



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

## How to Order

**Without auto switch**  
CQ2WB

**With auto switch**  
CDQ2WB

**125** — **30** **DC** [ ]

**125** — **30** **DC** [ ] — **Y7BW** **S**

**CUJ**

**CU**

**CQS**

**CQM**

**CQ2**

**RQ**

**MU**

**D-**

**-X**

**20-**

**Data**

**Built-in magnet** •

**Double rod** •

**Mounting style** •

**Bore size** •

**Cylinder stroke (mm)** •

**Auto switch** •

**Body option** •

**Cushion** •

**Action** •

**Mounting style**

|          |   |
|----------|---|
| <b>B</b> | Through-hole/Both ends tapped common (Standard) |
|----------|---|

**Bore size**

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

**Cylinder stroke (mm)**

Refer to "Standard Stroke" on page 7-6-116.

**Auto switch**

|            |                                       |            |          |
|------------|---------------------------------------|------------|----------|
| <b>Nil</b> | Without auto switch (Built-in magnet) | <b>2</b>   | 2 pcs.   |
| <b>S</b>   |                                       | <b>1</b>   | 1 pc.    |
| <b>n</b>   |                                       | <b>"n"</b> | "n" pcs. |

\* For the applicable auto switch model, refer to the table below.  
\* Auto switches are shipped together, (but not assembled).

**Body option**

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

**Cushion**

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

**Action**

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

### Applicable Auto Switch/Refer to page 7-9-1 for further information on auto switches.

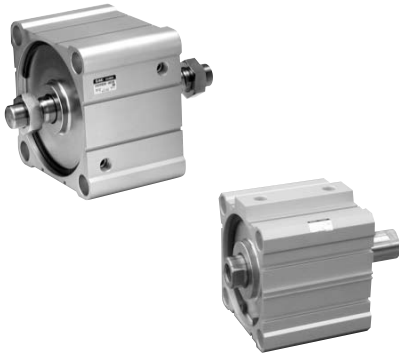
| Type  | Special function                           | Electrical entry | Indicator light | Wiring (Output)         | Load voltage |              | Rail mounting |              | Direct mounting |             | Lead wire length (m) * |       |       |          | Pre-wire connector | Applicable load |            |   |
|---|--|------------------|-----------------|-------------------------|--------------|--------------|---------------|--------------|-----------------|-------------|------------------------|-------|-------|----------|--------------------|-----------------|------------|---|
|   |  |                  |                 |                         | DC           | AC           | ø125 to ø160  |              | ø125 to ø200    |             | 0.5 (Nil)              | 3 (L) | 5 (Z) | None (N) |                    | IC circuit      | Relay, PLC |   |
|   |  |                  |                 |                         |              |              | Perpendicular | In-line      | Perpendicular   | In-line     |                        |       |       |          |                    |                 |            |   |
| Reed switch                                 | —  | Grommet          | Yes             | 3-wire (NPN equivalent) | —            | 5 V          | —             | —            | <b>A76H</b>     | —           | <b>Z76</b>             | ●     | ●     | —        | —                  | —               | —          |   |
|   |  |                  |                 |                         |              | 200 V        | <b>A72</b>    | <b>A72H</b>  | —               | —           | ●                      | ●     | —     | —        |                    |                 |            |   |
|   | Connector                                  | 2-wire           |                 | 12 V                    | 100 V        | <b>A73</b>   | <b>A73H</b>   | —            | <b>Z73</b>      | ●           | ●                      | ●     | —     | —        | —                  | —               | —          | — |
|   |  |                  |                 | 24 V                    | 12 V         | —            | <b>A73C</b>   | —            | —               | —           | ●                      | ●     | ●     | ●        |                    |                 |            |   |
| Diagnostic indication (2-color indication)  | Grommet                                    | —                | —               | <b>A79W</b>             | —            | —            | —             | ●            | ●               | —           | —                      | —     | —     | —        | —                  | —               |            |   |
| Solid state switch                          | —  | Grommet          | Yes             | 3-wire (NPN)            | —            | 5 V, 12 V    | —             | <b>F7NV</b>  | <b>F79</b>      | <b>Y69A</b> | <b>Y59A</b>            | ●     | ●     | ○        | —                  | —               | —          |   |
|   |  |                  |                 |                         |              |              |               | <b>F7PV</b>  | <b>F7P</b>      | <b>Y7PV</b> | <b>Y7P</b>             | ●     | ●     | ○        | —                  |                 |            | ○ |
|   | Connector                                  | 2-wire           |                 | 12 V                    | —            | <b>F7B</b>   | <b>J79</b>    | <b>Y69B</b>  | <b>Y59B</b>     | ●           | ●                      | ○     | —     | ○        | —                  | —               | —          | — |
|   |  |                  |                 | 24 V                    | —            | —            | —             | —            | —               | ●           | ●                      | ●     | ●     | —        |                    |                 |            |   |
|   | Diagnostic indication (2-color indication) | Grommet          | 3-wire (NPN)    | 5 V, 12 V               | —            | <b>F7NVV</b> | <b>F79W</b>   | <b>Y7NVV</b> | <b>Y7NW</b>     | ●           | ●                      | ○     | —     | ○        | —                  | —               | —          | — |
|   |  |                  |                 |                         |              | —            | <b>F7PW</b>   | <b>Y7PWV</b> | <b>Y7PW</b>     | ●           | ●                      | ○     | —     | ○        |                    |                 |            |   |
|   | Water resistant (2-color indication)       | Grommet          | 2-wire          | 12 V                    | —            | <b>F7BWV</b> | <b>J79W</b>   | <b>Y7BWV</b> | <b>Y7BW</b>     | ●           | ●                      | ○     | —     | ○        | —                  | —               | —          | — |
|   |  |                  |                 |                         |              | —            | <b>F7BA</b>   | —            | <b>Y7BA</b>     | —           | ●                      | ○     | —     | ○        |                    |                 |            |   |
| With diagnostic output (2-color indication) | Grommet                                    | 4-wire (NPN)     | 5 V, 12 V       | —                       | —            | —            | —             | —            | ●               | ●           | ○                      | —     | ○     | —        | —                  | —               | —          |   |
| —   | —  | —                | —               | <b>F79F</b>             | —            | —            | —             | —            | ●               | ●           | ○                      | —     | ○     | —        | —                  | —               | —          |   |

