{M} 26 \times 1.5$ | 35.5 |  |

## CQ2 Series

## Accessory Brackets

## Mounting Brackets

## Foot

$\varnothing 12$ to $\varnothing 25$ With auto switch magnet
CQ-LZ $\square \square$


* The foot bracket cannot be retrofitted for through-hole mounting (B).
* BS indicates the overall length of the cylinder tube to be used.

| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \\ \hline \end{gathered}$ | Part no. | AW | AW $_{1}$ | L | $L_{1}$ | LA | LA1 | LD | LG | LH | LJ | LS | LT | LX | LY | LZ | X | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | $\begin{aligned} & \hline \text { CQ-L012 } \\ & \hline \text { CQ-LZ12 } \end{aligned}$ | 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 |
| 16 | $\begin{aligned} & \hline \text { CQ-L016 } \\ & \hline \text { CQ-LZ16 } \\ & \hline \end{aligned}$ | 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 |
| 20 | $\begin{gathered} \text { CQ-LO20 } \\ \hline \text { CQ-LZ20 } \\ \hline \end{gathered}$ | $B S+29$ | 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 |
| 25 | $\begin{aligned} & \text { CQ-LO25 } \\ & \hline \text { CQ-LZ25 } \\ & \hline \end{aligned}$ | 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 |
| 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 |

Hexagon socket head cap screw (Accessory)


Rod end male thread


Rod end male thread


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


## CQ2 Series

## Mounting Brackets

## Compact foot

$\varnothing 12$ to $\varnothing 25$ With auto switch magnet Without auto switch magnet


CQ-LCO $\square \square$


$\varnothing 63$ to $\varnothing 100$
$\varnothing 32$ to $\varnothing 100$


Hexagon socket head cap screw (Accessory)


Rod end male thread

*1 For ø63 to ø100: Stroke - LA
Rod end male thread


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


| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | Part no. | AW | $\mathrm{AW}_{1}$ | L | L1 | LA | LA1 | LD | LH | LJ | LS | LT | LX | LY | LZ | X | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | CQ-LC012 | $B S+27.3$ | $B S+48$ | 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 | $B S+27.8$ | $B S+51$ | 13.5 | 25.5 | 4.2 | 16.2 | 4.5 | 19 | - | $B S+18.6$ | 2 | 20 | 33.5 | 29 | 9.3 | 5 |
|  | CQ-LCZ16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 | CQ-LC020 | $B S+33.5$ | $B S+57$ | 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 | $B S+34$ | $B S+65$ | 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 $\varnothing 80$ and $\varnothing 100$ 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 $\Rightarrow$ p. 26, 27


## Mounting Brackets

## Flange



* 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 <br> $[\mathrm{mm}]$ | Part no. | AW | AW $\mathbf{1}$ | FD | FT | FV | FX | FZ | $\mathbf{L}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{2}}$ | $\mathbf{L}_{\mathbf{3}}$ | $\mathbf{M}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ-F012 | BS +17 | BS +38 | 4.5 | 5.5 | 25 | 45 | 55 | 13.5 | 24 | 3.5 | $\mathbf{1 4}$ | - |
| $\mathbf{1 6}$ | CQ-F016 | BS +17 | BS +41 | 4.5 | 5.5 | 30 | 45 | 55 | 13.5 | 25.5 | 3.5 | 15.5 | - |
| $\mathbf{2 0}$ | CQ-F020 | BS +19 | BS +47 | 6.6 | 8 | 39 | 48 | 60 | 14.5 | 28.5 | 4.5 | 18.5 | - |
| $\mathbf{2 5}$ | CQ-F025 | BS +20 | BS +55 | 6.6 | 8 | 42 | 52 | 64 | 15 | 32.5 | 5 | 22.5 | - |
| $\mathbf{3 2}$ | CQ-F032 | BS +24 | BS +67 | 5.5 | 8 | 48 | 56 | 65 | 17 | 38.5 | 7 | 28.5 | 34 |
| $\mathbf{4 0}$ | CQ-F040 | BS +24 | BS +67 | 5.5 | 8 | 54 | 62 | 72 | 17 | 38.5 | 7 | 28.5 | 40 |
| $\mathbf{5 0}$ | CQ-F050 | BS +26 | BS +77 | 6.6 | 9 | 67 | 76 | 89 | 18 | 43.5 | 8 | 33.5 | 50 |
| $\mathbf{6 3}$ | CQ-F063 | BS +26 | BS +77 | 9 | 9 | 80 | 92 | 108 | 18 | 43.5 | 8 | 33.5 | 60 |
| $\mathbf{8 0}$ | CQ-F080 | BS +30 | BS +97 | 11 | 11 | 99 | 116 | 134 | 20 | 53.5 | 10 | 43.5 | 77 |
| $\mathbf{1 0 0}$ | CQ-F100 | BS +34 | BS +97 | 11 | 11 | 117 | 136 | 154 | 22 | 53.5 | 12 | 43.5 | 94 |

[^8]
# Compact Cylinder: Standard Single Acting, Single Rod CQ2 Series $\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50$ 

How to Order
 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.
* For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions $L$ and $L_{1}$ ) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by $10 \mathrm{~mm}(-\mathrm{XC} 2)$ cylinder.
For details $\Rightarrow$ p. 166


## (4) Cylinder stroke

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

| Bore size | Standard stroke |
| :---: | :---: |
| $\mathbf{1 2 , 1 6 , 2 0 , 2 5 , 3 2 , 4 0}$ | 5,10 |
| $\mathbf{5 0}$ | 10,20 |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 45

Auto switch mounting groove
Z

| $\varnothing 12$ to $\varnothing 25$ | 2 surfaces |
| :---: | :---: |
| $\varnothing 32$ to $\varnothing 50$ | 4 surfaces |

## Bore size

| $\mathbf{1 2}$ | 12 mm |
| :--- | :--- |
| $\mathbf{1 6}$ | 16 mm |
| $\mathbf{2 0}$ | 20 mm |
| $\mathbf{2 5}$ | 25 mm |
| $\mathbf{3 2}$ | 32 mm |
| $\mathbf{4 0}$ | 40 mm |
| $\mathbf{5 0}$ | 50 mm |

(3) Port thread type

| Nil | M thread | $\varnothing 12$ to $\varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc |  |
| TN | NPT | $ø 32$ to $\varnothing 50$ |
| TF | G |  |
| F | Built-in One-touch fittings*1 |  |

*1 The bore sizes available with One-touch fittings are $\varnothing 32$ to $\varnothing 50$.

* For cylinders without an auto switch magnet, M threads are compatible only with $\varnothing 32-5 \mathrm{~mm}$ stroke.


8 Through-hole type mounting bolt Nil L $\quad$ Nhipped togethe

* Mounting bolt is shipped together with the product only when the mounting bracket is " B " (Through-hole). For details $\Rightarrow$ p. 48
* When a made-to-order option is selected, the mounting bolt is not shipped together with the product. Please order it separately.

Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{F}$ | With boss on head end |
| $\mathbf{M}$ | Rod end male thread |

* Combined body options "FM" can be selected.

9 Rod end bracket ( $\leftrightharpoons$ p. 26, 27)

| Nil | None |
| :---: | :---: |
| $\mathbf{D}$ | Simple joint A type + Joint |
| E | Simple joint B type + Joint |
| $\mathbf{V}$ | Single knuckle joint |
| $\mathbf{W}$ | Double knuckle joint |

* Options "D" and "E" must be used in combination with body option (Nil), the rod end female thread, and options "V" and "W" must be used in combination with body option $(M)$, the rod end male thread.
* The applicable bore size for "D" and "E" is $\varnothing 32$ to $\varnothing 100$.

A knuckle pin is not provided with the single knuckle joint $(\mathrm{V})$. If a pin is required, please order it separately. For details $\Rightarrow$ p. 26

* When a made-to-order option is selected, the rod end bracket cannot be selected. Please order it separately.


## Compact Cylinder：Standard Single Acting，Single Rod <br> CQ2 Series



11 Number of auto switches

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

## 12 Made to order common specifications

For details $\Rightarrow$ 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 $\Rightarrow$ 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 |  | Wiring <br> （Output） | Load voltage |  |  | Auto switch model |  | Lead wire length［m］ |  |  |  |  | Pre－wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In－line | $\begin{array}{\|c} \hline 0.5 \\ \text { (Nil) } \end{array}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{array}{\|c} 3 \\ (\mathrm{~L}) \end{array}$ | $\begin{gathered} 5 \\ (Z) \end{gathered}$ | None <br> （N） |  |  |  |
|  | Diagnostic indication （2－color indicator） | Grommet | Yes | 3－wire（NPN） | 24 V | 5 V ， | － | M9NV | M9N | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ | C circuit | Relay， PLC |
|  |  |  |  | 3－wire（PNP） |  | 12 V |  | M9PV | M9P | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BV | M9B | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ | － |  |
|  |  |  |  | 3－wire（NPN） |  | 5 V ， |  | M9NWV | M9NW | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3－wire（PNP） |  | 12 V |  | M9PWV | M9PW | $\bullet$ | $\bullet$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BWV | M9BW | $\bullet$ | $\bullet$ | $\bullet$ | 0 | － | $\bigcirc$ | － |  |
|  | Water resistant （2－color indicator） |  |  | 3－wire（NPN） |  | 5 V ， |  | M9NAV＊1 | M9NA＊1 | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3－wire（PNP） |  | 12 V |  | M9PAV＊1 | M9PA＊1 | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ |  |  |
|  |  |  |  | 2－wire |  | 12 V |  | M9BAV＊1 | M9BA＊${ }^{\text {＊}}$ | $\bigcirc$ | 0 | $\bullet$ | $\bigcirc$ | － | $\bigcirc$ | － |  |
|  |  | Grommet | $\begin{array}{\|l\|} \hline \text { Yes }- \\ \hline \mathrm{No} \\ \hline \end{array}$ | （NPN ${ }^{3 \text {－wirequivalent）}}$ | － | 5 V | － | A96V | A96 | － | － | $\bullet$ | － | － | － | IC circuit | － |
| 문 |  |  |  | 2－wire | 24 V | $\frac{12 \mathrm{~V}}{5 \mathrm{~V}, 12 \mathrm{~V}}$ | 100 V | A93V＊2 | A93 | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | － | － | － | Relay， |
|  |  |  |  |  |  |  | 100 V or less | A90V | A90 | $\bullet$ | － | $\bullet$ | － | － | － | IC circuit | PLC |

[^9]＊There are applicable auto switches other than those listed above．For details $\Rightarrow$ p． 152

## CQ2 Series



| Made to <br> Order | Made to Order Common Specifications <br> (For details $\Rightarrow$ p. 155 to 188) |  |
| :--- | :--- | :---: |
| Symbol | Specifications |  |
| -XA | Change of rod end shape, spring return type only |  |
| -XB10 | Intermediate stroke (Using exclusive body), <br> 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 <br> material: Stainless steel |  |
| -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 <br> -XC85 |  |
| Grease for food processing equipment |  |  |
| -X144 | Special port location, with auto switch |  |
| -X271 | Fluororubber seals |  |
| -X1876 | Cylinder tube: With concave boss on head <br> end |  |

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

Specifications

| Bore size [mm] | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Single acting, Single rod |  |  |  |  |  |  |
| Fluid | Air |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |
| Minimum operating pressure [MPa] | 0.25 | 0.25 | 0.18 | 0.18 | 0.17 | 0.15 | 0.13 |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ <br> With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.022 | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 |
| Stroke length tolerance | $\begin{gathered} +1.0 \mathrm{~mm} \\ 0 \end{gathered}$ |  |  |  |  |  |  |

## 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 CQ2B20-5T with 2 mm width spacer inside The B dimension is 24.5 mm . |  |

## Mounting Bracket Part Nos.

| Bore size [mm] |  | Foot*1 | Compact foo** | Flange | Double clevis | Doube clevispiot 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.
$\varnothing 12$ to $\varnothing 25$ :
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) $\varnothing 32$ to $\varnothing 50$ :
- 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) $\Rightarrow$ 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 .

## Compact Cylinder: Standard <br> Single Acting, Single Rod <br> CQ2 Series

## Theoretical Output

| 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 $\square \longleftarrow \mathrm{in}$

| 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

[ N$]$

| 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 return

- First spring state


When spring is set in cylinder

- Second spring state


When spring is compressed with air

Single Acting, Spring Extend

| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | 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 extend

-First spring state


When spring is set in cylinder

- Second spring state


When spring is compressed with air

## CQ2 Series

## Weight

## Without Auto Switch Magnet

## Spring Return

[g]

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 29 | 35 | - |
| $\mathbf{1 6}$ | 42 | 51 | - |
| $\mathbf{2 0}$ | 63 | 76 | - |
| $\mathbf{2 5}$ | 87 | 101 | - |
| $\mathbf{3 2}$ | 125 | 145 | - |
| $\mathbf{4 0}$ | 196 | 217 | - |
| $\mathbf{5 0}$ | - | 357 | 426 |

Spring Extend
Spring Extend

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke $[\mathrm{mm}]$ |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 29 | 35 | - |
| 16 | 43 | 50 | - |
| 20 | 67 | 78 | - |
| 25 | 92 | 104 | - |
| $\mathbf{3 2}$ | 135 | 151 | - |
| $\mathbf{4 0}$ | 206 | 223 | - |
| $\mathbf{5 0}$ | - | 374 | 429 |

Additional Weight
Additional Weight

| Bore size [mm] | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 44 | 49 | - |
| $\mathbf{1 6}$ | 64 | 72 | - |
| $\mathbf{2 0}$ | 97 | 109 | - |
| 25 | 135 | 150 | - |
| 32 | 182 | 202 | - |
| 40 | 269 | 290 | - |
| 50 | - | 456 | 521 |

Spring Extend
[g]

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 49 | 65 | - |
| $\mathbf{1 6}$ | 63 | 71 | - |
| $\mathbf{2 0}$ | 110 | 119 | - |
| $\mathbf{2 5}$ | 149 | 163 | - |
| $\mathbf{3 2}$ | 192 | 208 | - |
| $\mathbf{4 0}$ | 279 | 296 | - |
| $\mathbf{5 0}$ | - | 486 | 540 |

Additional Weight
Additional Weight

| Bore size [mm] | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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

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 25 L 4 pcs.

## Spring Return

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2B12-5S | 6.5 | 25 | CQ-M3 x 25L |
| -10S |  | 30 | x 30L |
| CQ2B16-5S | 5 | 25 | CQ-M3 x 25L |
| -10S |  | 30 | x 30L |
| CQ2B20-5S | 7.5 | 25 | CQ-M5 x 25L |
| -10S |  | 30 | x 30L |
| CQ2B25-5S | 9.5 | 30 | CQ-M5 x 30L |
| -10S |  | 35 | x 35L |
| CQ2B32-5SZ | 9 | 30 | CQ-M5 x 30L |
| -10SZ |  | 35 | $\times 35 \mathrm{~L}$ |
| CQ2B40-5SZ | 7.5 | 35 | CQ-M5 x 35L |
| -10SZ |  | 40 | x 40L |
| CQ2B50-10SZ | 12.5 | 45 | CQ-M6 x 45L |
| -20SZ |  | 55 | x 55L |

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


Spring Extend

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2B12-5T | 6.5 | 25 | CQ-M3 x 25L |
| -10T |  | 30 | $\times 30 \mathrm{~L}$ |
| CQ2B16-5T | 5 | 25 | CQ-M3 x 25L |
| -10T |  | 30 | x 30L |
| CQ2B20-5T | 7.5 | 25 | CQ-M5 x 25L |
| -10T |  | 30 | x 30L |
| CQ2B25-5T | 9.5 | 30 | CQ-M5 x 30L |
| -10T |  | 35 | x 35L |
| CQ2B32-5TZ | 9 | 30 | CQ-M5 x 30L |
| -10TZ |  | 35 | x 35L |
| CQ2B40-5TZ | 7.5 | 35 | CQ-M5 x 35L |
| -10TZ |  | 40 | x 40L |
| CQ2B50-10TZ | 12.5 | 45 | CQ-M6 x 45L |
| -20TZ |  | 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. |
| :---: | :---: | :---: | :---: |
| CDQ2B12-5SZ | 5.5 | 35 | CQ-M3 x 35L |
| -10SZ |  | 40 | x 40L |
| CDQ2B16-5SZ | 8 | 40 | CQ-M3 x 40L |
| -10SZ |  | 45 | x 45L |
| CDQ2B20-5SZ | 10.5 | 40 | CQ-M5 x 40L |
| -10SZ |  | 45 | x 45L |
| CDQ2B25-5SZ | 9.5 | 40 | CQ-M5 x 40L |
| -10SZ |  | 45 | x 45L |
| CDQ2B32-5SZ | 9 | 40 | CQ-M5 x 40L |
| -10SZ |  | 45 | x 45L |
| CDQ2B40-5SZ | 7.5 | 45 | CQ-M5 x 45L |
| -10SZ |  | 50 | x 50L |
| CDQ2B50-10SZ | 12.5 | 55 | CQ-M6 x 55L |
| -20SZ |  | 65 | x 65L |

Spring Extend

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDQ2B12-5TZ | 6.1 | 40 | CQ-M3 x 40L |
| -10TZ |  | 45 | x 45L |
| CDQ2B16-5TZ | 8 | 40 | CQ-M3 x 40L |
| -10TZ |  | 45 | x 45L |
| CDQ2B20-5TZ | 10.5 | 40 | CQ-M5 x 40L |
| -10TZ |  | 45 | x 45L |
| CDQ2B25-5TZ | 9.5 | 40 | CQ-M5 x 40L |
| -10TZ |  | 45 | x 45L |
| CDQ2B32-5TZ | 9 | 40 | CQ-M5 x 40L |
| -10TZ |  | 45 | x 45L |
| CDQ2B40-5TZ | 7.5 | 45 | CQ-M5 x 45L |
| -10TZ |  | 50 | $\times 50 \mathrm{~L}$ |
| CDQ2B50-10TZ | 12.5 | 55 | CQ-M6 x 55L |
| -20TZ |  | 65 | x 65L |



## CQ2 Series

Construction

## Without auto switch magnet

## Spring return



Port size
M5 x 0.8

## Spring extend



## With auto switch magnet



With boss on head end


Rod end male thread


Built-in One-touch fittings


Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}^{* 1}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 50$, Hard chrome plating |
| $\mathbf{4}$ | Collar | Aluminum alloy | $\varnothing 12$ to $\varnothing 40$, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$, Chromated, Painted |
| $\mathbf{5}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{6}$ | Bushing | Bearing alloy | $\varnothing 50$ |
| $\mathbf{7}$ | Return spring | Piano wire | Zinc chromated |
| $\mathbf{8}$ | Bronze element | Sintered metallic BC | Port size Rc1/8, 1/4 |
| $\mathbf{9}$ | Retaining ring | Carbon tool steel |  |
| $\mathbf{1 0}$ | Plug with fixed orifice | Alloy steel | Port size M5 x 0.8 |
| $\mathbf{1 1}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{1 2}$ | Centering location ring | Aluminum alloy | $\varnothing 20$ to $\varnothing 50$, Anodized |
| $\mathbf{1 3}$ | One-touch fitting | - | $\varnothing 32$ to $\varnothing 50$ |
| $\mathbf{1 4}$ | Piston seal | NBR |  |
| $\mathbf{1 5}$ | Rod seal | NBR |  |
| $\mathbf{1 6}$ | Gasket | NBR |  |
| $\mathbf{1 7}$ | Magnet | - |  |

*1 For the spring extend type (Type T), the piston and piston rod are integrated (stainless steel). (Except $\varnothing 12$ and $\varnothing 16$ of built-in magnet type)

## Replacement Parts/Seal Kit

| Bore size <br> $[\mathrm{mm}]$ | Single acting, Spring return | Single acting, Spring extend |
| :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ2B12-S-PS | CQ2B12-T-PS |
| $\mathbf{1 6}$ | CQ2B16-S-PS | CQ2B16-T-PS |
| $\mathbf{2 0}$ | CQ2B20-S-PS | CQ2B20-T-PS |
| $\mathbf{2 5}$ | CQ2B25-S-PS | CQ2B25-T-PS |
| $\mathbf{3 2}$ | CQ2B32-S-PS | CQ2B32-T-PS |
| $\mathbf{4 0}$ | CQ2B40-S-PS | CQ2B40-T-PS |
| $\mathbf{5 0}$ | 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)

## б12 to $\varnothing 25$ Spring Return/Extend: without Auto Switch Magnet

Through-hole: CQ2B $\square \mathbf{S} / \mathbf{T}$


Spring return


Spring extend

*1 For the spring extend type, the value refers to the length when the piston rod is extended due to spring force.

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


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{1}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |

## With boss on head end

|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{G}$ | Th9 |
| $\mathbf{1 2}$ | 1.5 | $15_{-0.043}^{0}$ |
| $\mathbf{1 6}$ | 1.5 | $20_{-0.052}$ |
| $\mathbf{2 0}$ | 2 | $13_{-0.043}$ |
| $\mathbf{2 5}$ | 2 | $1_{-0.043}$ |

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

## CQ2 Series

## Bore Size

## $\varnothing 12$ to $\varnothing 25$ Spring Return/Extend: With Auto Switch Magnet

Through-hole: CDQ2B $\square$ S/T
$\varnothing 16$ to $\varnothing 25$



Spring return


Min. lead wire bending radius 10


## Spring extend

Min. lead wire bending radius 10


| Bore size [mm] | Stroke [mm] | A |  | B |  | C | D | E | EA | EB | F | H | K | L |  | M | N | 0 | Q | S | U | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Spring return | Spring exiend | Spring retum | Spring exiend |  |  |  |  |  |  |  |  | Spring retum | 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 |  |  |  |  |  |  |  |

*1 For the spring extend type, the value refers to the length when the piston rod is extended due to spring force.
$* 2$ For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145

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


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{1}$ | $\mathbf{R}$ |
| $\mathbf{1 2}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{1 6}$ | $\mathrm{M} 4 \times 0.7$ | 7 |
| $\mathbf{2 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{2 5}$ | $\mathrm{M} 6 \times 1.0$ | 10 |

With boss on head end

Rod end male thread


## Dimensions of Each Mounting Bracket

| Bore size [mm] | B1 | $\mathrm{C}_{1}$ | $\mathrm{H}_{1}$ | L1 |  |  | MM | X |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Spring | Spring extend |  |  |  |
|  |  |  |  | return | 5 st | 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 | M $8 \times 1.25$ | 14 |
| 25 | 17 | 15 | 6 | 22.5 | 27.5 | 32.5 | M10 1.25 | 17.5 |

*3 For the spring extend type, the value refers to the length when the piston rod is extended due to spring force.

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: CDQ2B $\square \mathbf{S} / \mathrm{T}$


Spring return


Spring extend


| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | Stroke [mm] | Without auto switch magnet |  |  |  |  | With auto switch magnet |  |  |  |  | C | D | E | H | J | K | L |  | M | N | 0 | Q | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A |  | B | F | P | A |  | B | F | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Springreturn | Spoing extend |  |  |  | Spring retum | Sping extend |  |  |  |  |  |  |  |  |  | Sppingret | pring exerend |  |  |  |  |  |  |
| 32 | 5 | 35 | 40 | 28 | 5.5 | M5 x 0.8 | 45 | 50 | 38 | 7.5 | 1/8 | 13 | 16 | 45 | M8x 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 |  |  |  |  |  |  |  |  |  | 17 |  |  |  |  |  |  |
| 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 $\times 1.25$ | 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 |  |  |  |  |  |  |
|  | 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 $\times 1.5$ | 7 | 17 | 8 | 18 | 50 | 6.6 | 11 depth 8 | 10.5 | 71 | 19 |
| 50 | 20 | 58.5 | 78.5 | 50.5 |  |  | 68.5 | 88.5 | 60.5 |  |  |  |  |  |  |  |  |  | 28 |  |  |  |  |  |  |

*1 For the spring extend type, the value refers to the length when the piston rod is extended due to spring force.
*2 The A, B dimensions of the $\varnothing 32-5 \mathrm{~mm}$ stroke with built-in One-touch fittings without auto switch magnet are the same as those of the ø $22-10 \mathrm{~mm}$ stroke without auto switch magnet.
*3 For the auto switch proper mounting position and mounting height $\leftrightarrows$ p. 139 to 145

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


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{3 2}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{4 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{5 0}$ | $\mathrm{M} 8 \times 1.25$ | 14 |

With boss on head end


Built-in One-touch fittings*2


## 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: Large Bore Size Double Acting, Single Rod CQ2 Series ø125, ø140, ø160, ø180, ø200 

## How to Order



| 7 Body option |
| :--- | :--- |
| NiI Rod end female thread <br> $\mathbf{M}$ Rod end male thread |

Auto switch mounting groove

| $\mathbf{Z}$ | 4 surfaces |
| :--- | :--- |

## 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 <br> For details $\Rightarrow$ p. 54

For details on auto switch mounting $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{gathered} \hline 0.5 \\ \text { (Nil) } \end{gathered}$ | $\begin{array}{c\|} \hline 1 \\ (\mathrm{M}) \end{array}$ | $\begin{gathered} 3 \\ (\mathrm{~L}) \end{gathered}$ | $\begin{gathered} 5 \\ (Z) \end{gathered}$ | None <br> ( N ) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit | Relay, PLC |
|  | - |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | - | - | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | Water resistant (2-color indicator) |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV*1 | M9PA*1 | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Magnetic field resistant $(2$-color indicator) |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  | - | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline \text { No } \\ \hline \end{array}$ | (NPN ${ }_{\text {equire }}^{\text {3-wivalent) }}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
|  |  |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | Relay, |
|  |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V orless | A90V | A90 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | PLC |

*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: $0.5 \mathrm{~m} \ldots \ldots .$. Nil (Example) M9NW * Solid state auto switches marked with "O" are produced upon receipt of order.

1 m ......... M (Example) M9NWM
$3 \mathrm{~m} \quad$........ L $\quad$ (Example) M9NWL
5 m ......... Z (Example) M9NWZ

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


## Compact Cylinder: Large Bore Size Double Acting, Single Rod <br> CQ2 Series

## Specifications

| Bore size [mm] | 125 | 140 | 160 | 180 | 200 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |
| Fluid | Air |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  | 1.05 MPa |  |
| Maximum operating pressure | 1.0 MPa |  |  | 0.7 MPa |  |
| Minimum operating pressure | 0.05 MPa |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  | 20 to $400 \mathrm{~mm} / \mathrm{s}$ |  |
| Cushion | Rubber bumper |  |  |  |  |
| Allowable kinetic energy [J] | 7.4 | 9.8 | 12.4 |  |  |
| Stroke length tolerance | $\begin{gathered} +1.4 \mathrm{~mm} * 1 \\ 0 \end{gathered}$ |  |  |  |  |

*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. | Refer to "How to Order" for the <br> standard model number. ( $\leftrightharpoons$ p. 53) | Suffix "-XB10" to the end of <br> standard model number. ( $\leftrightharpoons$ p. 53) |
| Description | Strokes in 5 mm increments are <br> available by installing a spacer in <br> the standard stroke cylinder. | Strokes in 1 mm increments are <br> available by using an exclusive body <br> with the specified stroke. |
| Stroke range | 5 to 295 | 11 to 299 |
| Example | Part no.: CQ2B160-165DCZ <br> CQ2B160-175DCZ with 10 mm <br> 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. |

## CQ2 Series

## Allowable Kinetic Energy

Load Mass and Piston Speed

| Bore size [mm] | 125 | $\mathbf{1 4 0}$ | $\mathbf{1 6 0}$ | $\mathbf{1 8 0}$ | 200 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Standard/ <br> Allowable kinetic energy: Ea | 7.4 | 9.8 |  | 12.4 |  |

Kinetic energy $E[J]=\frac{(m 1+m 2)}{2} V^{2}$
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 | 1.25 | 1.34 | 1.42 | 1.5 | 1.58 | 1.77 | 1.97 | 2.17 | 2.37 | 2.57 | 2.77 | 3.17 | 3.57 |
| 140 | 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 |
| 160 | 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 |
| 180 | 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 |
| 200 | 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

| Bore size [mm] | Cylinder stroke [mm] |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
| 125 | 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 |
| 140 | 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 |
| 160 | 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 |
| 180 | 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 |
| 200 | 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

| Bore size [mm] |  |  | $\mathbf{1 2 5}$ | $\mathbf{1 4 0}$ |
| :--- | :--- | :---: | :---: | :---: |
| $\mathbf{R}$Rod end male <br> thread | Male thread $180, \mathbf{0 0 0}$ |  |  |  |
|  | Nut | 0.16 | 0.3 | 0.48 |

Calculation: (Example) CDQ2B125-100DCMZ

- Basic mass
- Additional mass : Rod end male thread ......... 0.46 kg


## Theoretical Output



# Compact Cylinder：Large Bore Size <br> Double Acting，Single Rod <br> CQ2 Series 

## Weight

Without Auto Switch Magnet

|  | Cylinder stroke［mm］ |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ［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 | 26.9 |

With Auto Switch Magnet

| Bore size ［mm］ | Cylinder stroke［mm］ |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 250 | 300 |
| 125 | 5.30 | 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 |

［kg］

## Additional Weight

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

Calculation：（Example）CDQ2B125－30DCMZ
－Basic weight：CDQ2B125－30DCZ $\cdots . .5 .77 \mathrm{~kg}$
－Additional weight：Rod end male thread $\cdots 0.47 \mathrm{~kg}$ 6.24 kg


## Through－hole Type Mounting Bolt for the CDQ2

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． |
| :---: | :---: | :---: | :---: |
| CDQ2B125／140－10DCZ | 22.9 | 100 | CQ－M12 x 100L |
| －20DCZ |  | 110 | x 110L |
| －30DCZ |  | 120 | x 120L |
| －40DCZ |  | 130 | x 130L |
| －50DCZ |  | 140 | x 140L |
| －75DCZ |  | 165 | x 165L |
| －100DCZ |  | 190 | x 190L |
| CDQ2B160－10DCZ | 27.7 | 110 | CQ－M14 x 110L |
| －20DCZ |  | 120 | x 120L |
| －30DCZ |  | 130 | x 130L |
| －40DCZ |  | 140 | x 140L |
| －50DCZ |  | 150 | x 150L |
| －75DCZ |  | 175 | x 175L |
| －100DCZ |  | 200 | x 200L |


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

## CQ2 Series

Construction

## Rod end male thread



Component Parts

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

Replacement Parts/Seal Kit

| Bore size $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| 125 | CQ2B125-PS |  |
| $\mathbf{1 4 0}$ | CQ2B140-PS |  |
| $\mathbf{1 6 0}$ | CQ2B160-PS |  |
| $\mathbf{1 8 n}$ Set of nos. (12), (13), (14) |  |  |
| $\mathbf{2 0 0}$ | CQ2B180-PS |  |
|  | 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)

## Compact Cylinder: Large Bore Size Double Acting, Single Rod <br> CQ2 Series

## Bore Size

## $\varnothing 125$ to $\varnothing 200$

Through-hole: CDQ2B
The dimensions are the same with or without an auto switch magnet.

ø180, ø200
$\mathbf{H}$ thread effective depth $\mathbf{C} \quad 2 \times 4 \times \varnothing \mathbf{O B}$ counterbore depth $\mathbf{R B}$

[mm]

| Bore size [mm] | Standard stroke range | A | B | $B_{1}$ | C | D | E | H | J | K | L | M | $\mathrm{M}_{1}$ | $M_{2}$ | N | OA | OB | Q | RA | RB | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 125 | 10, 20, 30, 40, 50 <br> 75, 100, 125, 150 <br> $175,200,250,300$ | 99 | 83 | 2.5 | 30 | 36 | 142 | M22 x 2.5 | 11 | 32 | 16 | 114 | - | - | 12.5 | M14 $\times 2$ | 21.2 | 24.5 | 25 | 18.4 | 153 |
| 140 |  | 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 |  | 108 | 91 | 2.5 | 33 | 40 | 178 | M $24 \times 3$ | 10 | 36 | 17 | 144 | - | - | 14.5 | M16 $\times 2$ | 24.2 | 27.5 | 28 | 21.2 | 188 |
| 180 |  | 119 | 102 | 3 | 33 | 40 | 204 | M $24 \times 3$ | 3 | 36 | 17 | 162 | 52 | 52 | 19 | M22 $\times 2.5$ | 31.5 | 29 | 38 | 26 | - |
| 200 |  | 126 | 109 | 3 | 33 | 40 | 226 | M24 x 3 | 7.1 | 36 | 17 | 182 | 62 | 62 | 19 | M22 $\times 2.5$ | 31.5 | 30 | 38 | 26 | - |

*1 Be sure to use the attached flat washer for mounting cylinder with through-holes.
*2 For sizes $\varnothing 125$ to $\varnothing 160$ with a stroke of 10 mm or less, and for sizes $\varnothing 180$ and $\varnothing 200$ with a stroke of 20 mm or less, the product comes with an OA through thread.

## Rod end male thread



|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2 5}$ | 46 | 42 | 18 | 58 | $\mathrm{M} 30 \times 1.5$ | 45 |
| $\mathbf{1 4 0}$ | 46 | 42 | 18 | 58 | $\mathrm{M} 30 \times 1.5$ | 45 |
| $\mathbf{1 6 0}$ | 55 | 47 | 21 | 64 | $\mathrm{M} 36 \times 1.5$ | 50 |
| $\mathbf{1 8 0}$ | 55 | 47 | 21 | 64 | $\mathrm{M} 36 \times 1.5$ | 50 |
| $\mathbf{2 0 0}$ | 55 | 47 | 21 | 64 | $\mathrm{M} 36 \times 1.5$ | 50 |

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


# Compact Cylinder: Large Bore Size Double Acting, Double Rod CQ2W Series ø125, ø140, ø160, ø180, ø200 

## How to Order




W $\quad$ Double rod
 available as an option. For details $\Rightarrow$ p. 62


8 Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{M}$ | Rod end male thread |

11 Number of auto switches

| $\mathbf{N i l}$ | 2 |
| :---: | :---: |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | n |

## 10 Auto switch <br> Nil <br> Without auto switch <br> —lor <br> For applicable auto switches, refer to the table below.

## 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 $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{array}{\|c\|} \hline 0.5 \\ \text { (Nil) } \end{array}$ | $\begin{gathered} 1 \\ (M) \end{gathered}$ | $\begin{array}{\|c} \hline 3 \\ (\mathrm{~L}) \end{array}$ | $\begin{gathered} 5 \\ (Z) \\ \hline \end{gathered}$ | None <br> ( N ) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  | Relay, PLC |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | - | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | - | - | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | Water resistant |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV*1 | M9PA*1 | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  | (2-color indicator) |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  | Grommet | $\begin{array}{\|c\|} \hline \text { Yes } \\ \hline \text { Noo } \\ \hline \end{array}$ | (NPN ${ }^{3 \text {-wirequivalent) }}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
| 훈 | - |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | - | - | Relay, |
| 言 |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V orless | A90V | A90 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | PLC |

*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: $0.5 \mathrm{~m} \ldots \ldots .$. Nil (Example) M9NW * Solid state auto switches marked with "O" are produced upon receipt of order. $1 \mathrm{~m} \quad$......... M (Example) M9NWM
$3 \mathrm{~m} \quad \cdots \ldots \ldots . \mathrm{L} \quad$ (Example) M9NWL
$5 \mathrm{~m} \quad$......... Z (Example) M9NWZ
* There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152


## Specifications



Symbol


Made to Order Common Specifications
(For details $\Rightarrow$ 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, $\varnothing 125$ to $\varnothing 160$ only |
| -X633 | Intermediate stroke for double rod cylinder |

* -X633: Intermediate stroke in 5 mm increments only

| Bore size [mm] | 125 | 140 | 160 | 180 | 200 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Double rod |  |  |  |  |
| Fluid | Air |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  | 1.05 MPa |  |
| Maximum operating pressure | 1.0 MPa |  |  | 0.7 MPa |  |
| Minimum operating pressure | 0.05 MPa |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ $\qquad$ |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  | 20 to $400 \mathrm{~mm} / \mathrm{s}$ |  |
| Cushion | Rubber bumper |  |  |  |  |
| Allowable kinetic energy [J] | 7.4 | 9.8 | 12.4 |  |  |
| Stroke length tolerance | $+1.4 \mathrm{~mm} * 1$ |  |  |  |  |

*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. ( $\leftrightarrows$ p. 59) | Suffix "-XB10" to the end of standard model number. ( $\Delta>$ 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 CQ2WB160-175DCZ with 10 mm width spacer inside The $B$ dimension is 266 mm . | Part no.: CQ2WB160-165DCZ-XB10 Makes 165 mm stroke tube. The $B$ dimension is 256 mm . |

## CQ2W Series

## Allowable Kinetic Energy

Load Mass and Piston Speed

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

Kinetic energy $E[J]=\frac{(m 1+m 2) V^{2}}{2}$
m1: Mass of cylinder movable parts [kg]
m2: Load mass
[kg]
V: Piston speed [m/s]

## 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

| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | 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

| Bore size [mm] |  | $\mathbf{1 2 5}$ | $\mathbf{1 4 0}$ | $\mathbf{1 6 0 , 1 8 0}, \mathbf{2 0 0}$ |
| :--- | :--- | :---: | :---: | :---: |
| Rod end male <br> 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


## Theoretical Output

| Bore size <br> $[\mathrm{mm}]$ | Operating pressure [MPa] |  |  |
| :---: | :---: | :---: | :---: |
|  | 0.3 | 0.5 | 0.7 |
|  | 3376 | 5627 | 7878 |
| $\mathbf{1 4 0}$ | 4313 | 7188 | 10063 |
| $\mathbf{1 6 0}$ | 5655 | 9425 | 13195 |
| $\mathbf{1 8 0}$ | 7257 | 12095 | 16933 |
| $\mathbf{2 0 0}$ | 9048 | 15080 | 21112 |

# Compact Cylinder: Large Bore Size Double Acting, Double Rod <br> CQ2W Series 

## 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 |

## Additional Weight

| $\begin{array}{c}\text { Bore size } \\ {[\mathrm{mm}]}\end{array}$ |  | 125 | 140 | 160 |
| :--- | :--- | :--- | :--- | :--- |
| 180 |  |  |  |  |
| 200 |  |  |  |  |$]$

Calculation: (Example) CDQ2WB125-30DCMZ

- Basic weight: CDQ2WB125-30DCZ $\cdots .6 .11 \mathrm{~kg}$
- Additional weight: Rod end male thread $\cdots . .0 .94 \mathrm{~kg}$

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

Both ends tapped
(When the stroke length exceeds 100 mm )


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


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

## CQ2W Series

Construction

## Rod end male thread



## Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | 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 $\square$ 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 $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| 125 | CQ2WB125-PS |  |
| 140 | CQ2WB140-PS |  |
| $\mathbf{1 6 0}$ | CQ2WB160-PS |  |
| $\mathbf{1 8 0}$ | CQ2WB180-PS |  |
| $\mathbf{2 0 0}$ | 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 Double Acting, Double Rod <br> CQ2W Series 

## Bore Size

## $\varnothing 125$ to ø200

The dimensions are the same with or without an auto switch magnet.
Through-hole: CDQ2WB

$\underline{2 \times \mathbf{H} \text { thread effective depth } \mathbf{C} \quad 2 \times 4 \times \varnothing \mathbf{O B} \text { counterbore depth } \mathbf{R B}, ~}$ (Also back cover) $2 \times 4 \times \varnothing \mathbf{O B}$ coun


[mm]

| Bore size [mm] | Standard stroke range | A | B | $B_{1}$ | C*3 | D | E | H | J | K | L | M | M1 | $\mathrm{M}_{2}$ | N | OA | OB | Q | RA | RB | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 125 | $\begin{gathered} 10,20,30,40,50 \\ 75,100,125,150 \\ 175,200,250,300 \end{gathered}$ | 115 | 83 | 2.5 | 30 (22.5) | 36 | 142 | M22 x 2.5 | 11 | 32 | 16 | 114 | - | - | 12.5 | M14 $\times 2$ | 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 $\times 2$ | 21.2 | 24.5 | 25 | 18.4 | 168 |
| 160 |  | 125 | 91 | 2.5 | 33 (26.5) | 40 | 178 | $\mathrm{M} 24 \times 3$ | 10 | 36 | 17 | 144 | - | - | 14.5 | $\mathrm{M} 16 \times 2$ | 24.2 | 27.5 | 28 | 21.2 | 188 |
| 180 |  | 136 | 102 | 3 | 33 | 40 | 204 | $\mathrm{M} 24 \times 3$ | 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 For sizes $\varnothing 125$ to $\varnothing 160$ with a stroke of 10 mm or less, and for sizes $\varnothing 180$ and $\varnothing 200$ with a stroke of 20 mm or less, the product comes with an OA through thread. *3 ( ): Values of effective length in one side for 10 mm stroke model

* The positions of double rod width across flats are not the same.


