

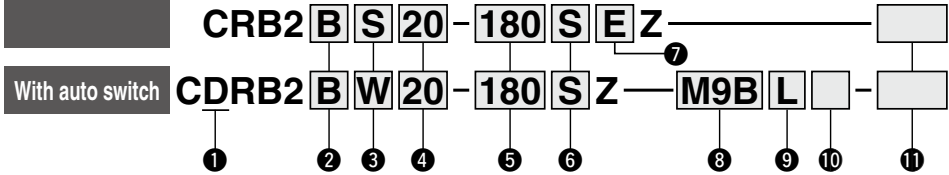
# Rotary Actuator Vane Type

RoHS

# CRB2 Series

Size: 10, 15, 20, 30, 40

## How to Order



### 1 With auto switch

(With auto switch unit and built-in magnet)  
\* Refer to page 99 when the auto switch unit is needed separately.

### 2 Mounting

| Symbol | Mounting    |
|--------|-------------|
| B      | Basic type  |
| F*     | Flange type |

\* F: Excess size 40

### 3 Shaft type

| Symbol | Shaft type   | Shaft-end shape |                              |
|--------|--------------|-----------------|------------------------------|
|        |              | Long shaft      | Short shaft                  |
| S      | Single shaft | Single flat*    | —                            |
| W      | Double shaft | Single flat*    | Single flat                  |
| J**    | Double shaft | Round shaft     | Single flat                  |
| K**    | Double shaft | Round shaft     | Round shaft                  |
| T**    | Single shaft | Round shaft     | —                            |
| Y**    | Double shaft | Single flat*    | Long shaft with single flat* |

\* A key is used for size 40. \*\* J, K, T and Y are made to order.

\*\*\* When an auto switch is mounted to the rotary actuator, only shaft types W and J are available.

### 4 Size

|    |
|----|
| 10 |
| 15 |
| 20 |
| 30 |
| 40 |

### 9 Electrical entry/Lead wire length

|     |                             |
|-----|-----------------------------|
| Nil | Grommet/Lead wire: 0.5 m    |
| M   | Grommet/Lead wire: 1 m      |
| L   | Grommet/Lead wire: 3 m      |
| CN  | Connector/Without lead wire |
| C   | Connector/Lead wire: 0.5 m  |
| CL  | Connector/Lead wire: 3 m    |

\* Connectors are available only for the R73, R80, T79.

\*\* Lead wire with connector part nos.  
D-LC05: Lead wire 0.5 m  
D-LC30: Lead wire 3 m  
D-LC50: Lead wire 5 m

### 5 Rotating angle

|             |     |      |
|-------------|-----|------|
| Single vane | 90  | 90°  |
|             | 180 | 180° |
|             | 270 | 270° |
| Double vane | 90  | 90°  |
|             | 100 | 100° |

### 6 Vane type

|   |             |
|---|-------------|
| S | Single vane |
| D | Double vane |

### 7 Connecting port location

|     |              |
|-----|--------------|
| Nil | Side ported  |
| E   | Axial ported |

### 8 Auto switch

|     |   |
|-----|---|
| Nil | Without auto switch (Built-in magnet)         |
| M   | Without M9 type auto switch (Built-in magnet) |

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

\*\* The operating range and hysteresis of the D-M9□ are different from those of the other auto switches. For details, refer to page 102.

### 10 Number of auto switches

|     |          |
|-----|----------|
| S   | 1 pc.*   |
| Nil | 2 pcs.** |

\* S: A right-hand auto switch is shipped.

\*\* Nil: A right-hand switch and a left-hand switch are shipped.

### 11 Made to Order

For details, refer to the next page.

## Applicable Auto Switches/Refer to pages 797 to 850 for further information on auto switches.

| Applicable size  | Type                    | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage |    | Auto switch model |                          | Lead wire type           | Lead wire length [m] |       |       |       |          | Pre-wired connector | Applicable load |
|------------------|-------------------------|------------------|------------------|-----------------|-----------------|--------------|----|-------------------|--------------------------|--------------------------|----------------------|-------|-------|-------|----------|---------------------|-----------------|
|                  |                         |                  |                  |                 |                 | DC           | AC | Perpendicular     | In-line                  |                          | 0.5 (Nil)            | 1 (M) | 3 (L) | 5 (Z) | None (N) |                     |                 |
|                  |                         |                  |                  |                 |                 |              |    |                   |                          |                          |                      |       |       |       |          |                     |                 |
| For 10, 15       | Solid state auto switch | —                | Grommet          | Yes             | 3-wire (NPN)    | 5 V, 12 V    | —  | M9NV              | M9N                      | Oilproof heavy-duty cord | ●                    | ●     | ●     | ○     | —        | ○                   | IC circuit      |
|                  |                         |                  |                  |                 | 3-wire (PNP)    |              |    | M9PV              | M9P                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 2-wire          |              |    | M9BV              | M9B                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
|                  | Reed auto switch        | —                | Grommet          | No              | 3-wire (NPN)    | 5 V, 12 V    | —  | S99V              | S99                      | Vinyl parallel cord      | ●                    | ●     | ●     | ○     | —        | ○                   | IC circuit      |
|                  |                         |                  |                  |                 | 3-wire (PNP)    |              |    | S99V              | S99                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 2-wire          |              |    | S9PV              | S9P                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
| For 20, 30, 40   | Solid state auto switch | —                | Grommet          | Yes             | 3-wire (NPN)    | 5 V, 12 V    | —  | M9NV              | M9N                      | Oilproof heavy-duty cord | ●                    | ●     | ●     | ○     | —        | ○                   | IC circuit      |
|                  |                         |                  |                  |                 | 3-wire (PNP)    |              |    | M9PV              | M9P                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 2-wire          |              |    | M9BV              | M9B                      |                          | ●                    | ●     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 3-wire (NPN)    |              |    | —                 | S79                      |                          | ●                    | —     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 3-wire (PNP)    |              |    | —                 | S7P                      |                          | ●                    | —     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | 2-wire          |              |    | —                 | T79                      |                          | ●                    | —     | ●     | ○     | —        | ○                   | —               |
|                  | Reed auto switch        | —                | Grommet          | Yes             | 2-wire          | —            | —  | T99V              | T99                      | Oilproof heavy-duty cord | ●                    | —     | ●     | ○     | —        | ○                   | —               |
|                  |                         |                  |                  |                 | —               |              |    | —                 | —                        |                          | —                    | —     | —     | —     | —        | —                   | —               |
|                  |                         |                  |                  |                 | —               |              |    | —                 | —                        |                          | —                    | —     | —     | —     | —        | —                   | —               |
|                  |                         |                  |                  |                 | —               |              |    | —                 | —                        |                          | —                    | —     | —     | —     | —        | —                   | —               |
|                  |                         |                  |                  |                 | —               |              |    | —                 | —                        |                          | —                    | —     | —     | —     | —        | —                   | —               |
|                  |                         |                  |                  |                 | —               |              |    | —                 | —                        |                          | —                    | —     | —     | —     | —        | —                   | —               |
| Reed auto switch | —                       | Connector        | No               | 2-wire          | 48 V, 100 V     | —            | —  | —                 | Oilproof heavy-duty cord | ●                        | —                    | ●     | ○     | —     | ○        | —                   |                 |
|                  |                         |                  |                  | —               |                 |              | —  | —                 |                          | —                        | —                    | —     | —     | —     | —        |                     |                 |
|                  |                         |                  |                  | —               |                 |              | —  | —                 |                          | —                        | —                    | —     | —     | —     | —        | —                   |                 |
|                  |                         |                  |                  | —               |                 |              | —  | —                 |                          | —                        | —                    | —     | —     | —     | —        | —                   |                 |
|                  |                         |                  |                  | —               |                 |              | —  | —                 |                          | —                        | —                    | —     | —     | —     | —        | —                   |                 |
|                  |                         |                  |                  | —               |                 |              | —  | —                 |                          | —                        | —                    | —     | —     | —     | —        | —                   |                 |

\* Lead wire length symbols: 0.5 m..... Nil (Example) R73C

3 m..... L (Example) R73CL

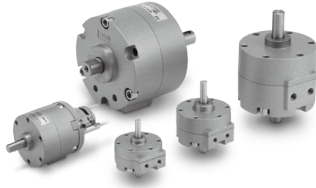
5 m..... Z (Example) R73CZ

None..... N (Example) R73CN

\* Auto switches are shipped together, (but not assembled).

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

### Single Vane Specifications



Symbol



### Flange Assembly Part No.

(For details about dimensions, refer to page 62.)

| Model    | Assembly part no. |
|----------|-------------------|
| CRB2F□10 | P211070-2         |
| CRB2F□15 | P211090-2         |
| CRB2F□20 | P211060-2         |
| CRB2F□30 | P211080-2         |



**Made to Order**

(For details, refer to pages 84 to 98.)

| Symbol       | Description                             | Applicable shaft type |
|--------------|---|-----------------------|
| XA1 to XA24  | Shaft type pattern I                    | W                     |
| XA31 to XA58 | Shaft type pattern II                   | S, J, K, T, Y         |
| XC1          | Add connecting ports                    | W, S, J, K, T, Y      |
| XC2          | Change threaded hole to through-hole    | W, S, J, K, T, Y      |
| XC3          | Change the screw position               | W, S, J, K, T, Y      |
| XC4          | Change the rotation range               | W, S, J, K, T, Y      |
| XC5          | Change rotation range between 0 to 200° | W, S, J, K, T, Y      |
| XC6          | Change rotation range between 0 to 110° | W, S, J, K, T, Y      |
| XC7          | Reversed shaft                          | W, J                  |
| XC30         | Fluorine grease                         | W, S, J, K, T, Y      |
| X5           | For M5 port (90°/180°)                  | W, S, J, K, T, Y      |

The above may not be selected when the product comes with an auto switch or angle adjustment unit. For details, refer to pages 84, 85, 90, 91, 96.

Refer to pages 102 to 106 for actuators with auto switches.

- Operating range and hysteresis
- How to change the auto switch detecting position
- Auto switch mounting
- Auto switch adjustment

| Size  | 10                          | 15        | 20          | 30          | 40        |
|---|-----------------------------|-----------|-------------|-------------|-----------|
| Rotating angle  | 90°, 180°, 270°             |           |             |             |           |
| Fluid   | Air (Non-lube)              |           |             |             |           |
| Proof pressure [MPa]                                    | 1.05                        |           | 1.5         |             |           |
| Ambient and fluid temperature                           | 5 to 60°C                   |           |             |             |           |
| Max. operating pressure [MPa]                           | 0.7                         |           | 1.0         |             |           |
| Min. operating pressure [MPa]                           | 0.2                         | 0.15      |             |             |           |
| Rotation time adjustment range s/90° <sup>Note 1)</sup> | 0.03 to 0.3                 |           | 0.04 to 0.3 | 0.07 to 0.5 |           |
| Allowable kinetic energy [J] <sup>Note 2)</sup>         | 0.00015                     | 0.001     | 0.003       | 0.02        | 0.04      |
|   |                             | 0.00025   | 0.0004      | 0.015       | 0.03      |
| Shaft load [N]  | Allowable radial load       | 15        | 15          | 25          | 30        |
|   | Allowable thrust load       | 10        | 10          | 20          | 25        |
| Port location   | Side ported or Axial ported |           |             |             |           |
| Port size (Side ported, Axial ported)                   | M3 x 0.5                    |           |             | M5 x 0.8    |           |
| Angle adjustable range <sup>Note 3)</sup>               | 0 to 230°                   | 0 to 240° |             |             | 0 to 230° |

Note 1) Make sure to use the actuator within the adjustable speed range. Exceeding the low speed range (0.3 s/90°) can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

Note 2) The upper numbers in this section in the table indicate the energy factor when the rubber bumper is used (at the end of the rotation), and the lower numbers indicate the energy factor when the rubber bumper is not used.

Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 64.

### Double Vane Specifications

| Size  | 10                          | 15     | 20          | 30          | 40   |
|---|-----------------------------|--------|-------------|-------------|------|
| Rotating angle  | 90°, 100°                   |        |             |             |      |
| Fluid   | Air (Non-lube)              |        |             |             |      |
| Proof pressure [MPa]                                    | 1.05                        |        | 1.5         |             |      |
| Ambient and fluid temperature                           | 5 to 60°C                   |        |             |             |      |
| Max. operating pressure [MPa]                           | 0.7                         |        | 1.0         |             |      |
| Min. operating pressure [MPa]                           | 0.2                         | 0.15   |             |             |      |
| Rotation time adjustment range s/90° <sup>Note 1)</sup> | 0.03 to 0.3                 |        | 0.04 to 0.3 | 0.07 to 0.5 |      |
| Allowable kinetic energy [J]                            | 0.0003                      | 0.0012 | 0.0033      | 0.02        | 0.04 |
|   |                             |        |             |             |      |
| Shaft load [N]  | Allowable radial load       | 15     | 15          | 25          | 30   |
|   | Allowable thrust load       | 10     | 10          | 20          | 25   |
| Port location   | Side ported or Axial ported |        |             |             |      |
| Port size (Side ported, Axial ported)                   | M3 x 0.5                    |        |             | M5 x 0.8    |      |
| Angle adjustable range <sup>Note 2)</sup>               | 0 to 90°                    |        |             |             |      |

Note 1) Make sure to use the actuator within the adjustable speed range. Exceeding the low speed range (0.3 s/90°) can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

Note 2) Adjustment range in the table is for 100°. For 90°, refer to page 64.

CRB2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

# CRB2 Series

## Volume

[cm<sup>3</sup>]

| Vane type<br>Size | Single vane |      |      |              |      |      |              |      |      |               |      |      | Double vane  |      |      |     |      |     |      |     |      |      |      |     |      |
|-------------------|-------------|------|------|--------------|------|------|--------------|------|------|---------------|------|------|--------------|------|------|-----|------|-----|------|-----|------|------|------|-----|------|
|                   | 10          |      |      | 15           |      |      | 20           |      |      | 30            |      |      | 40           |      |      | 10  |      | 15  |      | 20  |      | 30   |      | 40  |      |
| Rotating angle    | 90°         | 180° | 270° | 90°          | 180° | 270° | 90°          | 180° | 270° | 90°           | 180° | 270° | 90°          | 180° | 270° | 90° | 100° | 90° | 100° | 90° | 100° | 90°  | 100° | 90° | 100° |
| Volume            | 1<br>(0.6)  | 1.2  | 1.5  | 1.5<br>(1.0) | 2.9  | 3.7  | 4.8<br>(3.6) | 6.1  | 7.9  | 11.3<br>(8.5) | 15   | 20.2 | 25<br>(18.7) | 31.5 | 41   | 1.0 | 1.1  | 2.6 | 2.7  | 5.6 | 5.7  | 14.4 | 14.5 | 33  | 34   |

\* Values inside ( ) are volume of the supply side when A port is pressurized.

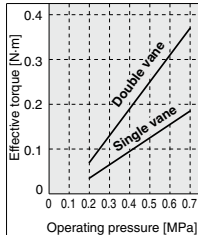
## Weight

[g]

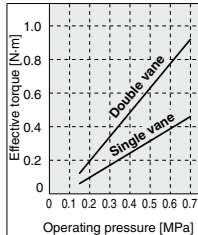
| Vane type<br>Size    | Single vane |      |      |     |      |      |     |      |      |     |      |      | Double vane |      |      |     |      |     |      |     |      |     |      |     |      |
|----------------------|-------------|------|------|-----|------|------|-----|------|------|-----|------|------|-------------|------|------|-----|------|-----|------|-----|------|-----|------|-----|------|
|                      | 10          |      |      | 15  |      |      | 30  |      |      | 40  |      |      | 10          |      | 15   |     | 30   |     | 40   |     |      |     |      |     |      |
| Rotating angle       | 90°         | 180° | 270° | 90° | 180° | 270° | 90° | 180° | 270° | 90° | 180° | 270° | 90°         | 180° | 270° | 90° | 100° | 90° | 100° | 90° | 100° | 90° | 100° | 90° | 100° |
| Rotary actuator body | 27          | 26   | 26   | 48  | 47   | 46   | 104 | 103  | 101  | 199 | 194  | 189  | 385         | 374  | 363  | 42  | 43   | 55  | 58   | 119 | 142  | 219 | 239  | 398 | 444  |
| Flange assembly      | 9           |      |      | 10  |      |      | 19  |      |      | 25  |      |      | —           |      |      | 9   | 10   | 19  | 25   | —   |      |     | —    |     |      |
| Auto switch unit     | 15          |      |      | 20  |      |      | 28  |      |      | 38  |      |      | 43          |      |      | 15  | 20   | 28  | 38   | 43  |      |     | —    |     |      |
| Angle adjuster unit  | 30          |      |      | 47  |      |      | 90  |      |      | 150 |      |      | 203         |      |      | 30  | 47   | 90  | 150  | 203 |      |     | —    |     |      |

## Effective Output

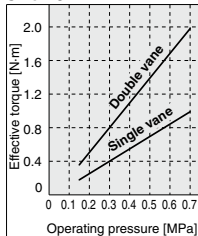
### Size 10



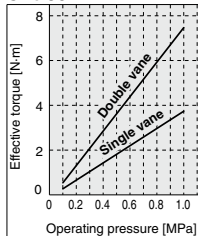
### Size 15



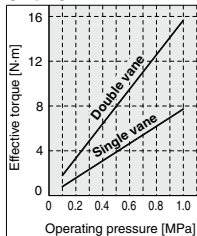
### Size 20



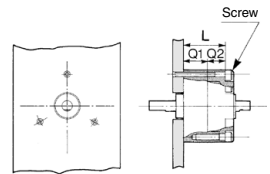
### Size 30



### Size 40



## Direct Mounting of Body



Dimension "L" of the actuators is provided in the table below for JIS standard hexagon socket head cap screws. If these types of screw are used, their heads will fit in the mounting hole.

### Reference Screw Size

| Size | L     | Screw |
|------|-------|-------|
| 10   | 11.5* | M2.5  |
| 15   | 16    | M2.5  |
| 20   | 24.5  | M3    |
| 30   | 34.5  | M4    |
| 40   | 39.5  | M4    |

\* Only the size 10 actuators have different L dimensions for single and double vane.

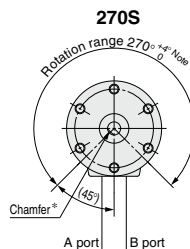
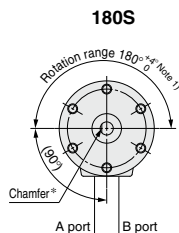
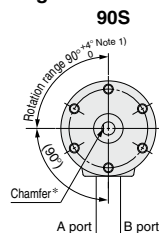
Double vane: L = 20.5

\* Refer to page 57 for Q1 and Q2 dimensions.

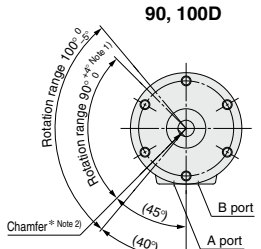
## Chamfered Position and Rotation Range: Top View from Long Shaft Side

Chamfered positions shown below illustrate the conditions of actuators when B port is pressurized.

### Single vane



### Double vane



\* For size 40 actuators, a parallel key will be used instead of chamfer.

Note 1) For single vane type, the tolerance of rotating angle of 90°, 180°, 270° will be +<sup>5</sup>/<sub>0</sub>° for size 10 only.