\* Lead wire length symbols: 0.5 m.....Nil (Example) A73C  
3 m.....L (Example) A73CL  
5 m.....Z (Example) A73CZ  
None.....N (Example) A73CN

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

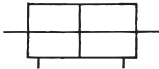
• Since there are other applicable auto switches than listed, refer to page 7-6-23 for details.  
• For details about auto switches with pre-wire connector, refer to page 7-9-36.

# Series CQ2W



## JIS Symbol

Double acting,  
Double rod



## ⚠ Precautions

**Be sure to read before handling.**  
**For Safety Instructions and Actuator Precautions, refer to pages 7-13-3 to 7-13-6.**

## ⚠ Caution

### Snap Ring Installation/Removal

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C snap ring).
- Even if a proper plier (tool for installing type C snap ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier (tool for installing a type C snap ring). Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

## Mounting

- When removing a load, be sure to secure the wrench flats of the piston rod on the load side.
- If this is done without securing the piston rod on the load side, be aware that the coupled (screwed-in) portion of the piston rod could become loosened.

## Type

| Bore size (mm) |                          | 125                                    | 140 | 160 | 180 | 200 |
|----------------|--------------------------|--|-----|-----|-----|-----|
| Pneumatic      | Mounting                 | Through-hole/Both ends tapped (Common) |     |     |     |     |
|                | Built-in magnet          | ●                                      | ●   | ●   | ●   | ●   |
|                | Piping                   | Screw-in type                          |     |     |     |     |
|                | Rod end male thread      | ●                                      | ●   | ●   | ●   | ●   |
|                | Rubber bumper (Standard) | ●                                      | ●   | ●   | ●   | ●   |