## Rod end male thread



# Compact Cylinder: Anti-lateral Load CQ2 $\square S$ Series ø32, ø40, ø50, ø63, ø80, ø100 

How to Order


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.

| 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 $\Rightarrow$ p. 69
For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions L and $L_{1}$ ) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by 10 mm (-XC2) cylinder. For details $\Rightarrow$ p. 166

Cushion
Rubber bumper
4 Port thread type

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

*1 The bore sizes available with Onetouch fittings are $\varnothing 32$ to $\varnothing 63$.
(5) Cylinder stroke (For details on the minimum stroke for auto switch mounting $\Rightarrow$ p. 145) [mm]

| Bore size | Standard stroke |
| :---: | :---: |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3}, \mathbf{8 0}, \mathbf{1 0 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 67

| 12 Number of auto switches |
| :--- |
| Nil |
| S |

## 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


For details on auto switch mounting $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{array}{\|c\|} \hline 0.5 \\ \text { (Nil) } \\ \hline \end{array}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{array}{\|c} \hline 3 \\ \text { (L) } \end{array}$ | $\begin{gathered} 5 \\ (\mathrm{Z}) \end{gathered}$ | None (N) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | C circuit | Relay, PLC |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | (2-color indicator) |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV* ${ }^{\text {* }}$ | M9PA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | $\underset{\substack{\text { Magnetic field resistant } \\(2 \text {-color indicator) }}}{\substack{\text { in }}}$ |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline \text { No } \\ \hline \end{array}$ | (NPN ${ }_{\text {equire }}^{3 \text {-wivalent) }}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
| ه0 | - |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | - | - | $\bigcirc$ | $\bigcirc$ | - | - | - | Relay, |
| - |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V} 100 \mathrm{~V}$ or less |  | A90V | A90 | - | - | - | - | - | - | IC circuit | PLC |

*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 | $\cdots \ldots \ldots . \mathrm{Nil}$ | (Example) M9NW |
| :--- | :--- | :--- |
| 1 m | $\cdots \ldots \ldots . \mathrm{M}$ | (Example) M9NWM |
| 3 m | $\cdots \ldots \ldots . \mathrm{L}$ | (Example) M9NWL |
| 5 m | $\cdots \ldots \ldots . \mathrm{Z}$ | (Example) M9NWZ |

* There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152
* Solid state auto switches marked with " $\bigcirc$ " are produced upon receipt of order.

$$
\text { For details } \Rightarrow \text { p. } 15
$$

## CQ2 $\square S$ Series

| Symbol |  |
| :---: | :---: |
| Rubber bumper |  |
|  |  |
| $\begin{array}{\|c\|} \hline \text { Made to } \\ \text { Order } \end{array}$ | Made to Order Common Specifications (For details $\Rightarrow$ p. 155 to 188) |
| Symbol | Specifications |
| -XA $\square$ | Change of rod end shape |
| -XB10 | Intermediate stroke (Using exclusive body) |
| -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 |
| -XC26口 | Double clevis width/Double knuckle width $12.5 \mathrm{~mm}, 16.5 \mathrm{~mm}$, or 19.5 mm : With double clevis and double knuckle joint |
| -XC27 | Double clevis pin/Double knuckle joint pin material: Stainless steel 304 |
| -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) |
| -X271 | Fluororubber seals |
| -X1876 | Cylinder tube: With concave boss on head end |
| Stainless steel accessories are also available. <br> For details $\Rightarrow$ 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 $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |
| Cushion | Rubber bumper |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| Stroke length tolerance | $+1.0 \mathrm{~mm} * 1$ |  |  |  |  |  |

*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. ( $\zeta$ p. 65) |  | Suffix "-XB10" to the end of standard model number. $(\Rightarrow$ 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 | Stroke range | Bore size | Stroke range |
|  | 32 to 100 | 1 to 99 | 32, 40 | 6 to 99 |
|  |  |  | 50 to 100 | 11 to 99 |
| Example | Part no.: CQ2BS50-57DCZ <br> CQ2BS50-75DCZ with 18 mm width <br> spacer inside <br> The $B$ dimension is 125.5 mm . |  | Part no.: CQ2BS50-57DCZ-XB10 Makes 57 stroke tube. <br> The $B$ dimension is 107.5 mm . |  |

- In the case of exclusive body type with $\varnothing 32$ to $\varnothing 100(-X B 10)$ 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 <br> $[\mathrm{mm}]$ | Foot*1 $^{*}$ | Compact foot*1 | Flange | Double clevis | Double clevis <br> pivot bracket |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{3 2}$ | CQ-L032 | CQ-LC032 | CQ-F032 | CQ-D032 | CQ-C032 |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 | CQ-D040 | CQ-C040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 | CQ-D050 | CQ-C050 |
| $\mathbf{6 3}$ | CQ-L063 | CQ-LC063 | CQ-F063 | CQ-D063 | CQ-C063 |
| $\mathbf{8 0}$ | CQ-L080 | CQ-LC080 | CQ-F080 | CQ-D080 | CQ-C080 |
| $\mathbf{1 0 0}$ | 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) $\Rightarrow$ 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 .

## $\uparrow$ Precautions

## Allowable Lateral Load at Rod End

## Without Auto Switch Magnet



## Weight

With Auto Switch Magnet



W（Mounting orientation：Horizontal）

## Without Auto Switch Magnet

［g］

| Bore size ［mm］ | Cylinder stroke［mm］ |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| 32 | 134 | 154 | 174 | 193 | 213 | 233 | 252 | 272 | 291 | 311 | 457 | 556 |
| 40 | 211 | 232 | 254 | 275 | 297 | 318 | 340 | 361 | 383 | 404 | 577 | 689 |
| 50 | － | 369 | 402 | 435 | 467 | 500 | 533 | 566 | 598 | 632 | 902 | 1073 |
| 63 | － | 557 | 595 | 633 | 671 | 709 | 747 | 786 | 824 | 862 | 1189 | 1386 |
| 80 | － | 983 | 1043 | 1104 | 1164 | 1224 | 1284 | 1345 | 1405 | 1465 | 1985 | 2281 |
| 100 | － | 1711 | 1792 | 1872 | 1952 | 2033 | 2113 | 2194 | 2274 | 2354 | 3086 | 3494 |

With Auto Switch Magnet
［g］

| Bore size ［mm］ | Cylinder stroke［mm］ |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| 32 | 191 | 211 | 230 | 250 | 270 | 289 | 309 | 329 | 348 | 368 | 468 | 567 |
| 40 | 284 | 305 | 327 | 348 | 369 | 391 | 412 | 434 | 455 | 477 | 589 | 701 |
| 50 |  | 480 | 513 | 546 | 579 | 611 | 644 | 677 | 710 | 743 | 915 | 1087 |
| 63 |  | 710 | 748 | 787 | 825 | 863 | 901 | 939 | 977 | 1015 | 1211 | 1408 |
| 80 | － | 1229 | 1289 | 1350 | 1410 | 1470 | 1530 | 1591 | 1651 | 1711 | 2008 | 2305 |
| 100 | － | 2070 | 2150 | 2231 | 2311 | 2391 | 2472 | 2552 | 2633 | 2713 | 3121 | 3529 |

Theoretical Output

| Bore size | Operating direction | Operating pressure［MPa］ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ［mm］ |  | 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 |  |

Additional Weight

| Bore size［mm］ |  | 32 | 40 | 50 | 63 | 80 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped |  | 6 | 6 | 6 | 19 | 45 | 45 |
| Rod end male thread | Male thread | 26 | 27 | 53 | 53 | 120 | 175 |
|  | Nut | 17 | 17 | 32 | 32 | 49 | 116 |
| With boss on head end |  | 5 | 7 | 13 | 25 | 45 | 96 |
| Foot（Including mounting bolts） |  | 120 | 138 | 219 | 297 | 589 | 968 |
| Compact foot（Including mounting bolts） |  | 94 | 109 | 172 | 234 | 492 | 762 |
| Rod flange（Including mounting bolts） |  | 180 | 214 | 373 | 559 | 1056 | 1365 |
| Head flange（Including mounting bolts） |  | 165 | 198 | 348 | 534 | 1017 | 1309 |
| Double clevis（Incuding pin，retaining tings，bolts） |  | 151 | 196 | 393 | 554 | 1109 | 1887 |

Calculation：（Example）CDQ2DS32－20DCMZ
－Basic weight ：CDQ2BS32－20DCZ．．．．． 250 g
－Additional weight：Both ends tapped…．．．．．．．．． 6 g
Rod end male thread …．．．．．．．．．．．．．．．．．．．．．．．．．． 151 g
Double clevis ．．．．．．．．．．．．．．．． 151 g 450 g

Add each weight of auto switches when auto switches are mounted
［g］

## CQ2 $\square$ S Series

## Through-hole Type Mounting Bolt for the CQ2 $\square$ 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.


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2BS32-5DCZ | 9 | 40 | CQ-M5 x 40L |
| -10DCZ |  | 45 | x 45L |
| -15DCZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DCZ |  | 55 | x 55L |
| -25DCZ |  | 60 | x 60L |
| -30DCZ |  | 65 | x 65L |
| -35DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40DCZ |  | 75 | x 75L |
| -45DCZ |  | 80 | x 80L |
| -50DCZ |  | 85 | x 85L |
| -75DCZ |  | 120 | $\times 120 \mathrm{~L}$ |
| -100DCZ |  | 145 | x 145L |
| CQ2BS40-5DCZ | 7.5 | 45 | CQ-M5 x 45L |
| -10DCZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -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 | $\times 150 \mathrm{~L}$ |
| CQ2BS50-10DCZ | 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 | $\times 80 \mathrm{~L}$ |
| -40DCZ |  | 85 | x 85L |
| -45DCZ |  | 90 | x 90L |
| -50DCZ |  | 95 | x 95L |
| -75DCZ |  | 130 | x 130L |
| -100DCZ |  | 155 | $\times 155 \mathrm{~L}$ |


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2BS63-10DCZ | 14.5 | 60 | CQ-M8 x 60L |
| -15DCZ |  | 65 | x 65L |
| -20DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -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 | $\times 160 \mathrm{~L}$ |
| CQ2BS80-10DCZ | 15 | 65 | CQ-M10 x 65L |
| -15DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DCZ |  | 75 | x 75L |
| -25DCZ |  | 80 | x 80L |
| -30DCZ |  | 85 | x 85L |
| -35DCZ |  | 90 | $\times \mathrm{90L}$ |
| -40DCZ |  | 95 | x 95L |
| -45DCZ |  | 100 | x 100L |
| -50DCZ |  | 105 | x 105L |
| -75DCZ |  | 140 | x 140L |
| -100DCZ |  | 165 | x 165L |
| CQ2BS100-10DCZ | 15.5 | 75 | CQ-M10 $\times$ 75L |
| -15DCZ |  | 80 | x 80L |
| -20DCZ |  | 85 | x 85L |
| -25DCZ |  | 90 | $\times \mathrm{90L}$ |
| -30DCZ |  | 95 | x 95L |
| -35DCZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -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 $\square$ S: With Auto Switch Magnet

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDQ2BS32-5DCZ | 9 | 50 | CQ-M5 x 50L |
| -10DCZ |  | 55 | x 55L |
| -15DCZ |  | 60 | x 60L |
| -20DCZ |  | 65 | x 65L |
| -25DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -30DCZ |  | 75 | $\times 75 \mathrm{~L}$ |
| -35DCZ |  | 80 | x 80L |
| -40DCZ |  | 85 | x 85L |
| -45DCZ |  | 90 | x 90L |
| -50DCZ |  | 95 | x 95L |
| -75DCZ |  | 120 | x 120L |
| -100DCZ |  | 145 | x 145L |
| CDQ2BS40-5DCZ | 7.5 | 55 | CQ-M5 x 55L |
| -10DCZ |  | 60 | x 60L |
| -15DCZ |  | 65 | x 65L |
| -20DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -25DCZ |  | 75 | x 75L |
| -30DCZ |  | 80 | $\times 80 \mathrm{~L}$ |
| -35DCZ |  | 85 | x 85L |
| -40DCZ |  | 90 | x 90L |
| -45DCZ |  | 95 | x 95L |
| -50DCZ |  | 100 | x 100L |
| -75DCZ |  | 125 | x 125L |
| -100DCZ |  | 150 | x 150L |
| CDQ2BS50-10DCZ | 12.5 | 65 | CQ-M6 x 65L |
| -15DCZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -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. |
| :---: | :---: | :---: | :---: |
| CDQ2BS63-10DCZ | 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 |
| CDQ2BS80-10DCZ | 15 | 75 | CQ-M10 $\times 75 \mathrm{~L}$ |
| -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 |
| CDQ2BS100-10DCZ | 15.5 | 85 | CQ-M10 $\times 85 \mathrm{~L}$ |
| -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 |

## Without auto switch magnet



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 | - |  |

Rod end male thread


Replacement Parts/Seal Kit

| Bore size $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| 32 | CQ2B32-PS |  |
| 40 | CQ2B40-PS |  |
| 50 | CQ2B50-PS |  |
| 63 | CQ2B63-PS | Set of nos. (11), (12), (13) |
| 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)


## CQ2 $\square S$ Series

## Bore Size

## Ø32 to Ø 100 with/Without Auto Switch Magnet

## Through-hole: CDQ2BS



| Bore size [mm] | Stroke range [ mm ] | Without auto switch magnet |  | With auto switch magnet |  | C | D | E | F | H | J | K | L | M | N | 0 | P | Q | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | A | B |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 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 | $\begin{array}{\|c\|} 14 \\ \text { depth } 10.5 \end{array}$ | 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 | $\begin{gathered} 17.5 \\ \text { depth } 13.5 \end{gathered}$ | 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 | $\begin{gathered} 17.5 \\ \text { depth } 13.5 \end{gathered}$ | 3/8 | 23 | 123.5 | 25 |
|  | 75, 100 | 85 | 73 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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

Both ends tapped


## Rod end male thread

Width across flats $\mathbf{B}_{1}$


|  |  | $[\mathrm{mm}]$ |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{3 2}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{4 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{5 0}$ | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |
| $\mathbf{8 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |
| $\mathbf{1 0 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |


|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{3 2}$ | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |
| $\mathbf{4 0}$ | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |
| $\mathbf{5 0}$ | 27 | 26 | 11 | 33.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |
| $\mathbf{6 3}$ | 27 | 26 | 11 | 33.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |
| $\mathbf{8 0}$ | 32 | 32.5 | 13 | 43.5 | $\mathrm{M} 22 \times 1.5$ | 35.5 |
| $\mathbf{1 0 0}$ | 41 | 32.5 | 16 | 43.5 | $\mathrm{M} 26 \times 1.5$ | 35.5 |

The dimensions with boss on head end are equivalent to those of the standard type, double acting, single rod. $\Rightarrow$ 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 ø32, ø40, ø50, ø63, ø80, ø100 

How to Order


| 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 |
| :---: | :---: |
| $\mathbf{H}$ | Air-hydro |


| $\mathbf{3}$ Bore size |  |
| :---: | :---: |
| $\mathbf{3 2}$ | 32 mm |
| $\mathbf{4 0}$ | 40 mm |
| $\mathbf{5 0}$ | 50 mm |
| $\mathbf{6 3}$ | 63 mm |
| $\mathbf{8 0}$ | 80 mm |
| $\mathbf{1 0 0}$ | 100 mm |

4 Port thread type

| Nil | Rc |
| :---: | :---: |
| TN | NPT |
| TF | G |
| F | Built-in One-touch <br> fittings |

*1 The bore sizes available with One-touch fittings are 032 to 063 . 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 $\Rightarrow$ p. 145) [mm]

| Bore size | Standard stroke |
| :---: | :---: |
| $\mathbf{3 2 , 4 0}, \mathbf{5 0}$ | $125,150,175$ |
| $\mathbf{6 3}, \mathbf{8 0}, \mathbf{1 0 0}$ | $200,250,300$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 73

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 $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{array}{\|c\|} \hline 0.5 \\ \text { (Nil) } \\ \hline \end{array}$ | $\begin{gathered} \hline 1 \\ (\mathrm{M}) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 3 \\ (\mathrm{~L}) \end{gathered}$ | $\begin{gathered} 5 \\ (Z) \\ \hline \end{gathered}$ | None <br> ( N ) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit | Relay, PLC |
|  | - |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | - | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | 16 circuit |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | - | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA* ${ }^{1}$ | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | (2-color indicator) |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV* ${ }^{\text {* }}$ | M9PA* ${ }^{\text {+ }}$ | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | (eametic $\begin{gathered}\text { Magetic field resistant } \\ (2 \text { (2-color indicator) }\end{gathered}$ |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  | - | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline \text { No } \\ \hline \end{array}$ | (NPN $\begin{aligned} & \text { ewirive } \\ & \text { equivent) }\end{aligned}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
|  |  |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | - | Relay, |
|  |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V or less | A90V | A90 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | PLC |

[^10][^11]
## CQ2 Series



1 Excludes the air-hydro
*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 $\Rightarrow$ p. 26


## $\triangle$ Precautions

Specifications
Pneumatic type

| 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 $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |
| Cushion | Rubber bumper |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.29 | 0.52 | 0.91 | 1.54 | 2.71 | 4.54 |
| Stroke length tolerance | $+1.4 \mathrm{~mm} * 1$ |  |  |  |  |  |

*1 Stroke length tolerance does not include the amount of bumper change.
Air-hydro type

| Bore size [mm] | 32 | 40 | 50 | 63 | 80 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |  |
| Fluid | Turbine oil* ${ }^{\text {* }}$ |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |
| Minimum operating pressure | 0.18 MPa | 0.1 MPa |  |  |  |  |
| Ambient and fluid temperatures | 5 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |
| Piston speed | 5 to $50 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |
| Stroke length tolerance | $\underset{0}{+1.4 \mathrm{~mm} * 2}$ |  |  |  |  |  |

*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 <br> standard model number. ( $\triangle$ p. 72) | Suffix "-XB10" to the end of <br> standard model number. ( $\checkmark$ p. 72) |
| Description | Strokes in 1 mm increments are <br> available by installing a spacer in <br> the standard stroke cylinder. | Strokes in 1 mm increments are <br> available by using an exclusive body <br> with the specified stroke. |
| Stroke range | 101 to 299 | 101 to 299 |
| Example | Part no.: CQ2A50-166DCZ <br> CQ2A50-175DCZ with 9 mm <br> 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 $^{* 1}$ | Compact foot*1 | Flange | Double clevis | Double clevis <br> pivot bracket |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{3 2}$ | CQ-L032 | CQ-LC032 | CQ-F032 | CQ-D032 | CQ-C032 |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 | CQ-D040 | CQ-C040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 | CQ-D050 | CQ-C050 |
| $\mathbf{6 3}$ | CQ-L063 | CQ-LC063 | CQ-F063 | CQ-D063 | CQ-C063 |
| $\mathbf{8 0}$ | CQ-L080 | CQ-LC080 | CQ-F080 | CQ-D080 | CQ-C080 |
| $\mathbf{1 0 0}$ | 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) $\Rightarrow$ 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 .

## Allowable Lateral Load at Rod End



Theoretical Output


## Weight

## Without Auto Switch Magnet

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 125 | 150 | 175 | 200 | 250 | 300 |
| $\mathbf{3 2}$ | 708 | 817 | 918 | 1017 | 1215 | 1415 |
| $\mathbf{4 0}$ | 888 | 997 | 1107 | 1217 | 1438 | 1657 |
| $\mathbf{5 0}$ | 1352 | 1517 | 1682 | 1841 | 2177 | 2507 |
| $\mathbf{6 3}$ | 1706 | 1900 | 2095 | 2292 | 2676 | 3065 |
| $\mathbf{8 0}$ | 2832 | 3130 | 3429 | 3725 | 4324 | 4921 |
| $\mathbf{1 0 0}$ | 4540 | 4906 | 5270 | 5634 | 6367 | 7096 |

With Auto Switch Magnet

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke $[\mathrm{mm}]$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 125 | 150 | 175 | 200 | 250 | 300 |
| $\mathbf{3 2}$ | 726 | 826 | 927 | 1026 | 1224 | 1424 |
| $\mathbf{4 0}$ | 902 | 1012 | 1121 | 1231 | 1451 | 1671 |
| $\mathbf{5 0}$ | 1367 | 1532 | 1697 | 1856 | 2192 | 2522 |
| $\mathbf{6 3}$ | 1730 | 1924 | 2119 | 2316 | 2700 | 3089 |
| $\mathbf{8 0}$ | 2856 | 3154 | 3453 | 3749 | 4348 | 4945 |
| $\mathbf{1 0 0}$ | 4578 | 4944 | 5308 | 5672 | 6405 | 7134 |

## Additional Weight

| Bore size [mm] |  | $\mathbf{3 2}$ | $\mathbf{4 0}$ | 50 | $\mathbf{6 3}$ | $\mathbf{8 0}$ | 100 |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Rod end male <br> 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

- Additional weight: Rod end male thread ......... 43
$\begin{array}{r}\text { Double clevis .................... } 151 \mathrm{~g} \\ \hline 1211 \mathrm{~g}\end{array}$

Add each weight of auto switches when
auto switches are mounted

[g]

## CQ2 Series

Construction


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 |  |
| 11 | Rod end nut | Carbon steel | Zinc chromated |
| 12 | Magnet | - | For CDQ2A $\square$ only |
| 13 | One-touch fitting | - | $\varnothing 32$ to $ø 63$ |
| 14 | Rod seal | NBR |  |
| 15 | Piston seal | NBR |  |
| 16 | Tube gasket | NBR |  |

## Replacement Parts/Seal Kit

Pneumatic Type

| Bore size $[\mathrm{mm}]$ | Kit no. |  |
| :---: | :---: | :---: |
| $\mathbf{3 2}$ | CQ2A32-L-PS |  |
| $\mathbf{4 0}$ | CQ2A40-L-PS |  |
| $\mathbf{5 0}$ | CQ2A50-L-PS |  |
| $\mathbf{6 n}$ | Set of nos. (14), (15), (16) |  |
| $\mathbf{8 0}$ |  |  |
| 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 $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| $\mathbf{3 2}$ | CQ2AH32-L-PS |  |
| $\mathbf{4 0}$ | CQ2AH40-L-PS |  |
| $\mathbf{5 0}$ | CQ2AH50-L-PS |  |
| $\mathbf{6 3}$ | CQ2AH63-L-PS |  |
| $\mathbf{8 0}$ | Set of nos. (14), (15), (16) |  |
| $\mathbf{1 0 0}$ | CQ2AH80-L-PS |  |
|  | 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)

## Compact Cylinder: Long Stroke <br> Double Acting, Single Rod <br> CQ2 Series

## Bore Size

## Ø32 to Ø 100 with/Without Auto Switch Magnet

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

## Both ends tapped: CDQ2A



| Bore size [mm] | Stroke range [mm] | A | B | C | D | E | H | J | K | L | M | 0 | P | Q | R | Th9 | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | $\begin{aligned} & 125,150, \\ & 175,200 \\ & 250,300 \end{aligned}$ | 62.5 | 45.5 | 13 | 16 | 45 | M8 x 1.25 | 4.5 | 14 | 17 | 34 | M6 x 1.0 | 1/8 | 10 | 10 | $22{ }_{-0.052}^{0}$ | 49.5 | 14 |
| 40 |  | 72 | 55 | 13 | 16 | 52 | M8 $\times 1.25$ | 5 | 14 | 17 | 40 | M6 x 1.0 | 1/8 | 12.5 | 10 | $28{ }_{-0.052}^{0}$ | 57 | 15 |
| 50 |  | 73.5 | 55.5 | 15 | 20 | 64 | M10 $\times 1.5$ | 7 | 17 | 18 | 50 | M $8 \times 1.25$ | 1/4 | 14 | 14 | $35{ }_{-0.062}^{0}$ | 71 | 19 |
| 63 |  | 75 | 57 | 15 | 20 | 77 | M10 $\times 1.5$ | 7 | 17 | 18 | 60 | M10 $\times 1.5$ | 1/4 | 16.5 | 18 | $35{ }_{-0.062}^{0}$ | 84 | 19 |
| 80 |  | 86 | 66 | 21 | 25 | 98 | M16 x 2.0 | 6 | 22 | 20 | 77 | M12 $\times 1.75$ | 3/8 | 19 | 22 | $43{ }_{-0.062}^{0}$ | 104 | 25 |
| 100 |  | 97.5 | 75.5 | 27 | 30 | 117 | M20 $\times 2.5$ | 6.5 | 27 | 22 | 94 | M12 $\times 1.75$ | 3/8 | 23 | 22 | $59{ }_{-0.074}^{0}$ | 123.5 | 25 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 73
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145

Rod end male thread


|  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |  |
| $\mathbf{3 2}$ | 22 | 20.5 | 8 | 38.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |  |
| $\mathbf{4 0}$ | 22 | 20.5 | 8 | 38.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |  |
| $\mathbf{5 0}$ | 27 | 26 | 11 | 43.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |  |
| $\mathbf{6 3}$ | 27 | 26 | 11 | 43.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |  |
| $\mathbf{8 0}$ | 32 | 32.5 | 13 | 53.5 | $\mathrm{M} 22 \times 1.5$ | 35.5 |  |
| $\mathbf{1 0 0}$ | 41 | 32.5 | 16 | 53.5 | $\mathrm{M} 26 \times 1.5$ | 35.5 |  |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, single rod. $\Rightarrow$ 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, Single Rod CQ2K Series $\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63$ 

How to Order


## Mounting

| B | Through-hole | $ø 12$ to ø63 |
| :---: | :---: | :---: |
| A | Both ends tapped | ø40, ø50, ø63 |
| 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:
Without auto switch magnet $\Rightarrow$ p. 81
With auto switch magnet $\Rightarrow$ p. 82
* For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions L and L1) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by 10 mm (-XC2) cylinder.
For details $\Rightarrow$ p. 166


## Cylinder stroke

(For details on the minimum stroke for auto switch mounting $\Rightarrow$ p. 145) $[\mathrm{mm}]$

| Bore size | Standard stroke |
| :---: | :--- |
| $\mathbf{1 2 , 1 6}$ | $5,10,15,20,25,30$ |
| $\mathbf{2 0 , 2 5}$ | $5,10,15,20,25,30,35$ <br> $40,45,50$ |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35$ <br> $40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3}$ | $10,15,20,25,30,35,40$ <br> $45,50,75,100$ |

[^12]
## Bore size

| $12^{* 1}$ | 12 mm |
| :---: | :---: |
| $\mathbf{1 6}$ | 16 mm |
| $\mathbf{2 0}$ | 20 mm |
| $\mathbf{2 5}$ | 25 mm |
| $\mathbf{3 2}$ | 32 mm |
| 40 | 40 mm |
| $\mathbf{5 0}$ | 50 mm |
| $\mathbf{6 3}$ | 63 mm |

*1 When $\varnothing 12$ with auto switch magnet is required, the body option should be with rubber bumper (C).
Example) CDQ2KB12-30DCZ
(3) Port thread type

| Nil | M thread | $\varnothing 12$ to $\varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc |  |
| TN | NPT | $\varnothing 32$ to $\varnothing 63$ |
| TF | G |  |
| F | Built-in One-touch fittings*1 |  |

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

* For cylinders without an auto switch magnet, $M$ threads are compatible only with $\varnothing 32-5$ mm stroke.


## 5 Action

D $\quad$ Double acting

## 6 Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{F}$ | With boss on head end |
| $\mathbf{C}$ | With rubber bumper |
| ( $\varnothing 12$ with auto switch magnet only) |  |
| $\mathbf{M}$ | Rod end male thread |

* Combined body options "FM" can be selected.


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

| 7 Auto switch mounting groove |  |  | 8 Auto switch |  | 9 Number of auto switches |  | 10 Made to order common specifications <br> For details $\Rightarrow$ p. 79 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Z | ¢12 to 825 | 2 suffaces | Nil | Without auto switch | Nil | 2 |  |
| 2 | ø32 to ø63 | 4 suffaces | * For applicable auto switches, referto the table below. |  | 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) CDQ2KB32-30DZ

For details on auto switch mounting $\triangleleft$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{gathered} 0.5 \\ \text { (Nil) } \end{gathered}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{array}{\|c} 3 \\ (\mathrm{~L}) \\ \hline \end{array}$ | $\begin{gathered} 5 \\ (\mathrm{Z}) \end{gathered}$ | None <br> (N) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit | Relay, PLC |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 二 | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | (2-color indicator) |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV*1 | M9PA* ${ }^{\text {1 }}$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  | (2-color indicator) |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Magnetic field resistant $(2$-color indicator) |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  | Grommet | $\begin{array}{\|l\|} \hline \text { Yes } \\ \hline \text { No } \\ \hline \end{array}$ | (NPN ${ }_{\text {equivivalent) }}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
| 휸융 | - |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | Relay, |
| 年 |  |  |  |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 00 V or less | A90V | A90 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | PLC |

*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.

[^13]* There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152


## CQ2K Series

| Symbol |  |
| :---: | :---: |
|  | Without cushion |
|  |  |
|  | Rubber bumper |
|  |  |
| Made to Order $\qquad$ | Made to Order Common Specifications (For details $\leftrightarrows$ p. 155 to 188) |
| Symbol | Specifications |
| -XA $\square$ | Change of rod end shape |
| -XB6 | Heat-resistant cylinder ( -10 to $150^{\circ} \mathrm{C}$ ) |
| -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/ 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*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 $\Rightarrow$ p. 26

Specifications

| Bore size [mm] | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |  |  |  |
| Fluid | Air |  |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |  |
| Minimum operating pressure | 0.07 MPa |  | 0.05 MPa |  |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | Without cushion or With rubber bumper (ø12 only) *1 |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.022 | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 |
|  | $0.043^{* 1}$ |  |  |  |  |  |  |  |
| Stroke length tolerance | ${ }_{0}^{+1.0} \mathrm{~mm}^{2}$ |  |  |  |  |  |  |  |
| Rod non-rotating accuracy | $\pm 2^{\circ}$ |  | $\pm 1^{\circ}$ |  | $\pm 0.8^{\circ}$ |  |  |  |

*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. ( $\zeta$ p. 77) |  | Suffix "-XB10" to the end of standard model number. ( $\Delta$ 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 CQ2KB50-75DZ with 18 mm width spacer inside The $B$ dimension is 115.5 mm . |  | Part no.: CQ2KB50-57DZ-XB10 Makes 57 mm stroke tube. The B dimension is 97.5 mm . |  |

## Mounting Bracket Part Nos.

| Bore size <br> $[\mathrm{mm}]$ | Foot*1 $^{*}$ | Compact foot*1 | Flange | Double clevis | Double clevis <br> pivot bracket |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 | CQ-D040 | CQ-C040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 | CQ-D050 | CQ-C050 |
| $\mathbf{6 3}$ | 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) $\leftrightharpoons$ 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 .

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

## Weight

Without Auto Switch Magnet
［g］

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke $[\mathrm{mm}]$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 60 | 10 | 15 | 20 | 25 | 30 | 30 | 35 | 40 | 45 | 50 | 75 |  |  |
| 100 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\mathbf{1 6}$ | 58 | 67 | 76 | 85 | 94 | 103 | - | - | - | - | - | - |  |  |
| $\mathbf{2 0}$ | 103 | 117 | 131 | 145 | 159 | 173 | 187 | 201 | 215 | 229 | - | - |  |  |
| $\mathbf{2 5}$ | 137 | 152 | 167 | 182 | 197 | 212 | 227 | 242 | 257 | 272 | - | - |  |  |
| $\mathbf{3 2}$ | 196 | 215 | 234 | 253 | 272 | 291 | 310 | 329 | 347 | 366 | 506 | 601 |  |  |
| $\mathbf{4 0}$ | 205 | 226 | 248 | 269 | 291 | 312 | 333 | 355 | 376 | 398 | 570 | 682 |  |  |
| $\mathbf{5 0}$ | - | 356 | 390 | 424 | 457 | 491 | 525 | 559 | 592 | 626 | 901 | 1075 |  |  |
| $\mathbf{6 3}$ | - | 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



Additional Weight

| Bore size［mm］ |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | - | - | - | - | - | 6 | 6 | 19 |  |
| Rod end <br> male thread | Male thread | 1.5 | 3 | 6 | 12 | 26 | 27 | 53 | 53 |
|  | Nut | 1 | 2 | 4 | 8 | 17 | 17 | 32 | 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
26 g
－Additional weight：Both ends tapped ．．．．．．．．．．．．．．．． 6

| Rod end male thread …．．．． 44 g |
| :--- |
| Double clevis …．．．．．．．．．．．．．．． 196 g |
| 572 g |

Add each weight of auto switches when
auto switches are mounted

## 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 $\Rightarrow$ p. 82
Example) CQ-M3 x 30L 2 pcs.
Type: Hexagon socket head cap screw Material: Chromium molybdenum steel Surface treatment: Zinc chromated

| Cylinder model | C | D | Mounting bolt part no. | $\mathrm{C}^{\prime}$ | D' | Mounting bolt part n . |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CQ2KB12-5D | 6.5 | 30 | CQ-M3 $\times 30 \mathrm{~L}$ | 6.5 | 30 | CQ-M3 x 30L |
| -10D |  | 35 | x 35L |  | 35 | x 35L |
| -15D |  | 40 | x 40L |  | 40 | x 40L |
| -20D |  | 45 | $\times 45 \mathrm{~L}$ |  | 45 | x 45L |
| -25D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | x 50L |
| -30D |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| CQ2KB16-5D | 5 | 30 | CQ-M3 $\times 30 \mathrm{~L}$ | 5 | 30 | CQ-M3 $\times$ 30L |
| -10D |  | 35 | $\times 35 \mathrm{~L}$ |  | 35 | $\times 35 \mathrm{~L}$ |
| -15D |  | 40 | $\times 40 \mathrm{~L}$ |  | 40 | x 40L |
| -20D |  | 45 | x 45L |  | 45 | x 45L |
| -25D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -30D |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| CQ2KB20-5D | 8 | 35 | CQ-M5 $\times 35 \mathrm{~L}$ | 9.5 | 35 | CQ-M5 x 35L |
| -10D |  | 40 | x 40L |  | 40 | x 40L |
| -15D |  | 45 | x 45L |  | 45 | x 45L |
| -20D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | x 50L |
| -25D |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | x 55L |
| -30D |  | 60 | $\times 60 \mathrm{~L}$ |  | 60 | x60L |
| -35D |  | 65 | x 65L |  | 65 | x 65L |
| -40D |  | 70 | $\times 70 \mathrm{~L}$ |  | 70 | x 70L |
| -45D |  | 75 | x 75L |  | 75 | x 75L |
| -50D |  | 80 | x 80L |  | 80 | x 80L |
| CQ2KB25-5D | 10 | 40 | CQ-M5 x 40L | 6.5 | 35 | CQ-M5 x 35L |
| -10D |  | 45 | x 45L |  | 40 | x 40L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |  | 45 | x 45L |
| -20D |  | 55 | $\times 55 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -25D |  | 60 | $\times 60 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -30D |  | 65 | $\times 65 \mathrm{~L}$ |  | 60 | x60L |
| -35D |  | 70 | $\times 70 \mathrm{~L}$ |  | 65 | x65L |
| -40D |  | 75 | x 75L |  | 70 | x 70L |
| -45D |  | 80 | x 80L |  | 75 | x 75L |
| -50D |  | 85 | x 85L |  | 80 | x 80L |
| CQ2KB32-5DZ | 8.5 | 40 | CQ-M5 x 40L | 10 | 40 | CQ-M5 x 40L |
| -10DZ |  | 45 | x 45L |  | 45 | x 45L |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | x 50L |
| -20DZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -25DZ |  | 60 | x 60L |  | 60 | x60L |
| -30DZ |  | 65 | x 65L |  | 65 | x 65L |
| -35DZ |  | 70 | $\times 70 \mathrm{~L}$ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40DZ |  | 75 | $\times 75 \mathrm{~L}$ |  | 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 |

## Head end mounting

Rod end mounting


| Cylinder model | C, $\mathbf{C}^{\prime}$ | D, $\mathbf{D}^{\prime}$ | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2KB40-5DZ | 7.5 | 35 | CQ-M5 x 35L |
| -10DZ |  | 40 | x 40L |
| -15DZ |  | 45 | x 45L |
| -20DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -25DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -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 |
| CQ2KB50-10DZ | 12.5 | 45 | CQ-M6 x 45L |
| -15DZ |  | 50 | x 50L |
| -20DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -25DZ |  | 60 | x 60L |
| -30DZ |  | 65 | x 65L |
| -35DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| -75DZ |  | 120 | x 120L |
| -100DZ |  | 145 | $\times 145 \mathrm{~L}$ |
| CQ2KB63-10DZ | 14.5 | 50 | CQ-M8 x 50L |
| -15DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 60 | x 60L |
| -25DZ |  | 65 | x 65L |
| -30DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 75 | x 75L |
| -40DZ |  | 80 | x 80L |
| -45DZ |  | 85 | x 85L |
| -50DZ |  | 90 | x 90L |
| -75DZ |  | 125 | x 125L |
| -100DZ |  | 150 | x 150L |