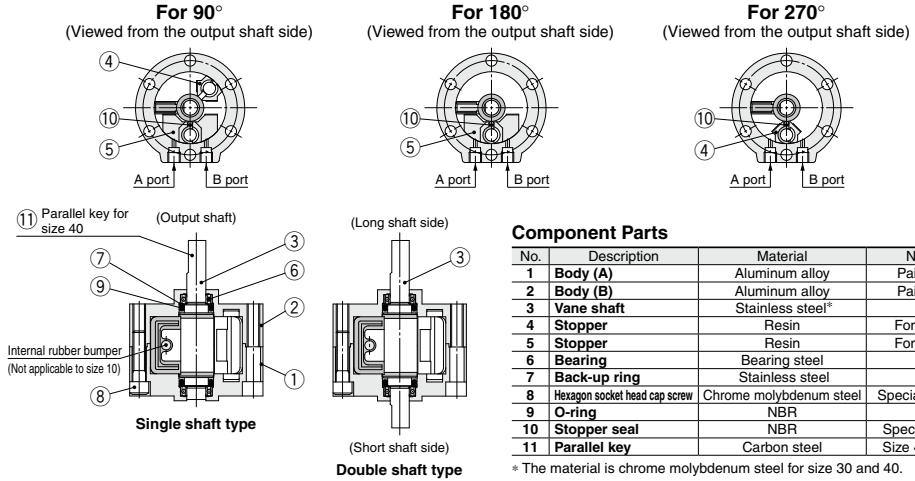
For double vane type, the tolerance of rotating angle of 90° will be +<sup>5</sup>/<sub>0</sub>° for size 10 only.

Note 2) The chamfered position of the double vane type shows the 90° specification position.

## Construction

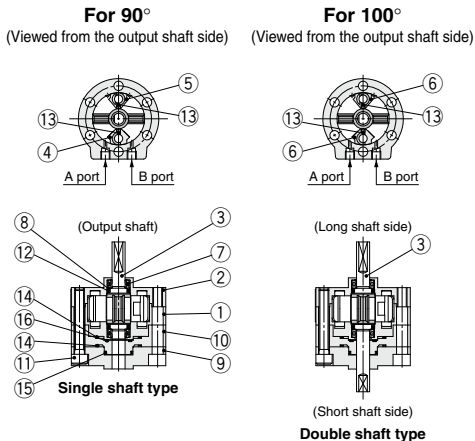
**Single vane** • Figures for 90° and 180° show the condition of the actuators when B port is pressurized, and the figure for 270° shows the position of the ports during rotation.

**Size: 10, 15, 20, 30, 40**

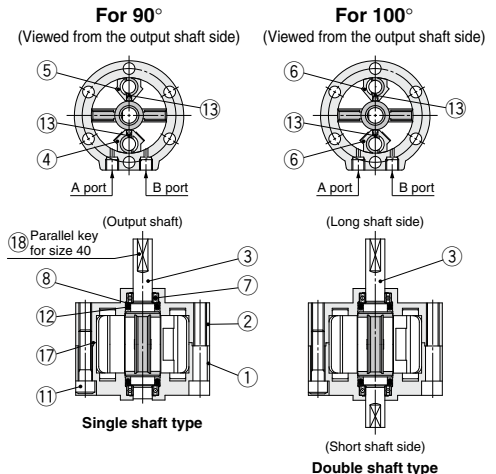


**Double vane** • Figures below show the intermediate rotation position when A or B port is pressurized.

**Size: 10**



**Size: 15, 20, 30, 40**



### Component Parts

| No. | Description  | Material                | Note    |
|-----|--------------|-------------------------|---------|
| 1   | Body (A)     | Aluminum alloy          | Painted |
| 2   | Body (B)     | Aluminum alloy          | Painted |
| 3   | Vane shaft   | Chrome molybdenum steel |         |
| 4   | Stopper      | Stainless steel*        |         |
| 5   | Stopper      | Resin                   |         |
| 6   | Stopper      | Stainless steel*        |         |
| 7   | Bearing      | Bearing steel           |         |
| 8   | Back-up ring | Stainless steel         |         |
| 9   | Cover        | Aluminum alloy          |         |

\* For size 40, material for ④, ⑥ is aluminum alloy.

| No. | Description                   | Material                | Note          |
|-----|-------------------------------|-------------------------|---------------|
| 10  | Plate                         | Resin                   |               |
| 11  | Hexagon socket head cap screw | Chrome molybdenum steel | Special screw |
| 12  | O-ring                        | NBR                     |               |
| 13  | Stopper seal                  | NBR                     | Special seal  |
| 14  | Gasket                        | NBR                     | Special seal  |
| 15  | O-ring                        | NBR                     |               |
| 16  | O-ring                        | NBR                     |               |
| 17  | O-ring                        | NBR                     | Size 40 only  |
| 18  | Parallel key                  | Carbon steel            | Size 40 only  |

CRB2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

# CRB2 Series

## Construction (With Auto Switch)

### Single vane

- Following figures show actuators for 90° and 180° when B port is pressurized.

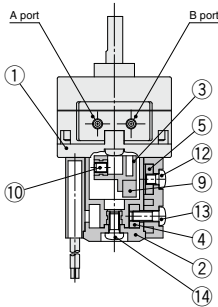
(The unit is common for single vane type and double vane type.)

### Double vane

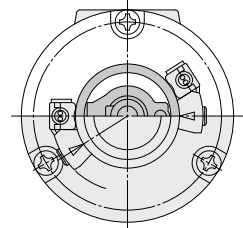
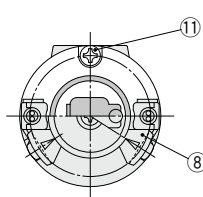
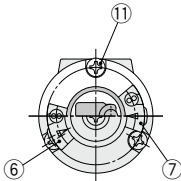
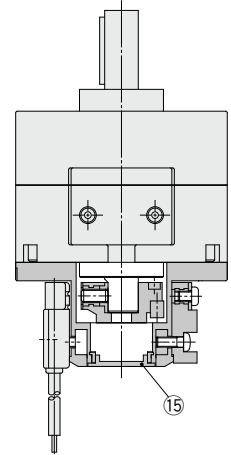
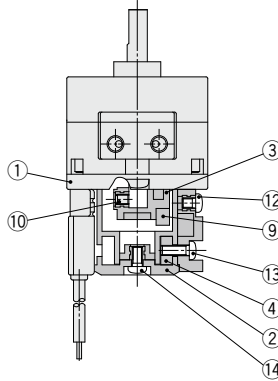
- Following figures show the intermediate rotation position when A or B port is pressurized.

Size: 40

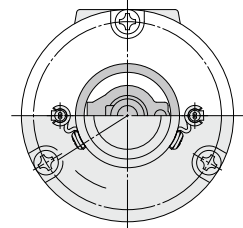
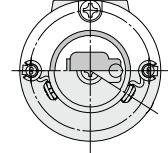
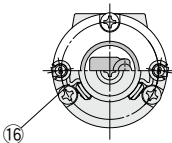
Size: 10, 15



Size: 20, 30



### D-M9□



### Component Parts

| No. | Description       | Material        |
|-----|-------------------|-----------------|
| 1   | Cover (A)         | Resin           |
| 2   | Cover (B)         | Resin           |
| 3   | Magnet lever      | Resin           |
| 4   | Holding block     | Stainless steel |
| 5   | Holding block (B) | Aluminum alloy  |
| 6   | Switch block (A)  | Resin           |
| 7   | Switch block (B)  | Resin           |
| 8   | Switch block      | Resin           |
| 9   | Magnet            |                 |

| No. | Description                     | Material        |
|-----|---------------------------------|-----------------|
| 10  | Hexagon socket head set screw   | Stainless steel |
| 11  | Cross recessed round head screw | Stainless steel |
| 12  | Cross recessed round head screw | Stainless steel |
| 13  | Cross recessed round head screw | Stainless steel |
| 14  | Cross recessed round head screw | Stainless steel |
| 15  | Rubber cap                      | NBR             |
| 16  | Switch holder                   | Stainless steel |

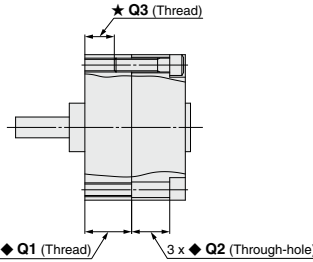
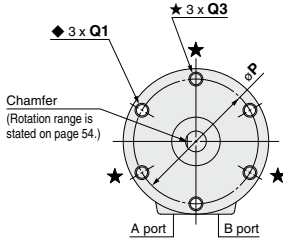
\* For size 10, 2 cross recessed round head screws ⑪ are required.

**Dimensions: Standard Type 10, 15, 20, 30, 40**

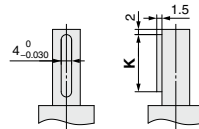
- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.  
For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

**Single shaft/Port location: Side ported**

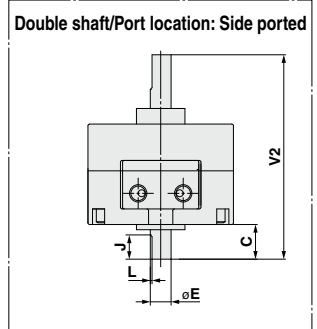
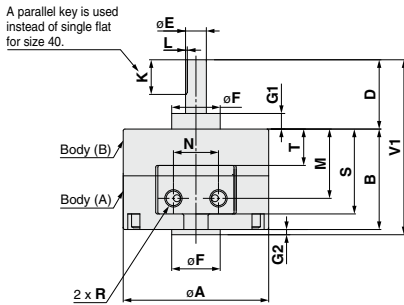
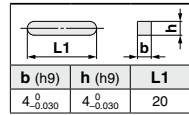
(The size 10 double vane type is indicated on page 58.)



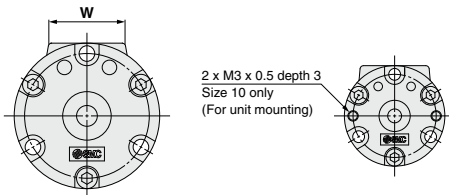
**Shaft-end shape of size 40**



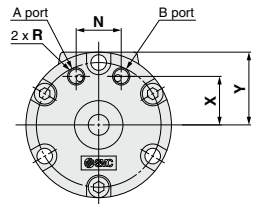
**Parallel key dimensions**



**Size: 10**  
**<Port location: Side ported>**



**Size: 10, 15, 20, 30, 40**  
**<Port location: Axial ported>**



Refer to page 61 for details of shaft types J, K, T and Y.

| Size | A  | B  | C  | D  | E (g7)                                 | F (h9)                            | G1  | G2  | J | K  | L   | M   | N   | P  | Q                   |      |                    | R        | S    | T    | V1   | V2 | W    | X    | Y    |
|------|----|----|----|----|--|-----------------------------------|-----|-----|---|----|-----|-----|-----|----|---------------------|------|--------------------|----------|------|------|------|----|------|------|------|
|      |    |    |    |    |  |                                   |     |     |   |    |     |     |     |    | ◆ Q1                | ◆ Q2 | ★ Q3               |          |      |      |      |    |      |      |      |
| 10   | 29 | 15 | 8  | 14 | 4 <sup>-0.004</sup> <sub>-0.016</sub>  | 12 <sup>0</sup> <sub>-0.036</sub> | 3   | 1   | 5 | 9  | 0.5 | 9.5 | 9.5 | 24 | M3 x 0.5 depth 6    | 6    | —                  | M3 x 0.5 | 14   | 3.6  | 30   | 37 | 19.8 | 8.5  | 14.5 |
| 15   | 34 | 20 | 9  | 18 | 5 <sup>-0.004</sup> <sub>-0.016</sub>  | 12 <sup>0</sup> <sub>-0.043</sub> | 4   | 1.5 | 6 | 10 | 0.5 | 14  | 10  | 29 | M3 x 0.5 depth 10   | 6    | M3 x 0.5 depth 5   | M3 x 0.5 | 19   | 7.6  | 39.5 | 47 | 21   | 11   | 17   |
| 20   | 42 | 29 | 10 | 20 | 6 <sup>-0.004</sup> <sub>-0.016</sub>  | 14 <sup>0</sup> <sub>-0.043</sub> | 4.5 | 1.5 | 7 | 10 | 0.5 | 20  | 13  | 36 | M4 x 0.7 depth 13.5 | 11   | M4 x 0.7 depth 7.5 | M5 x 0.8 | 24.5 | 10.5 | 50.5 | 59 | 22   | 14   | 21   |
| 30   | 50 | 40 | 13 | 22 | 8 <sup>-0.005</sup> <sub>-0.020</sub>  | 16 <sup>0</sup> <sub>-0.043</sub> | 5   | 2   | 8 | 12 | 1.0 | 26  | 14  | 43 | M5 x 0.8 depth 18   | 16.5 | M5 x 0.8 depth 10  | M5 x 0.8 | 34.5 | 14   | 64   | 75 | 24   | 15.5 | 25   |
| 40   | 63 | 45 | 15 | 30 | 10 <sup>-0.005</sup> <sub>-0.020</sub> | 25 <sup>0</sup> <sub>-0.052</sub> | 6.5 | 4.5 | 9 | 20 | 1.0 | 31  | 20  | 56 | M5 x 0.8 depth 16   | 17.5 | M5 x 0.8 depth 10  | M5 x 0.8 | 39.8 | 17   | 79.5 | 90 | 30   | 21   | 31.6 |

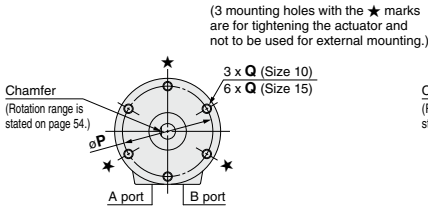


**Dimensions: Standard Type (With Auto Switch) 10, 15, 20, 30, 40**

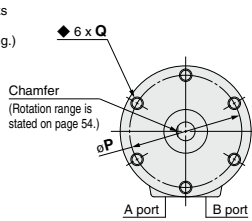
- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.  
For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

**Size: 10, 15**

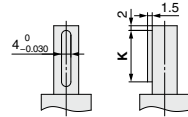
(The size 10 double vane type is indicated on page 60.)



**Size: 20, 30, 40**

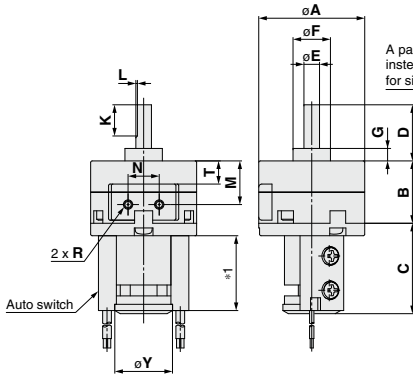


**Shaft-end shape of size 40**

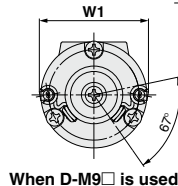
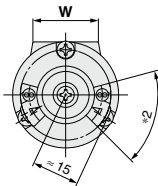
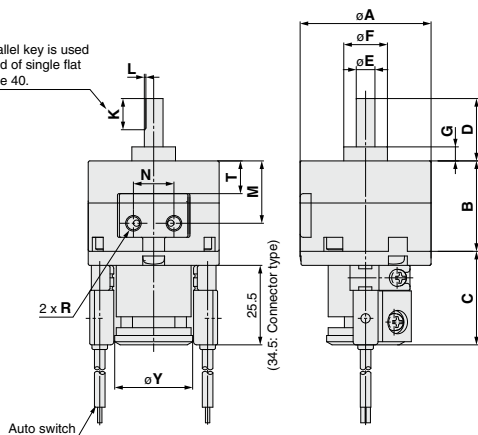


**Parallel key dimensions**

|                |                |      |
|----------------|----------------|------|
| $b$ (h9)       | $h$ (h9)       | $L1$ |
| $4_{-0.030}^0$ | $4_{-0.030}^0$ | 20   |

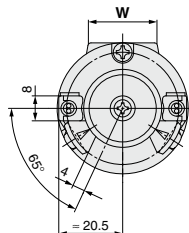


A parallel key is used instead of single flat for size 40.



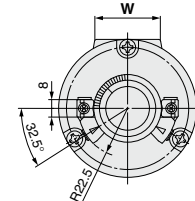
When D-M9□ is used

**Size: 20, 30**



(26.5: Connector type)

**Size: 40**



- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V)  
The length is 30 when any of the following are used: D-97/93A  
The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A  
The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 61 for details of shaft types J, K, T and Y.

| Size | A  | B  | C  | D  | E (g7)          | F (h9)          | G   | K  | L   | M   | N   | P  | Q                 | R        | T    | W    | W1 | Y    |
|------|----|----|----|----|-----------------|-----------------|-----|----|-----|-----|-----|----|-------------------|----------|------|------|----|------|
| 10   | 29 | 15 | 29 | 14 | $4_{-0.004}^0$  | $9_{-0.036}^0$  | 3   | 9  | 0.5 | 9.5 | 9.5 | 24 | M3 x 0.5 depth 6  | M3 x 0.5 | 3.6  | 19.8 | 35 | 18.5 |
| 15   | 34 | 20 | 29 | 18 | $5_{-0.004}^0$  | $12_{-0.043}^0$ | 4   | 10 | 0.5 | 14  | 10  | 29 | M3 x 0.5 depth 5  | M3 x 0.5 | 7.6  | 21   | 35 | 18.5 |
| 20   | 42 | 29 | 30 | 20 | $6_{-0.004}^0$  | $14_{-0.043}^0$ | 4.5 | 10 | 0.5 | 20  | 13  | 36 | M4 x 0.7 depth 7  | M5 x 0.8 | 10.5 | 22   | —  | 25   |
| 30   | 50 | 40 | 31 | 22 | $8_{-0.005}^0$  | $16_{-0.043}^0$ | 5   | 12 | 1.0 | 26  | 14  | 43 | M5 x 0.8 depth 10 | M5 x 0.8 | 14   | 24   | —  | 25   |
| 40   | 63 | 45 | 31 | 30 | $10_{-0.006}^0$ | $25_{-0.052}^0$ | 6.5 | 20 | 1.0 | 31  | 20  | 56 | M5 x 0.8 depth 10 | M5 x 0.8 | 17   | 30   | —  | 31   |

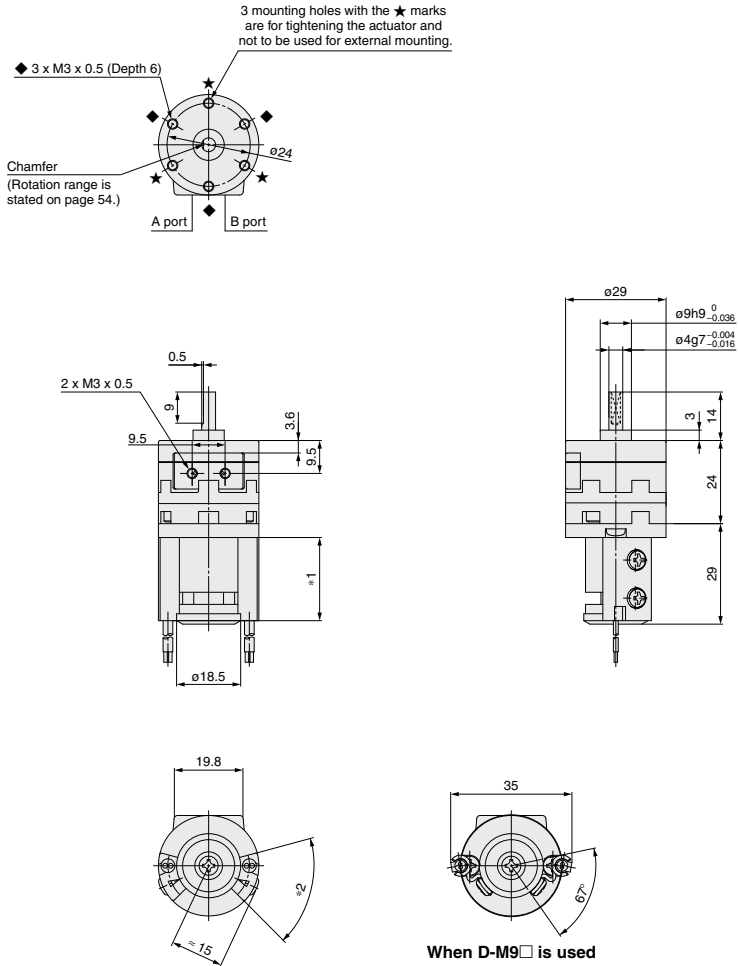


# CDRB2 Series

## Dimensions: Standard Type (With Auto Switch) 10

**Double vane** • Following figures show the intermediate rotation position when A or B port is pressurized.

**Size: 10**



\*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V)  
The length is 30 when any of the following are used: D-97/93A  
The length is 25.5 when the D-M9 is used.