## Specifications

| Bore size (mm)                | 125   | 140 | 160 | 180            | 200 |
|-------------------------------|---|-----|-----|----------------|-----|
| Type                          | Pneumatic (Non-lube)  |     |     |                |     |
| Fluid                         | Air   |     |     |                |     |
| Proof pressure                | 1.5 MPa   |     |     | 1.05 MPa       |     |
| Maximum operating pressure    | 1.0 MPa   |     |     | 0.7 MPa        |     |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing)<br>With auto switch: -10 to 60°C (No freezing) |     |     |                |     |
| Cushion                       | Rubber bumper (Standard)  |     |     |                |     |
| Rod end thread                | Female thread   |     |     |                |     |
| Rod end thread tolerance      | JIS Class 2   |     |     |                |     |
| Stroke length tolerance       | $^{+1.4}_0$   |     |     |                |     |
| Mounting                      | Through-hole/Both ends tapped (Common)  |     |     |                |     |
| Piston speed                  | 50 to 500 mm/s  |     |     | 20 to 400 mm/s |     |

## Minimum Operating Pressure

(MPa)

| Bore size (mm)             | 125  | 140 | 160 | 180 | 200 |
|----------------------------|------|-----|-----|-----|-----|
| Minimum operating pressure | 0.05 |     |     |     |     |

## Allowable Kinetic Energy

(J)

| Bore size (mm)           | 125 | 140 | 160  | 180 | 200 |
|--------------------------|-----|-----|------|-----|-----|
| Allowable kinetic energy | 7.4 | 9.8 | 12.4 |     |     |

## Standard Stroke

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

## Manufacture of Intermediate Stroke

| Description  | Spacer is installed in the standard stroke body.  | Exclusive body (-XB10)   |
|--------------|---|--|
| Part no.     | Refer to "How to Order" for the standard model no. on page 7-6-115.   | Suffix "-XB10" to the end of standard model no. on page 7-6-115.                                   |
| Description  | Dealing with the stroke by the 5 mm interval is available by installing spacer with standard stroke cylinder. | Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke. |
| Stroke range | Bore size<br>125 to 200   | Stroke range<br>5 to 295   |
| Example      | Part no.: CQ2WB160-165DC<br>CQ2WB160-175DC with 10 mm width spacer.<br>B dimension is 266 mm.                 | Part no.: CQ2WB160-165DC-XB10<br>Makes 165 stroke tube.<br>B dimension is 256 mm.                  |

## Minimum Stroke for Auto Switch Mounting

(mm)

| No. of auto switches mounted | D-F7□/F7□V<br>D-J79/J79C<br>D-Y59□/Y69□<br>D-Y7P/Y7PV | D-A7□, D-A80<br>D-A73C, D-A80C<br>D-A7□H, D-Z7□<br>D-Z80, D-A80H | D-F7□W/F7□WV<br>D-J79W<br>D-F7BAL/F7BAVL<br>D-F7NTL/F79F<br>D-F7□W/Y7□WV<br>D-Y7BAL | D-A79W |
|------------------------------|---|--|---|--------|
| 1 pc.                        | 5   | 5  | 10  | 15     |
| 2 pcs.                       | 5   | 10   | 15  | 20     |

# Compact Cylinder: Large Bore Size Type Double Acting, Double Rod Series **CQ2W**

## Theoretical Output

(N)

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



**Made to Order Specifications**  
(For details, refer to page 7-10-1.)

| Symbol | Specifications  |
|--------|---|
| -XB10  | Intermediate stroke (Using exclusive body)            |
| -XC18  | NPT finish piping port                                |
| -X235  | Change of piston rod end for double rod type cylinder |
| -X271  | Fluoro rubber for seals                               |
| -X633  | Intermediate stroke of double rod type                |