## Compact Cylinder: Non-rotating Rod Double Acting, Single Rod <br> CQ2K Series

## 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 $\Rightarrow$ 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. | $\mathbf{C}^{\prime}$ | D' | Mounting bolt part no. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CDQ2KB12-5DCZ | 5.5 | 35 | CQ-M3 x 35L | 5.5 | 40 | CQ-M3 x 40L |
| -10DCZ |  | 40 | x 40L |  | 45 | x 45L |
| -15DCZ |  | 45 | x 45L |  | 50 | $\times 50 \mathrm{~L}$ |
| -20DCZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 55 | x 55L |
| -25DCZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 60 | x 60L |
| -30DCZ |  | 60 | $\times 60 \mathrm{~L}$ |  | 65 | x 65L |
| CDQ2KB16-5DZ | 8 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ | 8 | 45 | CQ-M3 $\times 45 \mathrm{~L}$ |
| -10DZ |  | 45 | x 45L |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 55 | x 55L |
| -20DZ |  | 55 | x 55L |  | 60 | x 60L |
| -25DZ |  | 60 | x 60L |  | 65 | x65L |
| -30DZ |  | 65 | x 65L |  | 70 | x 70L |
| CDQ2KB20-5DZ | 10.5 | 40 | CQ-M5 x 40L | 7.5 | 45 | CQ-M5 x 45L |
| -10DZ |  | 45 | x 45L |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 60 | $\times 60 \mathrm{~L}$ |
| -25DZ |  | 60 | $\times 60 \mathrm{~L}$ |  | 65 | $\times 65 \mathrm{~L}$ |
| -30DZ |  | 65 | x 65L |  | 70 | x 70L |
| -35DZ |  | 70 | $\times 70 \mathrm{~L}$ |  | 75 | x 75L |
| -40DZ |  | 75 | x 75L |  | 80 | x 80L |
| -45DZ |  | 80 | x 80L |  | 85 | x 85L |
| -50DZ |  | 85 | x 85L |  | 90 | x 90L |
| CDQ2KB25-5DZ | 9.5 | 40 | CQ-M5 x 40L | 6.5 | 45 | CQ-M5 x 45L |
| -10DZ |  | 45 | x 45L |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 55 | x 55L |  | 60 | x60L |
| -25DZ |  | 60 | x 60L |  | 65 | x65L |
| -30DZ |  | 65 | x 65L |  | 70 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 70 | x 70L |  | 75 | x 75L |
| -40DZ |  | 75 | x 75L |  | 80 | x 80L |
| -45DZ |  | 80 | x 80L |  | 85 | x 85L |
| -50DZ |  | 85 | x 85L |  | 90 | x 90L |
| CDQ2KB32-5DZ | 8.5 | 50 | CQ-M5 x 50L | 10 | 50 | CQ-M5 x 50L |
| -10DZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -15DZ |  | 60 | x60L |  | 60 | x60L |
| -20DZ |  | 65 | x 65L |  | 65 | x 65L |
| -25DZ |  | 70 | $\times 70 \mathrm{~L}$ |  | 70 | $\times 70 \mathrm{~L}$ |
| -30DZ |  | 75 | x 75L |  | 75 | x 75L |
| -35DZ |  | 80 | x 80L |  | 80 | x 80L |
| CDQ2KB32-40DZ | 8.5 | 85 | CQ-M5 x 85L | 10 | 85 | CQ-M5 x 85L |
| -45DZ |  | 90 | x 90L |  | 90 | x 90L |
| -50DZ |  | 95 | x 95L |  | 95 | x 95L |
| -75DZ |  | 120 | x 120L |  | 120 | x 120L |
| -100DZ |  | 145 | x 145L |  | 145 | x 145L |


| Cylinder model | C, $\mathrm{C}^{\prime}$ | D, D' | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDQ2KB40-5DZ | 7.5 | 45 | CQ-M5 x 45L |
| -10DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 60 | x 60L |
| -25DZ |  | 65 | x 65L |
| -30DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 75 | x 75L |
| -40DZ |  | 80 | x 80L |
| -45DZ |  | 85 | x 85L |
| -50DZ |  | 90 | x 90L |
| -75DZ |  | 115 | x 115L |
| -100DZ |  | 140 | x 140L |
| CDQ2KB50-10DZ | 12.5 | 55 | CQ-M6 x 55L |
| -15DZ |  | 60 | x 60L |
| -20DZ |  | 65 | x 65L |
| -25DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -30DZ |  | 75 | $\times 75 \mathrm{~L}$ |
| -35DZ |  | 80 | x 80L |
| -40DZ |  | 85 | x 85L |
| -45DZ |  | 90 | x 90L |
| -50DZ |  | 95 | x 95L |
| -75DZ |  | 120 | x 120L |
| -100DZ |  | 145 | x 145L |
| CDQ2KB63-10DZ | 14.5 | 60 | CQ-M8 x 60L |
| -15DZ |  | 65 | x 65L |
| -20DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -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 |

## CQ2K Series

Construction

Without auto switch magnet $\varnothing 12$ to $\varnothing 32$

$\varnothing 40$ to $\varnothing 63$


With boss on head end


Built-in One-touch fittings


Rod end male thread


## Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 63$, Hard chrome plating |
| $\mathbf{4}$ | Rod cover | Brass | $\varnothing 12$, Electroless nickel plating |
|  |  | Aluminum alloy | $\varnothing 16$ to $\varnothing 32$, Anodized |
| $\mathbf{6}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{7}$ | Bushing | Oil-impregnated sintered alloy | $\varnothing 16$ to $\varnothing 63$ |
| $\mathbf{8}$ | Hexagon socket head cap screw | Alloy steel | $\varnothing 12$ to $\varnothing 32$, Nickel plating |
| 9 | Hexagon sockethead set screw | Alloy steel | $\varnothing 40$ to $\varnothing 63$, Nickel plating |
| $\mathbf{1 0}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{1 1}$ | Centering location ring | Aluminum alloy | $\varnothing 20$ to $\varnothing 63$, Anodized |
| $\mathbf{1 2}$ | One-touch fitting | - | $\varnothing 32$ to $\varnothing 63$ |
| $\mathbf{1 3}$ | Piston seal | NBR |  |
| $\mathbf{1 4}$ | Rod seal | NBR |  |
| $\mathbf{1 5}$ | Tube gasket | NBR |  |
| $\mathbf{1 6}$ | Magnet | - |  |
| 83 |  |  |  |

Replacement Parts/Seal Kit

| Bore size $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ2KB12-PS |  |
| $\mathbf{1 6}$ | CQ2KB16-PS |  |
| $\mathbf{2 0}$ | CQ2KB20-PS |  |
| $\mathbf{2 5}$ | CQ2KB25-PS |  |
| $\mathbf{3 2}$ | CQ2KB32-PS |  |
| $\mathbf{4 0}$ | Set of nos. (13), (14), (15) |  |
| $\mathbf{5 0}$ | CQ2KB40-PS |  |
| $\mathbf{6 3}$ | CQ2KB50-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

## $\varnothing 12$ to $\varnothing 25$ without Auto Switch Magnet

## Through-hole: CQ2KB



Piston rod cross section

$\varnothing 12, \varnothing 16$

$\varnothing 20, \varnothing 25$

[mm]

| Bore size <br> $[\mathrm{mm}]$ | Stroke range <br> $[\mathrm{mm}]$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{F}$ | $\mathbf{G}$ | $\mathbf{H}$ | $\mathbf{I}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{Q}$ | $\mathbf{T h 9}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | 5 to 30 | 25.5 | 22 | 6 | 6 | 25 | 5 | 1.5 | $\mathrm{M} 3 \times 0.5$ | 32 | 5.2 | 3.5 | 15.5 | 3.5 | 12.5 | $15_{-0.043}^{0}$ |
| $\mathbf{1 6}$ | 5 to 30 | 27 | 23.5 | 8 | 8 | 29 | 5.5 | 1.5 | $\mathrm{M} 4 \times 0.7$ | 38 | 6 | 3.5 | 20 | 3.5 | 13 | $20^{-0}{ }_{-0.052}$ |
| $\mathbf{2 0}$ | 5 to 50 | 32 | 27.5 | 7 | 10 | 36 | 5.5 | 2 | $\mathrm{M} 5 \times 0.8$ | 47 | 8 | 4.5 | 25.5 | 5.5 | 16 | $13_{-0.043}^{0}$ |
| $\mathbf{2 5}$ | 5 to 50 | 35.5 | 30.5 | 12 | 12 | 40 | 5.5 | 2 | $\mathrm{M} 6 \times 1.0$ | 52 | 10 | 5 | 28 | 5.5 | 17 | $15_{-0}^{0}$ |

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

Rod end male thread

Width across flats B


With boss on head end


## CQ2K Series

## Bore Size

## $\varnothing 12$ to $\varnothing 25$ With Auto Switch Magnet

## Through-hole: CDQ2KB

Piston rod cross section


$\varnothing 12, \varnothing 16$

$\frac{2 \times \mathrm{M} 5 \times 0.8}{(\text { Port size) }}$

ø20, ø25


| Bore size <br> $[\mathbf{m m}]$ | Stroke range <br> $[\mathbf{m m}]$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{E A}$ | $\mathbf{E B}$ | $\mathbf{F}$ | $\mathbf{G}$ | $\mathbf{H}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{Q}$ | $\mathbf{S}$ | $\mathbf{T h 9}$ | $\mathbf{U}$ | $\mathbf{V}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | 5 to 30 | 36.5 | 33 | 6 | 6 | 33 | - | - | 6.5 | 1.5 | $\mathrm{M} 3 \times 0.5$ | 5.2 | 3.5 | 22 | 3.5 | 16 | 27.5 | $15_{-0.043}^{-0}$ | 14 | 25 |
| $\mathbf{1 6}$ | 5 to 30 | 39 | 35.5 | 8 | 8 | 37 | 13.2 | 6.6 | 5.5 | 1.5 | $\mathrm{M} 4 \times 0.7$ | 6 | 3.5 | 28 | 3.5 | 15 | 29.5 | $20_{-0.052}$ | 15 | 29 |
| $\mathbf{2 0}$ | 5 to 50 | 44 | 39.5 | 7 | 10 | 47 | 13.6 | 6.8 | 5.5 | 2 | $\mathrm{M} 5 \times 0.8$ | 8 | 4.5 | 36 | 5.5 | 16 | 35.5 | $13_{-0.043}$ | 18 | 36 |
| $\mathbf{2 5}$ | 5 to 50 | 45.5 | 40.5 | 12 | 12 | 52 | 13.6 | 6.8 | 5.5 | 2 | $\mathrm{M} 6 \times 1.0$ | 10 | 5 | 40 | 5.5 | 17 | 40.5 | $15_{-0.043}^{-0}$ | 21 | 40 |

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


## Rod end male thread

Width across flats $\mathbf{B}_{1}$

|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |

With boss on head end


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

## Bore Size

## Ø32 with/Without Auto Switch Magnet

## Through-hole: CDQ2KB



Piston rod cross section


| $\left[\begin{array}{l} \\ \hline\end{array}\right.$ | $[\mathrm{mm}]$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Stroke range <br> $[\mathrm{mm}]$ | Without auto switch magnet |  | With auto switch magnet |  |
|  | A | B | A | B |
| 5 to 50 | 39 | 32 | 49 | 42 |
| 75,100 | 49 | 42 |  |  |

Rod end male thread


*1 ( ): For the 5 mm stroke


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. $\Rightarrow$ p. 19

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.

## CQ2K Series

Bore Size

## Ø40 to $\varnothing 63$ with/Without Auto Switch Magnet

## Through-hole: CDQ2KB



Piston rod cross section


| $\begin{gathered} \hline \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | Stroke range [mm] | Without auto swich magnet |  | With auto switch magnet |  | C | D | E | F | H | J | K | L | M | N | 0 | P | Q | Th9 | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | A | B |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 40 | 5 to 50 | 36.5 | 29.5 <br> 39.5 | 46.5 | 39.5 | 13 | 16 | 52 | 7.5 | M8x 1.25 | 5 | 14 | 7 | 40 | 5.5 | 9 depth 7 | 1/8 | 12.5 | $28{ }_{-0.052}^{0}$ | 57 | 15 |
| 50 | 10 to 50 | 38.5 | 30.5 | 48.5 | 40.5 | 15 | 20 | 64 | 10.5 | M10 $\times 1.5$ | 7 | 18 | 8 | 50 | 6.6 | 11 depth 8 | 1/4 | 10.5 | $35{ }_{-0.062}^{0}$ | 71 | 19 |
| 50 | 75, 100 | 48.5 | 40.5 | 48.5 | 40.5 | 15 | 20 | 64 | 10.5 | M10 $\times 1.5$ | 7 | 18 | 8 | 50 | 6.6 | 11 dept 8 |  |  | -0.062 |  |  |
| 63 | 10 to 50 | 44 | 36 | 54 | 46 | 15 | 20 | 77 | 10.5 | M10 $\times 1.5$ | 7 | 18 | 8 | 60 | 9 | 14 depth 10.5 | 1/4 | 15 | $35{ }_{-0.062}^{0}$ | 84 | 19 |

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


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{1}$ | $\mathbf{R}$ |
| $\mathbf{4 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{5 0}$ | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |

With boss on head end


Rod end male thread


|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{4 0}$ | 22 | 20.5 | $\mathbf{8}$ | 28.5 | M14 $\times 1.5$ | 23.5 |
| $\mathbf{5 0}$ | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |
| $\mathbf{6 3}$ | 27 | 26 | 11 | 33.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, single rod. $\Rightarrow$ 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.
${ }^{\text {cow }}$

# Compact Cylinder: Non-rotating Rod Double Acting, Double Rod CQ2KW Series $ø 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50$, ø63 

How to Order


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

## Mounting

| B | Through-hole | $\varnothing 12$ to $\varnothing 63$ |
| :---: | :---: | :---: |
| A | Both ends tapped |  |
| L | Foot |  |
| LC | Compact foot |  |
| F | 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 $\Rightarrow$ p. 93
With auto switch magnet $\Rightarrow$ p. 94
* For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions $L$ and $L_{1}$ ) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by $10 \mathrm{~mm}(-\mathrm{XC} 2)$ cylinder.
For details $\Rightarrow$ p. 166

Bore size

| $\mathbf{1 2}$ | 12 mm |
| :--- | :--- |
| $\mathbf{1 6}$ | 16 mm |
| $\mathbf{2 0}$ | 20 mm |
| $\mathbf{2 5}$ | 25 mm |
| $\mathbf{3 2}$ | 32 mm |
| $\mathbf{4 0}$ | 40 mm |
| $\mathbf{5 0}$ | 50 mm |
| $\mathbf{6 3}$ | 63 mm |

## Action

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

## (3) Port thread type

| Nil | M thread | $\varnothing 12$ to $\varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc | $\varnothing 32$ to $\varnothing 63$ |
| TN | NPT |  |
| TF | G |  |
| F | 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.


Cylinder stroke

| Bore size | Standard stroke |
| :---: | :---: |
| 12, 16 | 5, 10, 15, 20, 25, 30 |
| 20, 25 | $\begin{aligned} & 5,10,15,20,25,30,35 \\ & 40,45,50 \end{aligned}$ |
| 32, 40 | $\begin{aligned} & 5,10,15,20,25,30,35 \\ & 40,45,50,75,100 \end{aligned}$ |
| 50, 63 | $\begin{aligned} & 10,15,20,25,30,35,40 \\ & 45,50,75,100 \end{aligned}$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 91


## Auto switch mounting groove

| $\mathbf{Z}$ | $\varnothing 12$ to $\varnothing 25$ | 2 surfaces |
| :---: | :---: | :---: |
|  | $\varnothing 32$ to $\varnothing 63$ | 4 surfaces |

## 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

## 8 Auto switch

Nil Without auto switch

* For applicable auto switches, refer to the next page.
(9) Number of auto switches

| $\mathbf{N i l}$ | 2 |
| :---: | :---: |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | n |

n
Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{C}$ | With rubber bumper |
| (ø12 with auto switch magnet only) |  |$|$| Rod end male thread |
| :---: |
| $\mathbf{M}$ |

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



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

| Type | Special function | Electrical entry |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{array}{c\|} \hline 0.5 \\ \text { (Nil) } \end{array}$ | $\begin{gathered} 1 \\ (M) \end{gathered}$ | $\begin{array}{\|c\|} \hline 3 \\ (\mathrm{~L}) \end{array}$ | $\begin{gathered} 5 \\ (\mathrm{Z}) \end{gathered}$ | None <br> ( N ) |  |  |  |
|  |  | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , | - | M9NV | M9N | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit | Relay, PLC |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PV | M9P | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BV | M9B | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | Diagnostic indication (2-color indicator) |  |  | 3-wire (NPN) |  | 5 V , |  | M9NWV | M9NW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  |  |  |  | 3-wire (PNP) |  | 12 V |  | M9PWV | M9PW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BWV | M9BW | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  |  |  |  | 3-wire (NPN) |  | 5 V , |  | M9NAV*1 | M9NA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | IC circuit |  |
|  | (2-color indicator) |  |  | 3-wire (PNP) |  | 12 V |  | M9PAV*1 | M9PA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  |  |  | 2-wire |  | 12 V |  | M9BAV*1 | M9BA*1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - |  |
|  | $\underset{\substack{\text { Magnetic field resistant } \\(2 \text {-color indicator) }}}{ }$ |  |  | 2-wire (Non-polar) |  | - |  | - | P3DWA | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ |  |  |
|  |  | Grommet |  | (NPN ${ }^{3 \text { ewirequivalent) }}$ | - | 5 V | - | A96V | A96 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | - |
| 운응 | - |  |  | 2-wire | 24 V | 12 V | 100 V | A93V*2 | A93 | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | - | - | Relay, |
| 亳 |  |  | No |  |  | $5 \mathrm{~V}, 12 \mathrm{~V}$ | 100 V orless | A90V | A90 | $\bigcirc$ | - | $\bigcirc$ | - | - | - | IC circuit | PLC |

*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: $\qquad$ . Nil (Example) M9NW
* Solid state auto switches marked with "○" are produced upon receipt of order.
$1 \mathrm{~m} \cdots \cdots . . . \mathrm{M}$ (Example) M9NWM
$3 \mathrm{~m} \cdots \ldots . . \mathrm{L}$ (Example) M9NWL
$5 \mathrm{~m} \cdots \ldots . . \mathrm{Z}$ (Example) M9NWZ
* The D-P3DWA $\square$ type is only available in sizes $\varnothing 25$ to $\varnothing 63$.

[^14]
## CQ2KW Series

## Symbol



| Made to Order | Made to Order Common Specifications (For details $\Rightarrow$ p. 155 to 188) |
| :---: | :---: |
| Symbol | Specifications |
| -XA $\square$ | Change of rod end shape |
| -XB6 | Heat-resistant cylinder ( -10 to $150^{\circ} \mathrm{C}$ ) |
| -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 $\Rightarrow$ p. 26



## Moisture Control Tube

 IDK SeriesWhen 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

Specifications

| Bore size [mm] | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Double rod |  |  |  |  |  |  |  |
| Fluid | Air |  |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |  |
| Minimum operating pressure | 0.07 MPa |  | 0.05 MPa |  |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ <br> With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | Without cushion or With rubber bumper (ø12 only) *1 |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.022 | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 |
|  | $0.043^{* 1}$ |  |  |  |  |  |  |  |
| Stroke length tolerance | $+1.0 \mathrm{~mm} * 2$ |  |  |  |  |  |  |  |
| Rod non-rotating accuracy | $\pm 2^{\circ}$ |  | $\pm 1^{\circ}$ |  | $\pm 0.8^{\circ}$ |  |  |  |

*1 For cylinders with rubber bumper (ø12 with auto switch magnet only)
*2 Stroke length tolerance does not include the amount of bumper change.

* $\varnothing 12$ 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) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Part no. | Refer to "How to Order" for the standard model number. ( $\Rightarrow$ p. 89) |  | Suffix "-X633" (p. 186) to the end of standard model number. ( $\triangleleft$ p. 89) |  | Suffix "-XB10" to the end of standard model number. ( $\triangle$ p. 89) |  |
| 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 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 | Bore size | Stroke range |
|  |  |  | 12, 16 | 6 to 29 |  |  |
|  |  |  | 20, 25 | 6 to 49 |  |  |
|  | 32 to 63 | 55 to 95 | 32, 40 | 6 to 99 | 40 | 6 to 99 |
|  |  |  | 50,63 | 11 to 99 | 50,63 | 11 to 99 |
| Example | Part no.: CQ2KWB50-65DZ CQ2KWB50-75DZ with 10 mm width spacer inside The B dimension is 125.5 mm . |  | Part no.: CQ2KWB50-72DZ-X633 <br> CQ2KW50-75DZ with 3 mm <br> width spacer inside <br> The B dimension is 125.5 mm . |  | Part no.: CQ2KWB50-65DZ-XB10 Makes 65 mm stroke tube. The B dimension is 115.5 mm . |  |

Mounting Bracket Part Nos.

| Bore size <br> $[\mathrm{mm}]$ | Foot*1 $^{* 1}$ | Compact foot*1 $^{* 1}$ | Flange |
| :---: | :---: | :---: | :---: |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 |
| $\mathbf{6 3}$ | 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) $\Rightarrow$ p. 21 to 27
* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).


## $\triangle$ Precautions

## 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：Non－rotating Rod Double Acting，Double Rod <br> CQ2KW Series

## Weight

Without Auto Switch Magnet

| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | 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 | 71 |
| 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

| Bore size <br> $[\mathrm{mm}]$ |  |  |  |
| :---: | :---: | :---: | :---: |
|  | 0.3 | 0.5 | 0.7 |
| $\mathbf{1 2}$ | 25 | 42 | 59 |
| $\mathbf{1 6}$ | 45 | 75 | 106 |
| $\mathbf{2 0}$ | 71 | 118 | 165 |
| $\mathbf{2 5}$ | 113 | 189 | 264 |
| $\mathbf{3 2}$ | 181 | 302 | 422 |
| $\mathbf{4 0}$ | 317 | 528 | 739 |
| $\mathbf{5 0}$ | 495 | 825 | 1150 |
| $\mathbf{6 3}$ | 841 | 1400 | 1960 |

Additional Weight

| Bore size［mm］ |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | - | - | - | - | - | 6 | 6 | 19 |  |
| Rod end <br> male thread | Male thread | 3 | 6 | 12 | 24 | 52 | 54 | 106 | 106 |
|  | Nut | 2 | 4 | 8 | 16 | 34 | 34 | 64 | 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


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

## 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 $\Rightarrow$ 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 partno. | $\mathrm{C}^{\prime}$ | D' | Mounting bolt part no . |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CQ2KWB12-5D | 8.3 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ | 8.3 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ |
| -10D |  | 45 | x 45L |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20D |  | 55 | x 55L |  | 55 | x 55L |
| -25D |  | 60 | x 60L |  | 60 | x 60L |
| -30D |  | 65 | $\times 65 \mathrm{~L}$ |  | 65 | x 65L |
| CQ2KWB16-5D | 7.5 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ | 7.5 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ |
| -10D |  | 45 | $\times 45 \mathrm{~L}$ |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20D |  | 55 | x 55L |  | 55 | x 55L |
| -25D |  | 60 | x60L |  | 60 | x60L |
| -30D |  | 65 | $\times 65 \mathrm{~L}$ |  | 65 | $\times 65 \mathrm{~L}$ |
| CQ2KWB20-5D | 6.5 | 40 | CQ-M5 x 40L | 8 | 40 | CQ-M5 x 40L |
| -10D |  | 45 | x 45L |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -20D |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -25D |  | 60 | $\times 60 \mathrm{~L}$ |  | 60 | $\times 60 \mathrm{~L}$ |
| -30D |  | 65 | $\times 65 \mathrm{~L}$ |  | 65 | $\times 65 \mathrm{~L}$ |
| -35D |  | 70 | $\times 70 \mathrm{~L}$ |  | 70 | $\times 70 \mathrm{~L}$ |
| -40D |  | 75 | $\times 75 \mathrm{~L}$ |  | 75 | x 75L |
| -45D |  | 80 | x 80L |  | 80 | x 80L |
| -50D |  | 85 | x 85L |  | 85 | x 85L |
| CQ2KWB25-5D | 8.5 | 45 | CQ-M5 $\times 45 \mathrm{~L}$ | 10 | 45 | CQ-M5 $\times 45 \mathrm{~L}$ |
| -10D |  | 50 | $\times 50 \mathrm{~L}$ |  | 50 | x 50L |
| -15D |  | 55 | $\times 55 \mathrm{~L}$ |  | 55 | x 55L |
| -20D |  | 60 | $\times 60 \mathrm{~L}$ |  | 60 | $\times 60 \mathrm{~L}$ |
| -25D |  | 65 | $\times 65 \mathrm{~L}$ |  | 65 | $\times 65 \mathrm{~L}$ |
| -30D |  | 70 | $\times 70 \mathrm{~L}$ |  | 70 | x 70L |
| -35D |  | 75 | $\times 75 \mathrm{~L}$ |  | 75 | x 75L |
| -40D |  | 80 | x80L |  | 80 | x 80L |
| -45D |  | 85 | $\times 85 \mathrm{~L}$ |  | 85 | $\times 85 \mathrm{~L}$ |
| -50D |  | 90 | x90L |  | 90 | x 90L |
| CQ2KWB32-5DZ | 11 | 50 | CQ-M5 x 50L | 7.5 | 45 | CQ-M5 x 45L |
| -10DZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 60 | $\times 60 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 65 | $\times 65 \mathrm{~L}$ |  | 60 | $\times 60 \mathrm{~L}$ |
| -25DZ |  | 70 | $\times 70 \mathrm{~L}$ |  | 65 | x 65L |
| -30DZ |  | 75 | $\times 75 \mathrm{~L}$ |  | 70 | x 70L |
| -35DZ |  | 80 | x 80L |  | 75 | x 75L |
| -40DZ |  | 85 | $\times 85 \mathrm{~L}$ |  | 80 | $\times 80 \mathrm{~L}$ |
| -45DZ |  | 90 | x 90L |  | 85 | $\times 85 \mathrm{~L}$ |
| -50DZ |  | 95 | x 95L |  | 90 | x 90L |
| -75DZ |  | 130 | $\times 130 \mathrm{~L}$ |  | 125 | x 125L |
| -100DZ |  | 155 | x 155L |  | 150 | x 150L |

Mounting bolt
Non-rotating rod end mounting


| Cylinder model | C, ${ }^{\prime}$ | D, $\mathbf{D}^{\prime}$ | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CQ2KWB40-5DZ | 7 | 45 | CQ-M5 x 45L |
| -10DZ |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DZ |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DZ |  | 60 | x 60L |
| -25DZ |  | 65 | x 65L |
| -30DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -35DZ |  | 75 | x 75L |
| -40DZ |  | 80 | x 80L |
| -45DZ |  | 85 | x 85L |
| -50DZ |  | 90 | x 90L |
| -75DZ |  | 125 | x 125L |
| -100DZ |  | 150 | x 150L |
| CQ2KWB50-10DZ | 12.5 | 55 | CQ-M6 x 55L |
| -15DZ |  | 60 | x 60L |
| -20DZ |  | 65 | x 65L |
| -25DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -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 |
| CQ2KWB63-10DZ | 13.5 | 55 | CQ-M8 $\times 55 \mathrm{~L}$ |
| -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 |

* $\varnothing 40$ to $\varnothing 63$ : The $C^{\prime}$ and $D^{\prime}$ dimensions are the same as those of $C$ and $D$.


# Compact Cylinder: Non-rotating Rod Double Acting, Double Rod <br> CQ2KW Series 

## 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 $\Rightarrow$ 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 Mounting bolt


| Cylinder model | C | D | Mounting bolt partno. | $\mathbf{C}^{\prime}$ | D' | Mounting bolt partno. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CDQ2KWB12-5DCZ | 6.1 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ | 6.1 | 45 | CQ-M3 $\times 45 \mathrm{~L}$ |
| -10DCZ |  | 45 | x 45L |  | 50 | $\times 50 \mathrm{~L}$ |
| -15DCZ |  | 50 | x 50L |  | 55 | $\times 55 \mathrm{~L}$ |
| -20DCZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 60 | x60L |
| -25DCZ |  | 60 | $\times 60 \mathrm{~L}$ |  | 65 | x 65L |
| -30DCZ |  | 65 | x 65L |  | 70 | $\times 70 \mathrm{~L}$ |
| CDQ2KWB16-5DZ | 7.5 | 45 | CQ-M3 $\times 45 \mathrm{~L}$ | 7.5 | 50 | CQ-M3 $\times 50 \mathrm{~L}$ |
| -10DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 55 | $\times 55 \mathrm{~L}$ |
| -15DZ |  | 55 | $\times 55 \mathrm{~L}$ |  | 60 | x 60L |
| -20DZ |  | 60 | x60L |  | 65 | x 65L |
| -25DZ |  | 65 | $\times 65 \mathrm{~L}$ |  | 70 | x 70L |
| -30DZ |  | 70 | x 70L |  | 75 | x 75L |
| CDQ2KWB20-5DZ | 9 | 45 | CQ-M5 x 45L | 11 | 55 | CQ-M5 x 55L |
| -10DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 60 | x 60L |
| -15DZ |  | 55 | x 55L |  | 65 | x 65L |
| -20DZ |  | 60 | x 60L |  | 70 | $\times 70 \mathrm{~L}$ |
| -25DZ |  | 65 | x 65L |  | 75 | x 75L |
| -30DZ |  | 70 | x 70L |  | 80 | x 80L |
| -35DZ |  | 75 | x 75L |  | 85 | x 85L |
| -40DZ |  | 80 | x 80L |  | 90 | x 90L |
| -45DZ |  | 85 | x 85L |  | 95 | x 95L |
| -50DZ |  | 90 | x 90L |  | 100 | x 100L |
| CDQ2KWB25-5DZ | 8 | 45 | CQ-M5 x 45L | 10 | 55 | CQ-M5 x 55L |
| -10DZ |  | 50 | $\times 50 \mathrm{~L}$ |  | 60 | $\times 60 \mathrm{~L}$ |
| -15DZ |  | 55 | x 55L |  | 65 | x 65L |
| -20DZ |  | 60 | x 60L |  | 70 | $\times 70 \mathrm{~L}$ |
| -25DZ |  | 65 | $\times 65 \mathrm{~L}$ |  | 75 | x 75L |
| -30DZ |  | 70 | x 70L |  | 80 | x 80L |
| -35DZ |  | 75 | x 75L |  | 85 | x 85L |
| -40DZ |  | 80 | x 80L |  | 90 | $\times 90 \mathrm{~L}$ |
| -45DZ |  | 85 | x 85L |  | 95 | x 95L |
| -50DZ |  | 90 | x 90L |  | 100 | x 100L |
| CDQ2KWB32-5DZ | 11 | 60 | CQ-M5 x 60L | 7.5 | 55 | CQ-M5 x 55L |
| -10DZ |  | 65 | x 65L |  | 60 | x 60L |
| -15DZ |  | 70 | $\times 70 \mathrm{~L}$ |  | 65 | $\times 65 \mathrm{~L}$ |
| -20DZ |  | 75 | x 75L |  | 70 | x 70L |
| -25DZ |  | 80 | x 80L |  | 75 | x 75L |
| -30DZ |  | 85 | x 85L |  | 80 | x 80L |
| -35DZ |  | 90 | x 90L |  | 85 | x 85L |
| -40DZ |  | 95 | x 95L |  | 90 | x 90L |
| -45DZ |  | 100 | x 100L |  | 95 | x 95L |
| -50DZ |  | 105 | x 105L |  | 100 | $\times 100 \mathrm{~L}$ |
| -75DZ |  | 130 | x 130L |  | 125 | $\times 125 \mathrm{~L}$ |
| -100DZ |  | 155 | x 155L |  | 150 | x 150L |


| Cylinder model | C, $\mathrm{C}^{\prime}$ | D, D' | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDQ2KWB40-5DZ | 7 | 55 | CQ-M5 x 55L |
| -10DZ |  | 60 | x 60L |
| -15DZ |  | 65 | x 65L |
| -20DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -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 |
| CDQ2KWB50-10DZ | 12.5 | 65 | CQ-M6 x 65L |
| -15DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DZ |  | 75 | $\times 75 \mathrm{~L}$ |
| -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 |
| CDQ2KWB63-10DZ | 13.5 | 65 | CQ-M8 x 65L |
| -15DZ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DZ |  | 75 | $\times 75 \mathrm{~L}$ |
| -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 |

[^15]
## CQ2KW Series

Construction

## Without auto switch magnet

$\varnothing 12$ to $\varnothing 32$


With auto switch magnet
$\varnothing 12$ to $\varnothing 32$


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 | $\varnothing 12$ to ø25 |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 63$, Hard chrome plating |
| 4 | Piston rod B | Stainless steel | $\varnothing 12$ to ø25 |
|  |  | Carbon steel | $\varnothing 32$ to ø63, Hard chrome plating |
| 5 | Rod cover | Brass | ø12, Electroless nickel plating |
|  |  | Aluminum alloy | $\varnothing 16$ to ø32, Anodized |
| 6 | Collar for non-rotating | Aluminum alloy | $\varnothing 40$ to ø63, Anodized |
| 7 | Collar | Aluminum alloy | $\varnothing 12$ to ø40, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$ to $\varnothing 63$, Chromated, Painted |
| 8 | Retaining ring | Carbon tool steel | Phosphate coated |
| 9 | Bushing for non-rotating | Oil-impregnated sintered alloy | $\varnothing 16$ to ø63 |
| 10 | Bushing | Bearing alloy | ø50, ø63 |
| 11 | Hexagon socket head cap screw | Alloy steel | $\varnothing 12$ to ø32, Zinc chromated |
| 12 | Hexagon socket head set screw | Alloy steel | $\varnothing 40$ to $\varnothing 63$, 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 | - |  |

$\varnothing 40$ to $\varnothing 63$


Rod end male thread


## Replacement Parts/Seal Kit

| Bore size <br> $[\mathrm{mm}]$ | Kit no. | Contents |
| :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ2KWB12-PS |  |
| $\mathbf{1 6}$ | CQ2KWB16-PS |  |
| $\mathbf{2 0}$ | CQ2KWB20-PS | Set of nos. (15), (16), (17), (18) |
| $\mathbf{2 5}$ | CQ2KWB25-PS |  |
| $\mathbf{3 2}$ | CQ2KWB32-PS |  |
| $\mathbf{4 0}$ | CQ2KWB40-PS |  |
| $\mathbf{5 0}$ | CQ2KWB50-PS |  |
| $\mathbf{6 3}$ | 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)

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

## Bore Size

## $\varnothing 12$ to $\varnothing 32$ without Auto Switch Magnet

Through-hole: CQ2KWB $\varnothing 12$ to $\varnothing 25$
$\varnothing 32$


Piston rod cross section


$$
\varnothing 12, \varnothing 16
$$


$\varnothing 20$ to $\varnothing 32$


| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | Stroke range [mm] | A | B | C | D | E | F | G | H | I | J | K1 | K2 | L | M | N | P | Q | Th9 | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | 5 to 30 | 37.2 | 30.2 | 6 | 6 | 25 | 10 | 1.5 | M3 $\times 0.5$ | 32 | - | 5.2 | 5 | 3.5 | 15.5 | 3.5 | M5 x 0.8 | 15 | $15{ }_{-0.043}^{0}$ | - | - |
| 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 | $20{ }_{-0.052}^{0}$ | - | - |
| 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 | $13{ }_{-0.043}^{0}$ | - | - |
| 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 | $15{ }_{-0.043}^{0}$ | - | - |
| 32 | 5 | 53.5 | 39.5 | 13 | 16 | 45 | 10 | 2 | M8x 1.25 | - | 4.5 | 14 | 14 | 7 | 34 | 5.5 | M5 $\times 0.8$ | 19 | $21{ }_{-0.052}^{0}$ | 49.5 | 14 |
|  | 10 to 50 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1/8 |  |  |  |  |
|  | 75,100 | 63.5 | 49.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* The positions of piston rod's width across flats ( $\mathrm{K}_{2}$ ) are not constant.

Rod end male thread


|  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | Stroke range <br> $[\mathrm{mm}]$ | $\mathbf{A}_{\mathbf{1}}$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 5 to 30 | 58.2 | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 5 to 30 | 62 | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 5 to 50 | 71 | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 5 to 50 | 82 | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |
| $\mathbf{3 2}$ | 5 to 50 | 96.5 | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 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. $\Rightarrow$ p. 38

* The dimensions of $ø 32-5 \mathrm{~mm}$ 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.

## CQ2KW Series

Bore Size

## $\varnothing 12$ to $\varnothing 32$ with Auto Switch Magnet

## Through-hole: CDQ2KWB



Piston rod
cross section
 (Also back cover)


Piston rod cross section (on)

$\varnothing 12, \varnothing 16$

ø20, $\varnothing 25$

ø32


| Bore size [mm] | Stroke range [ mm ] | A | B | C | D | E | EA | EB | F | G | H | J | K1 | K2 | L | M | N | P | Q | S | Th9 | $\mathbf{U}$ | 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 | $15{ }_{-0.043}^{0}$ | 14 | 25 | - | - |
| 16 | 5 to 30 | 48 | 41 | 8 | 8 | 37 | 13.2 | 6.6 | 10 | 1.5 | $\mathrm{M} 4 \times 0.7$ | - | 6 | 6 | 3.5 | 28 | 3.5 | M5 x 0.8 | 15 | 29.5 | $20{ }_{-0.052}^{0}$ | 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 | $13{ }_{-0.043}^{0}$ | 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 | $15{ }_{-0.043}^{0}$ | 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 | - | $21{ }_{-0.052}^{0}$ | - | - | 49.5 | 14 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* The positions of piston rod's width across flats ( $\mathrm{K}_{2}$ ) are not constant.
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


## Rod end male thread $B_{1}$



|  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{A}_{\mathbf{1}}$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 65.4 | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 72 | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 83 | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 92 | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |
| $\mathbf{3 2}$ | 106.5 | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |

The dimensions with built-in One-touch fittings are equivalent to those of the standard type, double acting, double rod. $\Rightarrow$ 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.