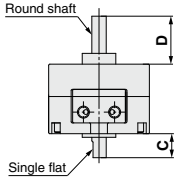
\*2. The angle is 60° when any of the following are used: D-90/90A/97/93A  
The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 61 for details of shaft types J, K, T and Y.

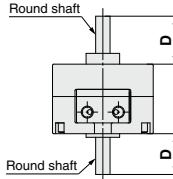
**Shaft Type Dimensions** (Dimensions other than specified below are the same as the standard type.)

Size: 10, 15, 20, 30, 40

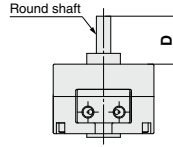
Double shaft/CRB2□J



Double shaft/CRB2□K

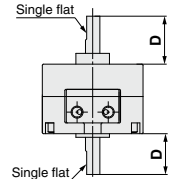


Single shaft/CRB2□T



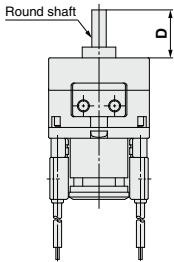
Double shaft/CRB2□Y

A parallel key is used instead of single flat for size 40.



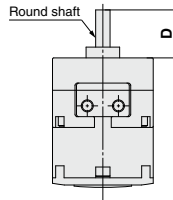
Double shaft/CRB2□J

With auto switch



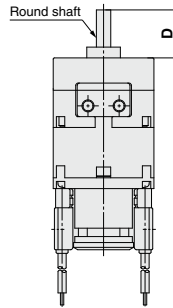
Double shaft/CRB2□JU

With angle adjuster unit



Double shaft/CRB2□JU

With auto switch and angle adjuster unit



[mm]

| Size     | 10 | 15 | 20 | 30 | 40 |
|----------|----|----|----|----|----|
| <b>C</b> | 8  | 9  | 10 | 13 | 15 |
| <b>D</b> | 14 | 18 | 20 | 22 | 30 |

Note 1) Dimensions of the shaft and single flat (a parallel key for size 40) are the same as the standard. Dimension parts different from the standard conform to the general tolerance.

Note 2) For rotary actuators with auto switch and angle adjuster unit, connection ports are side ports.

|       |
|-------|
| CRB2  |
| CRB1  |
| MSU   |
| CRJ   |
| CRA1  |
| CRO2  |
| MSQ   |
| MSZ   |
| CRO2X |
| MSQX  |
| MRQ   |

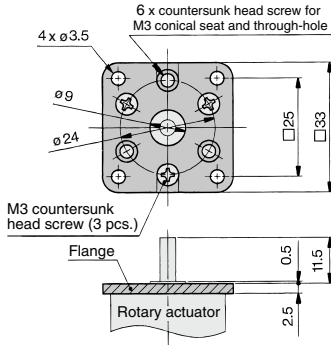
D-□

# CRB2 Series

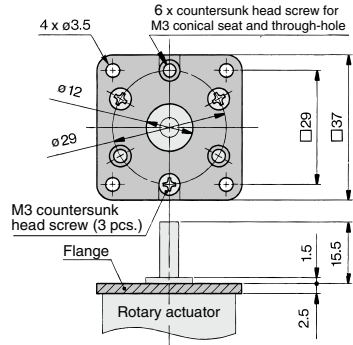
## Optional Specifications: Flange (Size: 10, 15, 20, 30)



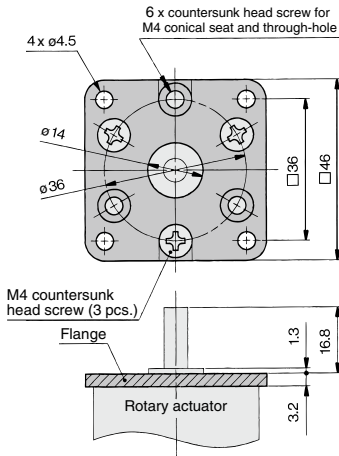
**Flange assembly for C□RB2F□□10**  
Part no.: P211070-2



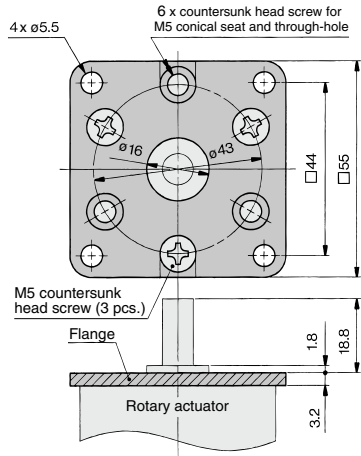
**Flange assembly for C□RB2F□□15**  
Part no.: P211090-2



**Flange assembly for C□RB2F□□20**  
Part no.: P211060-2



**Flange assembly for C□RB2F□□30**  
Part no.: P211080-2

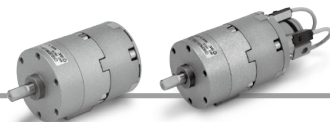


# Rotary Actuator With Angle Adjuster/Vane Type

(RoHS)

# CRB2□WU Series

## Size: 10, 15, 20, 30, 40



### How to Order

CRB2 **B** **W** **U** **20** - **180** **S** **Z** - □

With auto switch **C**DRB2 **B** **W** **U** **20** - **180** **S** **Z** - **M9B** **L** □ - □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

#### ① With auto switch

(With auto switch unit and built-in magnet)  
\* Refer to page 99 when the auto switch unit is needed separately.

#### ② Mounting

| Symbol    | Mounting    |
|-----------|-------------|
| <b>B</b>  | Basic type  |
| <b>F*</b> | Flange type |

\* F: Except size 40

#### ③ Shaft type

| Symbol     | Shaft-end shape |
|------------|-----------------|
| <b>W</b>   | Single flat*    |
| <b>J**</b> | Round shaft     |

\* A key is used for size 40.

\*\* J is made to order.

#### ④ With angle adjuster unit

\* Refer to page 99 when the angle adjuster unit is needed separately.

#### ⑤ Size

|    |  |
|----|--|
| 10 |  |
| 15 |  |
| 20 |  |
| 30 |  |
| 40 |  |

#### ⑥ Rotating angle

|             |     |      |
|-------------|-----|------|
| Single vane | 90  | 90°  |
|             | 180 | 180° |
| Double vane | 270 | 270° |
|             | 90  | 90°  |
|             | 100 | 100° |

#### ⑦ Vane type

|          |             |
|----------|-------------|
| <b>S</b> | Single vane |
| <b>D</b> | Double vane |

#### ⑧ Auto switch

|            |   |
|------------|---|
| <b>Nil</b> | Without auto switch (Built-in magnet)         |
| <b>M</b>   | Without M9 type auto switch (Built-in magnet) |

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

\*\* The operating range and hysteresis of the D-M9□ are different from those of the other auto switches. For details, refer to page 102.

#### ⑨ Electrical entry/Lead wire length

|            |                             |
|------------|-----------------------------|
| <b>Nil</b> | Grommet/Lead wire: 0.5 m    |
| <b>M</b>   | Grommet/Lead wire: 1 m      |
| <b>L</b>   | Grommet/Lead wire: 3 m      |
| <b>CN</b>  | Connector/Without lead wire |
| <b>C</b>   | Connector/Lead wire: 0.5 m  |
| <b>CL</b>  | Connector/Lead wire: 3 m    |

\*\* Connectors are available only for the R73, R80, T79.

\*\* Lead wire with connector part nos.  
D-LC05: Lead wire 0.5 m  
D-LC30: Lead wire 3 m  
D-LC50: Lead wire 5 m

Refer to pages 102 to 106 for actuators with auto switches.

- Operating range and hysteresis
- How to change the auto switch detecting position
- Auto switch mounting
- Auto switch adjustment

#### ⑩ Number of auto switches

|            |          |
|------------|----------|
| <b>S</b>   | 1 pc.*   |
| <b>Nil</b> | 2 pcs.** |

\* S: A right-hand auto switch is shipped.

\*\* Nil: A right-hand switch and a left-hand switch are shipped.

#### ⑪ Made to Order

For details, refer to the table below.

**Made to Order**  
(For details, refer to pages 84 to 98.)

### Applicable Auto Switches/Refer to pages 797 to 850 for further information on auto switches.

| Applicable size  | Type                    | Special function | Electrical entry | Indicator/light | Wiring (Output) | Load voltage |                  | Auto switch model |         | Lead wire type           | Lead wire length [m]     |       |       |       |            | Pre-wired connector | Applicable load |
|------------------|-------------------------|------------------|------------------|-----------------|-----------------|--------------|------------------|-------------------|---------|--------------------------|--------------------------|-------|-------|-------|------------|---------------------|-----------------|
|                  |                         |                  |                  |                 |                 | DC           | AC               | Perpendicular     | In-line |                          | 0.5 (Nil)                | 1 (M) | 3 (L) | 5 (Z) | None (Nil) |                     |                 |
|                  |                         |                  |                  |                 |                 |              |                  |                   |         |                          |                          |       |       |       |            |                     |                 |
| For 10, 15       | Solid state auto switch | —                | Grommet          | Yes             | 3-wire (NPV)    | 5 V, 12 V    | —                | M9NV              | M9N     | Oilproof heavy-duty cord | ●                        | ●     | ●     | ○     | ○          | IC circuit          |                 |
|                  |                         |                  |                  |                 | 3-wire (PNP)    | 12 V         | —                | M9PV              | M9P     |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | 2-wire          | 5 V, 12 V    | —                | M9BV              | M9B     |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  | Reed auto switch        | —                | No               | Grommet         | Yes             | 3-wire (NPV) | 5 V, 12 V        | —                 | S99V    | S99                      | Oilproof heavy-duty cord | ●     | ●     | ●     | ○          | ○                   | IC circuit      |
|                  |                         |                  |                  |                 |                 | 3-wire (PNP) | 5 V, 12 V, 100 V | —                 | S99V    | S99                      |                          | ●     | ●     | ●     | ○          | ○                   |                 |
|                  |                         |                  |                  |                 |                 | 2-wire       | 12 V             | —                 | T99V    | T99                      |                          | ●     | ●     | ●     | ○          | ○                   |                 |
| For 20, 30, 40   | Solid state auto switch | —                | Grommet          | Yes             | 3-wire (NPV)    | 5 V, 12 V    | —                | M9NV              | M9N     | Oilproof heavy-duty cord | ●                        | ●     | ●     | ○     | ○          | IC circuit          |                 |
|                  |                         |                  |                  |                 | 3-wire (PNP)    | 12 V         | —                | M9PV              | M9P     |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | 2-wire          | 5 V, 12 V    | —                | M9BV              | M9B     |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | 3-wire (NPV)    | 5 V, 12 V    | —                | S79               | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | 3-wire (PNP)    | 12 V         | —                | S7P               | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | 2-wire          | 12 V         | —                | T79               | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  | Reed auto switch        | —                | No               | Grommet         | Yes             | 3-wire (NPV) | —                | 100 V             | M9BV    | M9B                      | Oilproof heavy-duty cord | ●     | ●     | ●     | ○          | ○                   | IC circuit      |
|                  |                         |                  |                  |                 |                 | 3-wire (PNP) | —                | 100 V             | M9BV    | M9B                      |                          | ●     | ●     | ●     | ○          | ○                   |                 |
|                  |                         |                  |                  |                 |                 | 2-wire       | —                | 100 V             | S79     | —                        |                          | ●     | ●     | ●     | ○          | ○                   |                 |
|                  |                         |                  |                  |                 |                 | 3-wire (NPV) | —                | 100 V             | T79C    | —                        |                          | ●     | ●     | ●     | ○          | ○                   |                 |
|                  |                         |                  |                  |                 |                 | 3-wire (PNP) | —                | 100 V             | R73     | —                        |                          | ●     | ●     | ●     | ○          | ○                   |                 |
|                  |                         |                  |                  |                 |                 | 2-wire       | —                | 100 V             | R73C    | —                        |                          | ●     | ●     | ●     | ○          | ○                   |                 |
| Reed auto switch | —                       | No               | Connector        | No              | 4-wire          | 46 V, 100 V  | 100 V            | R80               | —       | IC circuit               | ●                        | ●     | ●     | ○     | ○          | IC circuit          |                 |
|                  |                         |                  |                  |                 | 2-wire          | —            | 24 V or less     | R80C              | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | —               | —            | —                | R80               | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | —               | —            | —                | R80C              | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | —               | —            | —                | R80               | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |
|                  |                         |                  |                  |                 | —               | —            | —                | R80C              | —       |                          | ●                        | ●     | ●     | ○     | ○          |                     |                 |

\* Lead wire length symbols: 0.5 m ..... Nil (Example) R73C  
3 m ..... L (Example) R73CL  
5 m ..... Z (Example) R73CZ  
None ..... N (Example) R73CN

\* Auto switches are shipped together, (but not assembled).  
\* Solid state auto switches marked with "○" are produced upon receipt of order.

| Symbol              | Description                              | Applicable shaft type |
|---------------------|--|-----------------------|
| <b>XA1 to XA24</b>  | Shaft type pattern I                     | W                     |
| <b>XA31 to XA58</b> | Shaft type pattern II                    | J                     |
| <b>XC1</b>          | Add connecting ports                     | W, J                  |
| <b>XC2</b>          | Change threaded hole to through-hole     | W, J                  |
| <b>XC3</b>          | Change the screw position                | W, J                  |
| <b>XC4</b>          | Change the rotation range                | W, J                  |
| <b>XC5</b>          | Change rotation range between 0 and 200° | W, J                  |
| <b>XC6</b>          | Change rotation range between 0 and 110° | W, J                  |
| <b>XC7</b>          | Reversed shaft                           | W, J                  |
| <b>XC30</b>         | Fluorine grease                          | W, J                  |
| <b>X5</b>           | For M5 port (90°/180°)                   | W, J                  |

The above may not be selected when the product comes with an auto switch or angle adjuster unit. For details, refer to pages 84, 85, 90, 91, 96.

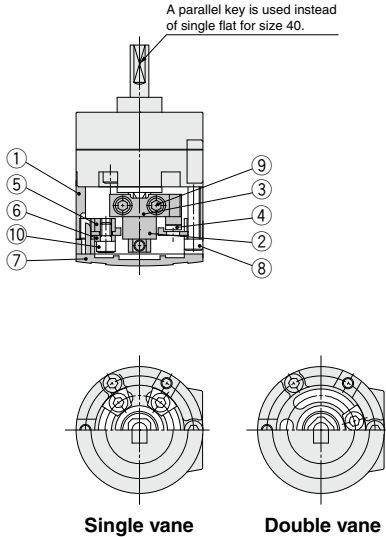
# CRB2□WU Series

## Construction: 10, 15, 20, 30, 40

- The unit is common for single vane type and double vane type.

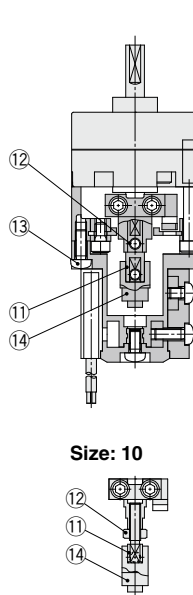
### With angle adjuster

Size: 10, 15, 20, 30, 40

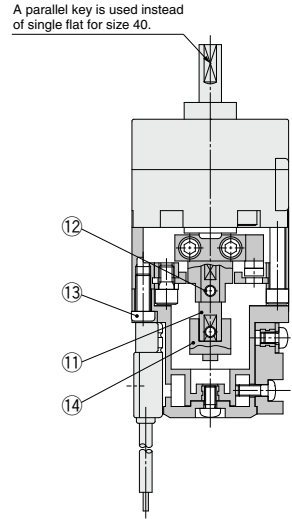


### With auto switch and angle adjuster

Size: 10, 15



Size: 20, 30, 40



### Component Parts

| No. | Description                     | Material                | Note                                       |
|-----|---------------------------------|-------------------------|--|
| 1   | Stopper ring                    | Aluminum alloy          |  |
| 2   | Stopper lever                   | Chrome molybdenum steel |  |
| 3   | Lever retainer                  | Rolled steel            | Zinc chromated                             |
| 4   | Rubber bumper                   | NBR                     |  |
| 5   | Stopper block                   | Chrome molybdenum steel | Zinc chromated                             |
| 6   | Block retainer                  | Rolled steel            | Zinc chromated                             |
| 7   | Cap                             | Resin                   |  |
| 8   | Hexagon socket head cap screw   | Stainless steel         | Special screw                              |
| 9   | Hexagon socket head cap screw   | Stainless steel         | Special screw                              |
| 10  | Hexagon socket head cap screw   | Stainless steel         | Special screw                              |
| 11  | Joint                           |                         |  |
| 12  | Hexagon socket head set screw   | Stainless steel         | Hexagon nut will be used for size 10 only. |
| 13  | Hexagon nut                     | Stainless steel         |  |
| 14  | Cross recessed round head screw | Stainless steel         |  |
| 17  | Magnet lever                    | —                       |  |

### ⚠ Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 4 to 14 for Rotary Actuator and Auto Switch Precautions.

### Angle Adjuster Unit

### ⚠ Caution

1. Since the maximum angle of the rotating angle adjustment range will be limited by the rotation of the rotary actuator, make sure to take this into consideration when ordering.

| Rotating angle of rotary actuator | Rotating angle adjustment range |
|-----------------------------------|---------------------------------|
| 270 <sup>+4</sup> <sub>0</sub>    | 0° to 230° (Size: 10, 40) *     |
|                                   | 0° to 240° (Size: 15, 20, 30)   |
| 180 <sup>+4</sup> <sub>0</sub>    | 0° to 175°                      |
| 90 <sup>+4</sup> <sub>0</sub>     | 0° to 85°                       |

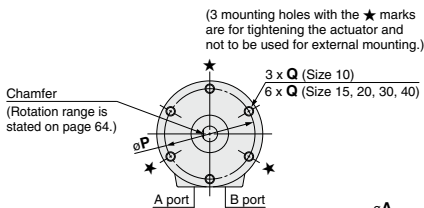
\* The maximum adjustment angle of the angle adjuster unit for size 10 and 40 is 230°

2. Connecting ports are side ported only.
3. The allowable kinetic energy is the same as the specifications of the rotary actuator.
4. Use a 100° rotary actuator when you desire to adjust the angle to 90° using a double vane type.