\* -X633 intermediate stroke with 5 mm intervals only

## Weight

### Without Auto Switch

(kg)

| Bore size (mm) | Cylinder stroke (mm) |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.71                 | 6.02  | 6.34  | 6.68  | 7.02  | 7.87  | 8.71  | 9.56  | 10.41 | 11.26 | 12.11 | 13.81 | 15.50 |
| 140            | 6.73                 | 7.07  | 7.43  | 7.80  | 8.18  | 9.13  | 10.07 | 11.01 | 11.96 | 12.90 | 13.84 | 15.73 | 17.62 |
| 160            | 9.26                 | 9.69  | 10.12 | 10.58 | 11.04 | 12.18 | 13.33 | 14.47 | 15.62 | 16.76 | 17.91 | 20.20 | 22.49 |
| 180            | 12.18                | 12.70 | 13.23 | 13.75 | 14.28 | 15.59 | 16.90 | 18.21 | 19.52 | 20.83 | 22.14 | 24.76 | 27.39 |
| 200            | 15.63                | 16.22 | 16.80 | 17.39 | 17.97 | 19.44 | 20.91 | 22.37 | 22.84 | 25.30 | 26.77 | 29.70 | 32.63 |

### Built-in Magnet

(kg)

| Bore size (mm) | Cylinder stroke (mm) |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | 10                   | 20    | 30    | 40    | 50    | 75    | 100   | 125   | 150   | 175   | 200   | 250   | 300   |
| 125            | 5.77                 | 6.08  | 6.40  | 6.74  | 7.08  | 7.93  | 8.77  | 9.62  | 10.47 | 11.32 | 12.17 | 13.87 | 15.56 |
| 140            | 6.80                 | 7.14  | 7.50  | 7.87  | 8.25  | 9.20  | 10.14 | 11.08 | 12.03 | 12.97 | 13.91 | 15.80 | 17.69 |
| 160            | 9.34                 | 9.77  | 10.20 | 10.66 | 11.12 | 12.26 | 13.41 | 14.55 | 15.70 | 16.84 | 17.99 | 20.28 | 22.57 |
| 180            | 12.26                | 12.78 | 13.31 | 13.83 | 14.36 | 15.67 | 16.98 | 18.29 | 19.60 | 20.91 | 22.22 | 24.84 | 27.47 |
| 200            | 15.71                | 16.30 | 16.88 | 17.47 | 18.05 | 19.52 | 20.99 | 22.45 | 22.92 | 25.38 | 26.85 | 29.78 | 32.71 |

## Mounting Bolt for CQ2

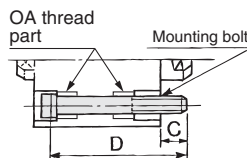
Mounting method: Mounting bolt for through-hole mounting style of CQ2WB is available as an option.

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

Example) Bolt M12 x 100ℓ 4 pcs.

Note 1) To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.

Note 2) Please consult with SMC regarding mounting bolts for strokes that exceed 100 mm. Use the OA screw provided on the cylinder tube to secure the cylinder.



| Model                     | C    | D   | Mounting bolt | Model                 | C  | D   | Mounting bolt |
|---------------------------|------|-----|---------------|-----------------------|----|-----|---------------|
| <b>C□Q2WB125/140-10DC</b> | 22.9 | 100 | M12 x 100ℓ    | <b>C□Q2WB180-10DC</b> | 36 | 125 | M18 x 125ℓ    |
|                           |      | 110 | x 110ℓ        |                       |    | 135 | x 135ℓ        |
|                           |      | 120 | x 120ℓ        |                       |    | 145 | x 145ℓ        |
|                           |      | 130 | x 130ℓ        |                       |    | 155 | x 155ℓ        |
|                           |      | 140 | x 140ℓ        |                       |    | 165 | x 165ℓ        |
|                           |      | 165 | x 165ℓ        |                       |    | 190 | x 190ℓ        |
|                           |      | 190 | x 190ℓ        |                       |    | 215 | x 215ℓ        |
| <b>C□Q2WB160-10DC</b>     | 27.7 | 110 | M14 x 110ℓ    | <b>C□Q2WB200-10DC</b> | 39 | 135 | M18 x 135ℓ    |
|                           |      | 120 | x 120ℓ        |                       |    | 145 | x 145ℓ        |
|                           |      | 130 | x 130ℓ        |                       |    | 155 | x 155ℓ        |
|                           |      | 140 | x 140ℓ        |                       |    | 165 | x 165ℓ        |
|                           |      | 150 | x 150ℓ        |                       |    | 175 | x 175ℓ        |
|                           |      | 175 | x 175ℓ        |                       |    | 200 | x 200ℓ        |
|                           |      | 200 | x 200ℓ        |                       |    | 225 | x 225ℓ        |