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

## Bore Size

## $\varnothing 40$ to $\varnothing 63$ with/Without Auto Switch Magnet

## Through-hole: CDQ2KWB



* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* The positions of piston rod's width across flats (K2) are not constant.
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145

Both ends tapped


|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{4 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{5 0}$ | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |

## Rod end male thread



| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | Stroke range [mm] | Without auto switch magnet | With auto switch magnet | $\mathrm{B}_{1}$ | C1 | $\mathrm{H}_{1}$ | L1 | MM | X |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A1 | $\mathrm{A}_{1}$ |  |  |  |  |  |  |
| 40 | 5 to 50 | 97 | 107 | 22 | 20.5 | 8 | 28.5 | M14 $\times 1.5$ | 23.5 |
|  | 75, 100 | 107 |  |  |  |  |  |  |  |
| 50 | 10 to 50 | 107.5 | 117.5 | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |
|  | 75, 100 | 117.5 |  |  |  |  |  |  |  |
| 63 | 10 to 50 | 109 | 119 | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |
|  | 75, 100 | 119 |  |  |  |  |  |  |  |

# Compact Cylinder: Water Resistant Double Acting, Single Rod 

 CQ2-R/V Series ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100
## How to Order



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.

|  | Mounting |  |
| :---: | :---: | :---: |
| B | Through-hole | ( $\varnothing 20$ to $\varnothing 100$ ) |
| A | Both ends tapped | (ø40 to ø100) |
| 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 $\Rightarrow$ p. 102

| 2 $\mathbf{y}$ Bore size |
| :--- |
| $\mathbf{2 0}$ 20 mm <br> $\mathbf{2 5}$ 25 mm <br> $\mathbf{3 2}$ 32 mm <br> $\mathbf{4 0}$ 40 mm <br> $\mathbf{5 0}$ 50 mm <br> $\mathbf{6 3}$ 63 mm <br> $\mathbf{8 0}$ 80 mm <br> $\mathbf{1 0 0}$ $\mathbf{1 0 0 ~ m m}$ |



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

| Bore size | Standard stroke |
| :--- | :---: |
| $\mathbf{2 0 , 2 5}$ | $5,10,15,20,25,30,35,40,45,50$ |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3}, \mathbf{8 0}, \mathbf{1 0 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 100
10 Number of auto switches

| Nil | 2 |
| :---: | :---: |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | n |

## Made to order <br> common specifications <br> For details $\Rightarrow$ p. 100



| 8 | Auto switch mounting groove |  |
| :---: | :---: | :---: |
| $\mathbf{Z}$ | $\varnothing 20$ to $\varnothing 25$ | 2 surfaces |
|  | $\varnothing 32$ to $\varnothing 100$ | 4 surfaces |

Nil $\quad$ Without auto switch

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

For details on auto switch mounting $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{gathered} 0.5 \\ \text { (Nil) } \end{gathered}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{gathered} 3 \\ \text { (L) } \\ \hline \end{gathered}$ | $\begin{gathered} 5 \\ (\mathrm{Z}) \\ \hline \end{gathered}$ |  |  |  |
| \% 융 | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , |  | M9NAV | M9NA | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  |  |
| \% |  |  |  | 3-wire (PNP) |  | 12 V | - | M9PAV | M9PA | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | IC circuit | Relay, |
| - |  |  |  | 2-wire |  | 12 V |  | M9BAV | M9BA | $\bigcirc$ | $\bigcirc$ | $\bullet$ | $\bigcirc$ | $\bigcirc$ | - |  |

[^16]Specifications


Symbol


| Made to <br> Order Made to Order Common Specifications <br> (For details $\Rightarrow$ p. 155 to 188) <br> Symbol Specifications <br> - XB10 Intermediate stroke (Using exclusive body) <br> - XC6(A) Piston rod/Retaining ring/Rod end nut <br> material: Stainless steel <br> - XC85 Grease for food processing equipment* Stainless steel accessories are also available. <br> For details $\Rightarrow$ 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. rings for axis, Body mounting bolts

| Bore size [mm] | 20 | 25 | 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 | 0.08 MPa |  |  |  |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| Stroke length tolerance | $+\begin{aligned} & +1.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |  |  |  |  |  |  |  |

## 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. ( $\checkmark$ p. 99) |  |
| Description | Strokes in 1 mm increments are available by installing a spacer in the <br> standard stroke cylinder. |  |
|  | Bore size |  |
|  | 20,25 |  |
|  | 32 to 100 |  |
| 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 <br> $[\mathrm{mm}]$ | Foot*1 | Compact foot*1 | Flange | Double clevis | Double clevis <br> pivot bracket |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 | CQ-D040 | CQ-C040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 | CQ-D050 | CQ-C050 |
| $\mathbf{6 3}$ | CQ-L063 | CQ-LC063 | CQ-F063 | CQ-D063 | CQ-C063 |
| $\mathbf{8 0}$ | CQ-L080 | CQ-LC080 | CQ-F080 | CQ-D080 | CQ-C080 |
| $\mathbf{1 0 0}$ | 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

* 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.

## CQ2-R/V Series

## Theoretical Output



## Weight

## Without Auto Switch Magnet



With Auto Switch Magnet


## Additional Weight

| Bore size [mm] |  | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | - | - | - | 6 | 6 | 19 | 45 | 45 |  |
| Rod end male <br> thread | Male thread | 6 | 12 | 26 | 27 | 53 | 53 | 120 | 175 |
|  | Nut | 4 | 8 | 17 | 17 | 32 | 32 | 49 | 116 |
| 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 $\qquad$
ped ..... .358 g

Rod end male thread $\cdots \cdots \cdots . . .44 \mathrm{~g}$
Double clevis

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

## Compact Cylinder: Water Resistant Double Acting, Single Rod

## 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. |
| :---: | :---: | :---: | :---: |
| CQ2B20-5D | 7.5 | 35 | CQ-M5 x 35L |
| -10D |  | 40 | x 40L |
| -15D |  | 45 | x 45L |
| -20D |  | 50 | $\times 50 \mathrm{~L}$ |
| -25D |  | 55 | x 55L |
| -30D |  | 60 | x 60L |
| -35D |  | 65 | x 65L |
| -40D |  | 70 | x 70L |
| -45D |  | 75 | x 75L |
| -50D |  | 80 | x 80L |
| CQ2B25 ${ }^{\text {- }}$-5D | 9.5 | 40 | CQ-M5 x 40L |
| -10D |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |
| -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 |
| CQ2B32 ${ }^{\text {R }}$-5DZ | 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 | $\times 70 \mathrm{~L}$ |
| -40DZ |  | 75 | x 75L |
| -45DZ |  | 80 | x 80L |
| -50DZ |  | 85 | x 85L |
| -75DZ |  | 120 | x 120L |
| -100DZ |  | 145 | x 145L |



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

| Cylinder model | C | D | Mounting bolt part no . |
| :---: | :---: | :---: | :---: |
| CDQ2B20碞-5DZ | 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 |
| CDQ2B25ํ.5DZ | 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 |
| CDQ2B32 ${ }^{\text {R }}$-5DZ | 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 n . |
| :---: | :---: | :---: | :---: |
| CDQ2B40ํ.5DZ | 7.5 | 45 | CQ-M5 x 45L |
| -10DZ |  | 50 | x 50L |
| -15DZ |  | 55 | x 55L |
| -20DZ |  | 60 | $\times 60 \mathrm{~L}$ |
| -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 |
| CDQ2B50 ${ }^{\text {¢ }}$-10DZ | 12.5 | 55 | CQ-M6 $\times 55 \mathrm{~L}$ |
| -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 |
| CDQ2B63 ${ }^{\text {² }}$-10DZ | 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. |
| :---: | :---: | :---: | :---: |
| CDQ2B80R-10DZ | 15 | 65 | CQ-M10 x 65L |
| -15DZ |  | 70 | x 70L |
| -20DZ |  | 75 | x 75L |
| -25DZ |  | 80 | x 80L |
| -30DZ |  | 85 | x 85L |
| -35DZ |  | 90 | $\times 90 \mathrm{~L}$ |
| -40DZ |  | 95 | x 95L |
| -45DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -50DZ |  | 105 | x 105L |
| -75DZ |  | 130 | x 130L |
| -100DZ |  | 155 | $\times 155 \mathrm{~L}$ |
| CDQ2B100 ${ }^{\text {- }}$-10DZ | 15.5 | 75 | CQ-M10 $\times$ 75L |
| -15DZ |  | 80 | x 80L |
| -20DZ |  | 85 | x 85L |
| -25DZ |  | 90 | x 90L |
| -30DZ |  | 95 | x 95L |
| -35DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -40DZ |  | 105 | x 105L |
| -45DZ |  | 110 | x 110L |
| -50DZ |  | 115 | $\times 115 \mathrm{~L}$ |
| -75DZ |  | 140 | x 140L |
| -100DZ |  | 165 | x 165L |

## CQ2-R/V Series

Construction

## Without auto switch magnet

ø20 to ø32

$\varnothing 40$ to $\varnothing 100$


## Rod end male thread



With auto switch magnet

$$
\varnothing 20 \text { to ø32 }
$$




Component Parts

| No. | Description | Material | Note |
| :---: | :---: | :---: | :---: |
| 1 | Cylinder tube | Aluminum alloy | Hard anodized |
| 2 | Piston | Aluminum alloy |  |
| 3 | Piston rod | Stainless steel | $\varnothing 20$ to ø25 |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 100$, Hard chrome plating |
| 4 | Rod cover | Aluminum alloy | $ø 20$ to ø32, Anodized |
| 5 | Collar | Aluminum alloy | $\varnothing 40$ to ø100, Anodized |
| 6 | Retaining ring | Carbon tool steel | $\varnothing 40$ to $\varnothing 100$, Phosphate coated |
| 7 | Bushing | Oil-impregnated sintered alloy | ø20, ø25 |
|  |  | Bearing alloy | ø32 to ø100 |
| 8 | Hexagon socket head cap screw | Chromium molybdenum steel | $\varnothing 20$ to $\varnothing 32$, 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 <br> $[\mathrm{mm}]$ | Kit no. |  | Contents |
| :---: | :---: | :---: | :---: |
|  | R: NBR | V: FKM |  |
| $\mathbf{2 0}$ | CQ2B20R-PS | CQ2B20V-PS |  |
| $\mathbf{2 5}$ | CQ2B25R-PS | CQ2B25V-PS |  |
| $\mathbf{3 2}$ | CQ2B32R-PS | CQ2B32V-PS | Set of nos. |
| $\mathbf{4 0}$ | CQ2B40R-PS | CQ2B40V-PS |  |
| $\mathbf{5 0}$ | CQ2B50R-PS | CQ2B50V-PS |  |
| $\mathbf{6 3}$ | CQ2B63R-PS | CQ2B63V-PS |  |
| $\mathbf{8 0}$ | CQ2B80R-PS | CQ2B80V-PS |  |
| $\mathbf{1 0 0}$ | 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

## $\varnothing 20, \varnothing 25$ without Auto Switch Magnet

Through-hole: CQ2B-R/V


| $[\mathrm{Mm}]$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | Stroke range <br> $[\mathrm{mm}]$ | A | B | C | D | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{I}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{Q}$ | $\mathbf{T}$ |
| $\mathbf{2 0}$ | 5 to 50 | 39 | 29.5 | 7 | 10 | 36 | $\mathrm{M} 5 \times 0.8$ | 47 | 8 | 9.5 | 25.5 | 18 | 16.1 |
| $\mathbf{2 5}$ | 5 to 50 | 42.5 | 32.5 | 12 | 12 | 40 | $\mathrm{M} 6 \times 1.0$ | 52 | 10 | 10 | 28 | 19 | 18.1 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 100


## Rod end male thread



## CQ2-R/V Series

## Bore Size

## $\varnothing 20, \varnothing 25$ with Auto Switch Magnet

## Through-hole: CDQ2B-R/V



| 10 | [mm] |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathbf{m m}]$ | Stroke range <br> $[\mathrm{mm}]$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{Q}$ | $\mathbf{S}$ | $\mathbf{T}$ | $\mathbf{U}$ | $\mathbf{V}$ |
| $\mathbf{2 0}$ | 5 to 50 | 51 | 41.5 | 7 | 10 | 47 | $\mathrm{M} 5 \times 0.8$ | 8 | 9.5 | 36 | 18 | 35.5 | 16.1 | 18 | 36 |
| $\mathbf{2 5}$ | 5 to 50 | 52.5 | 42.5 | 12 | 12 | 52 | $\mathrm{M} 6 \times 1.0$ | 10 | 10 | 40 | 19 | 40.5 | 18.1 | 21 | 40 |

* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 100
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


## Rod end male thread



|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{2 0}$ | 13 | 12 | 5 | 23.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 17 | 15 | 6 | 27.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |

## Bore Size

## Ø32 with/Without Auto Switch Magnet

Through-hole: CDQ2B-R/V

*1 ( ): Without auto switch, 5 mm stroke

|  |  |  |  |  |  |  | $[\mathrm{mm}]$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Stroke range | Without auto swith 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 $\Rightarrow$ p. 26, 27
* For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 100

Rod end male thread


## CQ2-R/V Series

## Bore Size

## Ø40 to Ø 100 With/Without Auto Switch Magnet

## Through-hole: CDQ2B-R/V



* For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27
* For calculation on the longitudinal dimension of intermediate strokes $\Rightarrow$ p. 100
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


## Both ends tapped



|  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{O}_{\mathbf{1}}$ | $\mathbf{R}$ |
| $\mathbf{4 0}$ | $\mathrm{M} 6 \times 1.0$ | 10 |
| $\mathbf{5 0}$ | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{6 3}$ | $\mathrm{M} 10 \times 1.5$ | 18 |
| $\mathbf{8 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |
| $\mathbf{1 0 0}$ | $\mathrm{M} 12 \times 1.75$ | 22 |

## 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 $\varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$ 

## How to Order



| Mounting |  |
| :---: | :---: |
| B | Through-hole |
| A | Both ends tapped |
| L | Foot |
| LC | Compact foot |
| F | 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 $\Rightarrow$ p. 111

| 6 | Action |
| :--- | :--- |
| D | Double acting |

Auto switch
Nil $\quad$ Without auto switch

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

| 2 | Bore size |
| :---: | :---: |
| $\mathbf{4 0}$ | 40 mm |
| $\mathbf{5 0}$ | 50 mm |
| $\mathbf{6 3}$ | 63 mm |
| $\mathbf{8 0}$ | 80 mm |
| $\mathbf{1 0 0}$ | 100 mm |


| 3 Port thread type |
| :--- |
| Nil |
|  |  |
|  |
| TN |
| TF |


(5) Cylinder stroke [mm]
For standard strokes $\Rightarrow$ p. 109

For details on auto switch mounting $\Rightarrow$ 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.
7 Body option

| $\mathbf{N i l}$ | Rod end female thread |
| :---: | :---: |
| $\mathbf{M}$ | Rod end male thread |

10 Number of auto switches

| $\mathbf{N i l}$ | 2 |
| :---: | :---: |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | n |


\section*{8 Auto switch mounting groove <br> | $\mathbf{Z}$ | $\varnothing 40$ to $\varnothing 100$ | 4 surfaces |
| :--- | :--- | :--- |}

## Made to order common specifications For details $\Rightarrow$ 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 |  | Wiring (Output) | Load voltage |  |  | Auto switch model |  | Lead wire length [m] |  |  |  | Pre-wired connector | Applicable load |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | DC |  | AC | Perpendicular | In-line | $\begin{gathered} \hline 0.5 \\ \text { (Nil) } \\ \hline \end{gathered}$ | $\begin{gathered} 1 \\ (\mathrm{M}) \end{gathered}$ | $\begin{gathered} 3 \\ (\mathrm{~L}) \end{gathered}$ | $\begin{gathered} 5 \\ (\mathrm{Z}) \end{gathered}$ |  |  |  |
| 유윤 | Water resistant (2-color indicator) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V , |  | M9NAV | M9NA | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | circuit |  |
| \% |  |  |  | 3-wire (PNP) |  | 12 V | - | M9PAV | M9PA | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | Relay, <br> PLC |
| - |  |  |  | 2-wire |  | 12 V |  | M9BAV | M9BA | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - |  |

* Lead wire length symbols: 0.5 m ......... Nil (Example) M9BA $\quad$ * Solid state auto switches marked with " $O$ " are produced upon receipt of order.
$1 \mathrm{~m} . . . . . . .$. M (Example) M9BAM
$3 \mathrm{~m} . . . . . . .$. L (Example) M9BAL
$5 \mathrm{~m} . . . . . . . . \mathrm{Z}$ (Example) M9BAZ


## CQ2W-R/V Series



Specifications

| Bore size [mm] | 40 | 50 | 63 | 80 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Double rod |  |  |  |  |
| Fluid | Air |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |
| Minimum operating pressure | 0.08 MPa |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |
| Cushion | None |  |  |  |  |
| Allowable kinetic energy [J] | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| Stroke length tolerance | $+\underset{0}{+1.0 \mathrm{~mm}}$ |  |  |  |  |

## Standard Strokes

| Bore size | Smm] |
| :--- | :---: |
| $\mathbf{4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |
| $\mathbf{5 0 , 6 3}, \mathbf{8 0}, \mathbf{1 0 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |

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 <br> standard stroke cylinder. |  |
|  | Bore size |  |
|  | 40 to 100 |  |
| 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 <br> $[\mathrm{mm}]$ | Foot*1 | Compact foot*1 | Flange |
| :---: | :---: | :---: | :---: |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 |
| $\mathbf{6 3}$ | CQ-L063 | CQ-LC063 | CQ-F063 |
| $\mathbf{8 0}$ | CQ-L080 | CQ-LC080 | CQ-F080 |
| $\mathbf{1 0 0}$ | 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

## 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: Water Resistant Double Acting, Double Rod 

## Theoretical Output

| Bore size <br> $[\mathrm{mm}]$ |  |  |  |  | Operating pressure [MPa] |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $[\mathrm{M0}$ | 0.3 | 0.5 | 0.7 |  |  |  |  |
| $\mathbf{5 0}$ | 317 | 528 | 739 |  |  |  |  |
| $\mathbf{6 3}$ | 895 | 825 | 1150 |  |  |  |  |
| $\mathbf{8 0}$ | 1360 | 1400 | 1960 |  |  |  |  |
| $\mathbf{1 0 0}$ | 2140 | 2270 | 3170 |  |  |  |  |

## Weight

Without Auto Switch Magnet

| Sore size | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\varnothing \mathbf{4 0}$ | 357 | 387 | 416 | 446 | 475 | 505 | 534 | 564 | 594 | 624 | 855 | 1004 |
| $\varnothing 50$ | - | 645 | 692 | 737 | 782 | 829 | 874 | 918 | 965 | 1010 | 1343 | 1572 |
| $\varnothing 63$ | - | 786 | 837 | 886 | 935 | 986 | 1035 | 1084 | 1135 | 1184 | 1555 | 1804 |
| $\varnothing 80$ | - | 1447 | 1526 | 1604 | 1682 | 1761 | 1839 | 1917 | 1996 | 2074 | 2674 | 3066 |
| $\varnothing 100$ | - | 2464 | 2572 | 2680 | 2787 | 2896 | 3003 | 3111 | 3219 | 3326 | 4156 | 4695 |

## Additional Weight

| Bore size [mm] |  | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: |
| Both ends tapped | 6 | 6 | 19 | 45 | 45 |  |
| Rod end male <br> thread | Male thread | 54 | 106 | 106 | 240 | 350 |
|  | Nut | 34 | 64 | 64 | 98 | 232 |
| 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
$\qquad$
........ 6 g
Flange
Add each weight of auto switches when auto switches are mounted.

With Auto Switch Magnet
[g]

| Stroke <br> Bore size | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 75 | 100 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\varnothing 40$ | 452 | 482 | 510 | 540 | 569 | 599 | 629 | 659 | 689 | 719 | 867 | 1016 |
| $\varnothing 50$ | - | 764 | 810 | 856 | 901 | 946 | 992 | 1037 | 1084 | 1129 | 1357 | 1586 |
| ø63 | - | 930 | 980 | 1030 | 1079 | 1129 | 1179 | 1228 | 1279 | 1328 | 1577 | 1826 |
| $\varnothing 80$ | - | 1680 | 1757 | 1836 | 1915 | 1992 | 2071 | 2150 | 2227 | 2306 | 2697 | 3089 |
| $\varnothing 100$ | - | 2791 | 2899 | 3008 | 3114 | 3222 | 3330 | 3438 | 3546 | 3653 | 4191 | 4730 |

## 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 n . |
| :---: | :---: | :---: | :---: |
| 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 ${ }^{\text {¢ }}$-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 |



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

| Cylinder model | C | D | Mounting bolt part n . | Cylinder model | C | D | Mounting bolt part no. | Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CDQ2WB40放5DZ | 7 | 55 | CQ-M5 x 55L | CDQ2WB63 ${ }^{\text {²-10DZ }}$ | 13.5 | 65 | CQ-M8 x 65L | CDQ2WB100 V -10DZ | 13 | 80 | CQ-M10 $\times 80 \mathrm{~L}$ |
| -10DZ |  | 60 | x 60L | -15DZ |  | 70 | $\times 70 \mathrm{~L}$ | -15DZ |  | 85 | x 85L |
| -15DZ |  | 65 | x 65L | -20DZ |  | 75 | x 75L | -20DZ |  | 90 | $\times 90 \mathrm{~L}$ |
| -20DZ |  | 70 | x 70L | -25DZ |  | 80 | x 80L | -25DZ |  | 95 | x 95L |
| -25DZ |  | 75 | x 75L | -30DZ |  | 85 | x 85L | -30DZ |  | 100 | $\times 100 \mathrm{~L}$ |
| -30DZ |  | 80 | x 80L | -35DZ |  | 90 | x 90L | -35DZ |  | 105 | $\times 105 \mathrm{~L}$ |
| -35DZ |  | 85 | x 85L | -40DZ |  | 95 | x 95L | -40DZ |  | 110 | $\times 110 \mathrm{~L}$ |
| -40DZ |  | 90 | x 90L | -45DZ |  | 100 | $\times 100 \mathrm{~L}$ | -45DZ |  | 115 | x 115L |
| -45DZ |  | 95 | x 95L | -50DZ |  | 105 | $\times 105 \mathrm{~L}$ | -50DZ |  | 120 | $\times 120 \mathrm{~L}$ |
| -50DZ |  | 100 | x 100L | -75DZ |  | 130 | $\times 130 \mathrm{~L}$ | -75DZ |  | 145 | x 145L |
| -75DZ |  | 125 | x 125L | -100DZ |  | 155 | $\times 155 \mathrm{~L}$ | -100DZ |  | 170 | x 170L |
| -100DZ |  | 150 | x 150L | CDQ2WB80 ${ }^{\text {P }}$-10DZ | 12.5 | 70 | CQ-M10 x 70L |  |  |  |  |
| CDQ2WB50退-10DZ | 12.5 | 65 | CQ-M6 x 65L | -15DZ |  | 75 | $\times 75 \mathrm{~L}$ |  |  |  |  |
| -15DZ |  | 70 | x 70L | -20DZ |  | 80 | x 80L |  |  |  |  |
| -20DZ |  | 75 | x 75L | -25DZ |  | 85 | x 85L |  |  |  |  |
| -25DZ |  | 80 | x 80L | -30DZ |  | 90 | $\times 90 \mathrm{~L}$ |  |  |  |  |
| -30DZ |  | 85 | x 85L | -35DZ |  | 95 | x 95L |  |  |  |  |
| -35DZ |  | 90 | x 90L | -40DZ |  | 100 | $\times 100 \mathrm{~L}$ |  |  |  |  |
| -40DZ |  | 95 | x 95L | -45DZ |  | 105 | $\times 105 \mathrm{~L}$ |  |  |  |  |
| -45DZ |  | 100 | x 100L | -50DZ |  | 110 | x 110L |  |  |  |  |
| -50DZ |  | 105 | x 105L | -75DZ |  | 135 | $\times 135 \mathrm{~L}$ |  |  |  |  |
| -75DZ |  | 130 | x 130L | -100DZ |  | 160 | x 160L |  |  |  |  |
| -100DZ |  | 155 | x 155L |  |  |  |  |  |  |  |  |

## Compact Cylinder: Water Resistant Double Acting, Double Rod

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 |  |
|  |  | V: FKM |  |
| 10 | Piston seal | R: NBR |  |
|  |  | V: FKM |  |
| 11 | Tube gasket | R: NBR |  |
|  |  | V: FKM |  |
| 12 | Rod scraper | R: NBR |  |
|  |  | 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.(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)

## CQ2W-R/V Series

Bore Size

## $\varnothing 40$ to $\varnothing 100$ with/Without Auto Switch Magnet

Through-hole: CDQ2WB-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 $[\mathrm{mm}]$ | $\mathbf{C}$ | $\mathbf{D}$ | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{J}$ | $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{P}$ | $\mathbf{Q}$ | $\mathbf{T}$ | $\mathbf{W}$ | $\mathbf{Z}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{4 0}$ | 13 | 16 | 52 | $\mathrm{M} 8 \times 1.25$ | 5 | 14 | 17 | 40 | 5.5 | 9 depth 7 | $1 / 8$ | 12.5 | 28 | 57 | 15 |
| $\mathbf{5 0}$ | 15 | 20 | 64 | $\mathrm{M} 10 \times 1.5$ | 7 | 17 | 18 | 50 | 6.6 | 11 depth 8 | $1 / 4$ | 14 | 35 | 71 | 19 |
| $\mathbf{6 3}$ | 15 | 20 | 77 | $\mathrm{M} 10 \times 1.5$ | 7 | 17 | 18 | 60 | 9 | 14 depth 10.5 | $1 / 4$ | 15.5 | 35 | 84 | 19 |
| $\mathbf{8 0}$ | 21 | 25 | 98 | $\mathrm{M} 16 \times 2.0$ | 6 | 22 | 20 | 77 | 11 | 17.5 depth 13.5 | $3 / 8$ | 18 | 43 | 104 | 25 |
| $\mathbf{1 0 0}$ | 27 | 30 | 117 | $\mathrm{M} 20 \times 2.5$ | 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 $\Rightarrow$ p. 26, 27
* For the auto switch proper mounting position and mounting height $\Rightarrow$ 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, 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 $ø 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$ 

How to Order



* A through-hole type mounting bolt is available as an option. For details $\Rightarrow$ p. 119

*1 The bore sizes available for the air-hydro type are ø20 to $\varnothing 100$.

| $\mathbf{3}$ Bore size |
| :--- |
| $\mathbf{1 2}$ 12 mm <br> $\mathbf{1 6}$ 16 mm <br> $\mathbf{2 0}$ 20 mm <br> $\mathbf{2 5}$ 25 mm <br> $\mathbf{3 2}$ 32 mm <br> $\mathbf{4 0}$ 40 mm <br> $\mathbf{5 0}$ 50 mm <br> $\mathbf{6 3}$ 63 mm <br> $\mathbf{8 0}$ 80 mm <br> $\mathbf{1 0 0}$ 100 mm |

(4) Port thread type

| Nil | M thread | $\varnothing 12$ to $\varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc | $\varnothing 32$ to $\varnothing 100$ |
| TN | NPT |  |
| TF | G |  |

Cylinder stroke (For details on the minimum stroke for auto switch mounting $\Rightarrow$ p. 145)

## Action

| $\quad$ [mm] |  |  |  |
| :---: | :--- | :---: | :---: |
| Bore size | Standard stroke |  |  |
| $\mathbf{1 2 , 1 6}$ | $5,10,15,20,25,30$ |  |  |
| $\mathbf{2 0 , 2 5}$ | $5,10,15,20,25,30,35,40,45,50$ |  |  |
| $\mathbf{3 2 , 4 0}$ | $5,10,15,20,25,30,35,40,45,50,75,100$ |  |  |
| $\mathbf{5 0 , 6 3 , 8 0} \mathbf{8 0}$ | $10,15,20,25,30,35,40,45,50,75,100$ |  |  |

* For the manufacturing of intermediate strokes $\triangleleft$ p. 117
* The bore sizes available for the air-hydro type are ø20 to ø100.

| 7 Body option |
| :--- |
| $\mathbf{N i l}$ |
| $\mathbf{C}$ |
| $\mathbf{C}$ |
| $\mathbf{M}$ |
| With rubber female 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
Nil $\quad$ Without auto switch

* For applicable auto switches $\Rightarrow$ p. 116
(9) Number of auto switches

| $\mathbf{N i l}$ | 2 |
| :---: | :---: |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | 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）CDQP2B32－30D

For details on auto switch mounting $\Rightarrow$ 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．

Solid state auto switches marked with＂○＂are produced upon receipt of order
＊The D－P4DW type is only available in sizes $\varnothing 40$ to $\varnothing 100$ ．
＊Only for the D－P4DW type，an auto switch is assembled and shipped with the cylinder．

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

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

## CQP2 Series



Made to Order Common Specifications (For details $\Rightarrow$ p. 155 to 188)

| Symbol | Specifications |
| :--- | :--- |
| -XA | Change of rod end shape |
| -XB6 | Heat-resistant cylinder ( -10 to $150^{\circ} \mathrm{C}$ ) w/o auto switch only*1 |
| -XB7 | Cold-resistant cylinder $\left(-40\right.$ to $\left.70^{\circ} \mathrm{C}\right)$ w/o auto switch only |
| -XB9 | Low-speed cylinder $(10$ to $50 \mathrm{~mm} / \mathrm{s})$ |
| -XB13 | Low-speed cylinder ( 5 to $50 \mathrm{~mm} / \mathrm{s}$ ) |
| -XC4 | With heavy duty scraper, $\varnothing 32$ to $\varnothing 100$ only |
| -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 |
| -X271 | Fluororubber seals*1 |

*1 Excludes the air-hydro type

* Stainless steel accessories are also available. For details $\Rightarrow$ 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.

## Specifications

| Pneumatic type |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size [mm] |  | 12 | 16 | 20 | 25 | 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 |  | 0.07 MPa |  | 0.05 MPa |  |  |  |  |  |  |  |
| Ambient and fluid temperatures |  | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |  |  |  |  |
| Lubrication |  | Not required (Non-lube) |  |  |  |  |  |  |  |  |  |
| Piston speed |  | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |  |  |
| Cushion |  | Without cushion or With rubber bumper |  |  |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 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 |
| Stroke length tolerance |  | $\underset{0}{+1.0 \mathrm{~mm}^{* 1}}$ |  |  |  |  |  |  |  |  |  |

*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 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |  |  |  |
| Fluid | Turbine oil*1 |  |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |  |
| Minimum operating pressure | 0.18 MPa |  |  | 0.1 MPa |  |  |  |  |
| Ambient and fluid temperatures | 5 to $60^{\circ} \mathrm{C}$ |  |  |  |  |  |  |  |
| Piston speed | 5 to $50 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |  |
| Stroke length tolerance | $\begin{gathered} +1.0 \mathrm{~mm} \\ 0 \\ \hline \end{gathered}$ |  |  |  |  |  |  |  |

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

## Manufacturing of Intermediate Strokes



- Excludes the air-hydro type
- In the case of spacer type, intermediate strokes with bumper for $\varnothing 40$ to $\varnothing 100$, it can be manufactured in 5 mm increments in 5 mm and 55 to 95 mm .


## Precautions


I Refer to pages 189 and 190 before I
I handling the products.
117

## Weight

## Without Auto Switch Magnet

| 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 | 117 | 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

| Bore size [mm] |  | $\rightarrow$ OUT |  | [ N$]$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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

| Bore size $[\mathrm{mm}]$ |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rod end <br> 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
- Additional weight: Rod end male thread ... $\begin{aligned} & \text { Rod end male thread } \cdots \cdots \cdots \cdot 43 \mathrm{~g} \\ & \text { With rubber bumper } \cdots \cdots \cdots \cdot 3 \mathrm{~g} \\ & 330 \mathrm{~g}\end{aligned}$


## Auto Switch Mounting Bracket Weight

| Mounting bracket partno. | Applicable bore size | Weight $[\mathrm{g}]$ |
| :--- | :---: | :---: |
| BQ-1 | $\varnothing 12$ to $\varnothing 25$ | 1.5 |
| BQ-2 | $\varnothing 32$ to $\varnothing 100$ | 1.5 |
| BQ2-012 | $\varnothing 12$ to $\varnothing 100$ | 5 |

Add each weight of auto switches and mounting brackets when auto switches are mounted.

## 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 n . |
| :---: | :---: | :---: | :---: |
| CQP2B32-5D | 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 |
| -75D |  | 110 | x 110L |
| -100D |  | 135 | x 135L |
| CQP2B40-5D | 7.5 | 35 | CQ-M5 x 35L |
| -10D |  | 40 | x 40L |
| -15D |  | 45 | x 45L |
| -20D |  | 50 | $\times 50 \mathrm{~L}$ |
| -25D |  | 55 | x 55L |
| -30D |  | 60 | x 60L |
| -35D |  | 65 | x 65L |
| -40D |  | 70 | x 70L |
| -45D |  | 75 | x 75L |
| -50D |  | 80 | x 80L |
| -75D |  | 115 | x 115L |
| -100D |  | 140 | x 140L |
| CQP2B50-10D | 12.5 | 45 | CQ-M6 $\times 45 \mathrm{~L}$ |
| -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 |

## Through-hole Type Mounting Bolt for the CDQP2: With Auto Switch Magnet

| Cylinder model | C | D | Mounting bolt part no |
| :---: | :---: | :---: | :---: |
| CDQP2B12-5D | 5.5 | 35 | CQ-M3 $\times 35 \mathrm{~L}$ |
| -10D |  | 40 | x 40L |
| -15D |  | 45 | x 45L |
| -20D |  | 50 | $\times 50 \mathrm{~L}$ |
| -25D |  | 55 | x 55L |
| -30D |  | 60 | $\times 60 \mathrm{~L}$ |
| CDQP2B16-5D | 8 | 40 | CQ-M3 $\times 40 \mathrm{~L}$ |
| -10D |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |
| -20D |  | 55 | x 55L |
| -25D |  | 60 | x 60L |
| -30D |  | 65 | x 65L |
| CDQP2B20-5D | 10.5 | 40 | CQ-M5 $\times 40 \mathrm{~L}$ |
| -10D |  | 45 | x 45L |
| -15D |  | 50 | $\times 50 \mathrm{~L}$ |
| -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 | $\times 85 \mathrm{~L}$ |
| CDQP2B25-5D | 9.5 | 40 | CQ-M5 x 40L |
| -10D |  | 45 | x 45L |
| -15D |  | 50 | x 50L |
| -20D |  | 55 | x 55L |
| -25D |  | 60 | $\times 60 \mathrm{~L}$ |
| -30D |  | 65 | x 65L |
| -35D |  | 70 | $\times 70 \mathrm{~L}$ |
| -40D |  | 75 | x 75L |
| -45D |  | 80 | x 80L |
| -50D |  | 85 | x 85L |


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDQP2B63-10D | 14.5 | 60 | CQ-M8 $\times 60 \mathrm{~L}$ |
| -15D |  | 65 | x 65L |
| -20D |  | 70 | $\times 70 \mathrm{~L}$ |
| -25D |  | 75 | x 75L |
| -30D |  | 80 | x 80L |
| -35D |  | 85 | x 85L |
| -40D |  | 90 | $\times 90 \mathrm{~L}$ |
| -45D |  | 95 | x 95L |
| -50D |  | 100 | $\times 100 \mathrm{~L}$ |
| -75D |  | 125 | $\times 125 \mathrm{~L}$ |
| -100D |  | 150 | $\times 150 \mathrm{~L}$ |
| CDQP2B80-10D | 15 | 65 | CQ-M10 $\times 65 \mathrm{~L}$ |
| -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 | $\times 100 \mathrm{~L}$ |
| -50D |  | 105 | $\times 105 \mathrm{~L}$ |
| -75D |  | 130 | $\times 130 \mathrm{~L}$ |
| -100D |  | 155 | $\times 155 \mathrm{~L}$ |
| CDQP2B100-10D | 15.5 | 75 | CQ-M10 $\times 75 \mathrm{~L}$ |
| -15D |  | 80 | x 80L |
| -20D |  | 85 | x 85L |
| -25D |  | 90 | $\times 90 \mathrm{~L}$ |
| -30D |  | 95 | x 95L |
| -35D |  | 100 | $\times 100 \mathrm{~L}$ |
| -40D |  | 105 | $\times 105 \mathrm{~L}$ |
| -45D |  | 110 | $\times 110 \mathrm{~L}$ |
| -50D |  | 115 | $\times 115 \mathrm{~L}$ |
| -75D |  | 140 | $\times 140 \mathrm{~L}$ |
| -100D |  | 165 | x 165L |

Without auto switch magnet


A-A section (Port on rod end)


B-B section (Port on head end)

Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod | Stainless steel | $\varnothing 12$ to ø25 |
|  |  | Carbon steel | $ø 32$ to ø100, Hard chrome plating |
| $\mathbf{4}$ | Collar | Aluminum alloy | $\varnothing 12$ to ø40, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$ to ø100, Chromated, Painted |
| $\mathbf{5}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{6}$ | Bushing | Bearing alloy | $\varnothing 50$ to ø100 |
| $\mathbf{7}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{8}$ | Bumper A | Urethane |  |
| $\mathbf{9}$ | Bumper B | Urethane |  |
| $\mathbf{1 0}$ | Steel ball | Carbon steel |  |
| $\mathbf{1 1}$ | Hexagon socket head set screw | Alloy steel | Zinc chromated |
| $\mathbf{1 2}$ | Piston seal | NBR |  |
| $\mathbf{1 3}$ | Rod seal | NBR |  |
| $\mathbf{1 4}$ | Gasket | NBR |  |
| $\mathbf{1 5}$ | Magnet | - |  |

Replacement Parts/Seal Kit

| Bore size <br> $[\mathrm{mm}]$ | Kit no. |  | Contents |
| :---: | :---: | :---: | :---: |
|  | Pneumatic type (Non-lube) | Air-hydro type |  |
| $\mathbf{1 2}$ | CQ2B12-PS | - |  |
| $\mathbf{1 6}$ | CQ2B16-PS | - |  |
| $\mathbf{2 0}$ | CQ2B20-PS | CQ2BH20-PS |  |
| $\mathbf{2 5}$ | CQ2B25-PS | CQ2BH25-PS |  |
| $\mathbf{3 2}$ | CQ2B32-PS | CQ2BH32-PS | Set of nos. |
| $\mathbf{4 0}$ | CQ2B40-PS | CQ2BH40-PS |  |
| $\mathbf{5 0}$ | CQ2B50-PS | CQ2BH50-PS |  |
| $\mathbf{6 3}$ | CQ2B63-PS | CQ2BH63-PS |  |
| $\mathbf{8 0}$ | CQ2B80-PS | CQ2BH80-PS |  |
| $\mathbf{1 0 0}$ | 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)


## CQP2 Series

Bore Size

## Ø12 to Ø 100 with/Without Auto Switch Magnet

Through-hole: CDQP2B


| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | Stroke range [ mm ] | Wirotatidos sithmmanet |  | With auto switch magnet |  |  |  | C | D | E | E1 | $\mathrm{E}_{2}$ | F | H | I | K | L | M | N | 0 | 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 | M $4 \times 0.7$ | 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 $\Rightarrow$ 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 $\Rightarrow$ p. 139 to 145


## ø32 to $\varnothing 100$



Min. lead wire bending radius 10



* For details on the rod end nut and accessory brackets $\Rightarrow$ 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 $\Rightarrow$ p. 139 to 145

Rod end male thread | Width across flats $\mathbf{B}_{1}$ |
| :---: |

# Compact Cylinder: Axial Piping Single Acting, Single Rod CQP2 Series $\varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50$ 

How to Order

(1) Mounting
$\qquad$

* A through-hole type mounting bolt is available as an option. For details $\Rightarrow$ p. 126


## Action

| S | Single acting, Spring return |
| :---: | :---: |
| T | Single acting, Spring extend |
| 8 Number of auto switches |  |
| Nil | 2 |
| S | 1 |
| n | n |

(2) Bore size

| $\mathbf{1 2}$ | 12 mm | $\mathbf{3 2}$ | 32 mm |
| :--- | :--- | :--- | :--- |
| $\mathbf{1 6}$ | 16 mm | $\mathbf{4 0}$ | 40 mm |
| $\mathbf{2 0}$ | 20 mm | $\mathbf{5 0}$ | 50 mm |
| $\mathbf{2 5}$ | 25 mm |  |  |
|  |  |  |  |

6 Body option

| Nil | Rod end female thread |
| :---: | :--- |
| $\mathbf{M}$ | Rod end male thread |

## (9) Made to order <br> common specifications <br> For details $\Rightarrow$ p. 123

For details on auto switch mounting $\Rightarrow$ 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.


