

# Rotary Actuator/Vane Style

## Series CRB2

Size: 10, 15, 20, 30, 40

Basic style  
Series CRB2



With angle adjuster  
Series CRB2BWU



| Standard       | Fluid                                 |                                    | Air   |              |             |              |             |              |             |              |             |              |             |              |             |              |             |              |   |
|----------------|---------------------------------------|------------------------------------|---|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|---|
|                | Size                                  |                                    | 10  |              |             |              | 15          |              |             |              | 20,30       |              |             |              | 40          |              |             |              |   |
|                | Vane type                             | Single vane (S)<br>Double vane (D) | S   |              | D           |              | S           |              | D           |              | S           |              | D           |              | S           |              | D           |              |   |
| Port location  | Side ported (Nil)<br>Axial ported (E) |                                    | Side ported   | Axial ported | Side ported | Axial ported | Side ported | Axial ported | Side ported | Axial ported | Side ported | Axial ported | Side ported | Axial ported | Side ported | Axial ported | Side ported | Axial ported |   |
| Rotating angle | 90°                                   |                                    | ●   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                | 100°                                  |                                    |   |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |   |
|                | 180°                                  |                                    | ●   | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
|                | 270°                                  |                                    | ●   | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
| Shaft type     | Double shaft                          | W                                  |   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           |              |   |
| Cushion        | Rubber bumper                         |                                    | ●   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           |              |   |
| Variations     | Basic type                            |                                    | ●   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                | With auto switch                      |                                    | ●   | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
|                | With angle adjuster                   |                                    | ●   | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
|                | With auto switch and angle adjuster   |                                    | ●   | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
|                | Copper-free and fluorine-free         | 20-                                |   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           |              |   |
| Option         | Mounting style                        | With flange                        | F   |              | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           |              |   |
| Made to Order  | Shaft type                            | Double shaft type                  | Long shaft without single flat & Short shaft with single flat | J            |             | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                |                                       |                                    | Long shaft without keyway & Short shaft with single flat      |              |             | ●            | ●           |              |             | ●            | ●           |              |             | ●            | ●           |              |             | ●            | ● |
|                |                                       | Double shaft type                  | Same length double long shaft with single flat on both shafts | Y            |             | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ● |
|                |                                       |                                    | Double shaft key  | K            |             | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ● |
|                | Single shaft type                     | Double round shaft                 | K   |              | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                |                                       | Single flat                        | S   |              | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ● |
|                |                                       | Single shaft key                   | S   |              |             |              | ●           | ●            |             |              | ●           | ●            |             |              | ●           | ●            |             |              |   |
| Pattern        | Single round shaft                    | T                                  |   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                | Shaft pattern                         |                                    |   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |
|                | Rotation pattern                      |                                    |   | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            | ●           | ●            |   |

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

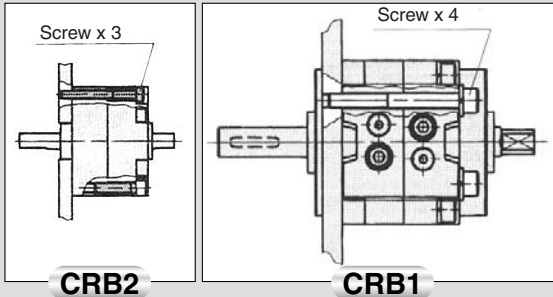
# Rotary Actua

## Rotating angle: 90°, 180°, 270° All series can rotate up to 270°.

The use of specially designed seals and stoppers now enables our compact vane type rotary actuators to rotate up to 270°. (Single vane type)

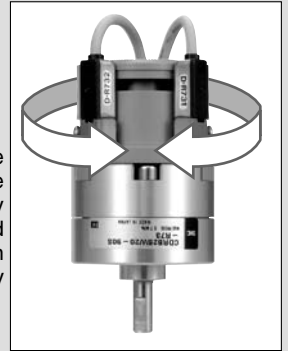
## Direct mounting

The body of rotary actuator can be mounted directly.  
\* Not possible to use direct mount type with units sized 10 to 40.



## Unrestricted auto switch mounting position

Since the switches can be moved anywhere along the circumference of rotary actuator, they can be mounted at the optimum position according to the rotary actuator's specifications.



## Direct mounting from 3 different directions is possible (CRBU2).

Series CRBU2 can be mounted in 3 directions: axial, vertical, and lateral. In the axial direction, there are 4 mounting variations.

## Excellent reliability and durability

Bearings are used in all series to support thrust and radial loads. The use of a rubber bumper (except size 10) further improves reliability.

## Two different connecting port locations (side and axial) are available.

The port location can be selected according to the application. (Types with various units sized 10 to 40 are body side face only.)

## Low pressure operation

Special seal construction allows for a broader operating pressure range and makes operation in low pressure applications possible.