- CUJ
- CU
- CQS
- CQM
- CQ2**
- RQ
- MU
- D-
- X
- 20-
- Data

# Series CQ2W

## Additional Weight

(kg)

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

Calculation: (Example) CDQ2WB125-30DCM

• Cylinder weight: CDQ2WB125-30DC.....6.40 kg

• Option weight: Rod end male thread.....0.94 kg

7.34 kg

Add the weight of auto switches and mounting brackets.

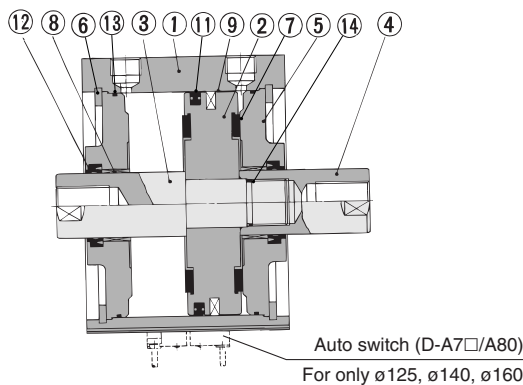
## Auto Switch Mounting Bracket Weight

| Mounting bracket part no. | Applicable bore size (mm) | Weight (g) |
|---------------------------|---------------------------|------------|
| <b>BQ-2</b>               | 125 to 160                | 1.5        |

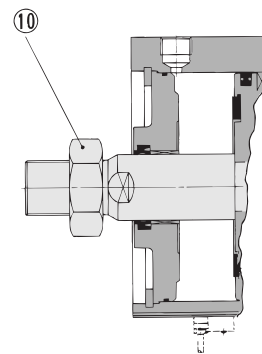
For auto switch weight, refer to page 7-9-1.

## Construction

### Double acting, Double rod



### Rod end male thread



## Component Parts

| No. | Description   | Material           | Note               |
|-----|---------------|--------------------|--------------------|
| ①   | Cylinder tube | Aluminum alloy     | Hard anodized      |
| ②   | Piston        | Aluminum alloy     | Chromated          |
| ③   | Piston rod A  | Carbon steel       | Hard chrome plated |
| ④   | Piston rod B  | Carbon steel       | Hard chrome plated |
| ⑤   | Rod cover     | Cast iron          | Nickel plated      |
| ⑥   | Snap ring     | Carbon tool steel  | Phosphate coated   |
| ⑦   | Bumper        | Resin              |                    |
| ⑧   | Bushing       | Lead-bronze casted | For only CDQ2B□    |
| ⑨   | Magnet        | —                  | Nickel plated      |
| ⑩   | Rod end nut   | Carbon steel       |                    |
| ⑪   | Piston seal   | NBR                |                    |
| ⑫   | Rod seal      | NBR                |                    |
| ⑬   | Tube gasket   | NBR                |                    |
| ⑭   | Piston gasket | NBR                |                    |

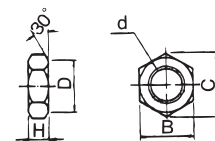
## Replacement Parts: Seal Kit

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

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

Auto switch mounting bracket: Part number and the proper auto switch mounting position and its mounting height are common as CQ2 series, large bore, double acting, single rod. For details, refer to page 7-6-111 and 114.