## 7 Auto switch

Nil Without auto switch

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

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


[^17]| 4. Cylinder stroke <br> (For details on the minimum stroke for auto switch mounting $\Rightarrow$ p. 145) |  |
| :---: | :---: |
| Bore size | Standard stroke |
| 12, 16, 20, 25, 32, 40 | 5, 10 |
| 50 | 10, 20 |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 123

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

[^18]

Symbol


|  | Made to Order Common Specifications <br> (For details $\Rightarrow$ p. 155 to 188) |
| :---: | :---: |
| Symbol | Specifications |
| -XA $\square$ | 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 |

[^19]Specifications

| Bore size [mm] | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Action | Double acting, Single rod |  |  |  |  |  |  |
| Fluid | Air |  |  |  |  |  |  |
| Proof pressure | 1.5 MPa |  |  |  |  |  |  |
| Maximum operating pressure | 1.0 MPa |  |  |  |  |  |  |
| Minimum operating pressure [MPa] | 0.25 | 0.25 | 0.18 | 0.18 | 0.17 | 0.15 | 0.13 |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |
| Cushion | None |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.022 | 0.038 | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 |
| Stroke length tolerance | $\begin{gathered} +1.0 \mathrm{~mm} \\ 0 \end{gathered}$ |  |  |  |  |  |  |


| Type | A spacer is installed in the standard stroke body. |  |
| :---: | :--- | :---: |
| Part no. | Refer to "How to Order" for the standard model number. ( $\checkmark \mathrm{p} .122$ ) |  |
| Description | Strokes in 1 mm increments are available by installing a spacer in <br> the standard stroke cylinder. |  |
|  | Bore size |  |
|  | 12 to 40 |  |
|  | 50 |  |
| Example | Part no.: CQP2B20-3T <br> CQP2B20-5T with 2 mm width spacer inside range <br> The B dimension is 24.5 mm. |  |

## Manufacturing of Intermediate Strokes <br> (Except single acting, spring return)

## Moisture Control Tube

 IDK SeriesWhen 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.

## Compact Cylinder: Axial Piping Single Acting, Single Rod <br> CQP2 Series

## Theoretical Output



Spring Force

Single Acting, Spring Return

| Bore size <br> $[\mathrm{mm}]$ | Stroke <br> $[\mathrm{mm}]$ | Spring reaction force [N] |  |
| :---: | :---: | :---: | :---: |
|  | 5 | Second | First |
|  | 10 | 13 | 8.6 |
| $\mathbf{1 6}$ | 5 | 13 | 3.9 |
|  | 10 | 15 | 10.3 |
| $\mathbf{2 0}$ | 5 | 15 | 5.9 |
|  | 10 | 15 | 10 |
| $\mathbf{2 5}$ | 5 | 15 | 5.9 |
|  | 10 | 20 | 16 |
|  | 5 | 20 | 11 |
| $\mathbf{4 0}$ | 10 | 30 | 23 |
|  | 5 | 30 | 16 |
|  | 10 | 30 | 13 |

## Single acting, Spring return

- First spring state
$\xrightarrow{\mathrm{IN}}$
When spring is set in cylinder
- Second spring state


When spring is compressed with air

Single Acting, Spring Extend

| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | 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 extend

- First spring state


When spring is set in cylinder

- Second spring state
$\stackrel{\mathbb{N}}{\Rightarrow} \stackrel{\square}{\square}=$
When spring is compressed with air



## CQP2 Series

## Weight

## Without Auto Switch Magnet

## Spring Return

Spring Return

| Bre size <br> $[\mathrm{mm}]$ | Cylinder stroke $[\mathrm{mm}]$ |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 33 | 40 | - |
| $\mathbf{1 6}$ | 55 | 64 | - |
| $\mathbf{2 0}$ | 68 | 83 | - |
| $\mathbf{2 5}$ | 103 | 118 | - |
| $\mathbf{3 2}$ | 149 | 173 | - |
| $\mathbf{4 0}$ | 236 | 262 | - |
| $\mathbf{5 0}$ | - | 426 | 691 |

Spring Extend
[g]

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 33 | 40 | - |
| $\mathbf{1 6}$ | 55 | 64 | - |
| $\mathbf{2 0}$ | 73 | 87 | - |
| $\mathbf{2 5}$ | 109 | 124 | - |
| $\mathbf{3 2}$ | 160 | 180 | - |
| $\mathbf{4 0}$ | 262 | 284 | - |
| $\mathbf{5 0}$ | - | 468 | 540 |

## With Auto Switch Magnet

Spring Return
[g]

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |
| :---: | :---: | :---: | :---: |
|  | 5 | 10 | 20 |
| $\mathbf{1 2}$ | 55 | 63 | - |
| $\mathbf{1 6}$ | 92 | 100 | - |
| $\mathbf{2 0}$ | 121 | 135 | - |
| $\mathbf{2 5}$ | 178 | 191 | - |
| $\mathbf{3 2}$ | 217 | 242 | - |
| $\mathbf{4 0}$ | 323 | 349 | - |
| $\mathbf{5 0}$ | - | 558 | 641 |

Spring Extend
[g]

| Bore size <br> $[\mathrm{mm}]$ | 5 | 10 | 20 |
| :---: | :---: | :---: | :---: |
|  | 61 | 69 | - |
| $\mathbf{1 6}$ | 92 | 100 | - |
| $\mathbf{2 0}$ | 126 | 140 | - |
| $\mathbf{2 5}$ | 184 | 197 | - |
| $\mathbf{3 2}$ | 228 | 253 | - |
| $\mathbf{4 0}$ | 349 | 375 | - |
| $\mathbf{5 0}$ | - | 600 | 683 |

## Additional Weight

| Bore size [mm |  | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rod end male <br> 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
- Additional weight: Rod end male thread

242 g .. .43 285 g

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

## 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 | $\times 30 \mathrm{~L}$ |
| CQP2B16-5S | 5 | 25 | CQ-M3 x 25L |
| -10S |  | 30 | $\times 30 \mathrm{~L}$ |
| 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 | $\times 30 \mathrm{~L}$ |
| CQP2B16-5T | 5 | 25 | CQ-M3 x 25L |
| -10T |  | 30 | $\times 30 \mathrm{~L}$ |
| 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 | $\times 50 \mathrm{~L}$ |
| 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 | $\times 50 \mathrm{~L}$ |
| CDQP2B50-10T | 12.5 | 55 | CQ-M6 x 55L |
| -20T |  | 65 | x 65L |

## CQP2 Series

Construction
Without auto switch magnet

## Spring return




M5 $x$ a.

Spring extend


A-A section (Port on rod end)

With auto switch magnet


## Component Parts

| No. | Description | Material | Note |
| :---: | :--- | :---: | :---: |
| $\mathbf{1}$ | Cylinder tube | Aluminum alloy | Hard anodized |
| $\mathbf{2}^{* 1}$ | Piston | Aluminum alloy |  |
| $\mathbf{3}$ | Piston rod | Stainless steel | $\varnothing 12$ to $\varnothing 25$ |
|  |  | Carbon steel | $\varnothing 32$ to $\varnothing 50$, Hard chrome plating |
| $\mathbf{4}$ | Collar | Aluminum alloy | $\varnothing 12$ to $\varnothing 40$, Anodized |
|  |  | Aluminum alloy casted | $\varnothing 50$, Chromated, Painted |
| $\mathbf{5}$ | Retaining ring | Carbon tool steel | Phosphate coated |
| $\mathbf{6}$ | Bushing | Bearing alloy |  |
| $\mathbf{7}$ | Return spring | Piano wire | Zinc chromated |
| $\mathbf{8}$ | Bronze element | Sintered metallic BC | Port sizes Rc1/8, 1/4 |
| 9 | Retaining ring | Carbon tool steel |  |
| $\mathbf{1 0}$ | Plug with fixed orifice | Alloy steel | Port size M5 x 0.8 |
| $\mathbf{1 1}$ | Steel ball | Carbon steel |  |
| $\mathbf{1 2}$ | Hexagon sockethead set screw | Alloy steel | Zinc chromated |
| $\mathbf{1 3}$ | Rod end nut | Carbon steel | Zinc chromated |
| $\mathbf{1 4}$ | Piston seal | NBR |  |
| $\mathbf{1 5}$ | Rod seal | NBR |  |
| $\mathbf{1 6}$ | Gasket | NBR |  |
| $\mathbf{1 7}$ | Magnet | - |  |

*1 For the spring extend type (Type T), the piston and piston rod are integrated (stainless steel).

## Replacement Parts/Seal Kit

| Bore size <br> $[\mathrm{mm}]$ | Kit no. <br> (Single acting/Spring return) | Kit no. <br> (Single acting/Spring extend) |
| :---: | :---: | :---: |
| $\mathbf{1 2}$ | CQ2B12-S-PS | CQ2B12-T-PS |
| $\mathbf{1 6}$ | CQ2B16-S-PS | CQ2B16-T-PS |
| $\mathbf{2 0}$ | CQ2B20-S-PS | CQ2B20-T-PS |
| $\mathbf{2 5}$ | CQ2B25-S-PS | CQ2B25-T-PS |
| $\mathbf{3 2}$ | CQ2B32-S-PS | CQ2B32-T-PS |
| $\mathbf{4 0}$ | CQ2B40-S-PS | CQ2B40-T-PS |
| $\mathbf{5 0}$ | 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)

## Compact Cylinder: Axial Piping <br> Single Acting, Single Rod <br> CQP2 Series

Bore Size

## $\varnothing 12$ to $\varnothing 50$ Spring Return with/Without Auto Switch Magnet

Through-hole: CDQP2B $\square$ S $\varnothing 12$ to $\varnothing 25$


| Bore size [ mm ] | Without auto switch magnet |  |  |  | With auto switch magnet |  |  |  |  |  | C | D | E | E1 | $E_{2}$ | F | H | I | K | L | M | N | 0 | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A |  | B |  | A |  | B |  | S | $\mathbf{U}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 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 $\times 0.5$ | 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 $\times 0.7$ | 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 $\times 0.8$ | 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 $\Rightarrow$ p. 26, 27
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


| Bore size [mm] | Without auto switch magnet |  |  |  |  |  | With auto switch magnet |  |  |  |  |  |  |  | C | D | E | F | H | I | J | K | L | M | N | 0 | P | Q | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A |  |  | B |  |  | A |  |  | B |  |  | S | U |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 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 | M $8 \times 1.25$ | 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 $\times 1.5$ | 86 | 13 | 17 | 8 | 50 | 6.6 | 11 depth 8 | 1/4 | 10 | 77 | 39 |

* For details on the rod end nut $\Rightarrow$ p. 26
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


|  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{B}_{\mathbf{1}}$ | $\mathbf{C}_{\mathbf{1}}$ | $\mathbf{H}_{\mathbf{1}}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{M M}$ | $\mathbf{X}$ |
| $\mathbf{1 2}$ | 8 | 9 | 4 | 14 | $\mathrm{M} 5 \times 0.8$ | 10.5 |
| $\mathbf{1 6}$ | 10 | 10 | 5 | 15.5 | $\mathrm{M} 6 \times 1.0$ | 12 |
| $\mathbf{2 0}$ | 13 | 12 | 5 | 18.5 | $\mathrm{M} 8 \times 1.25$ | 14 |
| $\mathbf{2 5}$ | 17 | 15 | 6 | 22.5 | $\mathrm{M} 10 \times 1.25$ | 17.5 |
| $\mathbf{3 2}$ | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |
| $\mathbf{4 0}$ | 22 | 20.5 | 8 | 28.5 | $\mathrm{M} 14 \times 1.5$ | 23.5 |
| $\mathbf{5 0}$ | 27 | 26 | 11 | 33.5 | $\mathrm{M} 18 \times 1.5$ | 28.5 |

## CQP2 Series

Bore Size

## $\varnothing 12$ to $\varnothing 50$ Spring Extend withWithout Auto Switch Magnet

## Through-hole: CDQP2B $\square$ T

 $\varnothing 12$ to $\varnothing 25$

| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | Without auto switch magnet |  |  |  | With auto switch magnet |  |  |  |  |  | C | D | E | $\mathrm{E}_{1}$ | E2 | F | H | 1 | K | L |  | M | N | 0 | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A |  | B |  | A |  | B |  | S | U |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 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 $\times 0.5$ | 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 0.0 .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 $\times 0.8$ | 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 | M6x 1.0 | 52 | 10 | 10 | 15 | 40 | 5.5 | 9 depth 7 | 41.5 |

* For details on the rod end nut $\Rightarrow$ p. 26
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145
$\varnothing 32$ to $\varnothing 50$



| Bore size [mm] | Without auto switch magnet |  |  |  |  |  | With auto switch magnet |  |  |  |  |  |  |  | C | D | E | F | H | I | J | K | L |  |  | M | N | 0 | P | Q | W | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A |  |  | B |  |  | A |  |  | B |  |  | S | U |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 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 | st |  |  |  |  |  |  |  |
| 32 | 40 | 50 | - | 28 | 33 | - | 50 | 60 | - | 38 | 43 | - | 62 | 29 | 13 | 16 | 45 | 8.5 | M8 $\times 1.25$ | 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 $\times 1.25$ | 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 $\times 1.5$ | 86 | 13 | 17 | - | 18 | 28 | 50 | 6.6 | 11 depth 8 | 1/4 | 10 | 77 | 39 |

* For details on the rod end nut $\Rightarrow$ p. 26
* For the auto switch proper mounting position and mounting height $\Rightarrow$ p. 139 to 145


| Bore size [mm] | $B_{1}$ | C 1 | $\mathrm{H}_{1}$ | L1 |  |  | 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 | - | M8x 1.25 | 14 |
| 25 | 17 | 15 | 6 | 27.5 | 32.5 | - | M10 $\times 1.25$ | 17.5 |
| 32 | 22 | 20.5 | 8 | 33.5 | 38.5 | - | M14 $\times 1.5$ | 23.5 |
| 40 | 22 | 20.5 | 8 | 33.5 | 38.5 | - | M14 $\times 1.5$ | 23.5 |
| 50 | 27 | 26 | 11 | - | 43.5 | 53.5 | M18 $\times 1.5$ | 28.5 |

# Compact Cylinder: With End Lock CBQ2 Series $ø 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$ 

How to Order


|  |  |  |
| :---: | :---: | :---: |
| 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 | $ø 32$ to $\varnothing 100$ |

*1 ø20, ø25 have both through-hole (B) and both ends tapped (A).
At the 75 and 100 mm strokes with $\varnothing 80, \varnothing 100$, 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 $\Rightarrow$ p. 135

Cylinder stroke (For details on the minimum stroke for auto switch mounting $\lrcorner>$ p. 145) [mm]

| Bore size | Standard stroke |
| :---: | :---: |
| $\mathbf{2 0 , 2 5}, \mathbf{3 2 , 4 0} \mathbf{5 0 , 6 3}$ | $10,15,20,25,50,75,100$ |
| $\mathbf{8 0}, \mathbf{1 0 0}$ | $25,50,75,100$ |

* For the manufacturing of intermediate strokes $\Rightarrow$ p. 133
7 Body option

| Nil | Rod end female thread |
| :---: | :---: |
| $\mathbf{M}$ | Rod end male thread |

(1)

| Number of auto switches |  |
| :---: | :---: |
| Nil | 2 |
| $\mathbf{S}$ | 1 |
| $\mathbf{n}$ | n |


| 8 | Lock position |
| :---: | :---: |
| $\mathbf{H}$ | Head end lock |
| R | Rod end lock |

## Made to order

 common specifications For details $\Rightarrow$ p. 133| 2 | Bore size |
| :--- | :--- |
| $\mathbf{2 0}$ | 20 mm |
| $\mathbf{2 5}$ | 25 mm |
| $\mathbf{3 2}$ | 32 mm |
| $\mathbf{4 0}$ | 40 mm |
| $\mathbf{5 0}$ | 50 mm |
| $\mathbf{6 3}$ | 63 mm |
| $\mathbf{8 0}$ | 80 mm |
| $\mathbf{1 0 0}$ | 100 mm |

Port thread type

| Nil | M thread | $\varnothing 12, ~ \varnothing 25$ |
| :---: | :---: | :---: |
|  | Rc |  |
| TN | NPT |  |
| TF | G |  |

## (5) Action

D $\quad$ Double acting

Cushion
C Rubber bumper

## 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


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

*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) M9NW
$1 \mathrm{~m} \cdots \ldots . . . \mathrm{M}$ (Example) M9NWM
$3 \mathrm{~m} \cdots \cdots \cdots . \mathrm{L}$ (Example) M9NWL
$5 \mathrm{~m} \cdots \cdots \cdots . \mathrm{Z}$ (Example) M9NWZ
None $\cdots \cdots . . \mathrm{N}$ (Example) J79CN
$3 \mathrm{~m} . . . . . . .$. L (Example) M9NWL
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 $\varnothing 40$ to $\varnothing 100$.
* 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 $\Rightarrow$ p. 152
* When the $\mathrm{D}-\mathrm{A} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~W}(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ types with $\varnothing 32$ to $\varnothing 50$ are mounted on a surface other than the port side, order auto switch mounting brackets separately. For details $\Rightarrow$ p. 150, 151


## CBQ2 Series



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

Specifications

| Bore size [mm] | 20 | 25 | 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 | $0.15 \mathrm{MPa}^{* 1}$ |  |  |  |  |  |  |  |
| Ambient and fluid temperatures | Without auto switch magnet: -10 to $70^{\circ} \mathrm{C}$ <br> With auto switch magnet: -10 to $60^{\circ} \mathrm{C}$ (No freezing) |  |  |  |  |  |  |  |
| Lubrication | Not required (Non-lube) |  |  |  |  |  |  |  |
| Piston speed | 50 to $500 \mathrm{~mm} / \mathrm{s}$ |  |  |  |  |  |  |  |
| Cushion | Rubber bumper |  |  |  |  |  |  |  |
| Allowable kinetic energy [J] | 0.055 | 0.09 | 0.15 | 0.26 | 0.46 | 0.77 | 1.36 | 2.27 |
| Stroke length tolerance | $+{ }_{0}^{+1.0 \mathrm{~mm} * 2}$ |  |  |  |  |  |  |  |

*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] | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Holding force (Max.) [N] | 215 | 330 | 550 | 860 | 1340 | 2140 | 3450 | 5390 |
| Backlash | 2 mm or less |  |  |  |  |  |  |  |
| Manual release | Nock 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. ( $\leftrightarrows$ p. 131) |  | Suffix "-XB10" to the end of standard model number. ( $\leftrightarrows$ 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 | Stroke range | Bore size | Stroke range |
|  | 20 to 100 | 5 to 95 | 20 to 63 | 11 to 99 |
|  |  |  | 80, 100 | 26 to 99 |
| Example | Part no.: CBQ2B40-45DC-HL CBQ2B40-50DC-HL with 5 mm width spacer inside. $B$ dimension is 125 mm . |  | Part no.: CBQ2B40-45DC-HL-XB10 Makes 45 stroke tube. $B$ dimension is 120 mm . |  |

In the case of an exclusive body type for $\varnothing 20, \varnothing 25, \varnothing 80$ and $\varnothing 100(-$ 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 <br> $[\mathrm{mm}]$ | Foot*1 | Compact <br> foot*1 | Flange | Double clevis*2 | Double clevis <br> pivot bracket |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{2 0}$ | CQS-L020 | CQS-LC020 | CQS-F020 | CQS-D020 | CQ-C020 |
| $\mathbf{2 5}$ | CQS-L025 | CQS-LC025 | CQS-F025 | CQS-D025 | CQ-C025 |
| $\mathbf{3 2}$ | CQ-L032 | CQ-LC032 | CQ-F032 | CQ-D032 | CQ-C032 |
| $\mathbf{4 0}$ | CQ-L040 | CQ-LC040 | CQ-F040 | CQ-D040 | CQ-C040 |
| $\mathbf{5 0}$ | CQ-L050 | CQ-LC050 | CQ-F050 | CQ-D050 | CQ-C050 |
| $\mathbf{6 3}$ | CQ-L063 | CQ-LC063 | CQ-F063 | CQ-D063 | CQ-C063 |
| $\mathbf{8 0}$ | CQ-L080 | CQ-LC080 | CQ-F080 | CQ-D080 | CQ-C080 |
| $\mathbf{1 0 0}$ | 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).


## 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

0.4 MPa


Allowable Lateral Load at Rod End


## Weight

Without Auto Switch Magnet, Non-lock Type (- $\square \mathbf{N}$ )
[g]

| Bore size <br> $[\mathrm{mm}]$ | Cylinder stroke [mm] |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 10 | 15 | 20 | 25 | 50 | 75 | 100 |
| $\mathbf{2 0}$ | 211 | 224 | 237 | 249 | 313 | 416 | 480 |
| $\mathbf{2 5}$ | 278 | 294 | 310 | 325 | 405 | 534 | 613 |
| $\mathbf{3 2}$ | 378 | 399 | 419 | 440 | 544 | 649 | 754 |
| $\mathbf{4 0}$ | 540 | 563 | 586 | 610 | 725 | 845 | 965 |
| $\mathbf{5 0}$ | 868 | 904 | 940 | 976 | 1158 | 1346 | 1534 |
| $\mathbf{6 3}$ | 1097 | 1138 | 1179 | 1220 | 1424 | 1636 | 1847 |
| $\mathbf{8 0}$ | - | - | - | 2821 | 3160 | 3495 | 3829 |
| $\mathbf{1 0 0}$ | - | - | - | 4306 | 4760 | 5220 | 5680 |

## Additional Weight

| Bore size [mm] | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ | $\mathbf{8 0}$ | $\mathbf{1 0 0}$ |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lock type (-DL) | 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 | 53 | 120 | 175 |
|  | Nut | 4 | 8 | 17 | 17 | 32 | 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

$$
\ldots . . . . . . . . . . . . . . . ~ 544 \mathrm{~g}
$$

- Additional weight: Rod end male thread $\cdots \cdots \cdots . .43 \mathrm{~g}(26 \mathrm{~g}+17 \mathrm{~g})$

Total 587 g

## CBQ2 Series

## Through-hole Type Mounting Bolt for the CDBQ2

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 $\varnothing 25$ cylinders with through-holes.


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

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDBQ2B50-10DC-H $\square$ | 12.5 | 90 | CQ-M6 x 90L |
| -15DC-H $\square$ |  | 95 | x 95L |
| -20DC-H $\square$ |  | 100 | x 100L |
| -25DC-H $\square$ |  | 105 | x 105L |
| -50DC-H $\square$ |  | 130 | x 130L |
| -75DC-H $\square$ |  | 155 | x 155L |
| -100DC-H $\square$ |  | 180 | x 180L |
| CDBQ2B63-10DC-H $\square$ | 13.5 | 90 | CQ-M8 x 90L |
| -15DC-H $\square$ |  | 95 | x 95L |
| -20DC-H $\square$ |  | 100 | x 100L |
| -25DC-H $\square$ |  | 105 | x 105L |
| -50DC-H $\square$ |  | 130 | x 130L |
| -75DC-H $\square$ |  | 155 | x 155L |
| -100DC-H $\square$ |  | 180 | x 180L |
| CDBQ2B80-25DC-HD | 12.5 | 135 | CQ-M10 x 135L |
| -50DC-H $\square$ |  | 160 | x 160L |
| CDBQ2B100-25DC-H $\square$ | 13 | 145 | CQ-M10 x 145L |
| -50DC-H $\square$ |  | 170 | x 170L |


| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDBQ2B50-10DC-R $\square$ | 12.5 | 80 | CQ-M6 x 80L |
| -15DC-R $\square$ |  | 85 | x 85L |
| -20DC-R $\square$ |  | 90 | x 90L |
| -25DC-R $\square$ |  | 95 | x 95L |
| -50DC-R $\square$ |  | 120 | x 120L |
| -75DC-R $\square$ |  | 145 | x 145L |
| -100DC-R $\square$ |  | 170 | x 170L |
| CDBQ2B63-10DC-R $\square$ | 14.5 | 85 | CQ-M8 x 85L |
| -15DC-R $\square$ |  | 90 | x 90L |
| -20DC-R $\square$ |  | 95 | x 95L |
| -25DC-R $\square$ |  | 100 | x 100L |
| -50DC-R $\square$ |  | 125 | x 125L |
| -75DC-R $\square$ |  | 150 | x 150L |
| -100DC-R $\square$ |  | 175 | x 175L |
| CDBQ2B80-25DC-R $\square$ | 15 | 130 | CQ-M10 x 130L |
| -50DC-R $\square$ |  | 155 | x 155L |
| CDBQ2B100-25DC-R $\square$ | 15.5 | 140 | CQ-M10 x 140L |
| -50DC-R $\square$ |  | 165 | x 165L |

With Rod End Lock (R $\square$ )

| Cylinder model | C | D | Mounting bolt part no. |
| :---: | :---: | :---: | :---: |
| CDBQ2B20-10DC-R | 6.5 | 65 | CQ-M5 x 65L |
| -15DC-R $\square$ |  | 70 | $\times 70 \mathrm{~L}$ |
| -20DC-R $\square$ |  | 75 | x 75L |
| -25DC-R $\square$ |  | 80 | x 80L |
| -50DC-R $\square$ | 10 | 120 | x 120L |
| -75DC-R $\square$ |  | 145 | x 145L |
| -100DC-R $\square$ |  | 170 | x 170L |
| CDBQ2B25-10DC-R | 8.5 | 70 | CQ-M5 x 70L |
| -15DC-R $\square$ |  | 75 | x 75L |
| -20DC-R $\square$ |  | 80 | x 80L |
| -25DC-R $\square$ |  | 85 | x 85L |
| -50DC-R $\square$ | 7 | 120 | x 120L |
| -75DC-R $\square$ |  | 145 | x 145L |
| -100DC-R $\square$ |  | 170 | x 170L |
| CDBQ2B32-10DC-R | 9 | 70 | CQ-M5 x 70L |
| -15DC-R $\square$ |  | 75 | x 75L |
| -20DC-R $\square$ |  | 80 | x 80L |
| -25DC-R $\square$ |  | 85 | x 85L |
| -50DC-R $\square$ |  | 110 | x 110L |
| -75DC-R $\square$ |  | 135 | x 135L |
| -100DC-R $\square$ |  | 160 | x 160L |
| CDBQ2B40-10DC-R $\square$ | 7.5 | 75 | CQ-M5 x 75L |
| -15DC-R $\square$ |  | 80 | x 80L |
| -20DC-R $\square$ |  | 85 | x 85L |
| -25DC-R $\square$ |  | 90 | x 90L |
| -50DC-R $\square$ |  | 115 | x 115L |
| -75DC-R $\square$ |  | 140 | x 140L |
| -100DC-R $\square$ |  | 165 | x 165L |

## CBQ2 Series

Construction
$\varnothing 32$ to $\varnothing 63$


Head end lock


Rod end lock


Cylinder tube form $\varnothing 32$ to $\varnothing 63$


Cylinder tube form $ø 25$ or less


Manual release lock type: Suffix L


Cylinder tube form $\varnothing 80$ or more
ø20, ø25



## 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 bearing alloy | $\varnothing 40$ or less, Anodized |
|  |  | Aluminum alloy casted | 050 or more, Painted after chromated |
| 5 | Retaining ring | Carbon tool steel | Phosphate coated |
| 6 | Bushing | Lead-bronze casted | For ø50 or larger only |
| 7 | Magnet | - | With auto switch magnet |
| 8 | Bumper A | Urethane |  |
| 9 | Bumper B | Urethane |  |
| 10 | Piston seal | NBR |  |
| 11 | Rod seal | NBR |  |
| 12 | Tube gasket | NBR | Using 4 pcs. for $\varnothing 80, \varnothing 100$ |
| 13 | Lock piston seal | NBR |  |
| 14 | Piston gasket | NBR |  |
| 15 | Lock piston | Carbon steel | Quenched, Hard chrome plating |
| 16 | Lock holder | Brass | Electroless nickel plating |
| 17 | Gasket | NBR |  |
| 18 | Lock spring | Stainless steel |  |
| 19 | Bumper | Urethane |  |
| 20 | Head cover | Aluminum alloy | Anodized |
| 21 | Lock bolt | Carbon steel | Quenched, Hard chrome plating |
| 22 | Hexagon socket head cap screw | Alloy steel | Black zinc chromated |
| 23 | Rubber cap | Synthetic rubber |  |
| 24A | Cap A | Aluminum casted | Black painted |
| 24B | Cap B | Carbon steel | Black painted |
| 25 | M/O knob | Zinc die-casted | Black painted |
| 26 | M/O bolt | Alloy steel | Black zinc chromated |
| 27 | M/O spring | Steel wire | Zinc chromated |
| 28 | Stopper ring | Rolled steel | Zinc chromated |
| 29 | Hexagon socket head cap screw | Alloy steel | Zinc chromated |
| 30 | Rod end nut | Carbon steel |  |

Replacement Parts/Seal Kit (End lock type)

| Bore size [mm] | Kit no. | Contents |
| :---: | :---: | :---: |
| 20 | CBQ2B20-PS | Set of nos. <br> (10), (11), (12), (13), (17), (22), (29) <br> and a grease pack |
| 25 | CBQ2B25-PS |  |
| 32 | CBQ2B32-PS |  |
| 40 | CBQ2B40-PS |  |
| 50 | CBQ2B50-PS |  |
| 63 | CBQ2B63-PS |  |
| 80 | CBQ2B80-PS |  |
| 100 | CBQ2B100-PS |  |

* Seal kit includes (10, (11), (12), (13), (17), (22), (29). Order the seal kit based on each bore size.



## CBQ2 Series

Bore Size

## $\varnothing 20, \varnothing 25$ With/Without Auto Switch Magnet

Through-hole: CDBQ2B
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 | 25.5 | 5.4 | M6 x 1.0 | 9 | 9 | 10 | 7 |
|  | 50, 75, 100 | 80.5 | 66 | 80.5 | 66 | 9 |  |  |  |  |  |  |  |  |  | 14.5 |  |  |  |  |  |  |  |
| 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 | 28 | 5.4 | M6 x 1.0 | 9 | 11 | 10 | 7 |
|  | 50, 75, 100 | 84 | 69 | 84 | 69 | 11 |  |  |  |  |  |  |  |  |  | 15 |  |  |  |  |  |  |  |

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


## End lock mechanism

(Manual release lock type)


Rod end male thread


| Bore size [mm] | Standard stroke | B1 | $\mathrm{C}_{1}$ | $\mathrm{H}_{1}$ | L | MM | X |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20 | 10, 15, 20, 25 | 13 | 12 | 5 | 18.5 | M8 $\times 1.25$ | 14 |
|  | 50, 75, 100 |  |  |  | 28.5 |  |  |
| 25 | 10, 15, 20, 25 | 17 | 15 | 6 | 22.5 | M10 x 1.25 | 17.5 |
|  | 50, 75, 100 |  |  |  | 32.5 |  |  |

## 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 Ø100 with/Without Auto Switch Magnet

## Standard: CDBQ2B


[mm]

| Bore size | Standard stroke |  | With head end lock |  |  | With rod end lock |  |  |  | C | D | DL | DM | E | H | HR | I | J | K | L | LL | M |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| [mm] |  |  | A | B | Q | A | B | F | Q |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 32 | $\begin{gathered} 10,15,20 \\ 25,50 \\ 75,100 \end{gathered}$ |  | 72.5 | 65.5 | 12.5 | 65 | 58 | 7.5 | 10.5 | 13 | 16 | 25 | 22 | 45 | M8 $\times 1.25$ | 33.5 | 60 | 4.5 | 14 | 7 | 15 | 34 |
| 40 |  |  | 82 | 75 | 14 | 71.5 | 64.5 | 8 | 11 | 13 | 16 | 29 | 26 | 52 | M $8 \times 1.25$ | 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 $\times 1.5$ | 45 | 86 | 7 | 17 | 8 | 21 | 50 |
| 63 |  |  | 85 | 77 | 15.5 | 79 | 71 | 10.5 | 15 | 15 | 20 | 28.5 | 25 | 77 | M10 $\times 1.5$ | 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 |  |  |
| $\begin{gathered} \begin{array}{c} \text { Bore size } \\ {[\mathrm{mm}]} \end{array} \\ \hline \end{gathered}$ | N | 0 | P | R | RF | W | WL | Z | *1 At the 75 and 100 mm strokes with $\varnothing 80, \varnothing 100$, both ends tapped $(A)$ is the standard. Through-hole (B) is not available. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 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*1 | Rc3/8 | 13.5*1 | 21 | 104 | 40 | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 11 | 17.5*1 | Rc3/8 | 13.5*1 | 21 | 123.5 | 40 | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Both ends tapped



Rod end male thread


| Bore size [mm] | Standard stroke | B1 | $\mathrm{C}_{1}$ | $\mathrm{H}_{1}$ | L1 | MM | X |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | $\begin{gathered} 10,15,20 \\ 25,50 \\ 75,100 \end{gathered}$ | 22 | 20.5 | 8 | 28.5 | M14 $\times 1.5$ | 23.5 |
| 40 |  | 22 | 20.5 | 8 | 28.5 | M14 $\times 1.5$ | 23.5 |
| 50 |  | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |
| 63 |  | 27 | 26 | 11 | 33.5 | M18 $\times 1.5$ | 28.5 |
| 80 | 25, 50 | 32 | 32.5 | 13 | 43.5 | M22 x 1.5 | 35.5 |
|  | 75, 100 |  |  |  | 53.5 |  |  |
| 100 | 25, 50 | 41 | 32.5 | 16 | 43.5 | M26 x 1.5 | 35.5 |
|  | 75, 100 |  |  |  | 53.5 |  |  |

## 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 .

## Compact Cylinder <br> CDQ2 Series <br> Auto Switch Mounting

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

D-M9 $\square$
D-M9 $\square$ V
D-M9■W
D-M9■WV
D-M9 $\square$ A
D-M9 $\square$ AV
D-A9
D-A9 $\square$ V

Applicable cylinder series: CDQ2, CDQ2W, CDQ2-S/T (Single acting),
CDQ2, CDQ2W (Large bore size), CDQ2 $\square$ S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 $\square \mathbf{R} / \square \mathbf{V}, \mathrm{CDQ2W} \square \mathrm{R} / \square \mathbf{V}$ (Water resistant)
$\varnothing 12$ to ø25

$\varnothing 32$ to $\varnothing 200$


Applicable cylinder series: CDQP2, CDQP2-S/T (Axial piping) $\varnothing 12$ to $\varnothing 25$ $\varnothing 32$ to $\varnothing 100$


Applicable cylinder series: CDBQ2 (With end lock) ø20, ø25

$\varnothing 32$ to $\varnothing 100$


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

| D-A7 $\square$ | D-F7 $\square$ V |
| :--- | :--- |
| D-A80 | D-J79C |
| D-A7 $\square H$ | D-F7■W |
| D-A80H | D-J79W |
| D-A73C | D-F7 $\square W V$ |
| D-A80C | D-F7BAV |
| D-F7 | D-F7BA |
| D-F79F | D-F7NT |
| D-J79 | D-A79W |

D-P3DWA


Applicable cylinder series: CDQP2, CDQP2-S/T (Axial piping) $\varnothing 12$ to $\varnothing 25$

 $\varnothing 32$ to $\varnothing 100$


Applicable cylinder series: CDBQ2 (With end lock)


Applicable cylinder series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size), CDQ2 $\triangle$ (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 $\square \mathrm{R} / \square \mathrm{V}, \mathrm{CDQ2W} \square \mathrm{R} / \square \mathrm{V}$ (Water resistant)


## D-P4DW

Applicable cylinder series: CDQP2, CDQP2-S/T $\varnothing 40$ to $\varnothing 100$
(Axial piping)


Applicable cylinder series: CDBQ2 (With end lock) $\varnothing 40$ to $\varnothing 100$



## 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]

|  | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \square V \\ & \text { D-M9 } \square \mathbf{W} \\ & \text { D-M9 } \square \mathbf{W V} \\ & \text { D-M9 } \square \text { A } \\ & \text { D-M9 } \square \text { AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \square \\ & \text { D-A9 } \square \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | $\begin{aligned} & \text { D-A72/A7 } \square \mathrm{H} / \mathrm{A} 80 \mathrm{H} \\ & \text { D-A73C/A80C/F7 } \square \\ & \text { D-F79F/J79/F7 } \square \mathrm{V} \\ & \text { D-J79C/F7 } \square W \\ & \text { D-J79W/F7■WV } \\ & \text { D-F7BAV/F7BA } \end{aligned}$ |  | D-F7NT |  | D-A79W |  | D-P3DWA |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 12 | 7.5 | $\begin{gathered} 8.5 \\ (13) \\ \hline \end{gathered}$ | 3.5 | $\begin{aligned} & \hline 4.5 \\ & \text { (9) } \\ & \hline \end{aligned}$ | 4.5 | $\begin{gathered} 5.5 \\ (10) \\ \hline \end{gathered}$ | 5 | $\begin{gathered} 6 \\ (10.5) \\ \hline \end{gathered}$ | 10 | $\begin{aligned} & \hline 11 \\ & (15.5) \\ & \hline \end{aligned}$ | 2 | $\begin{gathered} \hline 3 \\ (7.5) \\ \hline \end{gathered}$ | - | - |
| 16 | $\begin{aligned} & \hline 10.5 \\ & (8.5) \\ & \hline \end{aligned}$ | $\begin{gathered} 8 \\ (10) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 6.5 \\ (4.5) \\ \hline \end{gathered}$ | 4 <br> (6) | $\begin{gathered} \hline 7.5 \\ (5.5) \end{gathered}$ | $\begin{gathered} 5 \\ (7) \\ \hline \end{gathered}$ | 8 | $\begin{gathered} \hline 5.5 \\ (7.5) \end{gathered}$ | $\begin{gathered} 13 \\ (11) \\ \hline \end{gathered}$ | $\begin{gathered} 10.5 \\ (12.5) \end{gathered}$ | $\begin{gathered} \hline 5 \\ (3) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 2.5 \\ (4.5) \\ \hline \end{gathered}$ | - | - |
| 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)

|  | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \quad \text { V } \\ & \text { D-M9 } \mathbf{W} \\ & \text { D-M9 } \mathbf{W V} \\ & \text { D-M9■A } \\ & \text { D-M9■AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | D-A72/A7DH/A80H <br> D-A73C/A80C/F7ㅁ <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 |
| 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)

|  | $\begin{aligned} & \text { D-M9 } \\ & \text { D-M9 } \square V \\ & \text { D-M9 } \square \mathbf{W} \\ & \text { D-M9 } \square \text { WV } \\ & \text { D-M9 } \square \text { A } \\ & \text { D-M9 } \square \text { AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | D-A72/A7 $\square H / A 80 H$D-A73C/A80CD-F7■/F7 $\square V$D-F79F/F7■WD-F7■WV/J79D-J79W/J79CD-F7BAD-F7BAV |  | D-F7NT |  | D-A79W |  | D-P3DWA |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 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 $\square$ S (Anti-lateral load)

Applicable Cylinder Series: CDQ2 (Long stroke)

|  | $\begin{aligned} & \text { D-M9 } \\ & \text { D-M9 } \\ & \text { D-M9 } \mathbf{V} \\ & \text { D-M9 WWV } \\ & \text { D-M9■A } \\ & \text { D-M9■AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A | B | A | B | A | B |
| 32 | 12.5 | 20.5 | 8.5 | 16.5 | 9.5 | 17.5 |
| 40 | 16 | 26.5 | 12 | 22.5 | 13 | 23.5 |
| 50 | 14 | 29.5 | 10 | 25.5 | 11 | 26.5 |
| 63 | 16.5 | 28.5 | 12.5 | 24.5 | 13.5 | 25.5 |
| 80 | 19.5 | 34.5 | 15.5 | 30.5 | 16.5 | 31.5 |
| 100 | 22.5 | 41 | 18.5 | 37 | 19.5 | 38 |

Applicable Cylinder Series: CDQ2K (Non-rotating rod)

|  | $\begin{aligned} & \text { D-M9 } \\ & \text { D-M9 } \square \mathbf{V} \\ & \text { D-M9 W } \\ & \text { D-M9■WV } \\ & \text { D-M9■A } \\ & \text { D-M9■AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | D-A72/A7DH/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 |
| 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)

|  | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \square V \\ & \text { D-M9 } \square \mathbf{W} \\ & \text { D-M9 } \square \mathbf{W V} \\ & \text { D-M9 } \square \text { A } \\ & \text { D-M9 } \square \text { AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \square \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | 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 |
| 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 |

## CDQ2 Series

Auto Switch Proper Mounting Position * Adjust the auto switch after confirming the operating conditions in the actual setting.