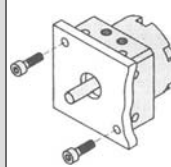
Min. operating pressure

Size 10: 0.2 MPa

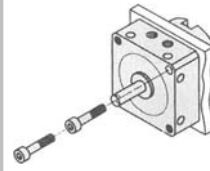
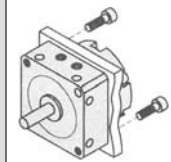
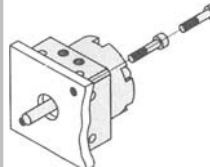
Size 15 to 100: 0.15 MPa

### Axial Mounting

#### Body tapped

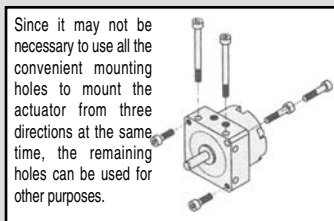
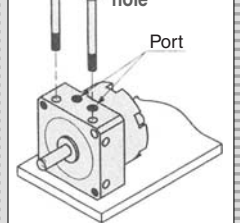


#### Body through-hole



### Vertical Mounting

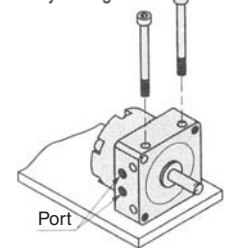
#### Body through-hole



Since it may not be necessary to use all the convenient mounting holes to mount the actuator from three directions at the same time, the remaining holes can be used for other purposes.

### Lateral Mounting

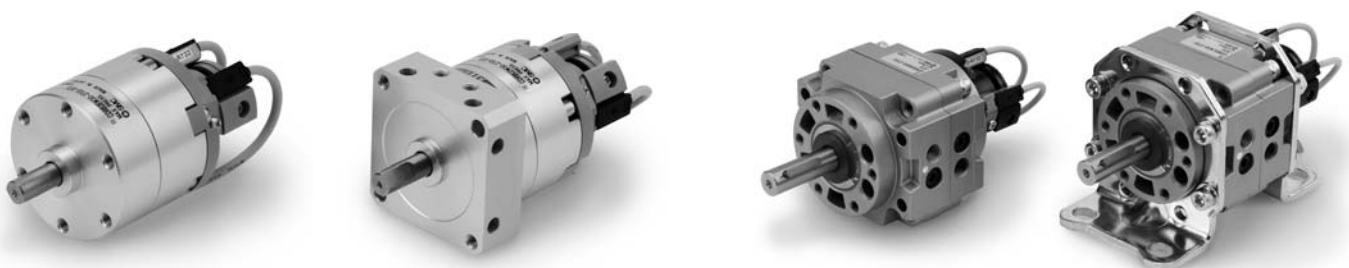
#### Body through-hole



## Block (Unit) type construction

For all series' rotary actuator's single body, various units for body outside diameter integral type can be easily retrofit.

### Basic Type + Switch Unit



# tor Vane Style



**CRB2/Size:**  
10, 15, 20, 30, 40



Free mount type  
**CRBU2/Size:**  
10, 15, 20, 30, 40



**CRB1/Size:**  
50, 63, 80, 100

Double vane construction is now a standard feature for 90° and 100° rotation type actuators.

Although the outside dimensions of the double vane construction actuators are equivalent to those of the single vane construction type (except for size 10). Double vane construction can get twice the torque of the single vane style.

| Model | Model       | Model |      |      |      |      |      |
|-------|-------------|-------|------|------|------|------|------|
|       |             | 90°   | 100° | 180° | 190° | 270° | 280° |
| CRB2  | Single vane | ●     |      | ●    |      | ●    |      |
|       | Double vane |       | ●    |      |      |      |      |
| CRBU2 | Single vane | ●     |      | ●    |      | ●    |      |
|       | Double vane | ●     | ●    |      |      |      |      |
| CRB1  | Single vane | ●     | ●    | ●    | ●    | ●    | ●    |
|       | Double vane | ●     | ●    |      |      |      |      |

- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

Basic Type + Angle Adjuster



Basic Type + Angle Adjuster + Switch Unit



D-□

# Rotary Actuator Vane Style

# Series *CRB2*

Size: 10, 15, 20, 30, 40

## How to Order

**Without auto switch**

**With auto switch  
Size: 10, 15**

**With auto switch  
Size: 20, 30, 40**

**With auto switch**  
(With auto switch unit and built-in magnet)  
\* Refer to page 141 when the auto switch unit is needed separately.