## Rod End Nut



Material: Carbon steel

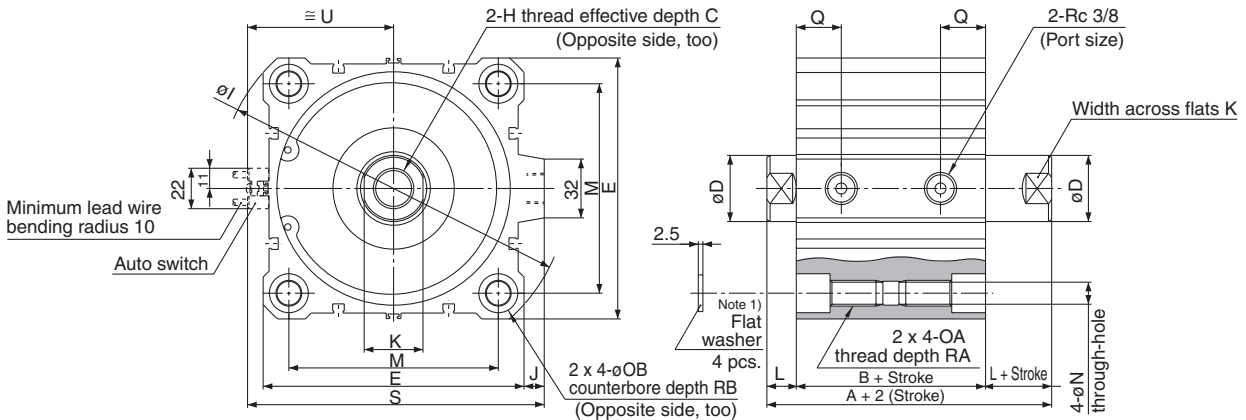
| Part no.     | Applicable bore size (mm) | d         | H  | B  | C    | D  |
|--------------|---------------------------|-----------|----|----|------|----|
| <b>NT-12</b> | 125, 140                  | M30 x 1.5 | 18 | 46 | 53.1 | 44 |
| <b>NT-16</b> | 160, 180, 200             | M36 x 1.5 | 21 | 55 | 63.5 | 53 |

# Compact Cylinder: Large Bore Size Type Double Acting, Double Rod Series **CQ2W**

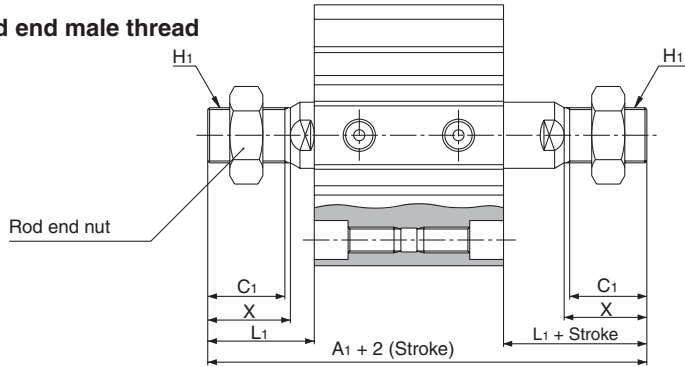
**Dimensions:  $\phi 125$ ,  $\phi 140$ ,  $\phi 160$**

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

**Basic style (Through-hole): C□Q2WB**



### Rod end male thread



### Rod End Male Thread

| Bore size (mm) | A <sub>1</sub> | C <sub>1</sub> | H <sub>1</sub> | L <sub>1</sub> | X  |
|----------------|----------------|----------------|----------------|----------------|----|
| <b>125</b>     | 199            | 42             | M30 x 1.5      | 58             | 45 |
| <b>140</b>     | 199            | 42             | M30 x 1.5      | 58             | 45 |
| <b>160</b>     | 219            | 47             | M36 x 1.5      | 64             | 50 |

Switches in the above figure are the case for the reed switches D-A73 type and D-A80 type.

| Bore size (mm) | Standard stroke range | A   | B  | C <sup>(2)</sup> | D  | E   | H         | I   | J  | K  | L  | M   | N    | OA      | OB   | Q    | RA | RB   | S   | U  |
|----------------|-----------------------|-----|----|------------------|----|-----|-----------|-----|----|----|----|-----|------|---------|------|------|----|------|-----|----|
| <b>125</b>     | 10, 20, 30, 40, 50    | 115 | 83 | 30 (22.5)        | 36 | 142 | M22 x 2.5 | 190 | 11 | 32 | 16 | 114 | 12.5 | M14 x 2 | 21.2 | 24.5 | 25 | 18.4 | 162 | 80 |
| <b>140</b>     | 75, 100, 125, 150     | 115 | 83 | 30 (22.5)        | 36 | 158 | M22 x 2.5 | 210 | 10 | 32 | 16 | 128 | 12.5 | M14 x 2 | 21.2 | 24.5 | 25 | 18.4 | 177 | 88 |
| <b>160</b>     | 175, 200, 250, 300    | 125 | 91 | 33 (26.5)        | 40 | 178 | M24 x 3   | 238 | 10 | 36 | 17 | 144 | 14.5 | M16 x 2 | 24.2 | 27.5 | 28 | 21.2 | 197 | 98 |