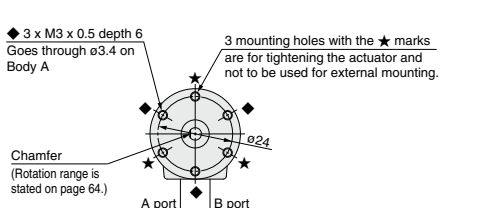
**Dimensions: Standard Type (With Angle Adjuster) 10, 15, 20, 30, 40**

- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized.  
For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

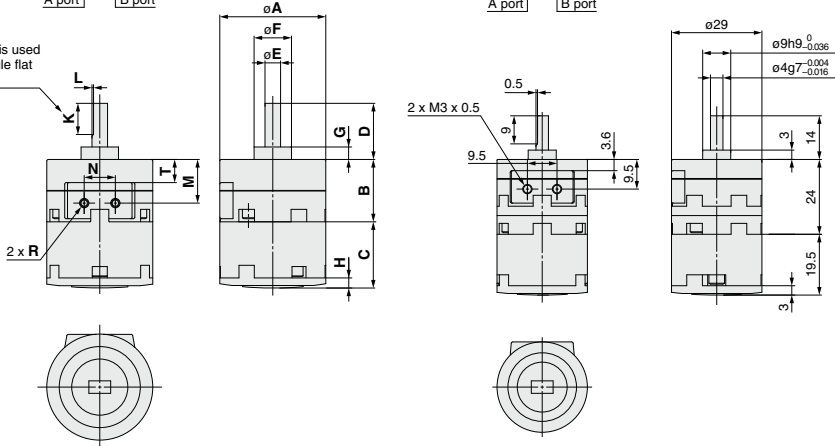
**Size: 10, 15, 20, 30, 40**



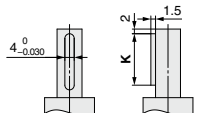
**Size: 10 (Double vane)**



A parallel key is used instead of single flat for size 40.



**Shaft-end shape of size 40**



**Parallel key dimensions**

|                                  |                                  |           |
|----------------------------------|----------------------------------|-----------|
|                                  |                                  |           |
| <b>b (h9)</b>                    | <b>h (h9)</b>                    | <b>L1</b> |
| 4 <sup>0</sup> <sub>-0.030</sub> | 4 <sup>0</sup> <sub>-0.030</sub> | 20        |

Refer to page 61 for details of shaft type J.

| Size      | A  | B  | C    | D  | E (g7)                                 | F (h9)                            | G   | H   | K  | L   | M   | N   | P  | Q                 | R        | T    |
|-----------|----|----|------|----|--|-----------------------------------|-----|-----|----|-----|-----|-----|----|-------------------|----------|------|
| <b>10</b> | 29 | 15 | 19.5 | 14 | 4 <sup>-0.004</sup> <sub>-0.016</sub>  | 9 <sup>0</sup> <sub>-0.036</sub>  | 3   | 3   | 9  | 0.5 | 9.5 | 9.5 | 24 | M3 x 0.5 depth 6  | M3 x 0.5 | 3.6  |
| <b>15</b> | 34 | 20 | 21.2 | 18 | 5 <sup>-0.004</sup> <sub>-0.016</sub>  | 12 <sup>0</sup> <sub>-0.043</sub> | 4   | 3.2 | 10 | 0.5 | 14  | 10  | 29 | M3 x 0.5 depth 5  | M3 x 0.5 | 7.6  |
| <b>20</b> | 42 | 29 | 25   | 20 | 6 <sup>-0.004</sup> <sub>-0.016</sub>  | 14 <sup>0</sup> <sub>-0.043</sub> | 4.5 | 4   | 10 | 0.5 | 20  | 13  | 36 | M4 x 0.7 depth 7  | M5 x 0.8 | 10.5 |
| <b>30</b> | 50 | 40 | 29   | 22 | 8 <sup>-0.005</sup> <sub>-0.020</sub>  | 16 <sup>0</sup> <sub>-0.043</sub> | 5   | 4.5 | 12 | 1.0 | 26  | 14  | 43 | M5 x 0.8 depth 10 | M5 x 0.8 | 14   |
| <b>40</b> | 63 | 45 | 36.3 | 30 | 10 <sup>-0.005</sup> <sub>-0.020</sub> | 25 <sup>0</sup> <sub>-0.052</sub> | 6.5 | 5   | 20 | —   | 31  | 20  | 56 | M5 x 0.8 depth 10 | M5 x 0.8 | 17   |

- CRB2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

D-□

# CDRB2 WU Series

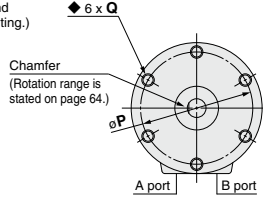
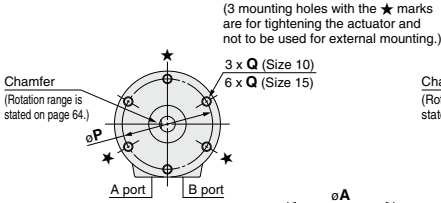
## Dimensions: Standard Type (With Auto Switch and Angle Adjuster) 10, 15, 20, 30, 40

- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

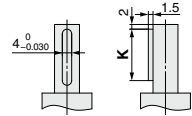
### Size: 10, 15

(The size 10 double vane type is indicated on page 67.)

### Size: 20, 30, 40

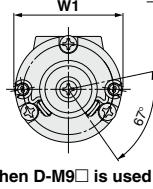
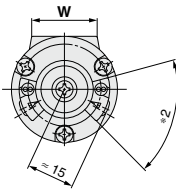
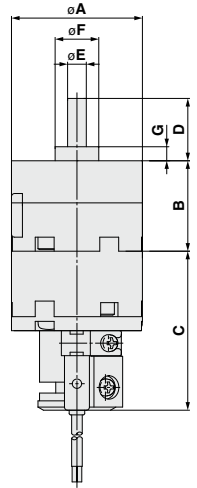
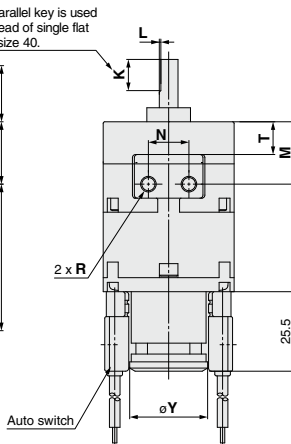
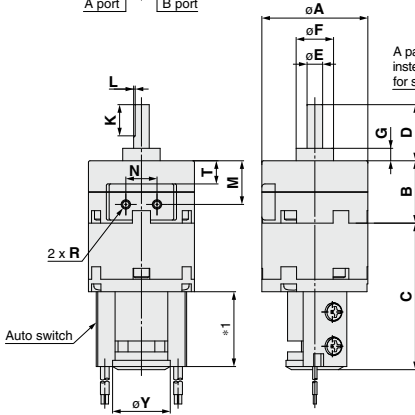


### Shaft-end shape of size 40



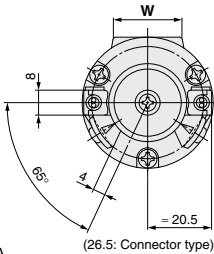
### Parallel key dimensions

|                                    |                                    |    |  |
|------------------------------------|------------------------------------|----|--|
| L1                                 |                                    | F  |  |
| b (h9)                             | h (h9)                             | L1 |  |
| 4.0 <sup>0</sup> <sub>-0.030</sub> | 4.0 <sup>0</sup> <sub>-0.030</sub> | 20 |  |

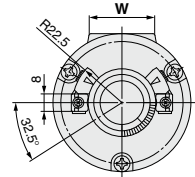


When D-M9  is used

### Size: 20, 30



### Size: 40



Refer to page 61 for details of shaft type J.

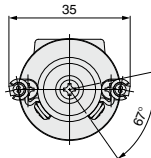
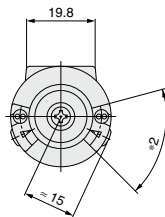
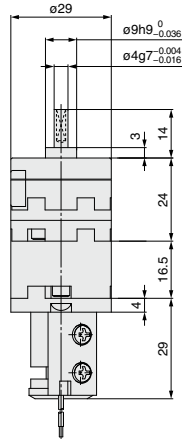
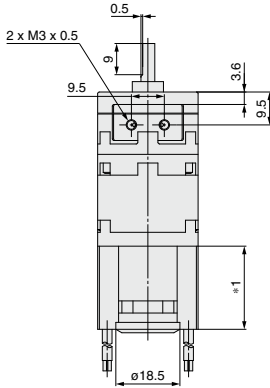
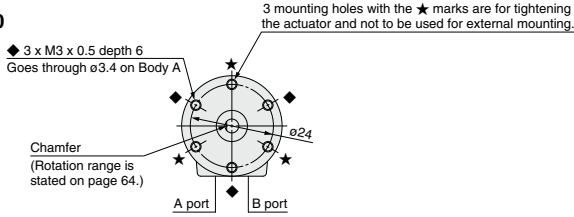
- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V)  
The length is 30 when any of the following are used: D-97/93A  
The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A  
The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

| Size | A  | B  | C    | D  | E (g7)                                 | F (h9)                           | G   | K  | L   | M   | N   | P  | Q                 | R        | T    | W    | W1 | Y    |
|------|----|----|------|----|--|----------------------------------|-----|----|-----|-----|-----|----|-------------------|----------|------|------|----|------|
| 10   | 29 | 15 | 45.5 | 14 | 4 <sup>-0.004</sup> <sub>-0.016</sub>  | 9 <sup>0</sup> <sub>0.036</sub>  | 3   | 9  | 0.5 | 9.5 | 9.5 | 24 | M3 x 0.5 depth 6  | M3 x 0.5 | 3.6  | 19.8 | 35 | 18.5 |
| 15   | 34 | 20 | 47   | 18 | 5 <sup>-0.004</sup> <sub>-0.016</sub>  | 12 <sup>0</sup> <sub>0.043</sub> | 4   | 10 | 0.5 | 14  | 10  | 29 | M3 x 0.5 depth 5  | M3 x 0.5 | 7.6  | 21   | 35 | 18.5 |
| 20   | 42 | 29 | 51   | 20 | 6 <sup>-0.004</sup> <sub>-0.016</sub>  | 14 <sup>0</sup> <sub>0.043</sub> | 4.5 | 10 | 0.5 | 20  | 13  | 36 | M4 x 0.7 depth 7  | M5 x 0.8 | 10.5 | 22   | —  | 25   |
| 30   | 50 | 40 | 55.5 | 22 | 8 <sup>-0.005</sup> <sub>-0.020</sub>  | 16 <sup>0</sup> <sub>0.043</sub> | 5   | 12 | 1.0 | 26  | 14  | 43 | M5 x 0.8 depth 10 | M5 x 0.8 | 14   | 24   | —  | 25   |
| 40   | 63 | 45 | 62.2 | 30 | 10 <sup>-0.005</sup> <sub>-0.020</sub> | 25 <sup>0</sup> <sub>0.052</sub> | 6.5 | 20 | —   | 31  | 20  | 56 | M5 x 0.8 depth 10 | M5 x 0.8 | 17   | 30   | —  | 31   |

**Dimensions: Standard Type (With Auto Switch and Angle Adjuster) 10**

**Double vane** • Following figures show the intermediate rotation position when A or B port is pressurized.

**Size: 10**



When D-M9  is used

Refer to page 61 for details of shaft type J.

- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V)  
The length is 30 when any of the following are used: D-97/93A  
The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A  
The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

|       |
|-------|
| CRB2  |
| CRB1  |
| MSU   |
| CRJ   |
| CRA1  |
| CRQ2  |
| MSQ   |
| MSZ   |
| CRQ2X |
| MSQX  |
| MRQ   |

D-



# CRB2/CRBU2 Series (Size: 10, 15, 20, 30, 40)

## Simple Specials

### -XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system. (Refer to the front matter.)

Please contact SMC for a specification sheet when placing an order.

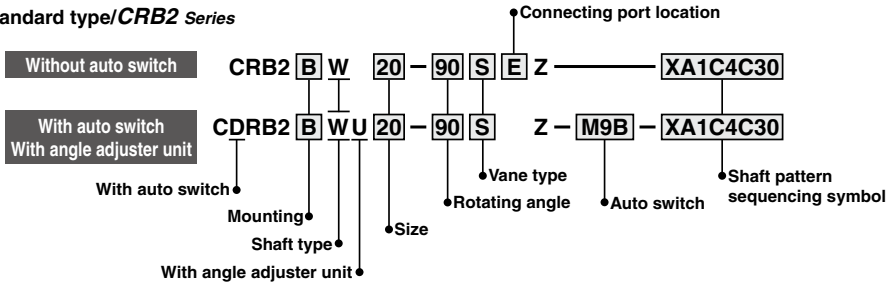
Symbol

**-XA1 to -XA24**

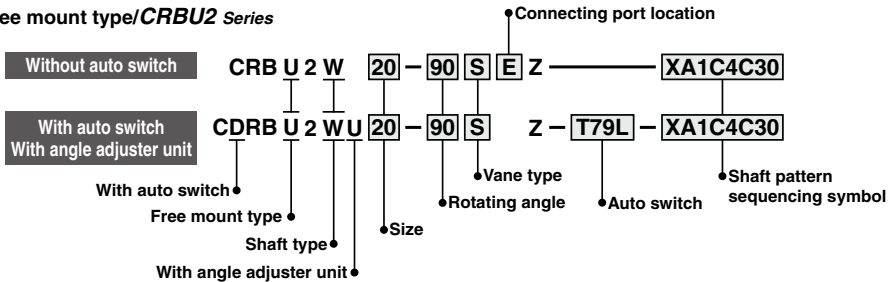
#### Shaft Pattern Sequencing I

Applicable shaft type: W (Standard)

Standard type/CRB2 Series



Free mount type/CRBU2 Series



#### Shaft Pattern Sequencing Symbol

##### ●Axial: Top (Long shaft side)

| Symbol | Description                                   | Applicable size |    |    |    |    |
|--------|---|-----------------|----|----|----|----|
|        |   | 10              | 15 | 20 | 30 | 40 |
| XA1    | Shaft-end female thread                       | ●               | ●  | ●  | ●  |    |
| XA3    | Shaft-end male thread                         | ●               | ●  | ●  | ●  |    |
| XA5    | Stepped round shaft                           | ●               | ●  | ●  | ●  |    |
| XA7    | Stepped round shaft with male thread          | ●               | ●  | ●  | ●  |    |
| XA9    | Modified length of standard chamfer           | ●               | ●  | ●  | ●  |    |
| XA11   | Double-sided chamfer                          | ●               | ●  | ●  | ●  |    |
| XA14*  | Shaft through-hole + Shaft-end female thread  | ●               | ●  | ●  | ●  | ●  |
| XA17   | Shortened shaft                               | ●               | ●  | ●  | ●  | ●  |
| XA21   | Stepped round shaft with double-sided chamfer | ●               | ●  | ●  | ●  |    |
| XA23   | Right-angle chamfer                           | ●               | ●  | ●  | ●  |    |
| XA24   | Double key                                    |                 |    |    |    | ●  |

\* These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.

##### ●Axial: Bottom (Short shaft side)

| Symbol | Description                                   | Applicable size |    |    |    |    |
|--------|---|-----------------|----|----|----|----|
|        |   | 10              | 15 | 20 | 30 | 40 |
| XA2*   | Shaft-end female thread                       | ●               | ●  | ●  | ●  |    |
| XA4*   | Shaft-end male thread                         | ●               | ●  | ●  | ●  |    |
| XA6*   | Stepped round shaft                           | ●               | ●  | ●  | ●  |    |
| XA8*   | Stepped round shaft with male thread          | ●               | ●  | ●  | ●  |    |
| XA10*  | Modified length of standard chamfer           | ●               | ●  | ●  | ●  |    |
| XA12*  | Double-sided chamfer                          | ●               | ●  | ●  | ●  |    |
| XA15*  | Shaft through-hole + Shaft-end female thread  | ●               | ●  | ●  | ●  | ●  |
| XA19*  | Shortened shaft                               | ●               | ●  | ●  | ●  | ●  |
| XA22*  | Stepped round shaft with double-sided chamfer | ●               | ●  | ●  | ●  |    |

##### ●Double Shaft

| Symbol | Description   | Applicable size |    |    |    |    |
|--------|---|-----------------|----|----|----|----|
|        |   | 10              | 15 | 20 | 30 | 40 |
| XA13*  | Shaft through-hole                                  | ●               | ●  | ●  | ●  |    |
| XA16*  | Shaft through-hole + Double shaft-end female thread | ●               | ●  | ●  | ●  |    |
| XA19*  | Shortened shaft                                     | ●               | ●  | ●  | ●  |    |
| XA20*  | Reversed shaft                                      | ●               | ●  | ●  | ●  | ●  |

## Combination

### XA□ Combination

| Symbol | Combination |     |     |     |     |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| XA1    | XA1         |     |     |     |     |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA2    | ●           | XA2 |     |     |     |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA3    | —           | ●   | XA3 |     |     |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA4    | ●           | —   | ●   | XA4 |     |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA5    | —           | ●   | —   | ●   | XA5 |     |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA6    | ●           | —   | ●   | —   | ●   | XA6 |     |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA7    | —           | ●   | —   | ●   | —   | ●   | XA7 |     |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA8    | ●           | —   | ●   | —   | ●   | —   | ●   | XA8 |     |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA9    | —           | ●   | —   | ●   | —   | ●   | —   | ●   | XA9 |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA10   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | XA10 |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA11   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | XA11 |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA12   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | XA12 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| XA13   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | ●    | ● | — |   |   |   |   |   |   |   |   |   |   |   |   |
| XA14   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | ●    | ● | — | — |   |   |   |   |   |   |   |   |   |   |   |
| XA15   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | ● | ● | — | — |   |   |   |   |   |   |   |   |   |   |
| XA16   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | — | — | — | — |   |   |   |   |   |   |   |   |   |   |
| XA17   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | — | ● | — | ● | — |   |   |   |   |   |   |   |   |   |
| XA18   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | —    | ● | — | ● | — | ● | — |   |   |   |   |   |   |   |   |
| XA19   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | — | — | — | — | — |   |   |   |   |   |   |   |   |   |
| XA20   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | — | — | — | — | — |   |   |   |   |   |   |   |   |   |
| XA21   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | — | ● | — | ● | — | ● |   |   |   |   |   |   |   |   |
| XA22   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | —    | ● | — | ● | — | ● | — | ● |   |   |   |   |   |   |   |
| XA23   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | — | ● | — | ● | — | ● | — | ● |   |   |   |   |   |   |
| XA24   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | — | ● | — | ● | — | ● | — | ● | — | ● | — | ● | — | — |

A total of two XA□ and XA□ combinations is available.

Example: -XA2A24

Note) The tolerance of the additionally machined parts conforms to the general tolerance.

### XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.

Refer to pages 96 to 98 for details on the Made-to-Order specifications.

| Symbol | Description                             | Applicable size    | Combination |
|--------|---|--------------------|-------------|
|        |   |                    | XA1 to XA24 |
| XC1*   | Add connecting ports                    | 10, 15, 20, 30, 40 | ●           |
| XC2*   | Change threaded hole to through-hole    | 15, 20, 30, 40     | ●           |
| XC3*   | Change the screw position               |                    | ●           |
| XC4    | Change the rotation range               |                    | ●           |
| XC5*   | Change rotation range between 0 to 200° | 10, 15, 20, 30, 40 | ●           |
| XC6*   | Change rotation range between 0 to 110° |                    | ●           |
| XC7*   | Reversed shaft                          |                    | —           |
| XC30   | Fluorine grease                         |                    | ●           |
| X5**   | For M5 port                             | 10, 15             | ●           |

\* These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.

\*\* Only the shaft type W or J can select "with auto switch" and/or "with angle adjuster unit".