**CRB2** **B** **W** **□** **□** - **180** **S** **E** **□**

**CDRB2** **F** **W** **□** **□** - **180** **S** - **T99** **L** **□** **□**

**CDRB2** **B** **W** **□** **□** - **180** **S** - **T79** **L** **□** **□**

**Mounting style**

|          |              |
|----------|--------------|
| <b>B</b> | Basic style  |
| <b>F</b> | Flange style |

\* F: Except size 40

**Shaft type**

|          |  |
|----------|--|
| <b>W</b> | Double shaft with single flat (Size 10 to 30)          |
|          | Long shaft key, Short shaft with single flat (Size 40) |

**Pattern**

|            |                               |
|------------|-------------------------------|
| <b>Nil</b> | Standard                      |
| <b>P</b>   | Simple Specials/Made to Order |

\* For details, refer to pages 69 to 80.

**Size**

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

**Rotating angle**

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

**Vane type**

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

**Auto switch**

|            |                                       |
|------------|---------------------------------------|
| <b>Nil</b> | Without auto switch (built-in magnet) |
|------------|---------------------------------------|

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

**Connecting port location**

|            |              |
|------------|--------------|
| <b>Nil</b> | Side ported  |
| <b>E</b>   | Axial ported |

**Size**

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

**Made to Order**  
Refer to the table below for details.

**Number of auto switches**

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

\* S (1 auto switch) is shipped with a right-hand auto switch.  
\*\* Nil (2 auto switches) is shipped with a right-hand and a left-hand switch.

**Electrical entry/Lead wire length**

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

\* Connectors are available only for auto switch types R73, R80 and 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

## Applicable Auto Switches/Refer to pages 761 to 809 for further information on auto switches.

| Applicable size   | Type               | Electrical entry | Indicator/light | Wiring (Output) | Load voltage |         | Auto switch model | Lead wire type  | Lead wire length (m) * |                    |         |                 | Applicable load |            |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|-------------------|--------------------|------------------|-----------------|-----------------|--------------|---------|-------------------|-----------------|------------------------|--------------------|---------|-----------------|-----------------|------------|-----------|---------------|-----|-------------------|-----------------|---------|----|------------|------------|------------|------------|--------|-----|---|--------------|------|-----------|---|---|---|------------|------------|
|                   |                    |                  |                 |                 | DC           | AC      |                   |                 | 0.5 (Nil)              | 3 (L)              | 5 (Z)   | None (N)        |                 |            |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
| For 10 and 15     | Solid state switch | Grommet          | Yes             | 2-wire          | 24V          | 12V     | T99               | Heavy-duty cord | ●                      | ●                  | —       | —               | IC circuit      | Relay, PLC |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | T99V                   | ●                  | ●       | —               |                 |            | —         |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | S99                    | ●                  | ●       | —               |                 |            | —         |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | S99V                   | ●                  | ●       | —               |                 |            | —         |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | S9P                    | ●                  | ●       | —               |                 |            | —         |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | S9PV                   | ●                  | ●       | —               |                 |            | —         |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
| For 10 and 15     | Reed switch        | Grommet          | No              | 2-wire          | 24V          | 5V, 12V | 90                | Parallel cord   | ●                      | ●                  | ●       | —               | IC circuit      | Relay, PLC |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | 5V, 12V, 100V          | 5V, 12V, 24V, 100V | 90A     | Heavy-duty cord |                 |            | ●         | ●             | ●   | —                 |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | —                      | —                  | 97      | Parallel cord   |                 |            | ●         | ●             | ●   | —                 |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | —                      | 100V               | 93A     | Heavy-duty cord |                 |            | ●         | ●             | ●   | —                 |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | For 20, 30 and 40      | Solid state switch | Grommet | Yes             |                 |            | 2-wire    | 24V           | 12V | T79               | Heavy-duty cord | ●       | ●  | —          | —          | IC circuit | Relay, PLC |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     |                   |                 | T79C    | ●  | ●          | ●          |            |            | ●      |     |   |              |      |           |   |   |   |            |            |
| S79               | ●                  | ●                | —               | —               |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
| S7P               | ●                  | ●                | —               | —               |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      |           |   |   |   |            |            |
| For 20, 30 and 40 | Reed switch        | Grommet          | Yes             | 2-wire          | 24V          | —       | R73               | Heavy-duty cord |                        |                    |         |                 | ●               | ●          |           |               |     |                   |                 | —       | —  | IC circuit | Relay, PLC |            |            |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 |                        |                    |         |                 | Connector       | ●          |           |               |     |                   |                 | ●       | ●  |            |            |            |            | ●      |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | For 20, 30 and 40      | Reed switch        | Grommet | No              | 2-wire          | 24V        | 48V, 100V | 100 V or less | R80 | ●                 | ●               | —       | —  |            |            | IC circuit | Relay, PLC |        |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     | Connector         | ●               | ●       | ●  |            |            |            |            | ●      |     |   |              |      |           |   |   |   |            |            |
|                   |                    |                  |                 |                 |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     | For 20, 30 and 40 | Reed switch     | Grommet | No |            |            |            |            | 2-wire | 24V | — | 24 V or less | R80C | ●         | ● | ● | ● | IC circuit | Relay, PLC |
|                   |                    |                  |                 |                 |              |         |                   |                 |                        |                    |         |                 |                 |            |           |               |     |                   |                 |         |    |            |            |            |            |        |     |   |              |      | Connector | ● | ● | ● |            |            |

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

## Flange Assembly Part No.

(For details, refer to page 52.)