Applicable Cylinder Series: CDQ2 $\square \mathrm{R} / \square \mathrm{V}$ (Water resistant) $\quad[\mathrm{mm}]$

| Auto switch <br> model | D-M9 $\square \mathbf{A}$ <br> D-M9 <br> Bore size |  | $\mathbf{A}$ | D-F7BA <br> D-F7BAV |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 19 | $\mathbf{B}$ | $\mathbf{A}$ | $\mathbf{B}$ |  |
| $\mathbf{2 0}$ | 19.5 | 8 | 18 | 6.5 |  |
| $\mathbf{2 5}$ | 22 | 9 | 18 | 7 |  |
| $\mathbf{3 2}$ | 16 | 11.5 | 19.5 | 6.5 |  |
| $\mathbf{4 0}$ | 14 | 14.5 | 13.5 | 9 |  |
| $\mathbf{5 0}$ | 16.5 | 17.5 | 11.5 | 12 |  |
| $\mathbf{6 3}$ | 19.5 | 22 | 14 | 15 |  |
| $\mathbf{8 0}$ | 24 | 27 | 21.5 | 24.5 |  |
| $\mathbf{1 0 0}$ |  |  |  | 19.5 |  |

Applicable Cylinder Series: CDQ2W $\square$ R/ $\square V$ (Water resistant, Double rod) [mm]

| Auto switch <br> model | D-M9 $\square \mathbf{A}$ <br> D-M9 <br> Bore size |  | $\mathbf{A}$ | D-F7BA <br> D-F7BAV |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{A}$ | $\mathbf{B}$ |  |
| $\mathbf{4 0}$ | 16 | 22 | 13.5 | 19.5 |  |
| $\mathbf{5 0}$ | 14 | 24.5 | 11.5 | 22 |  |
| $\mathbf{6 3}$ | 16.5 | 23.5 | 14 | 21 |  |
| $\mathbf{8 0}$ | 19.5 | 29.5 | 17 | 27 |  |
| $\mathbf{1 0 0}$ | 24 | 34.5 | 21.5 | 32 |  |

Applicable Cylinder Series: CDQP2 (Axial piping), CDQP2-S/T (Axial piping, Single acting)

|  | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \square \mathbf{V} \\ & \text { D-M9 } \quad \text { W } \\ & \text { D-M9 } \square \mathbf{W V} \\ & \text { D-M9 } \square \mathbf{A} \\ & \text { D-M9 } \square \text { AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A73 } \\ & \text { D-A80 } \end{aligned}$ |  | D-A72/A7■H/A80H <br> D-A73C/A80C/F7口 <br> D-F79F/J79/F7■V <br> D-J79C/F7 $\square W$ <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 |
| 12 | 6 | $\begin{gathered} 7 \\ (11) \end{gathered}$ | 2 | $3$ <br> (7) | 4.5 | $\begin{gathered} 5.5 \\ (10) \end{gathered}$ | 5 | $\begin{gathered} 6 \\ (10.5) \end{gathered}$ | 10 | $\begin{aligned} & \hline 11 \\ & (15.5) \end{aligned}$ | 2 | $\begin{aligned} & \hline 3 \\ & (7.5) \\ & \hline \end{aligned}$ | - | - |
| 16 | $\begin{gathered} \hline 9 \\ (7) \\ \hline \end{gathered}$ | $\begin{array}{r} 6.5 \\ (8.5) \\ \hline \end{array}$ | $\begin{aligned} & \hline 5 \\ & (3) \end{aligned}$ | $\begin{array}{r} 2.5 \\ (4.5) \\ \hline \end{array}$ | $\begin{gathered} \hline 7.5 \\ (5.5) \\ \hline \end{gathered}$ | $\begin{array}{r} 5 \\ (7) \\ \hline \end{array}$ | $\begin{gathered} \hline 8 \\ (6) \\ \hline \end{gathered}$ | $\begin{array}{r} 5.5 \\ (7.5) \\ \hline \end{array}$ | $\begin{gathered} 13 \\ (11) \end{gathered}$ | $\begin{array}{r} 10.5 \\ (12.5) \\ \hline \end{array}$ | $\begin{gathered} 5 \\ (3) \\ \hline \end{gathered}$ | $\begin{gathered} 2.5 \\ (4.5) \\ \hline \end{gathered}$ | - | - |
| 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 |

[^20]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)

|  | $\begin{aligned} & \text { D-M9 } \\ & \text { D-M9 } \mathbf{V} \\ & \text { D-M9 } \\ & \text { D-M9 W WV } \\ & \text { D-M9■A } \\ & \text { D-M9■AV } \end{aligned}$ |  | $\begin{aligned} & \text { D-A9 } \\ & \text { D-A9 } \square \text { V } \end{aligned}$ |  | $\begin{aligned} & \text { D-A7■ } \\ & \text { D-A80 } \end{aligned}$ |  | D-A7■H/A80HD-A73C/A80CD-F7 $\square / F 79 F / J 79$D-F7 $\square$ V/J79CD-F7 $\square$ W/J79WD-F7 $\square W V / F 7 B A ~$D-F7BAV/F7NT |  | D-A79W |  | D-P4DW |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A | B | A | B | A | B | A | B | A | B | A | B |
| 20 (Head end lock) | $\begin{gathered} 10 \\ \text { (11) } \\ \hline \end{gathered}$ | $\begin{gathered} 39 \\ (43) \\ \hline \end{gathered}$ | $\begin{gathered} 6 \\ (7) \\ \hline \end{gathered}$ | $\begin{gathered} 35 \\ (39) \\ \hline \end{gathered}$ | - | - | - | - | - | - | - | - |
| 20 (Rod end lock) | $\begin{aligned} & \hline 35.5 \\ & (38) \\ & \hline \end{aligned}$ | $\begin{gathered} 7 \\ (16) \\ \hline \end{gathered}$ | $\begin{aligned} & \hline 31.5 \\ & (34) \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ (12) \end{array}$ | - | - | - | - | - | - | - | - |
| 25 (Head end lock) | $\begin{gathered} \hline 12 \\ (14) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 41 \\ (43) \end{gathered}$ | $\begin{gathered} 8 \\ (10) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 37 \\ (39) \end{gathered}$ | - | - | - | - | - | - | - | - |
| 25 (Rod end lock) | $\begin{gathered} \hline 36 \\ (39) \end{gathered}$ | $\begin{gathered} 9.5 \\ (18) \end{gathered}$ | $\begin{gathered} \hline 32 \\ (35) \end{gathered}$ | $\begin{gathered} 5.5 \\ (14) \end{gathered}$ | - | - | - | - | - | - | - | - |
| 32 (Head end lock) | 12 | 41.5 | 8 | 37.5 | 9 | 38.5 | 9.5 | 39 | 6.5 | 36 | - | - |
| 32 (Rod end lock) | 39 | 7 | 35 | 3 | 36 | 4 | 36.5 | 4.5 | 33.5 | 1.5 | - | - |
| 40 (Head end lock) | 16 | 47 | 12 | 43 | 13 | 44 | 13.5 | 44.5 | 10.5 | 41.5 | 9 | 40 |
| 40 (Rod end lock) | 45 | 7.5 | 41 | 3.5 | 42 | 4.5 | 42.5 | 5 | 39.5 | 2 | 38 | 0.5 |
| 50 (Head end lock) | 14 | 49.5 | 10 | 45.5 | 11 | 46.5 | 11.5 | 47 | 8.5 | 44 | 7 | 42.5 |
| 50 (Rod end lock) | 44.5 | 9 | 40.5 | 5 | 41.5 | 6 | 42 | 6.5 | 39 | 3.5 | 37.5 | 2 |
| 63 (Head end lock) | 16.5 | 48.5 | 12.5 | 44.5 | 13.5 | 45.5 | 14 | 46 | 11 | 43 | 9.5 | 41.5 |
| 63 (Rod end lock) | 48.5 | 10.5 | 44.5 | 6.5 | 45.5 | 7.5 | 46 | 8 | 43 | 5 | 41.5 | 3.5 |
| 80 (Head end lock) | $\begin{gathered} 19.5 \\ (24.5) \end{gathered}$ | $\begin{gathered} 79.5 \\ (79.5) \\ \hline \end{gathered}$ | $\begin{gathered} 15.5 \\ (20.5) \\ \hline \end{gathered}$ | $\begin{gathered} 75.5 \\ (75.5) \\ \hline \end{gathered}$ | $\begin{gathered} 16.5 \\ (21.5) \end{gathered}$ | $\begin{gathered} 76.5 \\ (76.5) \\ \hline \end{gathered}$ | $\begin{gathered} 17 \\ (22) \end{gathered}$ | $\begin{gathered} \hline 77 \\ (77) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 14 \\ (19) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 74 \\ (74) \\ \hline \end{gathered}$ | $\begin{gathered} 12.5 \\ (17.5) \\ \hline \end{gathered}$ | $\begin{gathered} 72.5 \\ (72.5) \\ \hline \end{gathered}$ |
| 80 (Rod end lock) | $\begin{gathered} 69.5 \\ (69.5) \end{gathered}$ | $\begin{aligned} & 22 \\ & (34.5) \end{aligned}$ | $\begin{gathered} 65.5 \\ (65.5) \\ \hline \end{gathered}$ | $\begin{aligned} & 18 \\ & (30.5) \end{aligned}$ | $\begin{gathered} 66.5 \\ (66.5) \end{gathered}$ | $\begin{aligned} & 19 \\ & (31.5) \end{aligned}$ | $\begin{gathered} 67 \\ (67) \\ \hline \end{gathered}$ | $\begin{aligned} & 19.5 \\ & (32) \end{aligned}$ | $\begin{gathered} 64 \\ (64) \\ \hline \end{gathered}$ | $\begin{aligned} & 16.5 \\ & (29) \end{aligned}$ | $\begin{gathered} 62.5 \\ (62.5) \end{gathered}$ | $\begin{gathered} 15 \\ (27.5) \end{gathered}$ |
| 100 (Head end lock) | $\begin{gathered} 24 \\ (29) \end{gathered}$ | $\begin{gathered} 84.5 \\ (84.5) \end{gathered}$ | $\begin{gathered} \hline 20 \\ (25) \end{gathered}$ | $\begin{gathered} 80.5 \\ (80.5) \end{gathered}$ | $\begin{gathered} \hline 21 \\ (26) \\ \hline \end{gathered}$ | $\begin{gathered} 81.5 \\ (81.5) \end{gathered}$ | $\begin{gathered} 21.5 \\ (26.5) \end{gathered}$ | $\begin{gathered} 82 \\ (82) \\ \hline \end{gathered}$ | $\begin{gathered} 18.5 \\ (23.5) \end{gathered}$ | $\begin{gathered} 79 \\ (79) \\ \hline \end{gathered}$ | $\begin{gathered} 17 \\ (22) \end{gathered}$ | $\begin{gathered} 77.5 \\ (77.5) \end{gathered}$ |
| 100 (Rod end lock) | $\begin{aligned} & 74 \\ & (72.5) \end{aligned}$ | $\begin{gathered} 27 \\ (41) \\ \hline \end{gathered}$ | $\begin{gathered} 70 \\ (68.5) \end{gathered}$ | $\begin{gathered} \hline 23 \\ (37) \end{gathered}$ | $\begin{aligned} & 71 \\ & (69.5) \end{aligned}$ | $\begin{gathered} \hline 24 \\ (38) \end{gathered}$ | $\begin{aligned} & 71.5 \\ & (70) \\ & \hline \end{aligned}$ | $\begin{gathered} 24.5 \\ (38.5) \end{gathered}$ | $\begin{aligned} & \hline 68.5 \\ & (67) \end{aligned}$ | $\begin{gathered} 21.5 \\ (35.5) \end{gathered}$ | $\begin{aligned} & \hline 67 \\ & (65.5) \end{aligned}$ | $\begin{gathered} 20 \\ (34) \end{gathered}$ |

* The dimensions in parentheses for $\varnothing 20$ and $\varnothing 25$ are for 50,75 and 100 mm strokes, and the dimensions in parentheses for $\varnothing 80$ and $\varnothing 100$ 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 $\square$ S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 $\square \mathrm{R} / \square \mathrm{V}, \mathrm{CDQ2W} \square \mathrm{R} / \square \mathrm{V}$ (Water resistant)


| Auto switch model | $\begin{aligned} & \text { D-M9 } \square V \\ & \text { D-M9 } \square \text { WV } \\ & \text { D-M9 } \square \text { AV } \end{aligned}$ | D-A9■V | D-F7ㅁJ79 <br> D-F7■W/J79W <br> D-F7BA <br> D-F79F/F7NT <br> D-A7■H/A80H | $\begin{aligned} & \text { D-F7■V } \\ & \text { D-F7■WV } \\ & \text { D-F7BAV } \end{aligned}$ | D-J79C | $\begin{aligned} & \text { D-A7 } \\ & \text { D-A80 } \end{aligned}$ | $\begin{aligned} & \text { D-A73C } \\ & \text { D-A80C } \end{aligned}$ | D-A79W | D-P3DWA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size | U | U | U | U | U | U | U | U | U |
| 12 | 21.5 | 19 | 21.5 | 23.5 | 26.5 | 21 | 27.5 | 24.5 | - |
| 16 | 22.5 | 20 | 22.5 | 24.5 | 27.5 | 22 | 28.5 | 25.5 | - |
| 20 | 25 | 23 | 25.5 | 27.5 | 30 | 24.5 | 31 | 28 | - |
| 25 | 28 | 26 | 28 | 30.5 | 32.5 | 27.5 | 34 | 31 | 33.5 |
| 32 | 30 | 27.5 | 36 | 36.5 | 39.5 | 34 | 40.5 | 37.5 | 35.5 |
| 40 | 32 | 30 | 38 | 40 | 42.5 | 37.5 | 43.5 | 40.5 | 38 |
| 50 | 37.5 | 35 | 43.5 | 45 | 48 | 43 | 49 | 46 | 43 |
| 63 | 42.5 | 40.5 | 48.5 | 50.5 | 53.5 | 48 | 54.5 | 51.5 | 48 |
| 80 | 51 | 49 | 57 | 59 | 61.5 | 56.5 | 62.5 | 59.5 | 56.5 |
| 100 | 59 | 57 | 65.5 | 67 | 70 | 64.5 | 71 | 68 | 65 |

* The applicable auto switches for the CDQ2 $\square \mathrm{R} / \square \mathrm{V}$ (water resistant) are the $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ type only.
* Excludes the D-P3DW for the CDQ2-S/T (Single acting)


## Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)



| Auto switch model | $\begin{aligned} & \text { D-M9■V } \\ & \text { D-M9■WV } \\ & \text { D-M9■AV } \end{aligned}$ | D-A9■V | D-F7ㅁ/J79 <br> D-F7■W/J79W <br> D-F7BA <br> D-F79F/F7NT <br> D-A7■H/A80H | $\begin{aligned} & \text { D-F7■V } \\ & \text { D-F7■WV } \\ & \text { D-F7BAV } \end{aligned}$ | D-J79C | $\begin{aligned} & \text { D-A7 } \\ & \text { D-A80 } \end{aligned}$ | $\begin{aligned} & \text { D-A73C } \\ & \text { D-A80C } \end{aligned}$ | D-A79W | D-P3DWA |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size | U | U | U | U | U | U | U | U | U |
| 125 | 69.5 | 67.5 | 76.5 | 79 | 81 | 75.5 | 82.5 | 78 | 77 |
| 140 | 76.5 | 74.5 | 83.5 | 86 | 88 | 82.5 | 89.5 | 85 | 84 |
| 160 | 85.5 | 83.5 | 92.5 | 95 | 97 | 91.5 | 98.5 | 94 | 93 |
| 180 | 105.5 | 103.5 | - | - | - | - | - | - | 102 |
| 200 | 112.5 | 110.5 | - | - | - | - | - | - | 110 |

## 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 | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \square V \\ & \text { D-M9 } \square \mathbf{W} \\ & \text { D-M9 } \square \mathbf{W V} \\ & \text { D-M9 } \square \text { A } \\ & \text { D-M9 } \square \text { AV } \\ & \text { D-A9 } \\ & \text { D-A9 } \square V \end{aligned}$ | D-A7■H <br> D-A80H <br> D-F7口 <br> D-F79F <br> D-J79 <br> D-F7■W <br> D-J79W <br> D-F7BA <br> D-F7NT | $\begin{aligned} & \text { D-F7 } \square \mathbf{V} \\ & \text { D-F7 } \square \mathbf{W V} \\ & \text { D-F7BAV } \end{aligned}$ | D-J79C | $\begin{aligned} & \text { D-A7■ } \\ & \text { D-A80 } \end{aligned}$ | $\begin{aligned} & \text { D-A73C } \\ & \text { D-A80C } \end{aligned}$ | 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)

| Auto switch model | $\begin{aligned} & \text { D-M9■V } \\ & \text { D-M9■WV } \\ & \text { D-M9■AV } \end{aligned}$ | D-A9 $\square$ V | D-A7 $\square$ H <br> D-A80H/F7■ <br> D-F79F/J79 <br> D-F7■W/J79W <br> D-F7BA/F7NT | $\begin{aligned} & \text { D-F7■V } \\ & \text { D-F7■WV } \\ & \text { D-F7BAV } \end{aligned}$ | D-J79C | $\begin{aligned} & \text { D-A7 } \\ & \text { D-A80 } \end{aligned}$ | $\begin{aligned} & \text { D-A73C } \\ & \text { D-A80C } \end{aligned}$ | 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 $\square$ S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 $\square R / \square V, C D Q 2 W \square R / \square V$ (Water resistant),
CDQP2, CDQP2-S/-T (Axial piping), CDBQ2 (With end lock)

| Number of auto switches | $\begin{aligned} & \text { D-M9■V } \\ & \text { D-F7■V } \\ & \text { D-J79C } \end{aligned}$ | $\begin{aligned} & \text { D-A9 } \square V \\ & \text { D-A7 } \\ & \text { D-A80 } \\ & \text { D-A73C } \\ & \text { D-A80C } \end{aligned}$ | D-A9 $\square$ | $\begin{aligned} & \text { D-M9■WV } \\ & \text { D-M9■AV*1 } \\ & \text { D-F7■WV } \\ & \text { D-F7BAV } \end{aligned}$ | $\begin{aligned} & \text { D-M9■ } \\ & \text { D-F7 } \\ & \text { D-J79 } \end{aligned}$ | $\begin{aligned} & \text { D-M9 } \square \mathbf{W} \\ & \text { D-M9 } \square \mathbf{A}^{* 1} \end{aligned}$ | $\begin{aligned} & \text { D-A7■H } \\ & \text { D-A80H } \end{aligned}$ | 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 $\square \mathrm{R} / \square \mathrm{V}$ (water resistant) are the $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V}$ ) type only.
Applicable Cylinder Series: CDQ2, CDQ2W (Large bore size)

| Number of auto switches | $\begin{aligned} & \text { D-M9 } \square \\ & \text { D-M9 } \square \text { V } \\ & \text { D-F7 } \square \\ & \text { D-F7 } \square \text { V } \\ & \text { D-J79 } \\ & \text { D-J79C } \end{aligned}$ | $\begin{aligned} & \text { D-A9 } \square \\ & \text { D-A9 V } \\ & \text { D-A7 } \\ & \text { D-A80 } \\ & \text { D-A73C } \\ & \text { D-A80C } \\ & \text { D-A7 } \square H \\ & \text { D-A80H } \end{aligned}$ | $\begin{aligned} & \text { D-M9■W } \\ & \text { D-M9 } \square \mathbf{W V} \\ & \text { D-M9 } \square \text { A } \\ & \text { D-M9 } \square \mathbf{A V} \end{aligned}$ | 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 |  |  | 15 |
| With 2 pcs. | 5 | 10 |  |  | 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)

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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 $\square$ S（Anti－lateral load），CDQ2（Long stroke）， CDQ2K，CDQ2KW（Non－rotating rod），CDQ2 $\square R / \square \mathbf{V}$ ，CDQ2W $\square R / \square \mathbf{V}$（Water resistant）

| Auto switch model | Bore size |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 |
| $\begin{aligned} & \text { D-M9 } \square(V) \\ & \text { D-M9 } \quad \text { W(V) } \\ & \text { D-M9 } \square \mathbf{A}(V)^{*} \end{aligned}$ | 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 $\square$（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 |
| $\begin{aligned} & \text { D-A7 } \square(\mathrm{H})(\mathrm{C}) \\ & \mathrm{D}-\mathrm{A} 00 \square(\mathrm{H})(\mathrm{C}) \end{aligned}$ | 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 | － | － |
| $\begin{aligned} & \text { D-F7■(V) } \\ & \text { D-J79(C) } \\ & \text { D-F7■W(V) } \\ & \text { D-F7BA(V) } \\ & \text { D-F7NT } \\ & \text { D-F79F } \end{aligned}$ | 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 $\square \mathrm{R} / \square \mathrm{V}$（water resistant）are the $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ type only．
＊Values which include hysteresis are for reference purposes only．They are not a guarantee（assuming approximately $\pm 30 \%$ 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）

| Auto switch model | Bore size |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| $\begin{aligned} & \text { D-M9 } \square(V) \\ & \text { D-M9 } \square(V) \\ & \text { D-M9 } \square \text { A(V) } \end{aligned}$ | 3.5 | 5 | 5 | 5 | 5.5 | 5.5 | 6 | 6.5 | 7 | 7 |
| D－A9 $\square$（V） | 7.5 | 9.5 | 9 | 9 | 9.5 | 9.5 | 8.5 | 11 | 10 | 10.5 |
| $\begin{aligned} & \text { D-A7 } \square(\mathrm{H})(\mathrm{C}) \\ & \text { D-A80 } \square(\mathrm{H})(\mathrm{C}) \end{aligned}$ | 10 | 12 | 12 | 12 | 12 | 11 | 10 | 12 | 12 | 13 |
| D－A79W | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 16 | 15 | 17 |
| $\begin{aligned} & \text { D-F7口(V) } \\ & \text { D-J79(C) } \\ & \text { D-F7口W(V) } \\ & \text { D-F7BA(V) } \\ & \text { D-F7NT } \\ & \text { D-F79F } \end{aligned}$ | 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 $\pm 30 \%$ 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）

| Auto switch model | Bore size |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| $\begin{aligned} & \text { D-M9 } \square(V) \\ & \text { D-M9 } \square \mathbf{W}(\mathrm{V}) \\ & \mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V}) \end{aligned}$ | 5.5 | 5.5 | $\begin{aligned} & 6 \\ & (5.5) \end{aligned}$ | $\begin{gathered} 6 \\ (5.5) \end{gathered}$ | $\begin{gathered} 7 \\ (6) \end{gathered}$ | $\begin{gathered} 7.5 \\ (6.5) \end{gathered}$ | 8 <br> （7） | 8.5 <br> （7） |
| D－A9 $\square$（V） | 10 | 10 | $\begin{gathered} 9.5 \\ (9.5) \\ \hline \end{gathered}$ | $\begin{gathered} 9.5 \\ (9.5) \end{gathered}$ | $\begin{gathered} 9.5 \\ (8.5) \\ \hline \end{gathered}$ | $\begin{aligned} & 11.5 \\ & (11) \end{aligned}$ | $\begin{gathered} 9 \\ (10) \\ \hline \end{gathered}$ | $\begin{gathered} 11.5 \\ (10.5) \\ \hline \end{gathered}$ |
| $\begin{aligned} & \text { D-A7 } \square(H)(C) \\ & \text { D-A80 } \square(\mathrm{H})(\mathrm{C}) \end{aligned}$ | － | － | 12 | 11 | 10 | 12 | 12 | 13 |
| D－A79W | － | － | 13 | 14 | 14 | 16 | 15 | 17 |
| $\begin{aligned} & \text { D-F7口(V) } \\ & \text { D-J79(C) } \\ & \text { D-F7口W(V) } \\ & \text { D-F7BA(V) } \\ & \text { D-F7NT } \\ & \text { D-F79F } \end{aligned}$ | － | － | 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 $\pm 30 \%$ dispersion）and may change substantially depending on the ambient environment．
＊The auto switch mounting bracket BQ2－012 is not used for $\varnothing 32$ or more of the $\mathrm{D}-\mathrm{A} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~W}(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ types．The values above indicate the operating range when mounted with the existing auto switch installation groove．
＊The values in parentheses for $ø 32$ or more of the $\mathrm{D}-\mathrm{A} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~W}(\mathrm{~V}) / \mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ types indicate the operating range when the auto switch mounting bracket BQ2－012 is used．

## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDQ2, CDQ2W, CDQ2-S/T (Single acting), CDQ2, CDQ2W (Large bore size),
CDQ2 $\square$ S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod),
CDQ2 $\square$ R/ $\square \mathrm{V}, \mathrm{CDQ} 2 \mathrm{~W} \square \mathrm{R} / \square \mathrm{V}$ (Water resistant)

| Applicable auto switch | $\begin{aligned} & \text { D-M9 } \square / M 9 \square V \\ & \text { D-M9 } \square \text { W/M9 } \square W V \\ & \text { D-M9 } \square \text { A/M9 } \square A V \\ & \text { D-A9 } \square / A 9 \square V \end{aligned}$ | D-F7 $\square / F 7 \square$ V/J79/J79C/F7 $\square W / J 79 W / F 7 \square W V$ D-F7BA/F7BAV/F79F/F7NT <br> D-A7 $\square / A 80 / A 7 \square H / A 80 H / A 73 C / A 80 C / A 79 W$ |  | D-P3DWA |
| :---: | :---: | :---: | :---: | :---: |
| Bore size [mm] | ø12 to ø200 | $\varnothing 12$ to $\varnothing 25$ | $\varnothing 32$ to $\varnothing 160$ | ø25 to ø200 |
| Auto switch mounting bracket part no. | - | BQ4-012 | BQ5-032 | - |
| Auto switch mounting bracket fitting parts lineup/Weight | $\square$ | - Auto switch mounting screw (M2.5 x 8 L ) <br> - Auto switch mounting nut Weight: 1.5 g <br> When requesting the enclosure of the with the cylinder for shipment, add "-BQ" Standard model no. +BQ Example) CDQ CDQ | - Auto switch fixing screw (M2.5 x 10 L ) <br> - Auto switch mounting screw (M3 x 8 L ) <br> - Auto switch spacer <br> - Auto switch mounting nut Weight: 3.5 g <br> auto switch mounting brackets ( 2 pcs.) to the end of the cylinder model number. 2B32-30DZ-BQ/ <br> 2B32-30DZ-BQ-XC4 (Made to order) | - |
|  | Surfaces with auto switch mounting slot | Auto switch mounting rail side only | $A / B / C$ side except port side | Surfaces with auto switch mounting slot |
| Auto switch mounting surface |  |  | Port side |  |
| Mounting of auto switch | - When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm . <br> Tightening torque for auto switch mounting screw [ $\mathrm{N} \cdot \mathrm{m}$ ] | (1) Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. <br> (2) 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. <br> (3) 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. <br> (4) 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 $0.35 \mathrm{~N} \cdot \mathrm{~m}$. <br> (5) The detection position can be changed under the conditions in step (3). | (1) Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. <br> (2) 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. <br> (3) Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. <br> (4) Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. <br> (5) Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to $0.45 \mathrm{~N} \cdot \mathrm{~m}$. <br> (6) 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 $0.35 \mathrm{~N} \cdot \mathrm{~m}$. <br> (7) The detection position can be changed under the conditions in step (5). | (1) Insert the mounting bracket into the mating groove of the cylinder tube. <br> (2) 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 ). <br> (3) If the detecting position is changed, go back to step (1). <br> * Ensure that the auto switch is covered with the mating groove to protect the auto switch. <br> * The tightening torque for the hexagon socket head cap screw (M2.5 x 12 L ) is 0.2 to $0.3 \mathrm{~N} \cdot \mathrm{~m}$. |

[^21]Auto Switch Mounting Brackets/Part Nos.
Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping)

| Applicable auto switch | $\begin{aligned} & \text { D-M9 } \square / M 9 \square V \\ & \text { D-M9 } \square \text { W/M9 } \square W V \\ & \text { D-M9 } \square \text { A/M9 } \square \text { AV } \\ & \text { D-A9 } / \text { A9 } \square V \end{aligned}$ |  |
| :---: | :---: | :---: |
| Bore size [mm] | $ø 12$ to $\varnothing 25$ | $\varnothing 32$ to $\varnothing 100$ |
| 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 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 Weight: 5 g |
|  | Auto switch mounting rail side only | A/B/C side |
| Auto switch mounting surface |  |  |
| Mounting of |  |  |

-BQ-1 is a set of a and $b$ shown above.

- BQ2-012 is a set of $c$ and d shown above.
(1) Insert the square nut for BQ-1 in the switch mounting rail and set it at the approximate auto switch mounting position.
(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.
(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.
(4) Remove the set screw (M2.5) attached to the auto switch.
(5) Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.
(6) Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to $0.2 \mathrm{~N} \cdot \mathrm{~m}$ )
(7) Secure the auto switch mounting screw (3) after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to $0.7 \mathrm{~N} \cdot \mathrm{~m}$ )
(8) Modify the detecting position while the auto switch is secured at the position of (3) in the figure.
- $B Q-2$ is a set of $a, b$, and $c$ shown above.
- BQ2-012 is a set of $d$ and e shown above.
(1) Insert the square nut for BQ-2 in the switch mounting rail and set it at the approximate auto switch mounting position.
(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.
(3) Fit the convex part of the auto switch mounting bracket arm over the concave part of the switch spacer.
(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.
(5) Remove the set screw (M2.5) attached to the auto switch.
(6) Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket.
(7) Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to $0.2 \mathrm{~N} \cdot \mathrm{~m}$ )
(8) Secure the auto switch mounting screw (4) after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to $0.7 \mathrm{~N} \cdot \mathrm{~m}$ )
(9) Modify the detecting position while the auto switch is secured at the position of (4) in the figure.


## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDQP2, CDQP2-S/T (Axial piping)

| Applicable auto switch | D-F7 $\square$ /F7 $\square$ V/J79/J79C/F7 $\square$ W/J79W/F7 $\square$ WV <br> D-F7BA/F7BAV/F79F/F7NT <br> D-A7 $\square / A 80 / A 7 \square H / A 80 H / A 73 C / A 80 C / A 79 W$ |  | D-P4DW |
| :---: | :---: | :---: | :---: |
| Bore size [mm] | $ø 12$ to ø25 | $ø 32$ to $\varnothing 100$ | $\varnothing 40$ to $\varnothing 100$ |
| Auto switch mounting bracket part no. | BQ-1 | BQ-2 | BQP1-050 |
| Auto switch mounting bracket fitting parts lineup/Weight | - Cross recessed round head screw (M3 x 8 L ) <br> - Square nut (M3 x 0.5) <br> Weight: 1.5 g | - Cross recessed round head screw (M3 x 10 L ) <br> - Square nut (M3 x 0.5) <br> - Switch spacer <br> Weight: 1.5 g | - Cross recessed round head screw (M3 $\times 16 \mathrm{~L}$ ) <br> - Hexagon socket head cap screw (M3 x 14 L ) <br> - Auto switch mounting nut <br> - Auto switch mounting bracket <br> Weight: 16 g |
|  | Auto switch mounting rail side only | A/B/C side | A/B/C side |
| Auto switch mounting surface |  |  |  |
| Mounting of auto switch | (1) Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position. <br> (2) 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. <br> (3) Push the auto switch mounting screw lightly into the mounting nut through the hole of auto switch mounting arm. <br> (4) After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to $0.7 \mathrm{~N} \cdot \mathrm{~m}$.) <br> (5) Modification of the detecting position should be made in the condition of (3). | (1) Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position. <br> (2) Fit the convex part of auto switch mounting arm into the concave part of auto switch spacer. Then slide the switch over the nut. <br> (3) Push the auto switch mounting screw lightly into the mounting nut through the holes of the auto switch mounting arm and auto switch spacer. <br> (4) After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to $0.7 \mathrm{~N} \cdot \mathrm{~m}$.) <br> (5) Modification of the detecting position should be made in the condition of (3). | Auto switch mounting bracket fixing screw Hexagon socket head cap bolt <br> (1) 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. <br> (2) Insert the auto switch mounting bracket assembly (bracket + nut) into the mounting groove and set it at the auto switch mounting position. <br> (3) Push the auto switch mounting screw lightly into the auto switch through the auto switch mounting hole to secure. <br> (4) 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 $0.7 \mathrm{~N} \cdot \mathrm{~m}$.) |

## [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 $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ 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 | $\begin{aligned} & \text { D-M9 }- \text { /M9 } \square V \\ & \text { D-M9 } \square \text { W/M9 } \square W V \\ & \text { D-M9 } \square \text { A/M9 } \square \text { AV } \\ & \text { D-A9 } \square / A 9 \square V \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: |
| Bore size [mm] | ø20, ø25 | $\varnothing 32, \varnothing 40, \varnothing 50$ | $\varnothing 63, \varnothing 80, \varnothing 100$ |
| 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 Weight: 5 g | - |
|  | Port/A/B/C side $\quad$ Port side | $\mathrm{A} / \mathrm{B} / \mathrm{C}$ side | Port/A/B/C side |
| Auto switch mounting surface |  |  |  |
| Mounting of auto switch | - When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm . <br> Tightening torque for auto switch mounting screw [N.m] | - BQ-2 is a set of $a, b$, and $c$ shown above. <br> - BQ2-012 is a set of $d$ and e shown above. <br> (1) Insert the square nut for BQ-2 in the switch mounting rail and set it at the approximate auto switch mounting position. <br> (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. <br> (3) Fit the convex part of the auto switch mounting bracket arm over the concave part of the switch spacer. <br> (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. <br> (5) Remove the set screw (M2.5) attached to the auto switch. <br> (6) Insert the auto switch in the auto switch attachment part of the auto switch mounting bracket. <br> (7) Secure the auto switch mounting screw (M2.5). (Tightening torque of M2.5 screw: 0.1 to $0.2 \mathrm{~N} \cdot \mathrm{~m}$ ) <br> (8) Secure the auto switch mounting screw (4) after confirming the detecting position. (Tightening torque of M3 screw: 0.5 to $0.7 \mathrm{~N} \cdot \mathrm{~m}$ ) <br> (9) Modify the detecting position while the auto switch is secured at the position of (4) in the figure. | - When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm . <br> Tightening torque for auto switch mounting screw [N.m] |

## [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 $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ on a port other than the ports for $\varnothing 32, \varnothing 40$, and $\varnothing 50$, order auto switch mounting brackets $\mathrm{BQ} 2-012 \mathrm{~S}, \mathrm{BQ}-2$, and the stainless steel screw kit BBA2 separately.


## Auto Switch Mounting Brackets/Part Nos.

Applicable Cylinder Series: CDBQ2 (With end lock)

| Applicable auto switch | D-F7■/F7 $\square / J 79 / J 79 C / F 7 \square W / J 79 W / F 7 \square W V$ <br> D-F7BA/F7BAV/F79F/F7NT <br> D-A7■/A80/A7■H/A80H/A73C/A80C/A79W | D-P4DW |
| :---: | :---: | :---: |
| Bore size [mm] | $ø 32$ to ø100 | $\varnothing 40$ to $\varnothing 100$ |
| Auto switch mounting bracket part no. | BQ-2 | BQP1-050 |
| Auto switch mounting bracket fitting parts lineup/Weight | - Cross recessed round head screw (M3 x 10 L) <br> - Square nut (M3 x 0.5) <br> - Switch spacer <br> Weight: 1.5 g | - Cross recessed round head screw (M3 x 16 L ) <br> - Hexagon socket head cap screw (M3 x 14 L ) <br> - Auto switch mounting nut <br> - Auto switch mounting bracket <br> Weight: 16 g |
|  | A/B/C side | A/B/C side |
| Auto switch mounting surface |  |  |
| Mounting of auto switch | (1) Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position. <br> (2) Fit the convex part of auto switch mounting arm into the concave part of auto switch spacer. Then slide the switch over the nut. <br> (3) Push the auto switch mounting screw lightly into the mounting nut through the holes of the auto switch mounting arm and auto switch spacer. <br> (4) 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.) <br> (5) Modification of the detecting position should be made in the condition of (3). | Auto switch mounting bracket fixing screw Hexagon socket head cap bolt <br> (1) 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. <br> (2) Insert the auto switch mounting bracket assembly (bracket + nut) into the mounting groove and set it at the auto switch mounting position. <br> (3) Push the auto switch mounting screw lightly into the auto switch through the auto switch mounting hole to secure. <br> (4) 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 $0.7 \mathrm{~N} \cdot \mathrm{~m}$.) |

## [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 $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ on a port other than the ports for $\varnothing 32$, $\varnothing 40$, and $\varnothing 50$, 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 $\square$ S (Anti-lateral load), CDQ2 (Long stroke), CDQ2K, CDQ2KW (Non-rotating rod), CDQ2 $\square R / \square V, C D Q 2 W \square R / \square V$ (Water resistant)


* With pre-wired connector is also available for solid state auto switches. For details, refer to the Web Catalog.
* Normally closed ( $\mathrm{NC}=\mathrm{b}$ contact) solid state auto switches (D-M9■E(V)) 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 |
| :---: | :---: | :---: | :---: | :---: |
| Reed | D-A73 | Grommet (Perpendicular) | - | $\varnothing 12$ to $\varnothing 100$ |
|  | D-A80 |  | Without indicator light |  |
|  | D-A73H, A76H | Grommet (In-line) | - |  |
|  | D-A80H |  | Without indicator light |  |
| Solid state | D-F7NV, F7PV, F7BV | Grommet (Perpendicular) | - | $\varnothing 12$ to ø100 |
|  | D-F7NWV, F7BWV |  | 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) | $\varnothing 40$ to $\varnothing 100$ |

* With pre-wired connector is also available for solid state auto switches. For details, refer to the Web Catalog.
* Normally closed ( $\mathrm{NC}=\mathrm{b}$ contact) solid state auto switches ( $\mathrm{D}-\mathrm{M} 9 \square \mathrm{E}(\mathrm{V}$ )) 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: $\varnothing 32$ to $\varnothing 100$ )
* Heat-resistant solid state auto switch (D-F7NJ) is not applicable.
* Regarding the D-P5DW, please contact SMC separately.