Note 1) Be sure to use the attached plain washer for mounting, cylinder with through-holes.

Note 2) ( ) denotes the values of effective length in one side, only for the 10 stroke type.

CUJ

CU

CQS

CQM

**CQ2**

RQ

MU

D-

-X

20-

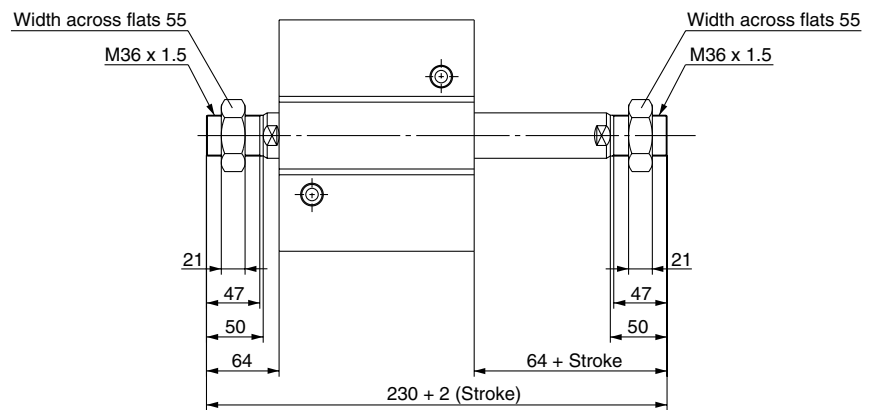
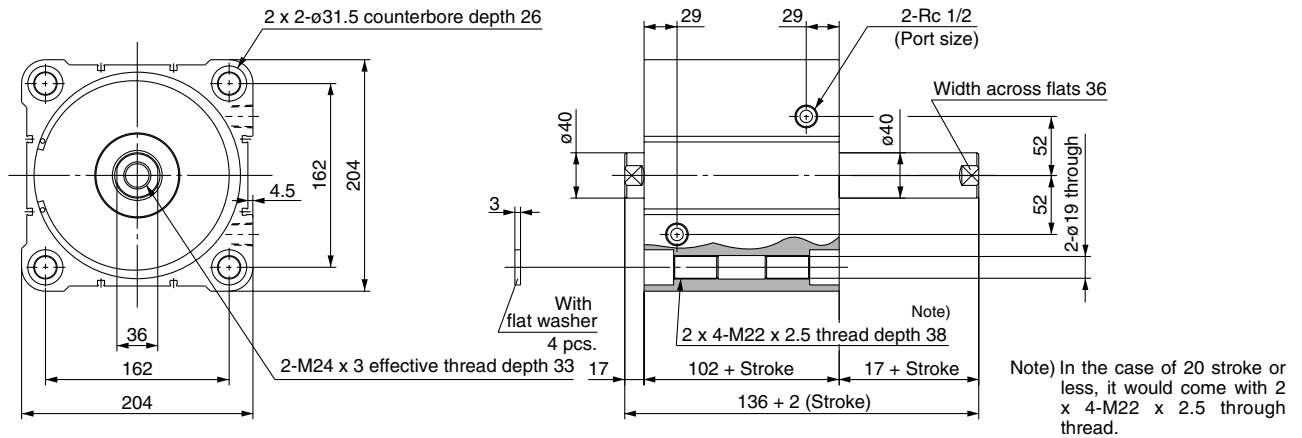
Data

# Series CQ2W

## Dimensions: $\phi 180$ , $\phi 200$

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

### $\phi 180$



### $\phi 200$