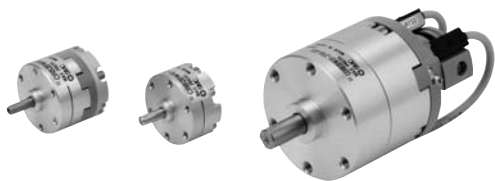
| Model    | Assembly part no. |
|----------|-------------------|
| CRB2FW10 | P211070-2         |
| CRB2FW15 | P211090-2         |
| CRB2FW20 | P211060-2         |
| CRB2FW30 | P211080-2         |

**Made to Order**  
(Refer to pages 69 to 73, 79 and 80 for details.)

| Symbol      | Specifications/Description               |
|-------------|--|
| XA1 to XA24 | Shaft type pattern                       |
| XC 1        | Add connection port                      |
| XC 2        | Change threaded hole to through-hole     |
| XC 3        | Change the screw position                |
| XC 4        | Change rotation range                    |
| XC 5        | Change rotation range between 0 and 200° |
| XC 6        | Change rotation range between 0 and 110° |
| XC 7        | Reversed shaft                           |
| XC30        | Fluorine grease                          |

The above may not be selected when the product comes with an auto switch or angle adjustment unit. Refer to pages 69, 70 and 79 for details.

## Single Vane Specifications



| Model (Size)  |                              | CRB2BW10-□S   | CRB2BW15-□S | CRB2BW20-□S | CRB2BW30-□S | CRB2BW40-□S                                  |
|---|------------------------------|---|-------------|-------------|-------------|--|
| <b>Vane type</b>  |                              | Single vane   |             |             |             |  |
| <b>Rotating angle</b>                                     |                              | 90°, 180°   | 270°        | 90°, 180°   | 270°        | 90°, 180°, 270°                              |
| <b>Fluid</b>  |                              | Air (Non-lube)  |             |             |             |  |
| <b>Proof pressure (MPa)</b>                               |                              | 1.05  |             |             | 1.5         |  |
| <b>Ambient and fluid temperature</b>                      |                              | 5 to 60°C   |             |             |             |  |
| <b>Max. operating pressure (MPa)</b>                      |                              | 0.7   |             |             | 1.0         |  |
| <b>Min. operating pressure (MPa)</b>                      |                              | 0.2   | 0.15        |             |             |  |
| <b>Rotation time adjustment range s/90°<sup>(1)</sup></b> |                              | 0.03 to 0.3   |             |             | 0.04 to 0.3 | 0.07 to 0.5                                  |
| <b>Allowable kinetic energy (J)<sup>(2)</sup></b>         |                              | 0.00015   | 0.001       | 0.003       | 0.02        | 0.04   |
|   |                              |   | 0.00025     | 0.0004      | 0.015       | 0.03   |
| <b>Shaft load (N)</b>                                     | <b>Allowable radial load</b> | 15  | 15          | 25          | 30          | 60   |
|   | <b>Allowable thrust load</b> | 10  | 10          | 20          | 25          | 40   |
| <b>Bearing type</b>                                       |                              | Bearing   |             |             |             |  |
| <b>Port location</b>                                      |                              | Side ported or Axial ported                                 |             |             |             |  |
| <b>Port size</b>  | <b>Side ported</b>           | M5 x 0.8  | M3 x 0.5    | M5 x 0.8    | M3 x 0.5    | M5 x 0.8                                     |
|   | <b>Axial ported</b>          | M3 x 0.5  |             |             | M5 x 0.8    |  |
| <b>Shaft type</b>   |                              | Double shaft (Double shaft with single flat on both shafts) |             |             |             | Double shaft (Long shaft flat & single flat) |
| <b>Angle adjustable range<sup>(3)</sup></b>               |                              | 0 to 230°   |             | 0 to 240°   |             | 0 to 230°                                    |
| <b>Mounting</b>   |                              | Basic style, Flange style                                   |             |             |             | Basic  |
| <b>Auto switch</b>  |                              | Mountable (Side ported only)                                |             |             |             |  |

Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 142.