# Prior to Use <br> 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)


3-wire AND connection for PNP output (Using relays)


## 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 $\mathrm{ON}=$ Power supply voltage -

$$
\begin{aligned}
& \text { Internal voltage drop } \times 2 \text { pcs. } \\
= & 24 \mathrm{~V} \times 4 \mathrm{~V} \times 2 \text { pcs. } \\
= & 16 \mathrm{~V}
\end{aligned}
$$

(Performed with auto switches only)

(Performed with auto switches only)


## 2-wire OR connection



Example) Load voltage at OFF
Leakage current: 1 mA
Load impedance: $3 \mathrm{k} \Omega$
Load voltage at OFF = Leakage current x 2 pcs. x
$\begin{aligned} & \text { Load impedance } \\ = & 1 \mathrm{~mA} \times 2 \text { pcs. } \times 3\end{aligned}$
$=1 \mathrm{~mA} \times 2 \mathrm{pcs} . \mathrm{X} 3 \mathrm{k} \Omega$
$=6 \mathrm{~V}$

3-wire OR connection for PNP output


3-wire OR connection for NPN output

(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.


## 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.

Symbol


Specifications

## -XA1 to 30

Change of rod end shape
Made to Order Common Specifications



Heat-resistant cylinder (-10 to $150^{\circ} \mathrm{C}$ )*


Cold-resistant cylinder ( -40 to $70^{\circ} \mathrm{C}$ )
Low-speed cylinder ( 10 to $50 \mathrm{~mm} / \mathrm{s}$ )


-XB13
-XB14
-XC2(A)
-XC4
-XC6(A)
-XC8
-XCs

## -XC10

-XC11
-XC26



-XC85

Cylinder tube: With concave boss on head end

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 |  | Double acting, Single rod | XA1, XA2, XA6 XA7, XA11 <br> XA17, XA18 |
|  |  |  | Single acting (Spring return)** |  |
|  |  | CQ2W | Double acting, Double rod |  |
|  | Axial piping | CQP2 | Double acting, Single rod |  |
|  |  |  | Single acting (Spring return)** |  |
|  | Non-rotating rod | CQ2K | Double acting, Single rod | $\begin{gathered} \text { XA1, XA2, XA6 } \\ \text { XA11, XA17 } \end{gathered}$ |
|  |  |  | Doube actig, Dovibe rod (Mor.odalingoside) |  |
|  |  | CQ2KW | Double acting, Double rod (Round rod side) | XA1, XA2, XA6, XA7 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.
$\varnothing 12, \varnothing 16 \rightarrow \mathrm{D}-1 \mathrm{~mm} \quad \varnothing 20, \varnothing 25 \rightarrow \mathrm{D}-2 \mathrm{~mm}$
- 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 H 1 dimension is changed from the standard product.


Conditions of Manufacture

| Change of rod end shape/Symbol | Single rod type |  | Double rod type |
| :---: | :---: | :---: | :---: |
| XA1 | For $\varnothing 12$ | $ø \mathrm{M}$ : 3 mm or more 5 mm or less | $ø \mathrm{M}: \varnothing 5 \mathrm{~mm}$ or less |
|  | $\varnothing 16$ | $ø \mathrm{M}$ : 3 mm or more 7 mm or less | $\varnothing \mathrm{M}: \varnothing 7 \mathrm{~mm}$ or less |
|  | ø20 | $ø \mathrm{M}: 4 \mathrm{~mm}$ or more 8 mm or less | $\varnothing \mathrm{M}$ : $\varnothing 8 \mathrm{~mm}$ or less |
|  | ø25 | ¢M: 4 mm or more 10 mm or less | $\varnothing \mathrm{M}$ : $\varnothing 10 \mathrm{~mm}$ or less |
| XA2 | For 012 | øJ: 4 mm or more, W1: 6 mm or less | øJ: 3 mm or more, $\mathrm{W}_{1}$ : 6 mm or less |
|  | $\varnothing 16$ | øJ: 4 mm or more, $\mathrm{W}_{1}: 6 \mathrm{~mm}$ or less | øJ: 4 mm or more, $\mathrm{W}_{1}$ : 6 mm or less |
|  | $\varnothing 20$ | øJ: 5 mm or more, Wi: 11 mm or less | øJ: 5 mm or more, W1: 11 mm or less |
|  | ø25 | øJ: 6 mm or more, W1: 13 mm or less | $ø \mathrm{~J}: 6 \mathrm{~mm}$ or more, W1: 13 mm or less |
| XA6 | For $\varnothing 12$ | H: M4 or less | H: M4 or less |
|  | $\varnothing 16$ | H: M6 or less | H: M6 or less |
|  | $\varnothing 20$ | H: M6 or less | H: M6 or less |
|  | ø25 | H: M8 or less | H: M8 or less |
| XA7 | For $\varnothing 12$ | H: M4 or less | H: M4 or less |
|  | $\varnothing 16$ | H: M5 or less | H: M5 or less |
|  | ø20 | H: M6 or less | H: M6 or less |
|  | ø25 | H: M8 or less | H: M8 or less |
| XA11 | For $\varnothing 12$ | SR3 mm only | SR3 mm or more |
|  | $\varnothing 16$ | SR4 mm only | SR4 mm or more |
|  | $\varnothing 20$ | SR5 mm only | SR5 mm or more |
|  | $\varnothing 25$ | SR6 mm only | SR6 mm or more |
| XA17 | For $\varnothing 12$ | H: M5 or more, X: 20 mm or less | H: M5 or less |
|  | $\varnothing 16$ | H: M6 or more, X: 22.5 mm or less | H: M6 or less |
|  | $\varnothing 20$ | H: M8 or more, X: 26.5 mm or less | H: M8 or less |
|  | ø25 | H : M10 or more, X: 33 mm or less | H: M10 or less |
| XA18 | For $\varnothing 12$ | H : M5 or more, X : 20 mm or less | H: M5 or less |
|  | $\varnothing 16$ | H: M6 or more, X: 22.5 mm or less | H: M6 or less |
|  | $\varnothing 20$ | H: M8 or more, X: 26.5 mm or less | H: M8 or less |
|  | ø25 | H: M10 or more, X: 33 mm or less | H: M10 or less |

Please contact your local sales representative for more details.

1 CQ2 (ø32 to $\varnothing 100$ )/CQ2 Large Bore Size (ø125 to ø200): Change of Rod End Shape

| Description | Model | Action | Symbol for change <br> of rod end shape |
| :--- | :--- | :--- | :--- |
| Standard |  | Double acting, Single rod | Single acting (Spring return) |
|  | CQ2W | 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 H 1 dimension is changed from the standard product.
Symbol: A1
Symbol: A13


## CQ2 Series

Made to Order Common Specifications
made to
Marder
Please contact SMC for detailed dimensions, specifications, and delivery times.

## 1 Heat-resistant Cylinder ( -10 to $150^{\circ} \mathrm{C}$ )

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 $150^{\circ} \mathrm{C}$.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Excludes models with a rubber bumper or auto switch magnet Excludes the air-hydro type |
|  | CQ2W | Double acting, Double rod |  |
| Axial piping | CQP2 | Double acting, Single rod |  |
| Non-rotating rod | CQ2K | Double acting, Single rod | Excludes models with a rubber bumper or auto switch magnet |
|  | CQ2KW | 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 $500 \mathrm{~mm} / \mathrm{s}$
* Please contact SMC for models with a rubber bumper.


## How to Order



Specifications

| Ambient temperature range | $-10^{\circ} \mathrm{C}$ to $150^{\circ} \mathrm{C}$ |
| :--- | :---: |
| Seal material | Fluororubber |
| Grease | Heat-resistant grease |
| Specifications other than the above and dimensions | Same as the standard type |

## $\triangle$ Warning <br> 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 $70^{\circ} \mathrm{C}$ )

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 $-40^{\circ} \mathrm{C}$.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Applicable to $\varnothing 12$ to $\varnothing 40$ Excludes models with a rubber bumper, auto switch magnet, or mounting bracket |
|  | CQ2W | Double acting, Double rod |  |
| Axial piping | CQP2 | 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

$\square$

Specifications

| Ambient temperature range | $-40^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}$ |
| :--- | :---: |
| Seal material | Low nitrile rubber |
| Grease | Cold-resistant grease |
| Auto switch | Not mountable |
| Dimensions | Same as the standard type |
| Specifications other than the above | Same as the standard type |

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 $50 \mathrm{~mm} / \mathrm{s}$ )

Stick-slip phenomenon can be prevented, and smooth operation can be achieved even at lower driving speeds between 10 to $50 \mathrm{~mm} / \mathrm{s}$.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Except long stroke and large bore type |
|  | CQ2W | Double acting, Double rod |  |
| Axial piping | CQP2 | Double acting, Single rod |  |

* Operate without lubrication from a pneumatic system lubricator.

How to Order
Standard model no.

- XB9

Low-speed cylinder ${ }^{6}$

## Specifications

| Piston speed | 10 to $50 \mathrm{~mm} / \mathrm{s}$ |
| :--- | :---: |
| Dimensions | Same as the standard type |
| Specifications other than the above | Same as the standard type |

## © Warning <br> 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.

## 4 Intermediate Stroke Using Exclusive Body

A made-to-order exclusive body for specified strokes is also available. The overall length can be made shorter than that of spacer-installed types 1 and 2.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod |  |
|  |  | Single acting (Spring retum) |  |
|  | CQ2W | Double acting, Double rod |  |
| Non-rotating rod | CQ2K | Double acting, Single rod | Applicable to ø40 to ø63 |
|  | CQ2KW | Double acting, Double rod |  |
| Large bore size | CQ2 | Double acting, Single rod |  |
|  | CQ2W | Double acting, Double rod |  |
| Long stroke | CQ2 | Double acting, Single rod |  |
| Anti-lateral load | CQ2 $\square$ S | Double acting, Single rod |  |
| Water resistant | CQ2-R/V | Double acting, Single rod | Applicable to $\varnothing 40$ to $\varnothing 100$ |
|  | CQ2W-R/V | Double acting, Double rod |  |
| With end lock | CBQ2 | Double acting, Single rod |  |

## How to Order



Intermediate stroke

| Bore size $[\mathrm{mm}]$ | Stroke range |
| :---: | :---: |
| $\mathbf{1 2}, \mathbf{1 6}$ | 6 to 29 |
| $\mathbf{2 0}, \mathbf{2 5}$ | 6 to 49 |
| $\mathbf{3 2 , 4 0}$ | 6 to 99 |
| $\mathbf{5 0}$ to $\mathbf{1 0 0}$ | 11 to 99 |

* 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 (A/ B dimension) will be the same as those with auto switch magnet.
Refer to the following for details.


## Ordering example



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


Single acting, Spring return

| Bore size <br> $[\mathrm{mm}]$ | Single rod type (Single acting/Spring return) |  | Applicable <br> stroke <br> range $[\mathrm{mm}]$ |
| :---: | :---: | :---: | :---: |
|  | $\mathbf{A}$ | $\mathbf{B}$ | 6 to 9 |
| $\mathbf{1 6}$ | $20.5(31.5)$ | $17(28)$ |  |
| $\mathbf{2 0}$ | $24(34)$ | $18.5(30.5)$ |  |
| $\mathbf{2 5}$ | $27.5(37.5)$ | $22.5(31.5)$ |  |
| $\mathbf{3 2}$ | $30(40)$ | $23(33)$ | 6 to 9 |
| $\mathbf{4 0}$ | $36.5(46.5)$ | $29.5(39.5)$ |  |
| $\mathbf{5 0}$ | $38.5(48.5)$ | $30.5(40.5)$ | 11 to 19 |

Double acting, Double rod/Standard

( ): Dimensions with auto switch magne

* Other dimensions are the same as those of the standard type.
* Applicable stroke available in 1 mm increments


## CQ2 Series

Dimensions (Dimensions other than those below are the same as those of the standard type.)

Double acting, Single rod/
Long stroke

[mm]

| Bore size <br> $[\mathrm{mm}]$ | Single rod type (Long stroke) |  | Applicable <br> stroke range <br> $[\mathrm{mm}]$ |
| :---: | :---: | :---: | :---: |
|  | $\mathbf{A}$ | $\mathbf{B}$ |  |
| $\mathbf{4 0}$ | 72 | 55.5 |  |
| $\mathbf{5 0}$ | 73.5 | 55.5 | 101 to 299 |
| $\mathbf{6 3}$ | 75 | 57 |  |
| $\mathbf{8 0}$ | 86 | 66 |  |
| $\mathbf{1 0 0}$ | 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

| 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

## Double acting, Single rod/End lock With rod side locking


[mm]

| 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 |  | 65.5 |  |  |
| 40 | 82 |  | 75 |  |  |
| 50 | 83.5 |  | 75.5 |  |  |
| 63 | 85 |  | 77 |  |  |
| Bore size [mm] | A |  | B |  | Applicable <br> 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 |  |
| 100 | 132.5 | 147.5 | 120.5 | 125.5 | 6 to 99 |


| 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 |  | 5 | 8 |  |
| 40 | 71.5 |  | 64.5 |  |  |
| 50 | 73.5 |  | 65.5 |  |  |
| 63 | 79 |  | 71 |  |  |
| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | A |  | B |  | Applicable stroke |
|  | 49 mm stroke or less | 51 to 99 mm stroke | 49 mm stroke or less | 51 to 99 mm stroke | range [mm] |
| 80 | 113.5 | 136 | 103.5 | 116 | 6 to |
| 100 | 125 | 147.5 | 113 | 125.5 | 6 to 99 |

## 5 Intermediate Stroke Spacer-installed Type 2

A spacer is installed on the exclusive body ( indication). The overall length is shorter than that of the spacer-installed type 1.
The © indicates the selectable stroke range. (Strokes with the indication are not selectable.)
The - indicates strokes supported by the spacer-installed type 1.


Ordering example


Specifications: Same as those of the standard type

## How to Order Standard model no. - XB10 A Intermediate stroke <br> Spacer-installed type

Dimensions (Dimensions other than those below are the same as those of the standard type.)


| Symbol | A |  |  |  |  |  |  |  | B |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Bore size | $\begin{array}{\|c\|c} 51 \text { to } \\ 54 \end{array}$ | $\begin{gathered} 56 \text { to } \\ 59 \end{gathered}$ | $\begin{array}{\|c\|} \hline 61 \text { to } \\ 64 \end{array}$ | $\begin{gathered} 66 \text { to } \\ 69 \end{gathered}$ | $\begin{array}{\|c\|} 76 \text { to } \\ 79 \end{array}$ | $\begin{gathered} 81 \text { to } \\ 84 \end{gathered}$ | $\begin{array}{\|c} 86 \text { to } \\ 89 \end{array}$ | $\begin{array}{\|c} 91 \text { to } \\ 94 \end{array}$ | $\begin{array}{\|c\|} 51 \text { to } \\ 54 \end{array}$ | $\begin{gathered} 56 \text { to } \\ 59 \end{gathered}$ | $\begin{array}{\|c\|} 61 \text { to } \\ 64 \end{array}$ | $\begin{gathered} 66 \text { to } \\ 69 \end{gathered}$ | $\begin{gathered} 76 \text { to } \\ 79 \end{gathered}$ | $\begin{gathered} 81 \text { to } \\ 84 \end{gathered}$ | $\begin{array}{\|c} 86 \text { to } \\ 89 \end{array}$ | $\begin{gathered} 91 \text { to } \\ 94 \end{gathered}$ |
| 32 | 95 | 100 | 105 | 110 | 120 | 125 | 130 | 135 | 88 | 93 | 98 | 103 | 113 | 118 | 123 | 128 |
| 40 | 101.5 | 106.5 | 111.5 | 116.5 | 126.5 | 131.5 | 136.5 | 141.5 | 94.5 | 99.5 | 104.5 | 109.5 | 119.5 | 124.5 | 129.5 | 134.5 |
| 50 | 103.5 | 108.5 | 113.5 | 118.5 | 128.5 | 133.5 | 138.5 | 143.5 | 95.5 | 100.5 | 105.5 | 110.5 | 120.5 | 125.5 | 130.5 | 135.5 |
| 63 | 109 | 114 | 119 | 124 | 134 | 139 | 144 | 149 | 101 | 106 | 111 | 116 | 126 | 131 | 136 | 141 |
| 80 | 118.5 | 123.5 | 128.5 | 133.5 | 143.5 | 148.5 | 153.5 | 158.5 | 108.5 | 113.5 | 118.5 | 123.5 | 133.5 | 138.5 | 143.5 | 148.5 |
| 100 | 130 | 135 | 140 | 145 | 155 | 160 | 165 | 170 | 118 | 123 | 128 | 133 | 143 | 148 | 153 | 158 |

## 6 Low-speed Cylinder ( 5 to $50 \mathrm{~mm} / \mathrm{s}$ )

Stick-slip phenomenon can be prevented, and smooth operation can be achieved even at lower driving speeds between 5 to $50 \mathrm{~mm} / \mathrm{s}$.

| Description | Model | Action |  |
| :--- | :--- | :---: | :--- |
| Compact <br> cylinder | CQ2 | Double acting, <br> Single rod | Except long stroke and large |
|  | CQ2W | Double acting, Double rod |  |
| bore type |  |  |  |

* Operate without lubrication from a pneumatic system lubricator.
* For the speed adjustment, use speed controllers for controlling at lower speeds. (AS-FM/AS-M series)

How to Order


## Specifications

| Piston speed | 5 to $50 \mathrm{~mm} / \mathrm{s}$ |
| :--- | :---: |
| Dimensions | Same as the standard type |
| Specifications other than the above | Same as the standard type |

## $\triangle$ 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.

## CQ2 Series

## Symbol <br> 7 Cylinder with Heat-resistant Auto Switch

A heat-resistant, compact cylinder which can mount a heat-resistant auto switch (Max. $150^{\circ} \mathrm{C}$ )

## Applicable Series

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact <br> cylinder | CQ2 | Double acting, <br> Single rod | Applicable to $\varnothing 16$ to $ø 63$ <br> Excludes models with a rubber bumper <br> Excludes the air-hydro type |

## How to Order



## Specifications

| Ambient and fluid temperature range | 0 to $150^{\circ} \mathrm{C}$ |
| :--- | :---: |
| Seal material | Fluororubber |
| Grease | Heat-resistant grease |
| Min. stroke for auto switch <br> mounting | 15 (Same for both 1 pc. and 2 pcs.) |
| Specifications other than the above | Same as the standard type |

For the detailed specifications of auto switches, refer to the Web Catalog.

* Lead wire length symbols
$3 \mathrm{~m} \cdots \cdots . . \mathrm{L}$ (Example) M9NJL
$5 \mathrm{~m} \cdots \cdots . \mathrm{Z}$ (Example) M9NJZ


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

## D-M9 $\square$ J

 $\varnothing 32$ to $\varnothing 63$


Auto switch (Sensor section) $\varnothing 32$ to $\varnothing 63$

## D-F7NJ <br> $\varnothing 16$ to $\varnothing 25$



Auto switch (Sensor section)

| $\begin{aligned} & \text { Adios switch } \\ & \text { Bore size } \\ & \text { model } \end{aligned}$ | D-M9 $\square$ J |  |  |  |  | D-F7NJ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A | B | U | EA | EB | A | B | U | EA | EB |
| 16 | 9.5 | 7 | 21 | 11 | 5.5 | 8 | 5.5 | 22.5 | 28 | 14 |
| 20 | 9.5 | 8.5 | 23.5 | 11 | 5.5 | 8 | 7 | 25.5 | 28 | 14 |
| 25 | 9.5 | 9 | 27 | 11 | 5.5 | 8 | 7.5 | 28 | 28 | 14 |
| 32 | 11 | 8 | 29 | 25 | 12.5 | 9.5 | 6.5 | 36 | 28 | 14 |
| 40 | 15 | 10.5 | 31 | 30 | 15 | 13.5 | 9 | 38 | 33 | 16.5 |
| 50 | 13 | 13.5 | 36 | 34 | 17 | 11.5 | 12 | 43.5 | 37 | 18.5 |
| 63 | 15.5 | 16.5 | 41.5 | 43 | 21.5 | 14 | 15 | 48.5 | 46 | 23 |


| Operating Range |  |  |  |  |  |  | [mm] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Auto switch model | Bore size |  |  |  |  |  |  |
|  | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
| D-M9 $\square$ 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 | Bore size [mm] |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| model | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ |
| D-F7NJL(Z) | BQ4-012 |  | BQJ2-032 |  |  |  |  |

## Auto Switch Mounting Bracket Weight

| Mounting bracket partno. | Weight $[\mathrm{g}]$ |
| :---: | :---: |
| 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 M2.5 screw is 0.25 to $0.35 \mathrm{~N} \cdot \mathrm{~m}$.

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## 8 Rod End Length Increased by 10 mm (For foot and flange bracket)

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 | CQ2 | Double acting, Single rod | Foot, Rod flange |
|  | CQ2 | Single acting (Spring return/extend) | Foot, Rod flange |
|  | CQ2W | Double acting, Double rod | Foot |
| Non-rotating rod | CQ2K | Double acting, Single rod | Foot, Rod flange |
|  | CQ2KW | Double acting, Double rod | Foot |
| Anti-lateral load | CQ2 $\square \mathbf{S}$ | 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 | CQ2W | Double acting, Double rod | Flange |
| Non-rotating rod | CQ2KW | Double acting, Double rod | Flange |

## How to Order

C(D)Q2A $\square$ Standard model no. - XC2(A)

## Specifications: Same as those of the standard type

Rod end length increased by 10 mm (For foot and flange bracket) | $-X C 2$ | For foot and single rod type rod flange |
| :--- | :--- |

-XC2A For double rod type flange

## 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)


Rod end female thread


Rod end male thread


Rod end female thread


Rod end male thread


Rod end female thread

$\mathrm{L}_{3}+$ Stroke
Rod end male thread

XC2: Standard, Anti-lateral load, Non-rotating rod [mm]

| Bore size <br> $[\mathrm{mm}]$ | Applicable series <br>  <br> Anti-lateral load |  | Non-rotating <br> rod | $\mathbf{L}$ |
| :---: | :---: | :---: | :---: | :---: |
|  | $\bigcirc$ | - | 13.5 | $\mathbf{L}_{\mathbf{1}}$ |
| $\mathbf{1 6}$ | $\bigcirc$ | - | 13.5 | 24 |
| $\mathbf{2 0}$ | $\bigcirc$ | - | 14.5 | 28.5 |
| $\mathbf{2 5}$ | $\bigcirc$ | - | 15 | 32.5 |
| $\mathbf{3 2}$ | $\bigcirc$ | - | 17 | 38.5 |
| $\mathbf{4 0}$ | $\bigcirc$ | $\bigcirc$ | 17 | 38.5 |
| $\mathbf{5 0}$ | $\bigcirc$ | $\bigcirc$ | 18 | 43.5 |
| $\mathbf{6 3}$ | $\bigcirc$ | $\bigcirc$ | 18 | 43.5 |
| $\mathbf{8 0}$ | $\bigcirc$ | - | 20 | 53.5 |
| $\mathbf{1 0 0}$ | $\bigcirc$ | - | 22 | 53.5 |

XC2A: Standard, Non-rotating rod

| Bore size <br> $[\mathrm{mm}]$ | Applicable series |  | Female thread |  | Male thread |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Standard | Non-rotating <br> rod | $\mathbf{L}$ | $\mathbf{L}_{2}$ | $\mathbf{L}_{\mathbf{1}}$ | $\mathbf{L} \mathbf{3}$ |
| $\mathbf{1 2}$ | $\bigcirc$ | - | 13.5 | 3.5 | 24 | 14 |
| $\mathbf{1 6}$ | $\bigcirc$ | - | 13.5 | 3.5 | 25.5 | 15.5 |
| $\mathbf{2 0}$ | $\bigcirc$ | - | 14.5 | 4.5 | 28.5 | 18.5 |
| $\mathbf{2 5}$ | $\bigcirc$ | - | 15 | 5 | 32.5 | 22.5 |
| $\mathbf{3 2}$ | $\bigcirc$ | - | 17 | 7 | 38.5 | 28.5 |
| $\mathbf{4 0}$ | $\bigcirc$ | $\bigcirc$ | 17 | 7 | 38.5 | 28.5 |
| $\mathbf{5 0}$ | $\bigcirc$ | $\bigcirc$ | 18 | 8 | 43.5 | 33.5 |
| $\mathbf{6 3}$ | $\bigcirc$ | $\bigcirc$ | 18 | 8 | 43.5 | 33.5 |
| $\mathbf{8 0}$ | $\bigcirc$ | - | 20 | 10 | 53.5 | 43.5 |
| $\mathbf{1 0 0}$ | $\bigcirc$ | - | 22 | 12 | 53.5 | 43.5 |

XC2: CQ2 Single acting

| Bore size End shape | Female thread |  |  |  | Male thread $\mathrm{L}_{1}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | L |  |  |  |  |  |  |  |
|  | Spring return | Spring extend |  |  | Spring return |  | ng ex |  |
|  | All strokes | 5 | 10 | 20 | All strokes | 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 |

## CQ2 Series

## 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 | CQ2 | Double acting, Single rod | Applicable to 020 to $\varnothing 100$ <br> The only mounting option selectable for <br> sizes $\varnothing 20$ to 032 is the (B) through-hole. |
|  | CQ2W | Double acting, Double rod | Applicable to $\varnothing 40$ to $\varnothing 100$ |
|  | CQP2 | Double acting, Single rod | Applicable to $\varnothing 32$ to $\varnothing 100$ |
|  | CQ2 | Double acting, Single rod |  |

Specifications

| Minimum operating pressure | 0.08 MPa |
| :---: | :---: |
| Specifications other than the above | Same as the standard type |

## $\triangle$ 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.


## How to Order

$\square$

Dimensions (Dimensions other than those below are the same as those of the standard type.)

Double acting, Single rod
$\varnothing 20, \varnothing 25$ (Without auto switch magnet), $\varnothing 32$

ø20, ø25 (With auto switch magnet)



| $\begin{gathered} \hline \text { Bore size } \\ {[\mathrm{mm}]} \\ \hline \end{gathered}$ | A |  |  | G |  | L |  | L1 |  | 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 | 100 mm stroke or less | 125 to 300 mm stroke |  |
| 20 | 34 (46) | - | - | - | - | 4.5 | - | 18.5 | - | - |
| 25 | 37.5 (47.5) | - | - | - | - | 5 | - | 22.5 | - | - |
| 32 | 40 (50) | 50 | 67.5 | - | - | 7 | 12 | 28.5 | 33.5 | - |
| 40 | 46.5 (56.5) | 56.5 | 77 | 5 | 10 | 17 | 22 | 38.5 | 43.5 | 28 |
| 50 | 48.5 (58.5) | 58.5 | 78.5 | 5 | 10 | 18 | 23 | 43.5 | 48.5 | 35 |
| 63 | 54 (64) | 64 | 80 | 5 | 10 | 18 | 23 | 43.5 | 48.5 | 35 |
| 80 | 63.5 (73.5) | 73.5 | 91 | 5 | 10 | 20 | 25 | 53.5 | 58.5 | 43 |
| 100 | 75 (85) | 85 | 102.5 | 5 | 10 | 22 | 27 | 53.5 | 58.5 | 59 |

( ): Dimensions with auto switch magnet

## Double acting, Double rod



| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{A}$ |  | $[\mathrm{mm}]$ |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Up to 50 mm stroke | $75,100 \mathrm{~mm}$ stroke | $\mathbf{L}$ | $\mathbf{L} 1$ |
|  | $46.5(56.5)$ | 56.5 | 17 | 38.5 |
| $\mathbf{5 0}$ | $48.5(58.5)$ | 58.5 | 18 | 43.5 |
| $\mathbf{6 3}$ | $54(64)$ | 64 | 18 | 43.5 |
| $\mathbf{8 0}$ | $63.5(73.5)$ | 73.5 | 20 | 53.5 |
| $\mathbf{1 0 0}$ | $75(85)$ | 85 | 22 | 53.5 |

( ): Dimensions with auto switch magnet

## 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 | CQ2 | Double acting, Single rod |
|  |  | Single acting (Spring return/extend) |
|  | CQ2W | Double acting, Double rod |
| Axial piping <br> (Centralized piping) | CQP2 | Double acting, Single rod |
|  |  |  |
| Long stroke | CQ2 | Double acting, Single rod |
| Anti-lateral load | CQ2 $\square \mathbf{S}$ | Double acting, Single rod |
| Water resistant | CQ2-R/V | Double acting, Single rod |
|  | CQ2W-R/V | Double acting, Double rod |

Specifications

| Parts changed to stainless steel | Retaining ring, Piston rod, Rod end nut |
| :--- | :---: |
| Specifications other than <br> the above and dimensions | 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 $\Rightarrow$ p. 26

## How to Order



| Description | Model | Action |
| :---: | :---: | :---: |
| Water resistant | CQ2 $\square \mathrm{V}$ | Double acting, Single rod |
|  | CQ2W $\square \mathrm{V}$ | Double acting, Double rod |

## How to Order


ø20 to $\varnothing 32$


Specifications

| Parts changed to <br> stainless steel | XC6 | Retaining ring, Piston rod, Rod end nut |
| :---: | :---: | :---: |
|  | XC6A | Piston rod, Rod end nut, <br> Cover holding bolt |

## Specifications other than

 the above and dimensionsSame as the standard type

* -XC6A is only applicable to $\varnothing 20, \varnothing 25$, and $\varnothing 32$ of the double acting, single rod type.


## CQ2 Series

## 1 Adjustable Stroke Cylinder/Adjustable Extension Type

Adjusts the extending stroke with the stroke-adjusting mechanism equipped in the head side

| Description | Model | Action | Note |
| :---: | :--- | :---: | :--- |
| Compact cylinder | CQ2 | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or mounting bracket |
| Non-rotating rod | CQ2K | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or mounting bracket |
| Air-hydro type | CQ2H | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |

## How to Order

| Standard model no. |
| :---: |
| XC8 |

## Specifications

| Stroke adjustment range [mm] | 0 to 10 |
| :--- | :---: |
| Specifications other than the above | Same as the standard type |

## Precautions

## $\triangle$ 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.)

$\varnothing 32$ to $\varnothing 100$

[mm]

| Bore size [mm] | A |  | B |  | L | MH | MT | MA | MI | MM | MK | ML | $\varnothing \mathbf{G}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 50 mm stroke or less | 75, 100 mm stroke | 50 mm stroke or less | 75, 100 mm stroke |  |  |  |  |  |  |  |  |  |
| 12 | 57.7 (64.9) | - | 25.2 (32.4) | - | 3.5 | 29 | 5 | 8 | $\square 25$ (ø15) | M4 x 0.7 | 5.5 | 20 | 14 |
| 16 | 58.5 (68.5) | - | 26 (36) | - | 3.5 | 29 | 5 | 10 | $\square 28$ (ø20) | M5 x 0.8 | 5.5 | 20 | 14 |
| 20 | 67.5 (79.5) | - | 26 (38) | - | 4.5 | 37 | 8 | 12 | $\square 36$ (ø25) | M6 $\times 1$ | 7 | 24 | 20 |
| 25 | 71 (81) | - | 29 (39) | - | 5 | 37 | 8 | 12 | $\square 40$ (ø30) | M6 x 1 | 7 | 24 | 20 |
| 32 | 78.5 (88.5) | 88.5 | 30.5 (40.5) | 40.5 | 7 | 41 | 6 | 17 | $ø 38$ | M8 x 1.25 | 9 | 28.5 | 25 |
| 40 | 88 (98) | 98 | 40 (50) | 50 | 7 | 41 | 6 | 19 | $\varnothing 46$ | M10 $\times 1.25$ | 10 | 27 | 25 |
| 50 | 100.5 (110.5) | 110.5 | 40.5 (50.5) | 50.5 | 8 | 52 | 8 | 24 | $\varnothing 57$ | M14 $\times 1.5$ | 13 | 31 | 35 |
| 63 | 102 (112) | 112 | 42 (52) | 52 | 8 | 52 | 10 | 24 | ø68 | M14 $\times 1.5$ | 13 | 31 | 35 |
| 80 | 125 (135) | 135 | 51 (61) | 61 | 10 | 64 | 12 | 32 | $ø 90$ | M20 x 1.5 | 16 | 40 | 45 |
| 100 | 138.5 (148.5) | 148.5 | 60.5 (70.5) | 70.5 | 12 | 66 | 14 | 32 | $\varnothing 110$ | M20 x 1.5 | 16 | 40 | 45 |

* ( ): Dimensions with auto switch magnet

The symbol is X525 for the long stroke type. $\Rightarrow$ p. 185

## Adjustable Stroke Cylinder/Adjustable Retraction Type

The retract stroke of the cylinder can be adjusted by the adjustment bolt.

| Description | Model | Action | Note |
| :---: | :--- | :---: | :--- |
| Compact cylinder | CQ2 | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or mounting bracket |
| Non-rotating rod | CQ2K | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or mounting bracket |

## How to Order


(After adjusting the stroke, the double-side cushion type becomes a single-side cushion type. CQ2 is without cushion.)

|  |
| :--- |
| P Warning |

1. 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.
2. 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


Dimensions (Dimensions other than those below are the same as those of the standard type.)

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.
[mm]

| $\begin{gathered} \text { Bore size } \\ {[\mathrm{mm}]} \end{gathered}$ | A |  | B |  | L | BL | BM |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 50 mm stroke or less | 75, 100 mm stroke | 50 mm stroke or less | 75, 100 mm stroke |  |  |  |
| 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 $\times 1.25$ |
| 25 | 63.5 (73.5) | - | 29 (39) | - | 5 | 29.5 | M8 $\times 1.25$ |
| 32 | 65.5 (75.5) | 75.5 | 30.5 (40.5) | 40.5 | 7 | 28 | M8 $\times 1.25$ |
| 40 | 84 (94) | 94 | 40 (50) | 50 | 7 | 37 | M12 $\times 1.5$ |
| 50 | 84.5 (94.5) | 94.5 | 40.5 (50.5) | 50.5 | 8 | 36 | M12 $\times 1.5$ |
| 63 | 88.5 (98.5) | 98.5 | 42 (52) | 52 | 8 | 38.5 | M16 $\times 1.5$ |
| 80 | 109.5 (119.5) | 119.5 | 51 (61) | 61 | 10 | 48.5 | M $20 \times 1.5$ |
| 100 | 125 (135) | 135 | 60.5 (70.5) | 70.5 | 12 | 52.5 | M $24 \times 1.5$ |

[^22]
## CQ2 Series

## 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 | CQ2 | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |
| Non-rotating rod | CQ2K | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |
| Air-hydro type | CQ2H | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |

## How to Order

CQ2B Bore size - Stroke $\mathbf{S}_{1}+$ Stroke $\mathbf{S}_{2} \mathrm{D}(\mathrm{C})(\mathrm{M})(\mathrm{Z})-$ 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 B and $\mathbf{C}$, stroke A is operated.

## Specifications

| Bore size $[\mathrm{mm}]$ | Max. manufacturable stroke $[\mathrm{mm}]$ |
| :---: | :---: |
| $\mathbf{1 2 , 1 6}$ | 60 (Max. 30 on one side) |
| $\mathbf{2 0 , 2 5}$ | 100 (Max. 50 on one side) |
| $\mathbf{3 2 , 4 0}$ | 200 (Max. 100 on one side) |
| $\mathbf{5 0}$ to 100 | 200 (Max. 100 on one side) |
| Specifications other than the above | Same as the standard type |



When air pressure is supplied to ports (A) and $D$, stroke B 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.)

## $\varnothing 12$ to $\varnothing 25$

With auto switch magnet


* In the case of bore sizes $\varnothing 12$ to $\varnothing 25$ 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 $\mathrm{S}_{1}$ side tapped.
* Please contact SMC for the through-hole type and models with a mounting bracket.

| Bore size [mm] | A |  |  | B |  | L | 0 | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $50{ }^{\text {st }}$ or less for both $\mathbf{S}_{1}$ and $\mathbf{S}_{2}$ | Combination of $50{ }^{\text {st }}$ or less, 75,100 st | 75, 100 st for both $\mathbf{S}_{\mathbf{1}}$ and $\mathbf{S}_{\mathbf{2}}$ | $50^{\text {st }}$ or less | 75, $100{ }^{\text {st }}$ |  |  |  |
| 12 | 41 (63) | - | - | 17 (28) | - | 3.5 | M4 x 0.7 | 7 |
| 16 | 44 (68) | - | - | 18.5 (30.5) | - | 3.5 | M4 $\times 0.7$ | 7 |
| 20 | 48 (72) | - | - | 19.5 (31.5) | - | 4.5 | M6 x 1.0 | 10 |
| 25 | 55 (75) | - | - | 22.5 (32.5) | - | 5 | M6 x 1.0 | 10 |
| 32 | 60 (80) | 70 (80) | 80 (80) | 23 (33) | 33 (33) | 7 | M6 x 1.0 | 10 |
| 40 | 73 (93) | 83 (93) | 93 (93) | 29.5 (39.5) | 39.5 (39.5) | 7 | M6 x 1.0 | 10 |
| 50 | 77 (97) | 87 (97) | 97 (97) | 30.5 (40.5) | 40.5 (40.5) | 8 | M8 x 1.25 | 14 |
| 63 | 88 (108) | 98 (108) | 108 (108) | 36 (46) | 46 (46) | 8 | M10 x 1.5 | 18 |
| 80 | 107 (127) | 117 (127) | 127 (127) | 43.5 (53.5) | 53.5 (53.5) | 10 | M12 $\times 1.75$ | 22 |
| 100 | 130 (150) | 140 (150) | 150 (150) | 53 (63) | 63 (63) | 12 | M12 $\times 1.75$ | 22 |

* ( ): Dimensions with auto switch
* Applicable stroke available in 5 mm increments

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 | CQ2 | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |
| Non-rotating rod | CQ2K | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |
| Air-hydro type | CQ2H | Double acting, <br> Single rod | Excludes models with a <br> mounting bracket |

## Specifications

| Bore size $[\mathrm{mm}]$ | Max. manufacturable stroke $[\mathrm{mm}]$ |
| :---: | :---: |
| $\mathbf{1 2 , 1 6}$ | 30 for both $\mathrm{S}_{1}$ and $\mathrm{S}_{2}$ |
| $\mathbf{2 0}$ to $\mathbf{1 0 0}$ | 50 for both $\mathrm{S}_{1}$ and $\mathrm{S}_{2}$ |
| Specifications other than the above | Same as the standard type |

* The max. manufacturable stroke is the combination of stroke 1 and stroke 2.
How to Order



## Functional description of dual stroke cylinder



1) Initial state (0 stroke position)

2) 1st stage:

Stroke $\mathrm{S}_{1}$ operation When air pressure is supplied to the A port, the rod operates stroke $\mathrm{S}_{1}$.
3) 2nd stage:

Stroke S2-S1 operation Following the 1st stage, when air pressure is supplied to the $C$ port, the rod operates stroke $\mathrm{S}_{2}-\mathrm{S}_{1}$.
4) Cylinder retraction When air pressure is supplied to the B port, the rod retracts completely.