A total of four XA□ and XC□ combinations is available.

Example: -XA2A24C1C30

-XA2C1C4C30

CRB□2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

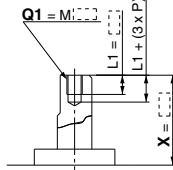
D-□

## Axial: Top (Long shaft side)

### Symbol: A1

The long shaft can be further shortened by machining female threads into it. (If shortening the shaft is not required, indicate "\*" for dimension X.)

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 = 6 mm
- Applicable shaft type: W



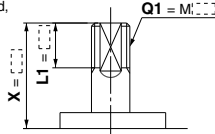
[mm]

| Size | CRB2      |            | CRBU2     |            |
|------|-----------|------------|-----------|------------|
|      | X         | Q1         | X         | Q1         |
| 15   | 4 to 18   | M3         | 1.5 to 18 | M3         |
| 20   | 4.5 to 20 | M3, M4     | 1.5 to 20 | M3, M4     |
| 30   | 5 to 22   | M3, M4, M5 | 2 to 22   | M3, M4, M5 |

### Symbol: A3

The long shaft can be further shortened by machining male threads into it. (If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft type: W



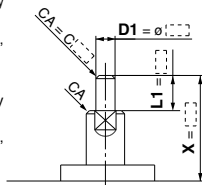
[mm]

| Size | CRB2     |        |    | CRBU2     |        |    |
|------|----------|--------|----|-----------|--------|----|
|      | X        | L1 max | Q1 | X         | L1 max | Q1 |
| 10   | 9 to 14  | X-5    | M4 | 7 to 14   | X-3    | M4 |
| 15   | 11 to 18 | X-6    | M5 | 8.5 to 18 | X-3.5  | M5 |
| 20   | 13 to 20 | X-7    | M6 | 10 to 20  | X-4    | M6 |
| 30   | 16 to 22 | X-8    | M8 | 13 to 22  | X-5    | M8 |

### Symbol: A5

The long shaft can be further shortened by machining it into a stepped round shaft. (If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker. (If not specifying dimension CA, indicate "\*" instead.)



[mm]

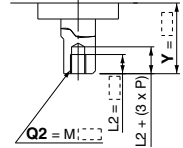
| Size | CRB2    |        |          | CRBU2   |        |          |
|------|---------|--------|----------|---------|--------|----------|
|      | X       | L1 max | D1       | X       | L1 max | D1       |
| 10   | 4 to 14 | X-3    | ø3       | 2 to 14 | X-1    | ø3       |
| 15   | 5 to 18 | X-4    | ø3 to ø4 | 3 to 18 | X-1.5  | ø3 to ø4 |
| 20   | 6 to 20 | X-4.5  | ø3 to ø5 | 3 to 20 | X-1.5  | ø3 to ø5 |
| 30   | 6 to 22 | X-5    | ø3 to ø6 | 3 to 22 | X-2    | ø3 to ø6 |

## Axial: Bottom (Short shaft side)

### Symbol: A2

The short shaft can be further shortened by machining female threads into it. (If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Not available for size 10
- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M3: L2 = 6 mm
- Applicable shaft type: W



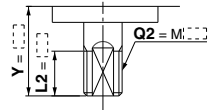
[mm]

| Size | CRB2, CRBU2 |            |
|------|-------------|------------|
|      | Y           | Q2         |
| 15   | 1.5 to 9    | M3         |
| 20   | 1.5 to 10   | M3, M4     |
| 30   | 2 to 13     | M3, M4, M5 |
| 40   | 4.5 to 15   | M3, M4, M5 |

### Symbol: A4

The short shaft can be further shortened by machining male threads into it. (If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: W



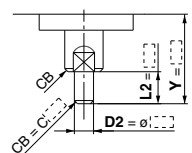
[mm]

| Size | CRB2, CRBU2 |        |     |
|------|-------------|--------|-----|
|      | Y           | L2 max | Q2  |
| 10   | 7 to 8      | Y-3    | M4  |
| 15   | 8.5 to 9    | Y-3.5  | M5  |
| 20   | 10          | Y-4    | M6  |
| 30   | 13          | Y-5    | M8  |
| 40   | 15          | Y-6    | M10 |

### Symbol: A6

The short shaft can be further shortened by machining it into a stepped round shaft. (If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker. (If not specifying dimension CB, indicate "\*" instead.)



[mm]

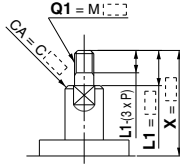
| Size | CRB2, CRBU2 |        |          |  |
|------|-------------|--------|----------|--|
|      | Y           | L2 max | D2       |  |
| 10   | 2 to 8      | Y-1    | ø3       |  |
| 15   | 3 to 9      | Y-1.5  | ø3 to ø4 |  |
| 20   | 3 to 10     | Y-1.5  | ø3 to ø5 |  |
| 30   | 3 to 13     | Y-2    | ø3 to ø6 |  |
| 40   | 6 to 15     | Y-4.5  | ø3 to ø8 |  |

## Axial: Top (Long shaft side)

### Symbol: **A7**

The long shaft can be further shortened by machining it into a stepped round shaft with male threads.  
(If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.  
(If not specifying dimension CA, indicate "\*" instead.)

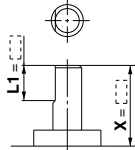


| Size | CRB2      |        |            | CRBU2     |        |            |
|------|-----------|--------|------------|-----------|--------|------------|
|      | X         | L1 max | Q1         | X         | L1 max | Q1         |
| 10   | 7.5 to 14 | X-3    | 3          | 5.5 to 14 | X-1    | 3          |
| 15   | 10 to 18  | X-4    | 3, 4       | 7.5 to 18 | X-1.5  | 3          |
| 20   | 12 to 20  | X-4.5  | 3, 4, 5    | 9 to 20   | X-1.5  | 3, 4       |
| 30   | 14 to 22  | X-5    | 3, 4, 5, 6 | 11 to 22  | X-2    | 3, 4, 5, 6 |

### Symbol: **A9**

The long shaft can be further shortened by changing the length of the standard chamfer on the long shaft side.  
(If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft type: W

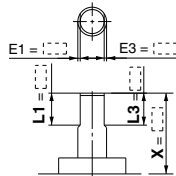


| Size | CRB2     |                      | CRBU2     |                      |
|------|----------|----------------------|-----------|----------------------|
|      | X        | L1                   | X         | L1                   |
| 10   | 5 to 14  | 9-(14-X) to (X-3)    | 3 to 14   | 9-(14-X) to (X-1)    |
| 15   | 8 to 18  | 10-(18-X) to (X-4)   | 5.5 to 18 | 10-(18-X) to (X-1.5) |
| 20   | 10 to 20 | 10-(20-X) to (X-4.5) | 7 to 20   | 10-(20-X) to (X-1.5) |
| 30   | 10 to 22 | 12-(22-X) to (X-5)   | 7 to 22   | 10-(22-X) to (X-2)   |

### Symbol: **A11**

The long shaft can be further shortened by machining a double-sided chamfer onto it.  
(If altering the standard chamfer and shortening the shaft are not required, indicate "\*" for both the L1 and X dimensions.)

- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore size of ø30.
- Applicable shaft type: W



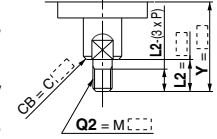
| Size | CRB2     |                      |        | CRBU2   |                      |        |
|------|----------|----------------------|--------|---------|----------------------|--------|
|      | X        | L1                   | L3 max | X       | L1                   | L3 max |
| 10   | 5 to 14  | 9-(14-X) to (X-3)    | X-3    | 3 to 14 | 9-(14-X) to (X-1)    | X-1    |
| 15   | 8 to 18  | 10-(18-X) to (X-4)   | X-4    | 3 to 18 | 10-(18-X) to (X-1.5) | X-1.5  |
| 20   | 10 to 20 | 10-(20-X) to (X-4.5) | X-4.5  | 3 to 20 | 10-(20-X) to (X-1.5) | X-1.5  |
| 30   | 10 to 22 | 12-(22-X) to (X-5)   | X-5    | 5 to 22 | 12-(22-X) to (X-2)   | X-2    |

## Axial: Bottom (Short shaft side)

### Symbol: **A8**

The short shaft can be further shortened by machining it into a stepped round shaft with male threads.  
(If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.  
(If not specifying dimension CB, indicate "\*" instead.)

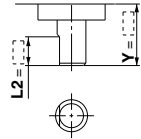


| Size | CRB2, CRBU2 |        |               |
|------|-------------|--------|---------------|
|      | Y           | L2 max | Q2            |
| 10   | 5.5 to 8    | Y-1    | 3             |
| 15   | 7.5 to 9    | Y-1.5  | 3, 4          |
| 20   | 9 to 10     | Y-1.5  | 3, 4, 5       |
| 30   | 11 to 13    | Y-2    | 3, 4, 5, 6    |
| 40   | 14 to 15    | Y-4.5  | 3, 4, 5, 6, 8 |

### Symbol: **A10**

The short shaft can be further shortened by changing the length of the standard chamfer on the short shaft side.  
(If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: W



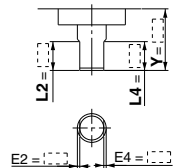
| Size | CRB2, CRBU2 |   |
|------|-------------|---|
|      | Y           | L2  |
| 10   | 3 to 8      | 5-(8-Y) to (Y-1)                                  |
| 15   | 3 to 9      | 6-(9-Y) to (Y-1.5)                                |
| 20   | 3 to 10     | 7-(10-Y) to (Y-1.5)                               |
| 30   | 5 to 13     | 8-(13-Y) to (Y-2)                                 |
| 40   | 7 to 15     | 9-(15-Y) to (Y-2)<br>[9-(15-Y) to (Y-4.5)] (Note) |

(Note) Values inside [ ] are for the CRBU2.

### Symbol: **A12**

The short shaft can be further shortened by machining a double-sided chamfer onto it.  
(If altering the standard chamfer and shortening the shaft are not required, indicate "\*" for both the L2 and Y dimensions.)

- Since L2 is a standard chamfer, dimension E2 is 0.5 mm or more, and 1 mm or more with shaft bore size of ø30 and ø40.
- Applicable shaft type: W



| Size | CRB2, CRBU2 |                     |        |  |
|------|-------------|---------------------|--------|--|
|      | Y           | L2                  | L4 max |  |
| 10   | 3 to 8      | 5-(8-Y) to (Y-1)    | Y-1    |  |
| 15   | 3 to 9      | 6-(9-Y) to (Y-1.5)  | Y-1.5  |  |
| 20   | 3 to 10     | 7-(10-Y) to (Y-1.5) | Y-1.5  |  |
| 30   | 5 to 13     | 8-(13-Y) to (Y-2)   | Y-2    |  |
| 40   | 7 to 15     | 9-(15-Y) to (Y-4.5) | Y-4.5  |  |

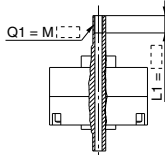
# CRB□2 Series

## Axial: Top (Long shaft side)

### Symbol: A14

Applicable to single vane type only. A special end is machined onto the long shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 max. = 6 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



The above figure shows the CRB2 series.

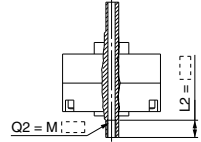
| Size/Thread | CRB2, CRBU2 |      |      |      |
|-------------|-------------|------|------|------|
|             | 15          | 20   | 30   | 40   |
| M3 x 0.5    | ø2.5        | ø2.5 | ø2.5 | ø2.5 |
| M4 x 0.7    | —           | ø3.3 | ø3.3 | —    |
| M5 x 0.8    | —           | —    | ø4.2 | —    |

## Axial: Bottom (Short shaft side)

### Symbol: A15

Applicable to single vane type only. A special end is machined onto the short shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

- A parallel key is used on the long shaft for size 40.
- Not available for size 10
- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M4: L2 max. = 8 mm
- Applicable shaft type: W



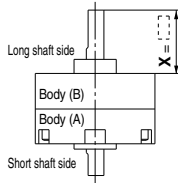
The above figure shows the CRB2 series.

| Size/Thread | CRB2, CRBU2 |      |      |      |
|-------------|-------------|------|------|------|
|             | 15          | 20   | 30   | 40   |
| M3 x 0.5    | ø2.5        | ø2.5 | ø2.5 | ø2.5 |
| M4 x 0.7    | —           | ø3.3 | ø3.3 | —    |
| M5 x 0.8    | —           | —    | ø4.2 | —    |

### Symbol: A17

The long shaft is shortened.

- Applicable shaft type: W



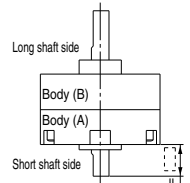
The above figure shows the CRB2 series.

| Size | CRB2 |       | CRBU2 |       |
|------|------|-------|-------|-------|
|      | X    |       | X     |       |
| 10   | 3    | to 14 | 1     | to 14 |
| 15   | 4    | to 18 | 1.5   | to 18 |
| 20   | 4.5  | to 20 | 1.5   | to 20 |
| 30   | 5    | to 22 | 2     | to 22 |
| 40   | 18   | to 30 | 18    | to 30 |

### Symbol: A18

The short shaft is shortened.

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



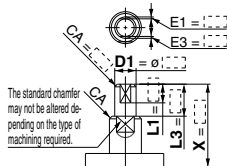
The above figure shows the CRB2 series.

| Size | CRB2, CRBU2 |       |
|------|-------------|-------|
|      | Y           |       |
| 10   | 1           | to 8  |
| 15   | 1.5         | to 9  |
| 20   | 1.5         | to 10 |
| 30   | 2           | to 13 |
| 40   | 4.5         | to 15 |

### Symbol: A21

The long shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer. (If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
- (If not specifying dimension CA, indicate "\*" instead.)



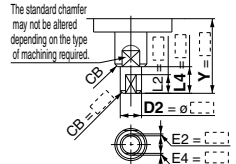
The standard chamfer may not be altered depending on the type of machining required.

| Size | CRB2     |        |          |          | CRBU2     |        |          |          |
|------|----------|--------|----------|----------|-----------|--------|----------|----------|
|      | X        | L1 max | L3       | D1       | X         | L1 max | L3       | D1       |
| 10   | 6 to 14  | X-4.5  | L1 + 1.5 | ø3       | 4 to 14   | X-2.5  | L1 + 1.5 | ø3       |
| 15   | 7 to 18  | X-5.5  | L1 + 1.5 | ø3 to ø4 | 4.5 to 18 | X-3    | L1 + 1.5 | ø3 to ø4 |
| 20   | 8 to 20  | X-6.5  | L1 + 2   | ø3 to ø5 | 5 to 20   | X-3.5  | L1 + 2   | ø3 to ø5 |
| 30   | 10 to 22 | X-8    | L1 + 3   | ø3 to ø6 | 7 to 22   | X-5    | L1 + 3   | ø3 to ø6 |

### Symbol: A22

The short shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer. (If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
- (If not specifying dimension CB, indicate "\*" instead.)



The standard chamfer may not be altered depending on the type of machining required.

| Size | CRB2, CRBU2 |        |                           |          |  |
|------|-------------|--------|---------------------------|----------|--|
|      | Y           | L1 max | L4                        | D2       |  |
| 10   | 4 to 8      | Y-2.5  | L2 + 1.5                  | ø3       |  |
| 15   | 4.5 to 10   | Y-3    | L2 + 1.5                  | ø3 to ø4 |  |
| 20   | 5 to 10     | Y-3.5  | L2 + 2                    | ø3 to ø5 |  |
| 30   | 7 to 13     | Y-5    | L2 + 3                    | ø3 to ø6 |  |
| 40   | 8 to 15     | Y-5.5  | L2 + 5<br>[L2 + 3] (Note) | ø3 to ø6 |  |

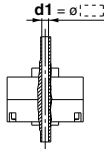
Note) Values inside [ ] are for the CRBU2.

**Double Shaft**

**Symbol: A13**

Applicable to single vane type only.  
Shaft with through-hole

- Not available for size 10
- Minimum machining diameter for d1 is 0.1 mm.
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



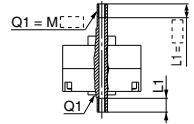
The above figure shows the CRB2 series.

| Size | CRB2, CRBU2  |
|------|--------------|
|      | d1           |
| 15   | ø2.5         |
| 20   | ø2.5 to ø3.5 |
| 30   | ø2.5 to ø4   |
| 40   | ø2.5 to ø3   |

**Symbol: A16**

Applicable to single vane type only.  
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.  
(Example) For M5: L1 max. = 10 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



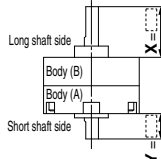
The above figure shows the CRB2 series.

| Thread   | CRB2, CRBU2 |      |      |      |
|----------|-------------|------|------|------|
|          | 15          | 20   | 30   | 40   |
| M3 x 0.5 | ø2.5        | ø2.5 | ø2.5 | ø2.5 |
| M4 x 0.7 | —           | ø3.3 | ø3.3 | —    |
| M5 x 0.8 | —           | —    | ø4.2 | —    |

**Symbol: A19**

Both the long shaft and short shaft are shortened.

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



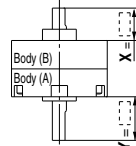
The above figure shows the CRB2 series.

| Size | CRB2      |           | CRBU2     |           |
|------|-----------|-----------|-----------|-----------|
|      | X         | Y         | X         | Y         |
| 10   | 3 to 14   | 1 to 8    | 1 to 14   | 1 to 8    |
| 15   | 4 to 18   | 1.5 to 9  | 1.5 to 18 | 1.5 to 9  |
| 20   | 4.5 to 20 | 1.5 to 10 | 1.5 to 20 | 1.5 to 10 |
| 30   | 5 to 22   | 2 to 13   | 2 to 22   | 2 to 13   |
| 40   | 18 to 30  | 4.5 to 15 | 18 to 30  | 4.5 to 15 |

**Symbol: A20**

The shafts are reversed.  
(Both the long shaft and the short shaft are shortened.)

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W
- Dimensions inside ( ) are for double vane type of size 10.



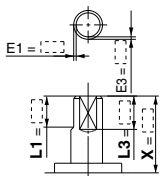
The above figure shows the CRB2 series.

| Size | CRB2         |             | CRBU2       |              |
|------|--------------|-------------|-------------|--------------|
|      | X            | Y           | X           | Y            |
| 10   | 3 to 10 (19) | 1 to 12 (3) | 1 to 3 (12) | 1 to 19 (10) |
| 15   | 4 to 11.5    | 1.5 to 15.5 | 1.5 to 6.5  | 1.5 to 20.5  |
| 20   | 4.5 to 13    | 1.5 to 17   | 1.5 to 7.5  | 1.5 to 22.5  |
| 30   | 5 to 16      | 2 to 19     | 2 to 8.5    | 2 to 26.5    |
| 40   | 6.5 to 17    | 16 to 28    | 3 to 9      | 24 to 36     |

**Symbol: A23**

The long shaft can be further shortened by machining right-angle double-sided chamfer onto it.  
(If altering the standard chamfer and shortening the shaft are not required, indicate “\*” for both the L1 and X dimensions.)

- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore size of ø30 and ø40.
- Applicable shaft type: W

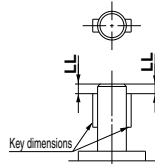


| Size | CRB2     |                      |        | CRBU2   |                      |        |
|------|----------|----------------------|--------|---------|----------------------|--------|
|      | X        | L1                   | L3 max | X       | L1                   | L3 max |
| 10   | 5 to 14  | 9-(14-X) to (X-3)    | X-3    | 3 to 14 | 9-(14-X) to (X-1)    | X-1    |
| 15   | 8 to 18  | 10-(18-X) to (X-4)   | X-4    | 3 to 18 | 10-(18-X) to (X-1.5) | X-1.5  |
| 20   | 10 to 20 | 10-(20-X) to (X-4.5) | X-4.5  | 3 to 20 | 10-(20-X) to (X-1.5) | X-1.5  |
| 30   | 10 to 22 | 12-(22-X) to (X-5)   | X-5    | 5 to 22 | 12-(22-X) to (X-2)   | X-2    |

**Symbol: A24**

Double key  
Keys and keyways are machined additionally at 180° from the standard position.

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



| Size | CRB2, CRBU2    |    |
|------|----------------|----|
|      | Key dimensions | LL |
| 40   | 4 x 4 x 20     | 2  |

- CRB□2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

D-□

# CRB2/CRBU2 Series (Size: 10, 15, 20, 30, 40)

## Simple Specials

### -XA31 to -XA58: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system. (Refer to the front matter.)

Please contact SMC for a specification sheet when placing an order.

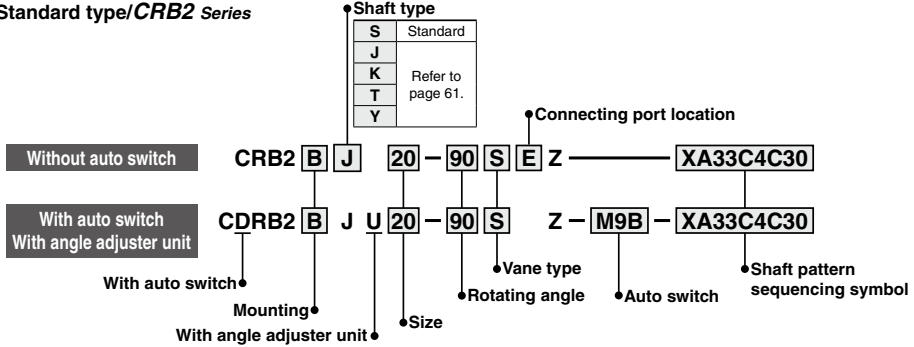
Symbol

**-XA31 to -XA58**

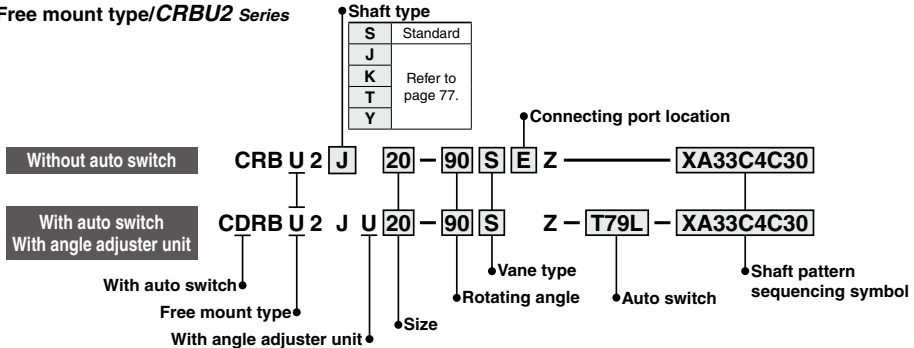
#### Shaft Pattern Sequencing II

Applicable shaft type: S, J, K, T, Y

Standard type/CRB2 Series



Free mount type/CRBU2 Series



#### Shaft Pattern Sequencing Symbol

##### ● Axial: Top (Long shaft side)

| Symbol | Description                 | Shaft type | Applicable size |    |    |    |    |
|--------|-----------------------------|------------|-----------------|----|----|----|----|
|        |                             |            | 10              | 15 | 20 | 30 | 40 |
| XA31   | Shaft-end female thread     | S, Y       | ●               | ●  | ●  | ●  | ●  |
| XA33   | Shaft-end female thread     | J, K, T    | ●               | ●  | ●  | ●  | ●  |
| XA37   | Stepped round shaft         | J, K, T    | ●               | ●  | ●  | ●  | ●  |
| XA45   | Middle-cut chamfer          | J, K, T    | ●               | ●  | ●  | ●  | ●  |
| XA47   | Machined keyway             | J, K, T    | ●               | ●  | ●  | ●  | ●  |
| XA48   | Change of long shaft length | S, Y       | ●               | ●  | ●  | ●  | ●  |
| XA51   | Change of long shaft length | J, K, T    | ●               | ●  | ●  | ●  | ●  |

##### ● Axial: Bottom (Short shaft side)

| Symbol | Description                  | Shaft type | Applicable size |    |    |    |    |
|--------|------------------------------|------------|-----------------|----|----|----|----|
|        |                              |            | 10              | 15 | 20 | 30 | 40 |
| XA32*  | Shaft-end female thread      | S, Y       | ●               | ●  | ●  | ●  | ●  |
| XA34*  | Shaft-end female thread      | J, K, T    | ●               | ●  | ●  | ●  | ●  |
| XA38*  | Stepped round shaft          | K          | ●               | ●  | ●  | ●  | ●  |
| XA46*  | Middle-cut chamfer           | K          | ●               | ●  | ●  | ●  | ●  |
| XA49*  | Change of short shaft length | Y          | ●               | ●  | ●  | ●  | ●  |
| XA52*  | Change of short shaft length | K          | ●               | ●  | ●  | ●  | ●  |
| XA55*  | Change of short shaft length | J          | ●               | ●  | ●  | ●  | ●  |

##### ● Double Shaft

| Symbol | Description                                   | Shaft type | Applicable size |    |    |    |    |
|--------|---|------------|-----------------|----|----|----|----|
|        |   |            | 10              | 15 | 20 | 30 | 40 |
| XA39*  | Shaft through-hole                            | S, Y       | ●               | ●  | ●  | ●  | ●  |
| XA40*  | Shaft through-hole                            | K, T       | ●               | ●  | ●  | ●  | ●  |
| XA41*  | Shaft through-hole                            | J          | ●               | ●  | ●  | ●  | ●  |
| XA42*  | Shaft through-hole + Shaft-end female thread  | S, Y       | ●               | ●  | ●  | ●  | ●  |
| XA43*  | Shaft through-hole + Shaft-end female thread  | K, T       | ●               | ●  | ●  | ●  | ●  |
| XA44*  | Shaft through-hole + Shaft-end female thread  | J          | ●               | ●  | ●  | ●  | ●  |
| XA50*  | Change of double shaft length                 | Y          | ●               | ●  | ●  | ●  | ●  |
| XA53*  | Change of double shaft length                 | K          | ●               | ●  | ●  | ●  | ●  |
| XA57*  | Change of double shaft length                 | J          | ●               | ●  | ●  | ●  | ●  |
| XA58*  | Reversed shaft, Change of double shaft length | J          | ●               | ●  | ●  | ●  | ●  |

\* These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.



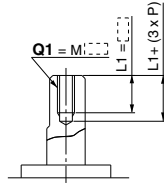


## Axial: Top (Long shaft side)

### Symbol: A31

Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 = 6 mm
- Applicable shaft types: S, Y

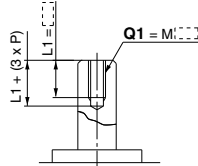


|      |        | CRB2, CRBU2   |   |
|------|--------|---------------|---|
|      |        | Q1            |   |
| Size | Symbol | S             | Y |
| 10   |        | Not available |   |
| 15   |        | M3            |   |
| 20   |        | M3, M4        |   |
| 30   |        | M3, M4, M5    |   |

### Symbol: A33

Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 = 6 mm
- Applicable shaft types: J, K, T



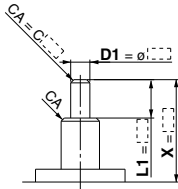
|      |        | CRB2, CRBU2   |   |   |
|------|--------|---------------|---|---|
|      |        | Q1            |   |   |
| Size | Symbol | J             | K | T |
| 10   |        | Not available |   |   |
| 15   |        | M3            |   |   |
| 20   |        | M3, M4        |   |   |
| 30   |        | M3, M4, M5    |   |   |
| 40   |        | M3, M4, M5    |   |   |

### Symbol: A37

The long shaft can be further shortened by machining it into a stepped round shaft.

(If shortening the shaft is not required, indicate "\*" for dimension X.)

- Applicable shaft types: J, K, T
- Equal dimensions are indicated by the same marker. (If not specifying dimension CA, indicate "\*" instead.)



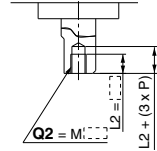
| Size | CRB2    |        |            | CRBU2   |        |            |
|------|---------|--------|------------|---------|--------|------------|
|      | X       | L1 max | D1         | X       | L1 max | D1         |
| 10   | 4 to 14 | X-3    | ø3 to ø3.9 | 2 to 14 | X-1    | ø3 to ø3.9 |
| 15   | 5 to 18 | X-4    | ø3 to ø4.9 | 3 to 18 | X-1.5  | ø3 to ø4.9 |
| 20   | 6 to 20 | X-4.5  | ø3 to ø5.9 | 3 to 20 | X-1.5  | ø3 to ø5.9 |
| 30   | 6 to 22 | X-5    | ø3 to ø7.9 | 3 to 22 | X-2    | ø3 to ø7.9 |
| 40   | 8 to 30 | X-6.5  | ø3 to ø9.9 | 4 to 30 | X-3    | ø3 to ø9.9 |

## Axial: Bottom (Short shaft side)

### Symbol: A32

Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M4: L2 = 8 mm
- However, for M5 with S shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: S, Y

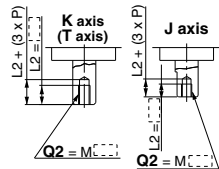


|      |        | CRB2, CRBU2   |   |
|------|--------|---------------|---|
|      |        | Q2            |   |
| Size | Symbol | S             | Y |
| 10   |        | Not available |   |
| 15   |        | M3            |   |
| 20   |        | M3, M4        |   |
| 30   |        | M3, M4, M5    |   |

### Symbol: A34

Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M3: L2 = 6 mm
- However, for M5 with T shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: J, K, T



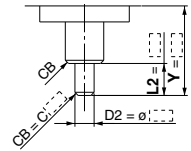
|      |        | CRB2, CRBU2   |   |   |
|------|--------|---------------|---|---|
|      |        | Q2            |   |   |
| Size | Symbol | J             | K | T |
| 10   |        | Not available |   |   |
| 15   |        | M3            |   |   |
| 20   |        | M3, M4        |   |   |
| 30   |        | M3, M4, M5    |   |   |
| 40   |        | M3, M4, M5    |   |   |

### Symbol: A38

The short shaft can be further shortened by machining it into a stepped round shaft.

(If shortening the shaft is not required, indicate "\*" for dimension Y.)

- Applicable shaft type: K
- Equal dimensions are indicated by the same marker. (If not specifying dimension CB, indicate "\*" instead.)



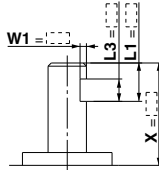
| Size | CRB2, CRBU2 |        |            |
|------|-------------|--------|------------|
|      | Y           | L2 max | D2         |
| 10   | 2 to 14     | Y-1    | ø3 to ø3.9 |
| 15   | 3 to 18     | Y-1.5  | ø3 to ø4.9 |
| 20   | 3 to 20     | Y-1.5  | ø3 to ø5.9 |
| 30   | 3 to 22     | Y-2    | ø3 to ø7.9 |
| 40   | 6 to 30     | Y-4.5  | ø5 to ø9.9 |

**Axial: Top (Long shaft side)**

**Symbol: A45**

The long shaft can be further shortened by machining a middle-cut chamfer into it.  
(The position of the chamfer is same as the standard one.)  
(If shortening the shaft is not required, indicate "a" for dimension X.)

- Applicable shaft types: J, K, T

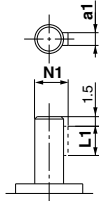


| Size | CRB2, CRBU2 |   |   |            |   |   |        |   |   |        |   |   |
|------|-------------|---|---|------------|---|---|--------|---|---|--------|---|---|
|      | X           |   |   | W1         |   |   | L1 max |   |   | L3 max |   |   |
|      | J           | K | T | J          | K | T | J      | K | T | J      | K | T |
| 10   | 6.5 to 14   |   |   | 0.5 to 2   |   |   | X-3    |   |   | L1-1   |   |   |
| 15   | 8 to 18     |   |   | 0.5 to 2.5 |   |   | X-4    |   |   | L1-1   |   |   |
| 20   | 9 to 20     |   |   | 0.5 to 3   |   |   | X-4.5  |   |   | L1-1   |   |   |
| 30   | 11.5 to 22  |   |   | 0.5 to 4   |   |   | X-5    |   |   | L1-2   |   |   |
| 40   | 15.5 to 30  |   |   | 0.5 to 5   |   |   | X-5.5  |   |   | L1-2   |   |   |

**Symbol: A47**

Machina a keyway into the long shaft. (The position of the keyway is the same as the standard model.)  
The key must be ordered separately.

- Applicable shaft type: J, K, T

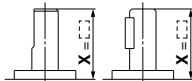


| Size | CRB2, CRBU2                        |    |     |
|------|------------------------------------|----|-----|
|      | a1                                 | L1 | N1  |
| 20   | 2h9 <sub>-0.025</sub> <sup>0</sup> | 10 | 6.8 |
| 30   | 3h9 <sub>-0.025</sub> <sup>0</sup> | 14 | 9.2 |

**Symbol: A48**

The long shaft is shortened.

- Applicable shaft type: S, Y



Size: 10 to 30    Size: 40

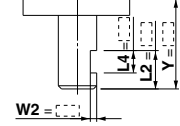
| Size | CRB2      | CRBU2     |
|------|-----------|-----------|
|      | X         | X         |
| 10   | 3 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   |
| 40   | 18 to 30  | 18 to 30  |

**Axial: Bottom (Short shaft side)**

**Symbol: A46**

The short shaft can be further shortened by machining a middle-cut chamfer into it.  
(The position of the chamfer is same as the standard one.)  
(If shortening the shaft is not required, indicate "a" for dimension Y.)

- Applicable shaft type: K

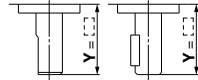


| Size | CRB2, CRBU2 |            |        |        |
|------|-------------|------------|--------|--------|
|      | Y           | W2         | L2 max | L4 max |
| 10   | 4.5 to 14   | 0.5 to 2   | Y-1    | L2-1   |
| 15   | 5.5 to 18   | 0.5 to 2.5 | Y-1.5  | L2-1   |
| 20   | 6 to 20     | 0.5 to 3   | Y-1.5  | L2-1   |
| 30   | 8.5 to 22   | 0.5 to 4   | Y-2    | L2-2   |
| 40   | 13.5 to 30  | 0.5 to 5   | Y-4.5  | L2-2   |

**Symbol: A49**

The short shaft is shortened.

- Applicable shaft type: Y



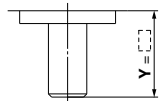
Size: 10 to 30    Size: 40

| Size | CRB2, CRBU2 |
|------|-------------|
|      | Y           |
| 10   | 1 to 14     |
| 15   | 1.5 to 18   |
| 20   | 1.5 to 20   |
| 30   | 2 to 22     |
| 40   | 18 to 30    |

**Symbol: A52**

The short shaft is shortened.

- Applicable shaft type: K



| Size | CRB2, CRBU2 |
|------|-------------|
|      | Y           |
| 10   | 1 to 14     |
| 15   | 1.5 to 18   |
| 20   | 1.5 to 20   |
| 30   | 2 to 22     |
| 40   | 4.5 to 30   |

- CRB□2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

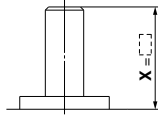
D-□

## Axial: Top (Long shaft side)

### Symbol: A51

The long shaft is shortened.

- Applicable shaft type: J, K, T



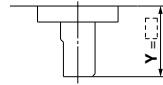
| Size      | [mm]      |           |
|-----------|-----------|-----------|
|           | CRB2      | CRBU2     |
|           | <b>X</b>  |           |
| <b>10</b> | 3 to 14   | 1 to 14   |
| <b>15</b> | 4 to 18   | 1.5 to 18 |
| <b>20</b> | 4.5 to 20 | 1.5 to 20 |
| <b>30</b> | 5 to 22   | 2 to 22   |
| <b>40</b> | 6.5 to 30 | 3 to 30   |

## Axial: Bottom (Short shaft side)

### Symbol: A55

The short shaft is shortened.

- Applicable shaft type: J



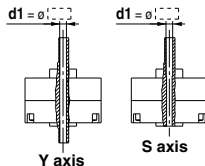
| Size      | [mm]        |   |
|-----------|-------------|---|
|           | CRB2, CRBU2 | Y |
| <b>10</b> | 1 to 8      |   |
| <b>15</b> | 1.5 to 9    |   |
| <b>20</b> | 1.5 to 10   |   |
| <b>30</b> | 2 to 13     |   |
| <b>40</b> | 4.5 to 15   |   |

## Double Shaft

### Symbol: A39

Applicable to single vane type only.  
Shaft with through-hole (Additional machining of S, Y shaft)

- Applicable shaft type: S, Y
- Equal dimensions are indicated by the same marker.
- Not available for size 10
- A parallel key is used on the long shaft for size 40.
- Minimum machining diameter for d1 is 0.1 mm. The above figure shows the CRB2 series.

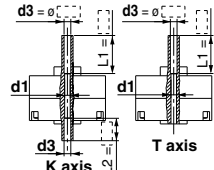


| Size      | CRB2         |   | CRBU2        |   |
|-----------|--------------|---|--------------|---|
|           | S            | Y | S            | Y |
|           | <b>d1</b>    |   |              |   |
| <b>15</b> | ø2.5         |   | ø2.5         |   |
| <b>20</b> | ø2.5 to ø3.5 |   | ø2.5 to ø3.5 |   |
| <b>30</b> | ø2.5 to ø4   |   | ø2.5 to ø4   |   |
| <b>40</b> | ø2.5 to ø3   |   | ø2.5 to ø5   |   |

### Symbol: A40

Applicable to single vane type only.  
Shaft with through-hole (Additional machining of K, T shaft)

- Applicable shaft type: K, T
- Equal dimensions are indicated by the same marker.
- Not available for size 10
- d1 = ø2.5, L1 = 18 (max.) for size 15; minimum machining diameter for d1 is 0.1 mm.
- d1 = d3 for size 20 to 40



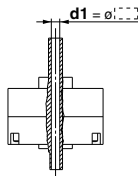
The above figure shows the CRB2 series.

| Size      | CRB2, CRBU2 |   | CRBU2        |   |
|-----------|-------------|---|--------------|---|
|           | K           | T | K            | T |
|           | <b>d1</b>   |   | <b>d3</b>    |   |
| <b>15</b> | ø2.5        |   | ø2.5 to ø3   |   |
| <b>20</b> | —           |   | ø2.5 to ø4   |   |
| <b>30</b> | —           |   | ø2.5 to ø4.5 |   |
| <b>40</b> | —           |   | ø2.5 to ø5   |   |

### Symbol: A41

Applicable to single vane type only.  
Shaft with through-hole

- Not available for size 10
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



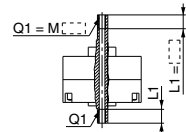
The above figure shows the CRB2 series.

| Size      | [mm]         |    |
|-----------|--------------|----|
|           | CRB2, CRBU2  | d1 |
| <b>15</b> | ø2.5         |    |
| <b>20</b> | ø2.5 to ø3.5 |    |
| <b>30</b> | ø2.5 to ø4   |    |
| <b>40</b> | ø2.5 to ø4.5 |    |

### Symbol: A42

Applicable to single vane type only.  
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm. However, for M5 on the short shaft of S shaft: L1 max. = 7.5 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: S, Y
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

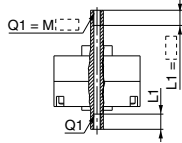
| Thread   | CRB2, CRBU2        |      |      |      |      |
|----------|--------------------|------|------|------|------|
|          | 15                 | 20   | 30   | 30   | 40   |
|          | <b>S Y S Y S Y</b> |      |      |      |      |
| M3 x 0.5 | ø2.5               | ø2.5 | ø2.5 | ø2.5 | ø2.5 |
| M4 x 0.7 | —                  | ø3.3 | ø3.3 | —    | —    |
| M5 x 0.8 | —                  | —    | ø4.2 | —    | —    |

**Double Shaft**

**Symbol: A43**

Applicable to single vane type only. A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm
- However, for M5 on the short shaft of T shaft: L1 max. = 7.5 mm
- Applicable shaft type: K, T
- Equal dimensions are indicated by the same marker.