## Double Vane Specifications

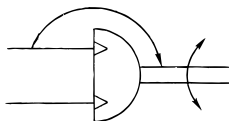
| Model (Size)  |                              | CRB2BW10-□D   | CRB2BW15-□D | CRB2BW20-□D | CRB2BW30-□D | CRB2BW40-□D |
|---|------------------------------|---|-------------|-------------|-------------|-------------|
| <b>Vane type</b>  |                              | Double vane   |             |             |             |             |
| <b>Rotating angle</b>                                     |                              | 90°, 100°   |             |             |             |             |
| <b>Fluid</b>  |                              | Air (Non-lube)  |             |             |             |             |
| <b>Proof pressure (MPa)</b>                               |                              | 1.05  |             |             | 1.5         |             |
| <b>Ambient and fluid temperature</b>                      |                              | 5 to 60°C   |             |             |             |             |
| <b>Max. operating pressure (MPa)</b>                      |                              | 0.7   |             |             | 1.0         |             |
| <b>Min. operating pressure (MPa)</b>                      |                              | 0.2   | 0.15        |             |             |             |
| <b>Rotation time adjustment range s/90°<sup>(1)</sup></b> |                              | 0.03 to 0.3   |             |             | 0.04 to 0.3 | 0.07 to 0.5 |
| <b>Allowable kinetic energy (J)</b>                       |                              | 0.0003  | 0.0012      | 0.0033      | 0.02        | 0.04        |
| <b>Shaft load (N)</b>                                     | <b>Allowable radial load</b> | 15  | 15          | 25          | 30          | 60          |
|   | <b>Allowable thrust load</b> | 10  | 10          | 20          | 25          | 40          |
| <b>Bearing type</b>                                       |                              | Bearing   |             |             |             |             |
| <b>Port location</b>                                      |                              | Side ported or Axial ported                                 |             |             |             |             |
| <b>Port size (Side ported, Axial ported)</b>              |                              | M3 x 0.5  |             |             | M5 x 0.8    |             |
| <b>Shaft type</b>   |                              | Double shaft (Double shaft with single flat on both shafts) |             |             |             |             |
| <b>Angle adjustable range<sup>(3)</sup></b>               |                              | 0 to 90°  |             |             |             |             |
| <b>Mounting</b>   |                              | Basic style, Flange style                                   |             |             |             | Basic style |
| <b>Auto switch</b>  |                              | Mountable (Side ported only)                                |             |             |             |             |

Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speed (0.3 sec/90°) can cause the unit to stick or not operate.

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 100°. For 90°, refer to page 142.

### JIS Symbol



## Volume

| Vane type | Single vane |      |             |             |             |             |             |             |             |             | Double vane |             |             |             |             |             |             |      |     |      |     |      |      |    |    |
|-----------|-------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|-----|------|-----|------|------|----|----|
|           | Model       |      | CRB2BW10-□S | CRB2BW15-□S | CRB2BW20-□S | CRB2BW30-□S | CRB2BW40-□S | CRB2BW10-□D | CRB2BW15-□D | CRB2BW20-□D | CRB2BW30-□D | CRB2BW40-□D | CRB2BW10-□D | CRB2BW15-□D | CRB2BW20-□D | CRB2BW30-□D | CRB2BW40-□D |      |     |      |     |      |      |    |    |
| Rotation  | 90°         | 180° | 270°        | 90°         | 180°        | 270°        | 90°         | 180°        | 270°        | 90°         | 180°        | 270°        | 90°         | 100°        | 90°         | 100°        | 90°         | 100° | 90° | 100° | 90° | 100° |      |    |    |
| Volume    | 1 (0.6)     | 1.2  | 1.5         | 1.5 (1.0)   | 2.9         | 3.7         | 4.8 (3.6)   | 6.1         | 7.9         | 11.3 (8.5)  | 15          | 20.2        | 25 (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.

## Mass

| Vane type                     | Single vane |      |             |             |             |             |             |             |             |             | Double vane |             |             |             |             |             |             |      |      |      |     |      |     |     |     |
|-------------------------------|-------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|------|------|-----|------|-----|-----|-----|
|                               | Model       |      | CRB2BW10-□S | CRB2BW15-□S | CRB2BW20-□S | CRB2BW30-□S | CRB2BW40-□S | CRB2BW10-□D | CRB2BW15-□D | CRB2BW20-□D | CRB2BW30-□D | CRB2BW40-□D | CRB2BW10-□D | CRB2BW15-□D | CRB2BW20-□D | CRB2BW30-□D | CRB2BW40-□D |      |      |      |     |      |     |     |     |
| Rotating angle                | 90°         | 180° | 270°        | 90°         | 180°        | 270°        | 90°         | 180°        | 270°        | 90°         | 180°        | 270°        | 90°         | 100°        | 90°         | 100°        | 90°         | 100° | 90°  | 100° | 90° | 100° |     |     |     |
| Body of rotary actuator       | 26.3        | 26.0 | 25.7        | 50          | 49          | 48          | 106         | 105         | 103         | 203         | 198         | 193         | 387         | 376         | 365         | 42          | 43          | 57   | 60   | 121  | 144 | 223  | 243 | 400 | 446 |
| Flange assembly               | 9           |      | 10          |             | 19          |             | 25          |             | —           |             | 9           |             | 10          |             | 19          |             | 25          |      | —    |      | —   |      | —   |     |     |
| Auto switch unit + 2 switches | 30          |      | 30          |             | 50          |             | 60          |             | 46.5        |             | 30          |             | 30          |             | 50          |             | 60          |      | 46.5 |      | —   |      | —   |     |     |
| Angle adjuster                | 30          |      | 47          |             | 90          |             | 150         |             | 203         |             | 30          |             | 47          |             | 90          |             | 150         |      | 203  |      | —   |      | —   |     |     |