Double output is possible.


Stroke $S_{1}$ and stroke $S_{2}$ can be operated individually.


Stroke S1 operation

1) Initial state
(0 stroke position)

2) Operation

When air pressure is supplied to the A port, the rod operates stroke $\mathrm{S}_{1}$.


## Stroke S2 operation

1) Initial state (0 stroke position)
2) Operation

When air pressure is supplied to the C port, the rod operates stroke $\mathrm{S}_{2}$.
Precautions

## $\triangle$ Caution

1. Remove the temporary fixing nut and flat washer from the mounting bolt, and secure the cylinder properly with the mounting bolt.
2. Although the cylinder can be detached by removing the nut, do not detach it for purposes other than replacing the seal.
3. Do not supply air to the cylinder until it has been properly secured with the mounting bolt.
If air is supplied prematurely, the cylinder may lurch, resulting in injury to nearby personnel or damage to peripheral equipment.
4. The removed nut and flat washer are not used to secure the body.



## CQ2 Series



* This cylinder includes mounting bolts to secure the cylinder.

| Bore size [mm] | A | B1 | B2 | L | R | Y | $\begin{gathered} \text { Stroke } \\ \text { Both } S_{1} \text { and } S_{2} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 12 | 45.7 (63.9) | 17 (28) | 25.2 (32.4) | 3.5 | 6.3 (8.1) | M3 x 0.5 | 5 to 30 |
| 16 | 48 (70) | 18.5 (30.5) | 26 (36) | 3.5 | 9 (7) |  |  |
| 20 | 50 (74) | 19.5 (31.5) | 26 (38) | 4.5 | 11.5 (7.5) | M5 x 0.8 | 5 to 50 |
| 25 | 56.5 (76.5) | 22.5 (32.5) | 29 (39) | 5 | 10.5 |  |  |
| 32 | 60.5 (80.5) | 23 (33) | 30.5 (40.5) | 7 | 8.5 |  |  |
| 40 | 76.5 (96.5) | 29.5 (39.5) | 40 (50) | 7 | 7.5 |  |  |
| 50 | 79 (99) | 30.5 (40.5) | 40.5 (50.5) | 8 | 12 | M6 x 1 | 10 to 50 |
| 63 | 86 (106) | 36 (46) | 42 (52) | 8 | 12.5 | M8 $\times 1.25$ |  |
| 80 | 104.5 (124.5) | 43.5 (53.5) | 51 (61) | 10 | 19 | M10 x 1.5 |  |
| 100 | 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. $\Rightarrow$ p. 187


## 15 With Split Pins for Double Clevis Pin/Double Knuckle Joint Pin and Flat Washers

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 retumexexeno) |  |
| Long stroke | CQ2 | Double acting, Single rod |  |
| Non-rotating rod*1 | CQ2K | Double acting, Single rod |  |
| Anti-lateral load | CQ2 $\square$ S | Double acting, Single rod |  |
| Water resistant*2 | CQ2-R/V | Double acting, Single rod |  |
| With end lock*3 | CBQ2 | Double acting, Single rod |  |

## Specifications: Same as those of the standard type

## How to Order


 split pin, and flat washer


Dimensions (Dimensions other than those below are the same as those of the standard type.)

Double clevis


* Body mounting bolts, pin, split pins, and flat washers are included.

Double knuckle joint


* A pin, split pins, and flat washers are included.

| Bore size [mm] | Double clevis | Double knuckle joint | Clevis pin Knuckle joint pin | L |
| :---: | :---: | :---: | :---: | :---: |
| 12 | CQ-D012-XC26 | Y-G012-XC26 | IY-G012-XC26 | 21 |
| 16 | CQ-D016-XC26 | Y-G016-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 |

## Clevis pin/Knuckle joint pin



* Split pins and flat washers are included.


## CQ2 Series

3 different double clevis widths and double knuckle joint widths are selectable: $12.5 \mathrm{~mm}, 16.5 \mathrm{~mm}$, or 19.5 mm

| Description | Model | Action | Note |
| :--- | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, <br> Single rod | Applicable to ø32 to ø63 <br> Double clevis (D) mounting only |
| Long stroke | CQ2 |  | Sindi-lateral load |

Specifications:<br>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 | $\bullet$ | $\bullet$ | $\bullet$ | - |
| Long stroke | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ |
| Anti-lateral load | - | - | $\bullet$ | $\bullet$ |

* For details on XC35 $\Rightarrow$ p. 176

For details on XC88, 89, and $91 \Rightarrow$ p. 178


## Dimensions (Dimensions other than those below are the same as those of the standard type.)

Double clevis


* Body mounting bolts, pin, split pins, and flat washers are included.

| $\begin{gathered} \hline \text { Bore size } \\ {[\mathrm{mm}]} \\ \hline \end{gathered}$ | Double clevis | Double knuckle joint | Clevis pin Knuckle joint pin | CX | L |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | CQ-D032-XC26C | Y-G04-XC26C | IY-G04-XC26 | 12.5 | 52.5 |
| 40 | CQ-D040-XC26A | Y-G04-XC26A |  | 16.5 |  |
|  | CQ-D040-XC26B | Y-G04-XC26B |  | 19.5 |  |
|  | CQ-D040-XC26C | Y-G04-XC26C |  | 12.5 |  |
| 50 | 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 |  |
| 63 | CQ-D063-XC26A | Y-G05-XC26A |  | 16.5 |  |
|  | CQ-D063-XC26B | Y-G05-XC26B |  | 19.5 |  |
|  | CQ-D063-XC26C | Y-G05-XC26C |  | 12.5 |  |

Double knuckle joint


* A pin, split pins, and flat washers are included. mm]


## 17 Double Clevis Pin/Double Knuckle Joint Pin Material: Stainless Steel 304

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 | CQ2 | Double acting, Single rod*1 |
|  |  | Single acting (Spring return/extend)*1 |
| Long stroke | CQ2 | Double acting, Single rod |
| Anti-lateral load | CQ2 $\square \mathbf{S}$ | Double acting, Single rod |
| Non-rotating rod | CQ2K | 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 $\Rightarrow$ p. 26

*1 Stainless steel specification for IY-J015 (ø16 knuckle pin) is IYJ015SUS.

## 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

Removes frost, ice, weld spatter, cutting chips, etc. adhered to the piston rod, protecting the seals.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Applicable to ø32 to ø100 |
|  | CQ2W | Double acting, Double rod | Applicable to $\varnothing 32$ to ø100 |
| Axial piping | CQP2 | Double acting, Single rod | Applicable to 032 to 0100 <br> Excludes models with a mounting bracket |
| Long stroke | CQ2 | Double acting, Single rod | Applicable to $\varnothing 32$ to $\varnothing 100$ |

## 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 <br> $[\mathrm{mm}]$ | A |  |  |  |  |  |  | [mm] |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 50 mm stroke or less | $75,100 \mathrm{~mm}$ stroke | 125 to 300 mm stroke | 100 mm stroke or less | 125 to 300 mm stroke | T |  |  |  |
|  | $35(45)$ | 45 | 62.5 | 12 | 17 | $23_{-0.052}^{+0}$ |  |  |  |
| $\mathbf{4 0}$ | $41.5(51.5)$ | 51.5 | 72 | 12 | 17 | $28_{-0.052}^{+0}$ |  |  |  |
| $\mathbf{5 0}$ | $43.5(53.5)$ | 53.5 | 73.5 | 13 | 18 | $35_{-0.062}^{+0}$ |  |  |  |
| $\mathbf{6 3}$ | $49(59)$ | 59 | 75 | 13 | 18 | $35_{-0.062}^{+0}$ |  |  |  |
| $\mathbf{8 0}$ | $58.5(68.5)$ | 68.5 | 86 | 15 | 20 | $43_{-0.062}^{+0}$ |  |  |  |
| $\mathbf{1 0 0}$ | $70(80)$ | 80 | 97.5 | 17 | 22 | $59_{-0.074}^{+0}$ |  |  |  |

* ( ): Dimensions with auto switch magnet

Double acting, Double rod


| Bore size <br> $[\mathrm{mm}]$ |  |  | A |  | $\mathbf{L m}]$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 50 mm stroke or less | $75,100 \mathrm{~mm}$ stroke | $\mathbf{L}$ |  |  |
| $\mathbf{3 2}$ | $54.5(64.5)$ | 64.5 | 12 |  |  |
| $\mathbf{4 0}$ | $64(74)$ | 74 | 12 |  |  |
| $\mathbf{5 0}$ | $66.5(76.5)$ | 76.5 | 13 |  |  |
| $\mathbf{6 3}$ | $68(78)$ | 78 | 13 |  |  |
| $\mathbf{8 0}$ | $81(91)$ | 91 | 15 |  |  |
| $\mathbf{1 0 0}$ | $94.5(104.5)$ | 104.5 | 17 |  |  |

* ( ): Dimensions with auto switch magnet


## CQ2 Series

## 19 With Boss on Rod End

Cylinder with boss on rod end

| Description | Model | Action |
| :--- | :--- | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod |
|  |  |  |
|  | CQ2W | Double acting, Double rod |
| Long stroke*1 | CQ2 | Double acting, Single rod |
| Non-rotating rod*1 | CQ2K | Double acting, Single rod |
|  | CQ2KW | Double acting, Double rod |
| Axial piping | CQP2 | 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 $\varnothing 125$ or more

How to Order


## Specifications: <br> Same as those of the standard type

Dimensions (Dimensions other than those below are the same as those of the standard type.)


|  |  | [mm] |
| :---: | :---: | :---: |
| Bore size <br> $[\mathrm{mm}]$ | Th9 | $\mathbf{G}$ |
| $\mathbf{1 2}$ | $15_{-0.043}^{0}$ | 1.5 |
| $\mathbf{1 6}$ | $20_{-0.052}^{0}$ | 1.5 |
| $\mathbf{2 0}$ | $13_{-0.043}^{0}$ | 2 |
| $\mathbf{2 5}$ | $15_{-0.043}$ | 2 |
| $\mathbf{3 2}$ | $21_{-0.052}^{0}$ | 2 |
| $\mathbf{4 0}$ | $28_{-0.052}^{0}$ | 2 |
| $\mathbf{5 0}$ | $35_{-0.062}^{0}$ | 2 |
| $\mathbf{6 3}$ | $35_{-0.062}^{0}$ | 2 |
| $\mathbf{8 0}$ | $43_{-0.062}^{0}$ | 2 |
| $\mathbf{1 0 0}$ | $5_{-0.074}^{0}$ | 2 |

## 20 Grease for Food Processing Equipment

## -XC85

Food grade grease (certified by NSF-H1) is used.

| Description | Model | Action |
| :--- | :--- | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod |
|  | CQ2 | Single acting (Spring return/extend) |
|  | CQ2W | Double acting, Double rod |
| Large bore size | CQ2 | Double acting, Single rod |
|  | CQ2W | Double acting, Double rod |
| Long stroke | CQ2 | Double acting, Single rod |
|  | CQ2K | Double acting, Single rod |
|  | CQ2KW | Double acting, Double rod |
| Water resistant | CQ2-R/V | Double acting, Single rod |
|  | CQ2W-R/V | Double acting, Double rod |
| Axial piping | CQP2 | Double acting, Single rod |
|  | CQP2 | Single acting (Spring return/extend) |
| With end lock | CQ2 $\square \mathbf{S}$ | Double acting, Single rod |

## How to Order

## Standard model no. - XC85

Grease for food

## $\triangle$ Warning

processing equipment

## 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

## Specifications

| Grease | Grease for food processing equipment |
| :--- | :---: |
| Dimensions | Same as the standard type |
| Specilications other than the above | Same as the standard type |



* 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.

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 | - | $\bigcirc$ | $\bigcirc$ |
|  | Long stroke | CQ2 | Double acting, Single rod |  | $\bigcirc$ | $\bigcirc$ | - |
|  | Anti-lateral load | CQ2 $\square$ S | Double acting, Single rod |  | - | $\bigcirc$ | - |

How to Order


Specifications

| Part no. | $\begin{array}{c}\text { Piston rod material } \\ \text { (Hard chrome plating) }\end{array}$ |  | $\begin{array}{c}\text { Coil } \\ \text { Scraper }\end{array}$ | $\begin{array}{c}\text { Lube- } \\ \text { retainer }\end{array}$ | $\begin{array}{c}\text { Grease } \\ \text { for } \\ \text { welding }\end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | S45C | Stainless steel304 |  |  |  |$)$

* Use the -XC91 in a place where the distance from the welding portion is far and the spatter scattering is minimized.

| Speciications other than the above | Same as the standard type |
| :--- | :--- |



| $\begin{aligned} & \text { Bore size } \\ & {[\mathrm{mm}]} \end{aligned}$ | XC88, 89 |  |  |  |  |  | XC91 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A |  |  | G | L | Th9 | A | G | L | Th9 |
|  | Standard | Long stroke | Anti-lateral load |  |  |  |  |  |  |  |
| 32 | 50 | 67.5 | 60 | 10 | 17 | $23{ }_{-0.052}^{0}$ | 45 | 5 | 12 | $23{ }_{-0.052}^{0}$ |
| 40 | 56.5 | 77 | 66.5 | 10 | 17 | $28{ }_{-0.052}^{0}$ | 51.5 | 5 | 12 | $28{ }_{-0.052}^{0}$ |
| 50 | 58.5 | 78.5 | 68.5 | 10 | 18 | 35 ${ }_{-0.062}^{0}$ | 53.5 | 5 | 13 | 35 ${ }_{-0.062}^{0}$ |
| 63 | 64 | 80 | 74 | 10 | 18 | 35 ${ }_{-0.062}^{0}$ | 59 | 5 | 13 | $35{ }_{-0.062}^{0}$ |
| 80 | 73.5 | 91 | 83.5 | 10 | 20 | $43{ }_{-0.062}^{0}$ | 68.5 | 5 | 15 | $43{ }_{-0.062}^{0}$ |
| 100 | 85 | 102.5 | 95 | 10 | 22 | $59{ }_{-0.074}^{0 .}$ | 80 | 5 | 17 | $59{ }_{-0.074}^{0}$ |

## CQ2 Series

## 24 Dust-resistant Actuator

For use in environments with airborne micro-powder ( 20 to $30 \mu \mathrm{~m}$ 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 | CQ2 | Double acting, Single rod | Applicable to $\varnothing 32$ to $\varnothing 100$ |

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.)
$\varnothing 32$
$\varnothing 40$ to $\varnothing 100$


| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{A}$ |  | B |  | [mm] |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Without auto switch | With auto switch | Without auto switch | With auto switch |  | T |
| $\mathbf{3 2}$ | $40(50)$ | 50 | $33(43)$ | 43 | 7 | - |
| $\mathbf{4 0}$ | $46.5(56.5)$ | 56.5 | $29.5(39.5)$ | 39.5 | 17 | 28 |
| $\mathbf{5 0}$ | $48.5(58.5)$ | 58.5 | $30.5(40.5)$ | 40.5 | 18 | 35 |
| $\mathbf{6 3}$ | $54(64)$ | 64 | $36(46)$ | 46 | 18 | 35 |
| $\mathbf{8 0}$ | $63.5(73.5)$ | 73.5 | $43.5(53.5)$ | 53.5 | 20 | 43 |
| $\mathbf{1 0 0}$ | $75(85)$ | 85 | $53(63)$ | 63 | 22 | 59 |

* Dimensions inside ( ) are for 75,100 st.


## 25 Special Port Location

This type is available for changing port location. (Only for $\varnothing 12$ to $\varnothing 25$ with auto switch magnet)

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Applicable to $\varnothing 12$ to $\varnothing 25$ |
|  |  | Singe acting( Sping retumexteno) |  |
|  | CQ2W | Double acting, Double rod |  |

## How to Order



In the case of CDQ2 $\square 20,25$, specify the port location with B, C, and D.

Specifications: Same as those of the standard type

## CQ2 Series

26 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 <br> cylinder | CQ2W | Double acting, <br> Double rod | Foot, compact foot, and <br> flange only <br> Excludes body option M <br> (Rod end male thread) and <br> the air-hydro type |
| Large bore <br> size | CQ2W | Double acting, <br> Double rod | Excludes body option M <br> (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.)
$\varnothing 12$ to $\varnothing 25$

$\varnothing 32$ to $\varnothing 200$

$\varnothing 12$ to $\varnothing 25$ (With auto switch magnet)


| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{A}$ |  |
| :---: | :---: | :---: |
|  | 50 mm stroke or less | 75 mm stroke or more |
| $\mathbf{1 2}$ | $42.7(49.9)$ | - |
| $\mathbf{1 6}$ | $45(55)$ | - |
| $\mathbf{2 0}$ | $49(61)$ | - |
| $\mathbf{2 5}$ | $56.5(66.5)$ | - |
| $\mathbf{3 2}$ | $66(76)$ | 76 |
| $\mathbf{4 0}$ | $75.5(85.5)$ | 85.5 |
| $\mathbf{5 0}$ | $82(92)$ | 92 |
| $\mathbf{6 3}$ | $83.5(93.5)$ | 93.5 |


| Bore size <br> $[\mathrm{mm}]$ | $\mathbf{A}$ |  |
| :---: | :---: | :---: |
|  | 50 mm stroke or less | 75 mm stroke or more |
| $\mathbf{8 0}$ | $104.5(114.5)$ | 114.5 |
| 100 | $116(126)$ | 126 |
| 125 |  | 157 |
| 140 | 157 |  |
| 160 | 172 |  |
| 180 | 183 |  |
| 200 | 190 |  |

* ( ): Dimensions with auto switch


## 27 Fluororubber Seals

The material of the seals has been changed to fluororubber.

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | With rubber bumper: The bumper material cannot be changed to fluororubber. Excludes the airhydro type |
|  | CQ2 | Single acting (Spring return/extend) |  |
|  | CQ2W | Double acting, Double rod |  |
| Large boresize | CQ2 | Double acting, Single rod |  |
|  | CQ2W | Double acting, Double rod |  |
| Long stroke | CQ2 | Double acting, Single rod |  |
| Anti-lateral load | CQ2 $\square$ S | Double acting, Single rod |  |
| Axial piping | CQP2 | Double acting, Single rod |  |
|  | CQP2 | Single acting (Spring return/extend) |  |

## Standard model no. - X271

Fluororubber sealsd
Specifications: Same as those of the standard type 183

## CQ2 Series

28 Long Stroke for Adjustable Extension Stroke Cylinder (-XC8)

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact <br> cylinder | CQ2 | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or mounting bracket |

## Standard model no. - X525



## Specifications: Same as those of the standard type

Dimensions (Dimensions other than those below are the same as those of the standard type.)
$\varnothing 12$ to $\varnothing 25$ (Without auto switch magnet)


* Only the through-hole mounting type is available.
$\varnothing 12$ to $\varnothing 25$ (With auto switch magnet)

$\varnothing 32$ to $\varnothing 100$

$\varnothing 12, \varnothing 16$

| $\underbrace{\text { Symbol }}_{\text {Bore size }}$ | A |  |  |  | B |  |  |  | C | L | Applicable stroke |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 35 st | 40 st | 45 st | 50 st | 35 st | 40 st | 45 st | 50 st |  |  |  |
| 12 | 99.9 | 104.9 | 109.9 | 114.9 | 72.4 | 77.4 | 82.4 | 87.4 | 24 | 3.5 | 35, 40 |
| 16 | 104.5 | 109.9 | 114.9 | 119.5 | 77 | 82 | 87 | 92 | 24 | 3.5 | 45, 50 |

$\varnothing 20$ to $\varnothing 100$

|  | A |  |  |  |  |  | B |  |  |  |  |  | C | L | Applicable stroke |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & 55 \text { to } \\ & 75 \text { st } \end{aligned}$ | $\begin{aligned} & 80 \text { to } \\ & 100 \text { st } \end{aligned}$ | $\begin{aligned} & 105 \text { to } \\ & 125 \mathrm{st} \end{aligned}$ | $\begin{aligned} & 130 \text { to } \\ & 150 \text { st } \end{aligned}$ | $\begin{aligned} & 155 \text { to } \\ & 175 \mathrm{st} \end{aligned}$ | $\begin{aligned} & 180 \text { to } \\ & 200 \text { st } \end{aligned}$ | $\begin{aligned} & 55 \text { to } \\ & 75 \text { st } \end{aligned}$ | $\begin{aligned} & 80 \text { to } \\ & 100 \text { st } \end{aligned}$ | $\begin{aligned} & 105 \text { to } \\ & 125 \mathrm{st} \end{aligned}$ | $\begin{aligned} & 130 \text { to } \\ & 150 \text { st } \end{aligned}$ | $\begin{aligned} & 155 \text { to } \\ & 175 \mathrm{st} \end{aligned}$ | $\begin{aligned} & 180 \text { to } \\ & 200 \mathrm{st} \end{aligned}$ |  |  |  |
| 20 | 155.5 | 180.5 | - | - | - | - | 122 | 147 | - | - | - | - | 29 | 4.5 | 55 to 100 |
| 25 | 156 | 181 | - | - | - | - | 122 | 147 | - | - | - | - | 29 | 5 |  |
| 32 | - | - | 213.5 | 238.5 | 263.5 | 288.5 | - | - | 171.5 | 196.5 | 221.5 | 246.5 | 35 | 7 | 105 to 200 |
| 40 | - | - | 223 | 248 | 273 | 298 | - | - | 181 | 206 | 231 | 256 | 35 | 7 |  |
| 50 | - | - | 235.5 | 260.5 | 285.5 | 310.5 | - | - | 183.5 | 208.5 | 233.5 | 258.5 | 44 | 8 |  |
| 63 | - | - | 237 | 262 | 287 | 312 | - | - | 187 | 212 | 237 | 262 | 42 | 8 |  |
| 80 | - | - | 260 | 285 | 310 | 335 | - | - | 198 | 223 | 248 | 273 | 52 | 10 |  |
| 100 | - | - | 273.5 | 298.5 | 323.5 | 348.5 | - | - | 209.5 | 234.5 | 259.5 | 284.5 | 52 | 12 |  |

[^23]
## Long Stroke for Adjustable Retraction Stroke Cylinder (-XC9)

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact <br> cylinder | CQ2 | Double acting, <br> Single rod | Excludes models with a rubber <br> bumper or 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 $^{\text {Symbol }}$ | $\mathbf{A}$ | $\mathbf{B}$ | $\mathbf{L}$ | $\mathbf{B L}$ | $\mathbf{B M}$ | Applicable stroke |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1 2}$ | $59.2(56.4)$ | 32.4 | 3.5 | $23.3(20.5)$ | $\mathrm{M} 5 \times 0.8$ | $35,40,45,50$ |
| $\mathbf{1 6}$ | 64 | 37 | 3.5 | 23.5 | $\mathrm{M} 6 \times 1.0$ |  |
| $\mathbf{2 0}$ | 74 | 39 | 4.5 | 30.5 | $\mathrm{M} 8 \times 1.25$ | 75,100 |
| $\mathbf{2 5}$ | 73.5 | 39 | 5 | 29.5 | $\mathrm{M} 8 \times 1.25$ |  |
| $\mathbf{3 2}$ | 75.5 | 40.5 | 7 | 28 | $\mathrm{M} 8 \times 1.25$ |  |
| $\mathbf{4 0}$ | 94 | 50 | 7 | 37 | $\mathrm{M} 12 \times 1.5$ | 125,150 |
| $\mathbf{5 0}$ | 94.5 | 50.5 | 8 | 36 | $\mathrm{M} 12 \times 1.5$ |  |
| $\mathbf{6 3}$ | 98.5 | 52 | 8 | 38.5 | $\mathrm{M} 16 \times 1.5$ | 175,200 |
| $\mathbf{8 0}$ | 119.5 | 61 | 10 | 48.5 | $\mathrm{M} 20 \times 1.5$ |  |
| $\mathbf{1 0 0}$ | 135 | 70.5 | 12 | 52.5 | $\mathrm{M} 24 \times 1.5$ |  |

* ( ): 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 $75,100,125,150,175,200 \mathrm{~mm}$ strokes

30 Intermediate Stroke for Double Rod Cylinder

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2W | Double acting, | Excludes models with a <br> mounting bracket |
| Large bore size | CQ2W |  |  |
| Nouble rod |  |  |  |

## 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.)


|  | 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 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 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 |  |  |
| 125 | 115 | 83 | - | - | 16 | 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 |
| 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 $\mathrm{S}_{1}$ has 5 mm increments for controlling intermediate strokes in 1 mm increments.
Example) In the case of CDQ2WB4018 DZ , stroke $\mathrm{S}_{1}$ is 20 mm and stroke $\mathrm{S}_{2}$ is 18 mm .
* For $\varnothing 40$ to $\varnothing 100$ cylinders with bumper, please consult with SMC.
For $\varnothing 32$ to $\varnothing 100$ cylinders, the dimensions of the 75 and 100 mm strokes are the same as those of the dimensions with auto switch in the brackets.


## CQ2 Series

| Description | Model | Action | Note |
| :---: | :---: | :---: | :---: |
| Compact cylinder | CQ2 | Double acting, Single rod | Excludes the both ends tapped type and models with a mounting bracket |

## 

## Specifications: Same as those of the standard type

## Applicable Strokes

| Bore size | Manufacturable stroke |
| :---: | :---: |
| $\propto \mathbf{1 2}, \varnothing \mathbf{1 6}$ | S2 35 to 50 |
| $\varnothing \mathbf{2 0}$ to $\varnothing \mathbf{1 0 0}$ | S2 55 to 100 |


| Specifications other than the above | Same as the standard type |
| :--- | :--- |

* The manufacturable stroke range is the combination of stroke 1 and stroke 2.


## Dimensions (Dimensions other than those below are the same as those of the standard type.)



Bore Size: $\varnothing 12, \varnothing 16$
[mm]

| Bore size | A | B1 | B2 | L | Stroke range |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | S1 | S2 |
| $\varnothing 12$ | $\begin{array}{r} 52.9(63.9) \\ + \text { Stroke }\left(\mathrm{S}_{1}+\mathrm{S}_{2}\right) \\ \hline \end{array}$ | $\begin{aligned} & 17(28) \\ + & \text { Stroke } S_{1} \end{aligned}$ | $\begin{array}{r} 32.4 \\ + \text { Stroke S2 } \\ \hline \end{array}$ | 3.5 | 5 to 30 | 35 to 50 |
| $\varnothing 16$ | $\begin{gathered} 58(70) \\ + \text { Stroke }\left(\mathrm{S}_{1}+\mathrm{S}_{2}\right) \\ \hline \end{gathered}$ | $\begin{array}{r} 18.5(30.5) \\ + \text { Stroke } \mathrm{S}_{1} \\ \hline \end{array}$ | $\begin{gathered} 36 \\ + \text { Stroke } \mathrm{S}_{2} \end{gathered}$ | 3.5 | 5 to 30 | 35 to 50 |

Bore Size: ø20, ø25

| Bore size stroke | $\frac{\mathbf{A}}{\text { Stroke } \mathbf{S} 2}$ |  | B1 | B2 |  | L | Stroke range |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Stroke S2 | S1 | S2 |  |
|  | 55 to 75 | 80 to 100 |  | 55 to 75 | 80 to 100 |  | S1 | S2 |
| $\varnothing 20$ | $\begin{gathered} 137(149) \\ + \text { Stroke } \mathrm{S}_{1} \\ \hline \end{gathered}$ | $\begin{array}{r} 162(174) \\ + \text { Stroke } \mathrm{S}_{1} \\ \hline \end{array}$ |  | $\begin{aligned} & 19.5(31.5) \\ & + \text { Stroke } \mathrm{S}_{1} \end{aligned}$ | 113 | 138 | 4.5 | 5 to 50 | 55 to 100 |
| ø25 | $\begin{gathered} 141.5(151.5) \\ + \text { Stroke } S_{1} \end{gathered}$ | $\begin{gathered} 166.5(176.5) \\ + \text { Stroke } \mathrm{S}_{1} \end{gathered}$ | $\begin{aligned} & 22.5(32.5) \\ + & \text { Stroke } \mathrm{S}_{1} \end{aligned}$ | 114 | 139 | 5 | 5 to 50 | 55 to 100 |

Bore Size: ø32 to ø100

|  | A |  |  |  |  | B1 |  |  | B2 |  | L | Stroke range |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Stroke S2 55 to 75 Stroke S1 |  | Stroke S2 80 to 100 |  |  | Stroke S1 |  |  | Stroke S2 |  |  | S1 | S2 |
|  |  |  |  |  |  | $\leq 50$ | 55 to 75 | 80 to 100 | 55 to 75 | 80 to |  |  |  |
|  | $\leq 50$ | 55 to 75 | $\leq 50$ | 55 to 75 | 80 to 100 | $\leq 50$ | 551075 | 80 | 55 to |  |  |  |  |
| ø32 | $\begin{gathered} 145.4(155.5) \\ + \text { Stroke } S_{1} \end{gathered}$ | 230.5 | $\begin{gathered} \hline 170.5(180.5) \\ + \text { Stroke } \mathrm{S}_{1} \end{gathered}$ | 255.5 | 280.5 | $\begin{aligned} & 23(33) \\ + & \text { Stroke } S_{1} \end{aligned}$ | 108 | 133 | 115.5 | 140.5 | 7 | 5 to 100 | 55 to 100 |
| $\varnothing 40$ | $\begin{gathered} 161.5(171.5) \\ + \text { Stroke } S_{1} \end{gathered}$ | 246.5 | $\begin{gathered} 186.5(196.5) \\ + \text { Stroke } S_{1} \end{gathered}$ | 271.5 | 296.5 | $\begin{aligned} & \hline 29.5(39.5) \\ & + \text { Stroke } S_{1} \end{aligned}$ | 114.5 | 139.5 | 125 | 150 | 7 | 5 to 100 | 55 to 100 |
| $\varnothing 50$ | $\begin{gathered} 164(174) \\ + \text { Stroke S1 } \end{gathered}$ | 249 | $\begin{gathered} 189(199) \\ + \text { Stroke } \mathbf{S}_{1} \end{gathered}$ | 274 | 299 | $\begin{aligned} & 30.5(40.5) \\ & + \text { Stroke } S_{1} \end{aligned}$ | 115.5 | 140.5 | 125.5 | 150.5 | 8 | 10 to 100 | 55 to 100 |
| $\varnothing 63$ | $\begin{gathered} 171(181) \\ + \text { Stroke S1 } \end{gathered}$ | 256 | $\begin{gathered} 196(206) \\ + \text { Stroke } S_{1} \end{gathered}$ | 281 | 306 | $\begin{aligned} & 36(46) \\ + & \text { Stroke } S_{1} \end{aligned}$ | 121 | 146 | 127 | 152 | 8 | 10 to 100 | 55 to 100 |
| $\varnothing 80$ | $\begin{gathered} 189.5(199.5) \\ + \text { Stroke } S_{1} \end{gathered}$ | 274.5 | $\begin{gathered} 214.5(224.5) \\ + \text { Stroke S } 1 \end{gathered}$ | 299.5 | 324.5 | $\begin{aligned} & \text { 43.5 }(53.5) \\ & + \text { Stroke } S_{1} \end{aligned}$ | 128.5 | 153.5 | 136 | 161 | 10 | 10 to 100 | 55 to 100 |
| $\varnothing 100$ | $\begin{aligned} & 210.5(220.5) \\ & + \text { Stroke } S_{1} \end{aligned}$ | 295.5 | $\begin{gathered} 235.5(245.5) \\ + \text { Stroke S } 1 \end{gathered}$ | 320.5 | 345.5 | $\begin{aligned} & 53(63) \\ + & \text { Stroke } S_{1} \end{aligned}$ | 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

| Description | Model | Action | Note |
| :--- | :--- | :---: | :---: |
| Compact <br> cylinder | CQ2 | Double acting, Single rod | Applicable to $\varnothing 32$ to $\varnothing 100$ |
|  |  | Applicable to $\varnothing 32$ to $\varnothing 50$ |  |
| Non-rotating rod | CQ2K | Double acting, Single rod | Applicable to $\varnothing 32$ to $\varnothing 63$ |
| Anti-lateral load | CQ2 $\square \mathbf{S}$ | Double acting, Single rod |  |



Dimensions (Dimensions other than those below are the same as those of the standard type.)


| Bore size <br> $[\mathrm{mm}]$ | TH10 | $\mathbf{G}$ |
| :---: | :---: | :---: |
| $\mathbf{3 2}$ | $30.9_{0}^{+0.100}$ | 1.4 |
| $\mathbf{4 0}$ | $39.3_{0}^{+0.100}$ | 1.3 |
| $\mathbf{5 0}$ | $48.7_{0}^{+0.100}$ | 2.1 |
| $\mathbf{6 3}$ | $61.5_{0}^{+0.120}$ | 2.4 |
| $\mathbf{8 0}$ | $78.3_{0}^{+0.120}$ | 2.7 |
| $\mathbf{1 0 0}$ | $98.9_{0}^{+0.140}$ | 2.8 |

## CQ2 Series <br> 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

## $\triangle$ 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

## $\triangle$ 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 

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 nonrotating 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 | $\mathbf{1 2}$ | $\mathbf{1 6}$ | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 2}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 3}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{N} \cdot \mathrm{m}$ 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

## $\triangle$ Caution

1. 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.
2. 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 heavyduty scraper (-XC4) type.

## <Precautions for axial piping type cylinders>

## Mounting/Removal

1. 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

## $\triangle$ 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 <br> 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

## $\triangle$ 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

## $\triangle$ 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

## $\triangle$ 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 <br> $[\mathrm{mm}]$ | Thread size | Pulling force <br> $[\mathrm{N}]$ | Stroke <br> $[\mathrm{mm}]$ |
| :---: | :---: | :---: | :---: |
| $\mathbf{2 0 , 2 5 , 3 2}$ | $\mathrm{M} 2.5 \times 0.45 \times 25 \mathrm{~L}$ or more | 4.9 | 2 |
| $\mathbf{4 0 , 5 0 , 6 3}$ | $\mathrm{M} 3 \times 0.5 \times 30 \mathrm{~L}$ or more | 10 | 3 |
| $\mathbf{8 0 , 1 0 0}$ | $\mathrm{M} 5 \times 0.8 \times 40 \mathrm{~L}$ 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 $90^{\circ}$ counterclockwise. The lock is released (and remains in a released state) by aligning the $\mathbf{\Delta}$ mark on the cap with the $\boldsymbol{\nabla}$ OFF mark on the M/O knob. When locking is desired, turn the M/O knob clockwise $90^{\circ}$ while pushing fully, correspond $\mathbf{\Delta}$ on cap and $\boldsymbol{\nabla}$ ON mark on the M/O knob. The correct position is confirmed by a click sound "click". If not confirmed, locking is not done.


Manually locked state


Manually unlocked state

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 indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
$\triangle$ Danger :
Danger indicates a hazard with a high level of risk which,

## $\triangle$ 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.
4. 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.
5. 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.
6. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
7. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
8. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
9. 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.
10. An application which could have negative effects on people, property, or animals requiring special safety analysis.
11. 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.
*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.

## 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.

## $\triangle$ 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

 * The -XB10A has been added to the standard type, double acting, single rod. * Number of pages has been decreased from 228 to 216 . OSOS
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.

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.

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[^0]:    *11 Copper-free for the externally exposed part For details, refer to the Web Catalog.
    *12 For details, refer to the Web Catalog.

[^1]:    *13 Without rubber bumper (Standard)
    *14 Excludes the air-hydro type

[^2]:    ＊There are applicable auto switches other than those listed above．For details $\Rightarrow$ p． 152

[^3]:    For details, refer to the Web Catalog.

[^4]:    * For details on the rod end nut and accessory brackets $\triangleleft$ p. 26, 27

[^5]:    * For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27

[^6]:    *1 A knuckle pin and retaining rings are included with the double knuckle joint. Retaining rings are included with the knuckle joint pin.

[^7]:    *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.
    

[^8]:    * For details on the rod end nut and accessory brackets $\Rightarrow$ p. 26, 27

[^9]:    ＊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： $0.5 \mathrm{~m} \cdots \ldots .$. Nil（Example）M9NW＊Solid state auto switches marked with＂○＂are produced upon receipt of order．

    | 1 m | $\cdots \cdots \cdots . . . \mathrm{M}$ | （Example）M9NWM |
    | :--- | :--- | :--- |
    | 3 m | $\cdots \cdots \cdots . \mathrm{L}$ | （Example）M9NWL |
    | 5 m | $\cdots \ldots \ldots . \mathrm{Z}$ | （Example）M9NWZ |

[^10]:    *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
    $1 \mathrm{~m} \quad$......... M (Example) M9NWM
    $3 \mathrm{~m} \quad \cdots . . . . . \mathrm{L} \quad$ (Example) M9NWL
    5 m ......... Z (Example) M9NWZ
    * Solid state auto switches marked with "○" are produced upon receipt of order.

[^11]:    * There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152

[^12]:    * For the manufacturing of intermediate strokes $\Rightarrow$ p. 79

[^13]:    * Lead wire length symbols:
    
    * Solid state auto switches marked with "○" are produced upon receipt of order.
    * The D-P3DWA $\square$ type is only available in sizes $\varnothing 25$ to $\varnothing 63$.

[^14]:    * There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152

[^15]:    * $\varnothing 40$ to $\varnothing 63$ : The $\mathrm{C}^{\prime}$ and $\mathrm{D}^{\prime}$ dimensions are the same as those of C and D .

[^16]:    * Lead wire length symbols: 0.5 m ......... Nil (Example) M9BA
    * Solid state auto switches marked with "○" are produced upon receipt of order.
    $1 \mathrm{~m} . . . . . . . .$. M (Example) M9BAM
    $3 \mathrm{~m} \ldots \ldots . . \mathrm{L}$ (Example) M9BAL
    $5 \mathrm{~m} . . . . . . . . \mathrm{Z}$ (Example) M9BAZ

[^17]:    *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
    * Solid state auto switches marked with "○" are produced upon receipt of order.
    $1 \mathrm{~m} \ldots \ldots . . \mathrm{M}$ (Example) M9NWM
    $3 \mathrm{~m} . . . . . . . . \mathrm{L}$ (Example) M9NWL
    $5 \mathrm{~m} . . . . . . .$. Z (Example) M9NWZ
    None ......... N (Example) J79CN

[^18]:    * There are applicable auto switches other than those listed above. For details $\Rightarrow$ p. 152

[^19]:    * Stainless steel accessories are also available. For details $\Rightarrow$ p. 26

[^20]:    (): For the single acting, spring extend type

[^21]:    * 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 $\square \mathrm{R} / \square \mathrm{V}$ (water resistant) are the $\mathrm{D}-\mathrm{M} 9 \square \mathrm{~A}(\mathrm{~V})$ type.
    * The applicable auto switches for the CDQ2-S/T (single acting) are those except for the D-P3DW type.

[^22]:    ( ): Dimensions with auto switch magnet

    * The symbol is X526 for the long stroke type. $\Rightarrow$ p. 186

[^23]:    * The dimensions are the same with or without an auto switch magnet.
    * Applicable stroke available in 5 mm increments