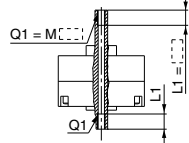
The above figure shows the CRB2 series.

| Thread   | CRB2, CRBU2 [mm] |      |      |      |    |    |    |    |
|----------|------------------|------|------|------|----|----|----|----|
|          | 15               | 20   | 30   | 40   | 15 | 20 | 30 | 40 |
| M3 x 0.5 | ø2.5             | ø2.5 | ø2.5 | ø2.5 | —  | —  | —  | —  |
| M4 x 0.7 | —                | ø3.3 | ø3.3 | ø3.3 | —  | —  | —  | —  |
| M5 x 0.8 | —                | —    | ø4.2 | ø4.2 | —  | —  | —  | —  |

**Symbol: A44**

Applicable to single vane type only. A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



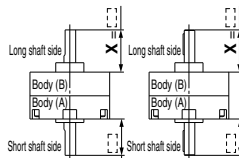
The above figure shows the CRB2 series.

| Thread   | CRB2, CRBU2 [mm] |      |      |      |    |    |    |    |
|----------|------------------|------|------|------|----|----|----|----|
|          | 15               | 20   | 30   | 40   | 15 | 20 | 30 | 40 |
| M3 x 0.5 | ø2.5             | ø2.5 | ø2.5 | ø2.5 | —  | —  | —  | —  |
| M4 x 0.7 | —                | ø3.3 | ø3.3 | ø3.3 | —  | —  | —  | —  |
| M5 x 0.8 | —                | —    | ø4.2 | ø4.2 | —  | —  | —  | —  |

**Symbol: A50**

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: Y



Size: 10 to 30      Size: 40

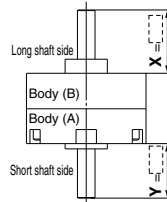
The above figure shows the CRB2 series. [mm]

| Size | CRB2      |           | CRBU2     |           |
|------|-----------|-----------|-----------|-----------|
|      | X         | Y         | X         | Y         |
| 10   | 3 to 14   | 1 to 14   | 1 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 | 1.5 to 18 | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 | 1.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   | 2 to 22   | 2 to 22   |
| 40   | 18 to 30  | 18 to 30  | 18 to 30  | 18 to 30  |

**Symbol: A53**

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: K



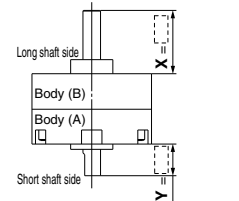
The above figure shows the CRB2 series. [mm]

| Size | CRB2      |           | CRBU2     |           |
|------|-----------|-----------|-----------|-----------|
|      | X         | Y         | X         | Y         |
| 10   | 3 to 14   | 1 to 14   | 1 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 | 1.5 to 18 | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 | 1.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   | 2 to 22   | 2 to 22   |
| 40   | 6.5 to 30 | 4.5 to 30 | 3 to 30   | 4.5 to 30 |

**Symbol: A57**

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: J



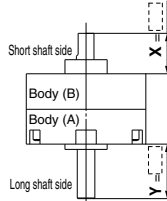
The above figure shows the CRB2 series. [mm]

| Size | CRB2      |           | CRBU2     |           |
|------|-----------|-----------|-----------|-----------|
|      | X         | Y         | X         | Y         |
| 10   | 3 to 14   | 1 to 14   | 1 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 | 1.5 to 18 | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 | 1.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   | 2 to 22   | 2 to 22   |
| 40   | 6.5 to 30 | 4.5 to 30 | 3 to 30   | 3 to 30   |

**Symbol: A58**

The shafts are reversed. Additionally, both the long shaft and the short shaft are shortened. (If shortening the shaft is not required, indicate "—" for dimension X, Y.)

- Applicable shaft type: J
- Dimensions inside ( ) are for double vane type of size 10.



The above figure shows the CRB2 series. [mm]

| Size | CRB2         |             | CRBU2       |              |
|------|--------------|-------------|-------------|--------------|
|      | X            | Y           | X           | Y            |
| 10   | 3 to 10 (19) | 1 to 12 (3) | 1 to 3 (12) | 1 to 19 (10) |
| 15   | 4 to 11.5    | 1.5 to 15.5 | 1.5 to 6.5  | 1.5 to 20.5  |
| 20   | 4.5 to 13    | 1.5 to 17   | 1.5 to 7.5  | 1.5 to 22.5  |
| 30   | 5 to 16      | 2 to 19     | 2 to 8.5    | 2 to 26.5    |
| 40   | 6.5 to 17    | 4.5 to 28   | 3 to 9      | 4.5 to 36    |

CRB□2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

# CRB2/CRBU2 Series (Size: 10, 15, 20, 30, 40)

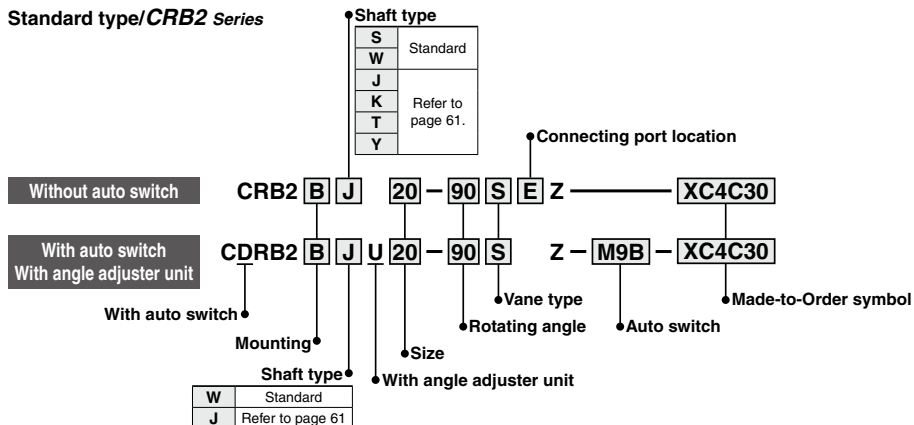
## Made to Order

### -XC1, 2, 3, 4, 5, 6, 7, 30, X5

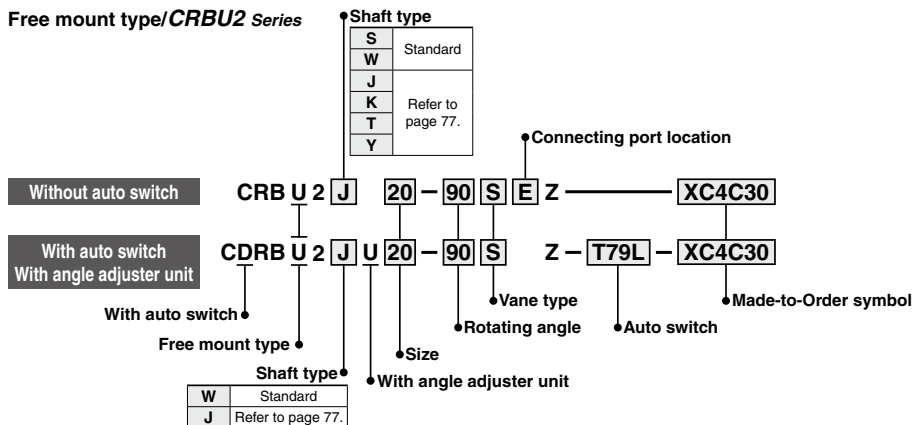
Symbol

**-XC1 to -XC7, -XC30, X5**

#### Standard type/CRB2 Series



#### Free mount type/CRBU2 Series



#### Made to Order Symbol

| Symbol | Description                             | Applicable shaft type<br>W, J, K, S, T, Y | Applicable size    |
|--------|---|---|--------------------|
| XC1*   | Add connecting ports                    | ●   | 10, 15, 20, 30, 40 |
| XC2*   | Change threaded holes to through-holes  | ●   | 15, 20, 30, 40     |
| XC3*   | Change the screw position               | ●   | 10, 15, 20, 30, 40 |
| XC4    | Change the rotation range               | ●   |                    |
| XC5*   | Change rotation range between 0 to 200° | ●   |                    |
| XC6*   | Change rotation range between 0 to 110° | ●   |                    |
| XC7*   | Reversed shaft                          | W, J                                      |                    |
| XC30   | Fluorine grease                         | ●   |                    |
| X5**   | For M5 port (90°/180°)                  | ●   |                    |

\* These specifications are not available for rotary actuators with auto switch and/or angle adjuster unit.

\*\* Only the shaft type W or J can select "with auto switch" and/or "with angle adjuster unit".

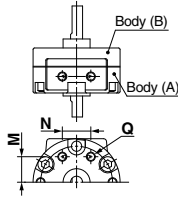
#### Combination

| Symbol | Combination |     |   |   |   |   |   |
|--------|-------------|-----|---|---|---|---|---|
| XC1    | ●           | XC2 |   |   |   |   |   |
| XC2    | ●           |     | ● |   |   |   |   |
| XC3    | ●           |     |   | ● |   |   |   |
| XC4    | ●           |     |   |   | ● |   |   |
| XC5    | ●           |     |   |   |   | ● |   |
| XC6    | ●           |     |   |   |   |   | ● |
| XC7    | ●           |     |   |   |   |   |   |
| XC30   | ●           | ●   | ● | ● | ● | ● | ● |
| X5     | ●           | ●   | ● | ● | ● | ● | ● |

**Symbol: C1**

The connecting ports are added on the Body (A) end surface. (It will have an aluminum surface since the additional machining will be left unfinished.)

- A parallel key is used instead of chamfer on the long shaft for size 40.
- Not available for the rotary actuator with auto switch

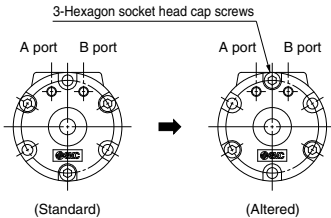


The above figure shows the CRB2 series.

| Size | CRB2, CRBU2 |      |     |
|------|-------------|------|-----|
|      | Q           | M    | N   |
| 10   | M3          | 8.5  | 9.5 |
| 15   | M3          | 11   | 10  |
| 20   | M5          | 14   | 13  |
| 30   | M5          | 15.5 | 14  |
| 40   | M5          | 21   | 20  |

**Symbol: C3**

The position of the screws for tightening the actuator body is changed.

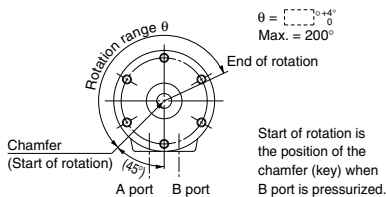


The above figure shows the CRB2 series. (Viewed from the short shaft side)

**Symbol: C5**

Applicable to single vane type only. Start of rotation is 45° up from the bottom of the vertical line to the left side.

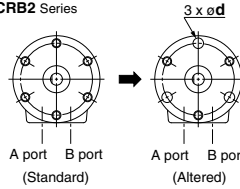
- Rotation tolerance for CRB2BW10 is  $\pm 5^\circ$
- Port size for CRB2BW10, 15 is M3.
- A parallel key is used instead of chamfer for size 40.



The above figure shows the CRB2 series. (Viewed from the long shaft side)

**Symbol: C2**

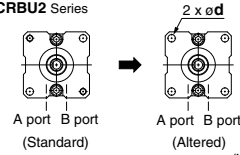
**CRB2 Series**



The threaded holes on the Body (B) are changed to through-holes. (It will have an aluminum surface since the additional machining will be left unfinished.)

- Not available for the rotary actuator with auto switch

**CRBU2 Series**

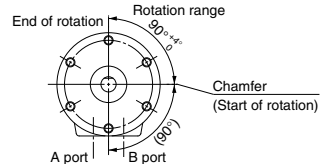


| Size | CRB2, CRBU2 |  |
|------|-------------|--|
|      | d [mm]      |  |
| 15   | 3.4         |  |
| 20   | 4.5         |  |
| 30   | 5.5         |  |
| 40   | 5.5         |  |

(Viewed from the long shaft side)

**Symbol: C4**

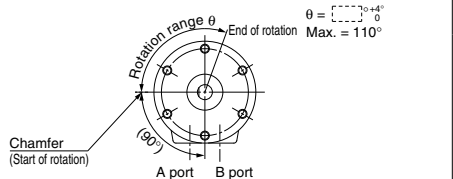
- Applicable to single vane type only.
- The rotation range is changed. Rotating angle 90°.
- Starts of rotation is the horizontal line (90° down from the top to the right side).
- Rotation tolerance for CRB2BW10 is  $\pm 5^\circ$
- A parallel key is used instead of chamfer on the long shaft for size 40.



Start of rotation is the position of the chamfer (key) when A port is pressurized. The above figure shows the CRB2 series. (Viewed from the long shaft side)

**Symbol: C6**

- Applicable to single vane type only.
- Start of rotation is horizontal line (90° down from the top to the left side).
- Rotation tolerance for CRB2BW10 is  $\pm 5^\circ$
- A parallel key is used instead of chamfer on the long shaft for size 40.



Start of rotation is the position of the chamfer (key) when B port is pressurized. The above figure shows the CRB2 series. (Viewed from the long shaft side)

CRB□2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

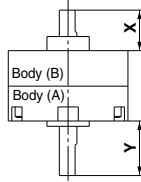
D-□

# CRB□2 Series

## Symbol: C7

The shafts are reversed.

- A parallel key is used instead of chamfer on the long shaft for size 40.
- Dimensions inside ( ) are for double vane type of size 10.



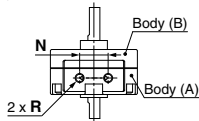
The above figure shows the CRB2 series.

| Size      | CRB2   |         | CRBU2   |        |
|-----------|--------|---------|---------|--------|
|           | Y      | X       | Y       | X      |
| <b>10</b> | 12 (3) | 10 (19) | 19 (10) | 3 (12) |
| <b>15</b> | 15.5   | 11.5    | 20.5    | 6.5    |
| <b>20</b> | 17     | 13      | 22.5    | 7.5    |
| <b>30</b> | 19     | 16      | 26.5    | 8.5    |
| <b>40</b> | 28     | 17      | 36      | 9      |

## Symbol: X5

Specifications with connection port size of sizes 10 and 15 changed to M5

- The rotating angle is only 90° and 180°.
- The vane type is compatible with single vanes only.
- Only the shaft type W or J can select "with auto switch" and/or "with angle adjuster unit".



The above figure shows the CRB2 series.

| Size      | CRB2, CRBU2 |    |
|-----------|-------------|----|
|           | N           | R  |
| <b>10</b> | 11.7        | M5 |
| <b>15</b> | 11.7        | M5 |

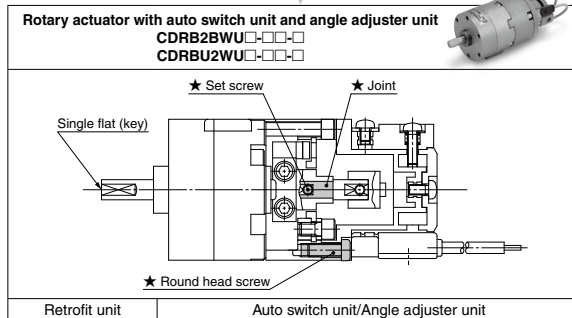
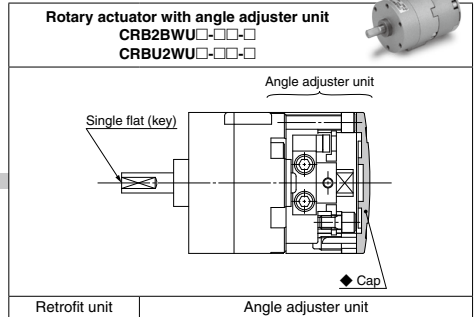
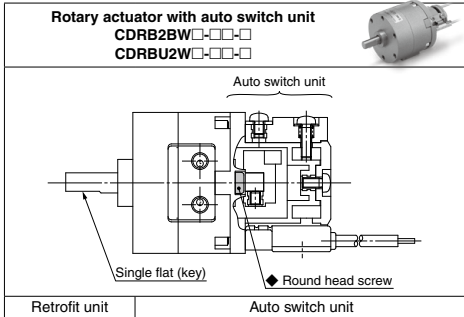
## Symbol: C30

The standard grease is changed to fluorine grease. (Not the low-speed specification)

# CRB□2 Series Component Unit

## Auto Switch Unit and Angle Adjuster Unit

**CRB2/CRBU2 Series** Auto switch unit and/or angle adjuster unit can be mounted on the rotary actuator vane type.



\* The rotary actuator with auto switch and angle adjuster is basically a combination of the auto switch unit and angle adjuster unit.  
The items marked with ★ are additional parts required for connection (joint unit parts), and the items marked with ◆ are unnecessary.

\* Use a unit part number when ordering joint unit separately.

Note) The figures show the CRB2 series.

### Unit Part Number for D-M9□

| Size | Auto switch unit part number <sup>1</sup> | Switch block unit part number<br>Common to right-hand and left-hand | Angle adjuster unit part number | Auto switch angle adjuster unit part number | Joint unit part number <sup>3</sup> |
|------|---|---|---------------------------------|---|-------------------------------------|
| 10   | P611070-1M                                | P811010-8M  | P811010-3                       | P811010-4M                                  | P211070-10                          |
| 15   | P611090-1M                                |   | P811020-3                       | P811020-4M                                  | P211090-10                          |
| 20   | P611060-1M                                | P811030-8M  | P811030-3                       | P811030-4M                                  | P211060-10                          |
| 30   | P611080-1M                                |   | P811040-3                       | P811040-4M                                  | P211080-10                          |
| 40   | P611010-1M                                | P811010-8M  | P811050-3                       | P811050-4M                                  | P211010-10                          |

### Unit Part Number Common to Series (Except D-M9□)

| Size | Auto switch unit part number <sup>1</sup> | Switch block unit part number <sup>2</sup> |           | Angle adjuster unit part number | Auto switch angle adjuster unit part number | Joint unit part number <sup>3</sup> |
|------|---|--|-----------|---------------------------------|---|-------------------------------------|
|      |   | Right-hand                                 | Left-hand |                                 |   |                                     |
| 10   | P611070-1                                 | P611070-8                                  | P611070-9 | P811010-3                       | P811010-4                                   | P211070-10                          |
| 15   | P611090-1                                 |  |           | P811020-3                       | P811020-4                                   | P211090-10                          |
| 20   | P611060-1                                 | P611060-8                                  | P811030-3 | P811030-4                       | P211060-10                                  |                                     |
| 30   | P611080-1                                 |  |           | P811040-3                       | P811040-4                                   | P211080-10                          |
| 40   | P611010-1                                 | P611010-8                                  | P611010-9 | P811050-3                       | P811050-4                                   | P211010-10                          |

\*1. An auto switch will not be included, please order it separately.