**CRB2**  
**CRBU2**  
**CRB1**  
**MSU**  
**CRJ**  
**CRA1**  
**CRQ2**  
**MSQ**  
**MSZ**  
**CRQ2X**  
**MSQX**  
**MRQ**

**D-□**

# Series CRB2

## Rotary Actuator: Replaceable Shaft

A shaft can be replaced with a different shaft type except for standard shaft type (W).

Without auto switch CRB2B J P Size — Rotating angle Vane type Port location — Made to order

### Shaft type

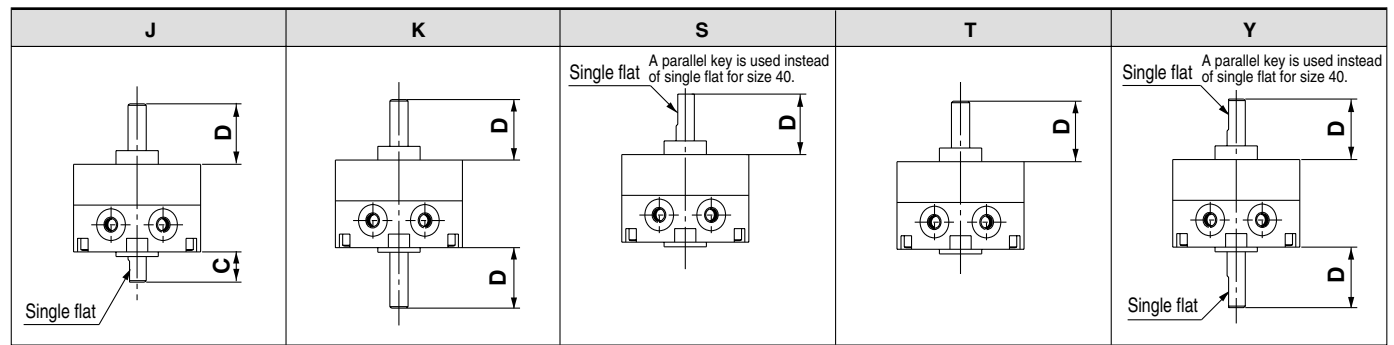
| Symbol | Shaft type   | Shaft-end shape                                   | Size |    |    |    |    |
|--------|--------------|---|------|----|----|----|----|
|        |              |   | 10   | 15 | 20 | 30 | 40 |
| J      | Double shaft | Long shaft without single flat & with single flat | ●    | ●  | ●  | ●  | ●  |
|        |              | Long shaft without keyway & with single flat      |      |    |    |    | ●  |
| K      | Double shaft | Double round shaft                                |      |    |    |    | ●  |
| S      | Single shaft | Single shaft with single flat                     | ●    | ●  | ●  | ●  | ●  |
|        |              | Single shaft key                                  |      |    |    |    | ●  |
| T      | Single shaft | Single round shaft                                | ●    | ●  | ●  | ●  | ●  |
| Y      | Double shaft | Double shaft with single flat                     | ●    | ●  | ●  | ●  | ●  |
|        |              | Double shaft key                                  |      |    |    |    | ●  |

| Pattern |                               |
|---------|-------------------------------|
| Nil     | Without Made to Order         |
| P       | Simple Specials/Made to Order |

### Made to order

| Symbol       | Description                              |
|--------------|--|
| XA31 to XA58 | Shaft type pattern                       |
| XC 1         | Add connection port                      |
| XC 2         | Change threaded hole to through-hole     |
| XC 3         | Change the screw position                |
| XC 4         | Change rotation range                    |
| XC 5         | Change rotation range between 0 and 200° |
| XC 6         | Change rotation range between 0 and 110° |
| XC 7         | Reversed shaft                           |
| XC30         | Fluorine grease                          |

For details, refer to pages 74 to 80.



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

Note ) Dimensions and tolerance of the shaft and single flat (a parallel key for size 40) are the same as the standard.

With auto switch With angle adjusted CDRB2B J U P Size — Rotating angle Vane type — Made to order

With auto switch

With angle adjuster

### Shaft type

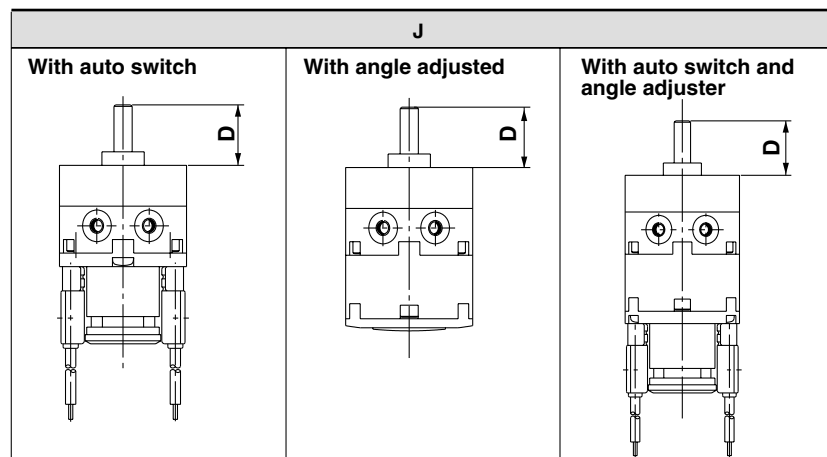
| Symbol | Shaft type   | Shaft-end shape                                   | Size |    |    |    |    |
|--------|--------------|---|------|----|----|----|----|
|        |              |   | 10   | 15 | 20 | 30 | 40 |
| J      | Double shaft | Long shaft without single flat & with single flat | ●    | ●  | ●  | ●  |    |
|        |              | Long shaft without keyway & with single flat      |      |    |    |    | ●  |

| Pattern |                               |
|---------|-------------------------------|
| Nil     | Without Made to Order         |
| P       | Simple Specials/Made to Order |

### Made to order

| Symbol       | Description                              |
|--------------|--|
| XA31 to XA58 | Shaft type pattern                       |
| XC 1         | Add connection port                      |
| XC 2         | Change threaded hole to through-hole     |
| XC 3         | Change the screw position                |
| XC 4         | Change rotation range                    |
| XC 5         | Change rotation range between 0 and 200° |
| XC 6         | Change rotation range between 0 and 110° |
| XC 7         | Reversed shaft                           |
| XC30         | Fluorine grease                          |

The above may not be selected when the product comes with an auto switch or angle adjustment unit. Refer to pages 74, 75 and 79 for details.



| Size | 10 | 15 | 20 | 30 | 40 |
|------|----|----|----|----|----|
| D    | 14 | 18 | 20 | 22 | 30 |

Note 1) Only side ports are available except for basic type.  
Note 2) Dimensions and tolerance of the shaft and single flat (a parallel key for size 40) are the same as the standard.

## Copper-free and Fluorine-free Rotary Actuator

20 – CRB2BW **P** **Size** – **Rotating angle** **Vane type** **Port location** – **Made to order**

● **Pattern**

|     |                               |
|-----|-------------------------------|
| Nil | Without Made to Order         |
| P   | Simple Specials/Made to Order |

● **Copper-free and fluorine-free**

Use the standard vane type rotary actuators in all series to prevent any adverse effects to CRTs due to copper ions or fluororesin.

● **Made to order**

| Symbol             | Description                              |
|--------------------|--|
| <b>XA1 to XA24</b> | Shaft type pattern                       |
| <b>XC 1</b>        | Add connection port                      |
| <b>XC 2</b>        | Change threaded hole to through-hole     |
| <b>XC 3</b>        | Change the screw position                |
| <b>XC 4</b>        | Change rotation range                    |
| <b>XC 5</b>        | Change rotation range between 0 and 200° |
| <b>XC 6</b>        | Change rotation range between 0 and 110° |
| <b>XC 7</b>        | Reversed shaft                           |

The above may not be selected when the product comes with an auto switch or angle adjustment unit. Refer to pages 69, 70 and 79 for details.

### Specifications

| Vane type                      | Single/Double vane                                 |             |             |             |    |
|--------------------------------|--|-------------|-------------|-------------|----|
|                                | 10   | 15          | 20          | 30          | 40 |
| Size                           | 10   | 15          | 20          | 30          | 40 |
| Operating pressure range (MPa) | 0.2 to 0.7   | 0.15 to 0.7 | 0.15 to 1.0 |             |    |
| Speed regulation range (s/90°) | 0.03 to 0.3  |             | 0.04 to 0.3 | 0.07 to 0.5 |    |
| Port location                  | Side ported or axial ported (Basic style only)     |             |             |             |    |
| Piping                         | Screw-in type                                      |             |             |             |    |
| Mounting                       | Basic style only                                   |             |             |             |    |
| Variations                     | Basic style, With auto switch, With angle adjuster |             |             |             |    |

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

### Precautions

Be sure to read before handling. Refer to front matters 38 and 39 for Safety Instructions and pages 4 to 13 for Rotary Actuator and Auto Switch Precautions.