\*2. Auto switch unit comes with one right-hand and one left-hand switch blocks that are used for addition or when the switch block is damaged.

Since the solid state switch for size 10 and 15 requires no switch block, the unit part number will be the P211070-13.

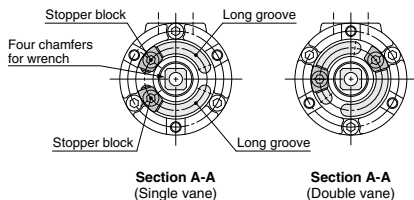
\*3. Joint unit is required to retrofit the angle adjuster unit to a rotary actuator with auto switch or to retrofit the auto switch unit to a rotary actuator with angle adjuster.



# CRB□2 Series Angle Adjustment Setting

## Rotating Angle Adjustment Method

Remove the resin cap in the illustrations below, slide the stopper block on the long groove and lock it into the appropriate position to adjust the rotating angle and rotating position. Protruding four chamfers for wrench on the output shaft that rotates allows manual operation and convenient positioning. (Refer to the rotating angle setting examples shown in the next page for details.)



Note) For size 40, each stopper block comes with 2 holding screws.

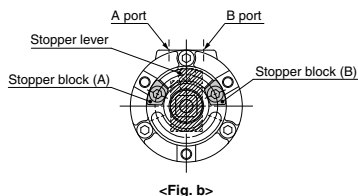
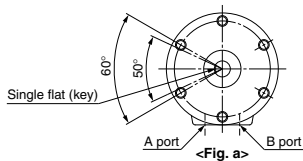
## Other Operating Method

Although one stopper block is mounted on each long groove for standard specifications as shown in the illustrations below, 2 stopper blocks can be mounted on one long groove.

Angle adjustment range when 2 stopper blocks are mounted on one long groove  
 Size: 10, 40 .....50°  
 Size: 15, 20, 30 .....60°

As shown in <Fig. b>, when mounting 2 stopper blocks on one long groove, by revolving each stopper block (A)(B), the rotation range of the output shaft with single flat (key) is adjustable, as described in <Fig. a>, within either left 50° or 60° against port A and B.

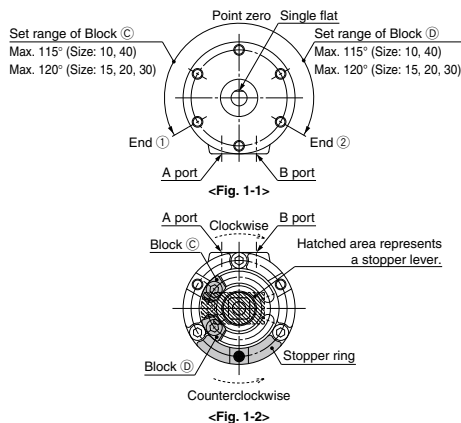
(Rotation range of single flat (key) when mounting 2 stopper blocks on the other side's groove is the opposite side from <Fig. a> and the setting range is within either right 50° or 60° against port A and B.)



\* These figures show the CRB2 series.

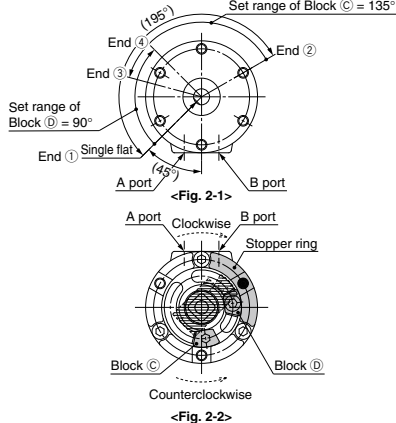
## Rotating Angle Setting Examples

**Example 1** The stopper ring is mounted on the standard position.  
(Rotary actuator with a rotating angle of 270° is used.)



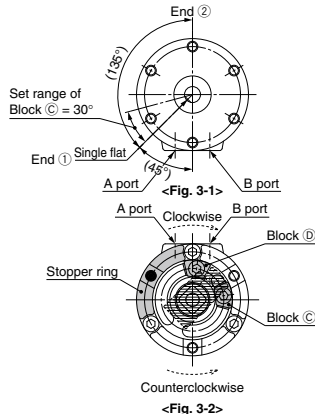
Lock Block D in Fig. 1-2, and move Block C clockwise to allow the rotation of the shaft with single flat in Fig. 1-1 from point zero to End 1. When Block C is locked and Block D is moved counterclockwise, the shaft with single flat in Fig. 1-1 rotates from point zero to End 2. The maximum rotation range of the shaft with single flat is as follows: Sizes 10, 40: up to 230°; Sizes 15, 20, 30: up to 240° (Fig. 1-2 shows when the rotating angle is 0°)

**Example 2** The stopper ring is mounted on 120° counterclockwise from the standard position shown in Fig. 1-2 of Example 1.



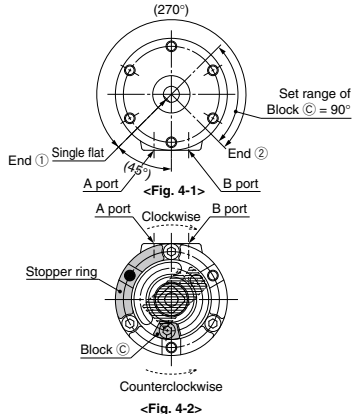
The maximum rotation range of the shaft with single flat in Fig. 2-2 is 195°, from End 1 to End 2. The rotation range of the shaft with single flat in Fig. 2-1 decreases to the range between End 2 and 3 when moving Block C in Fig. 2-2 clockwise, and similarly when moving Block D counterclockwise, the rotation range decreases to the range between End 1 and 4. However, since the internal stopper will come into contact with the vane at End 1 position of the shaft with single flat in Fig. 2-1, make sure that the stopper lever stops at Block D when adjusting.

**Example 3** The stopper ring is mounted on 120° clockwise from the standard position shown in Fig. 1-2 of Example 1 as in Fig. 4-2 of Example 4.



Lock Block C in Fig. 3-2 and move Block D counterclockwise to allow the rotation of the shaft with single flat in Fig. 3-1 from End 1 to End 2. However, since the internal stopper will come into contact with the vane at End 1 position of the shaft with single flat, make sure that the stopper lever stops at Block C when adjusting. End 1 side can be adjusted within 30° by moving Block C counterclockwise.

**Example 4** The stopper ring is mounted on 120° clockwise from the standard position shown in Fig. 1-2 of Example 1 as in Fig. 3-2 of Example 3.



The maximum rotation range of the shaft with single flat is 270°, from End 1 to End 2, when using the actuator for 270° and End 1 side in Fig. 4-1 is stopped using the internal stopper and End 2 side is adjusted using Block C. The rotation range can be adjusted within 90° in End 2 side. Note that Block C cannot be moved and set 90° or more counterclockwise from its position in Fig. 4-2 since the internal stopper will come into contact with the vane.

Note 1) Mounting of the stopper ring shown in Examples 2, 3, 4 are not applicable for size 10.

Note 2) ● marks in the illustrations above indicate the mounting position of the stopper ring.

Note 3) Select the appropriate rotation of the rotary actuator after careful consideration of the content of "Angle Adjustment Setting."

Note 4) For size 40, each block comes with 2 holding screws.

Note 5) These figures show the CRB2 series.

# CRB□2 Series Auto Switch Mounting

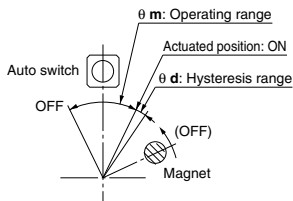
## Operating Range and Hysteresis

**\* Operating range:  $\theta m$**

The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the auto switch turns OFF as the magnet travels the same direction.

**\* Hysteresis range:  $\theta d$**

The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the auto switch turns OFF as the magnet travels the opposite direction.



**D-M9□**

| Size   | $\theta m$ : Operating range | $\theta d$ : Hysteresis range |
|--------|------------------------------|-------------------------------|
| 10, 15 | 170°                         | 20°                           |
| 20, 30 | 100°                         | 15°                           |
| 40     | 86°                          | 10°                           |

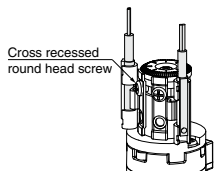
**D-S/T99(V)□, S9P(V), S/T79, S7P,  
D-97/93A, 90/90A, R73/80□**

| Size   | $\theta m$ : Operating range | $\theta d$ : Hysteresis range |
|--------|------------------------------|-------------------------------|
| 10, 15 | 110°                         | 10°                           |
| 20, 30 | 90°                          |                               |
| 40     | 52°                          | 8°                            |

Note) Since the figures in the above table are provided as a guideline only, they cannot be guaranteed. Adjust the auto switch after confirming the operating conditions in the actual setting.

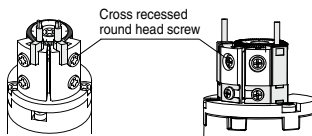
## How to Change the Auto Switch Detecting Position

\* When setting the detecting position, loosen the cross recessed round head screw a bit and move the auto switch to the preferred position and then tighten again and fix it. At this time, if tightened too much, screw can become damaged and unable to fix position. Proper tightening torque: 0.4 to 0.6 [N·m]  
When tightening the cross recessed round head screw, take care that the auto switch does not tilt.



Size: 10 to 40

D-M9□



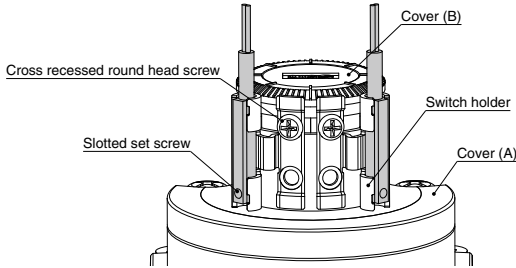
Size: 10, 15

D-S/T99(V)□, S9P(V), S/T79, S7P,  
D-97/93A, 90/90A, R73/80□

Size: 20 to 40

**Auto Switch Mounting: Size 10 to 40 (D-M9□)**

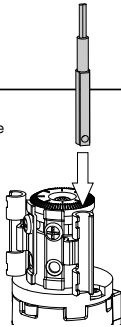
**External view and descriptions of auto switch unit**



**For CRB10, 15**

**1. Auto switch mounting**

Insert the auto switch into the groove of the switch holder.

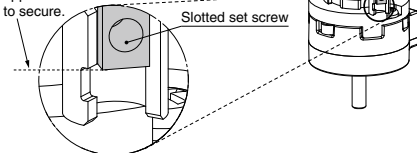


**2. Auto switch securing**

Align the auto switch with the upper surface of the groove on the side of the switch holder, and secure the slotted set screw. (Refer to the enlarged view.)

\* Proper tightening torque: 0.05 to 0.1 [N·m]

Align with the groove upper surface to secure.



**Enlarged view**

**3. Switch holder securing**

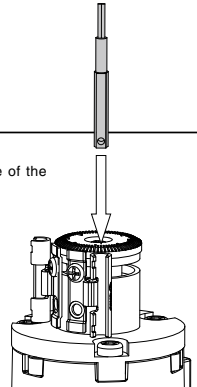
After the actuated position has been adjusted with the cross recessed round head screw, use the auto switch.

\* When tightening the screw, take care that the auto switch does not tilt.

**For CRB20 to 40**

**1. Auto switch mounting**

Insert the auto switch into the groove of the switch holder.

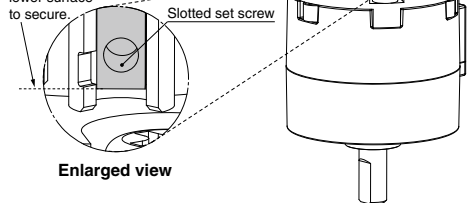


**2. Auto switch securing**

Align the auto switch with the lower surface of the groove on the side of the switch holder, and secure the slotted set screw. (Refer to the enlarged view.)

\* Proper tightening torque: 0.05 to 0.1 [N·m]

Align with the groove lower surface to secure.



**Enlarged view**

**3. Switch holder securing**

After the actuated position has been adjusted with the cross recessed round head screw, use the auto switch.

\* When tightening the screw, take care that the auto switch does not tilt.

CRB□2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

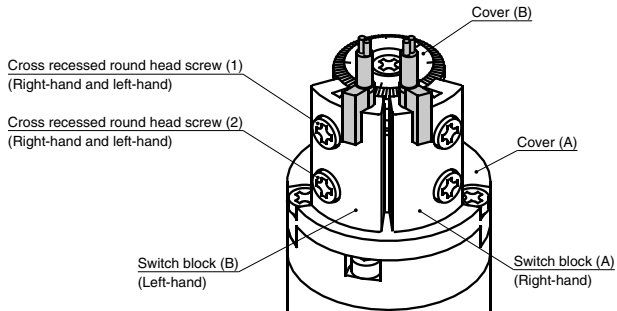
MRQ

D-□

## Auto Switch Mounting: Size 10, 15 (D-S/T99(V)□, S9P(V), 97/93A, 90/90A)

### External view and descriptions of auto switch unit

This following shows the external view and typical descriptions of the auto switch unit.



### Solid state auto switch

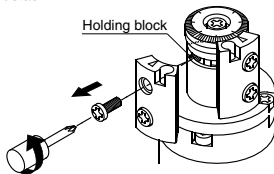
#### <Applicable auto switch>

3-wire type.....D-S99(V)□, S9P(V)□

2-wire type.....D-T99(V)□

#### 1. Switch block detaching

Remove the cross recessed round head screw (1) to detach the switch block.



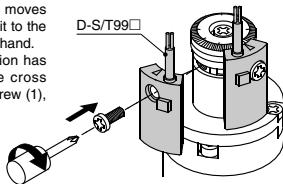
#### 2. Auto switch mounting

Secure the auto switch with the cross recessed round head screw (1) and holding block.

Proper tightening torque: 0.4 to 0.6 [N·m]

\* Since the holding block moves inside the groove, move it to the mounting position beforehand.

· After the actuated position has been adjusted with the cross recessed round head screw (1), use the auto switch.



### Reed auto switch

#### <Applicable auto switch>

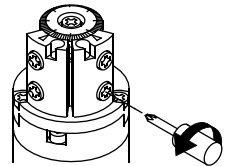
D-97/93A (With indicator light)

D-90/90A (Without indicator light)

#### 1. Preparations

Loosen the cross recessed round head screw (2) (About 2 to 3 turns).

\* This screw has been secured temporarily at shipment.

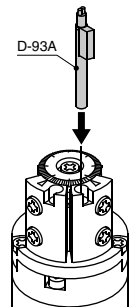


#### 2. Auto switch mounting

Insert the auto switch until it is in contact with the switch block hole.

\* For the D-97/93A model, insert the auto switch in the direction shown in the Fig. on the right.

\* Since the D-90/90A model is a round type, it has no directionality.

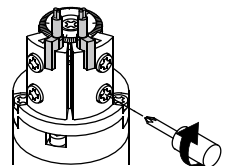


#### 3. Auto switch securing

Tighten the cross recessed round head screw (2) to secure the auto switch.

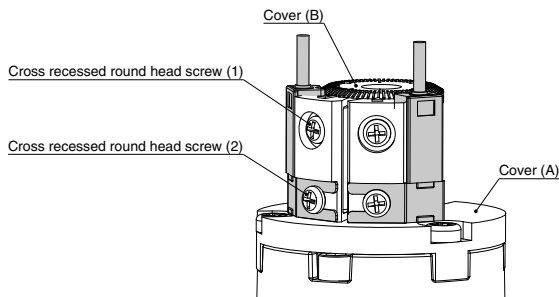
Proper tightening torque: 0.4 to 0.6 [N·m]

· After the actuated position has been adjusted with the cross recessed round head screw (1), use the auto switch.



**Auto Switch Mounting: Size 20 to 40 (D-S/T79□, S7P, R73/80□)**

**External view and descriptions of auto switch unit**



**Mounting Procedure**

**<Applicable auto switch>**

**Solid state auto switch**

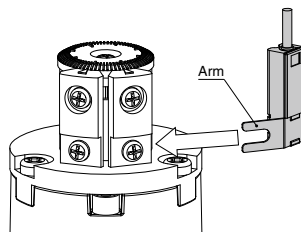
**D-S79, S7P  
D-T79, T79C**

**Reed auto switch**

**D-R73, R73C  
D-R80, R80C**

**1. Auto switch mounting**

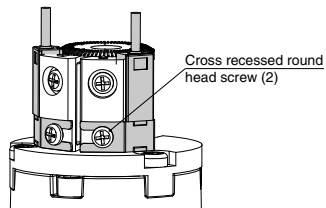
Loosen the cross recessed round head screw (2), and insert the arm of the auto switch.



**2. Auto switch securing**

Set the auto switch so that it is in contact with the switch block, and tighten the cross recessed round head screw (2).

\* Proper tightening torque: 0.4 to 0.6 [N·m]



**3. Switch holder securing**

After the actuated position has been adjusted with the cross recessed round head screw (1), use the auto switch.

\* Proper tightening torque: 0.4 to 0.6 [N·m]

CRB□2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

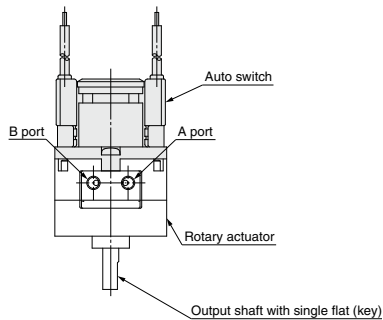
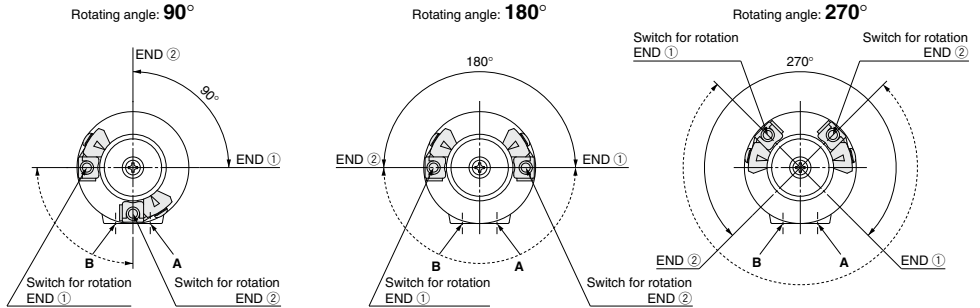
MRQ

D-□

## Auto Switch Adjustment

Rotation range of the output shaft with single flat (key for size 40 only) and auto switch mounting position  
 <Applicable models/Size: 10, 15, 20, 30, 40>

### <Single vane>



Size: 10 to 40

\* The above figure shows the CRB2 series.

- \* Solid-lined curves indicate the rotation range of the output shaft with single flat (key). When the single flat (key) is pointing to the END ① direction, the switch for rotation END ① will operate, and when the single flat (key) is pointing to the END ② direction, the switch for rotation END ② will operate.
- \* Broken-lined curves indicate the rotation range of the built-in magnet. Operating angle of the switch can be decreased by either moving the switch for rotation END ① clockwise or moving the switch for rotation END ② counterclockwise. Auto switch in the figures above is at the most sensitive position.
- \* Each auto switch unit comes with one right-hand and one left-hand switch.