### Angle Adjuster

### Caution

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

Refer to the table below.

| Rotating angle of the rotary actuator | Rotating angle adjustment range |
|---------------------------------------|---------------------------------|
| 270° <sup>+4</sup> / <sub>0</sub>     | 0° to 230° (Size: 10, 40) *1    |
|                                       | 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°                       |

\*1 The maximum adjustment angle of the angle adjuster for size 40 is 230°.

2. Connection ports are side ports only.
3. The allowable kinetic energy is the same as the specifications of the rotary actuator by itself (i.e., without angle adjuster).
4. Use a 100° rotary actuator if you desire to adjust the angle to 90° using a double vane type.

D-□

# Series CRB2

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



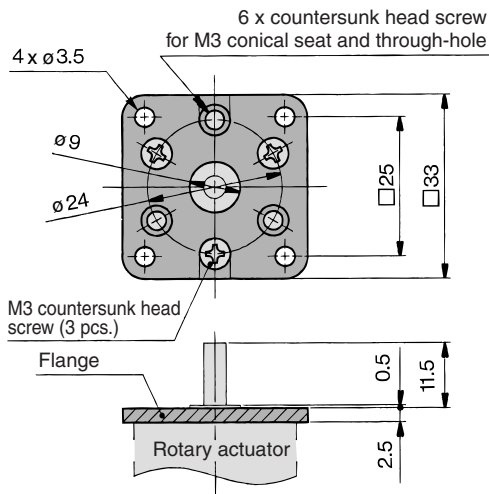
| Basic type      | Type             |                     |                                     | Flange assembly part no. |
|-----------------|------------------|---------------------|-------------------------------------|--------------------------|
|                 | With auto switch | With angle adjuster | With angle adjuster and auto switch |                          |
| <b>CRB2FW10</b> | CDRB2FW10        | CRB2FWU10           | CDRB2FWU10                          | P211070-2                |
| <b>CRB2FW15</b> | CDRB2FW15        | CRB2FWU15           | CDRB2FWU15                          | P211090-2                |
| <b>CRB2FW20</b> | CDRB2FW20        | CRB2FWU20           | CDRB2FWU20                          | P211060-2                |
| <b>CRB2FW30</b> | CDRB2FW30        | CRB2FWU30           | CDRB2FWU30                          | P211080-2                |



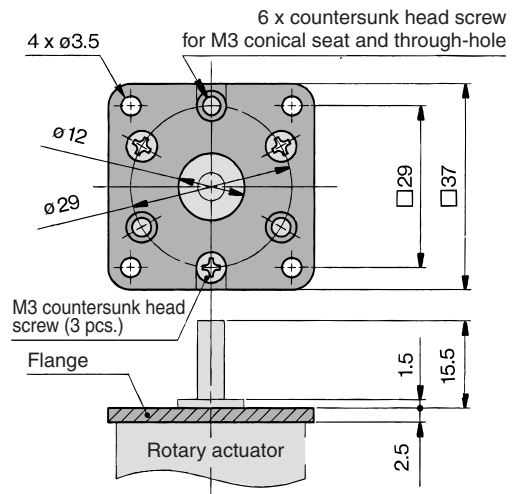
Note 1) The flange (with countersunk head screws) is not mounted on the actuator at the time of shipment.

Note 2) The flange can be mounted on the rotary actuator at 60-degree intervals.

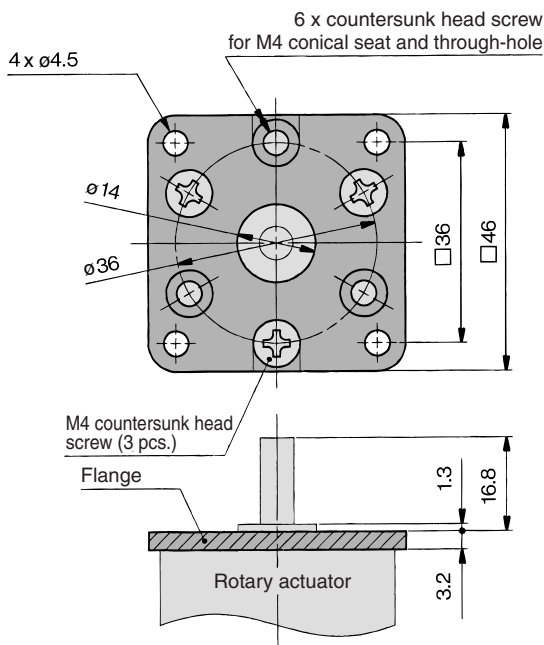
### Assembly Part No.: P211070-2 (for C□RB2FW□10)



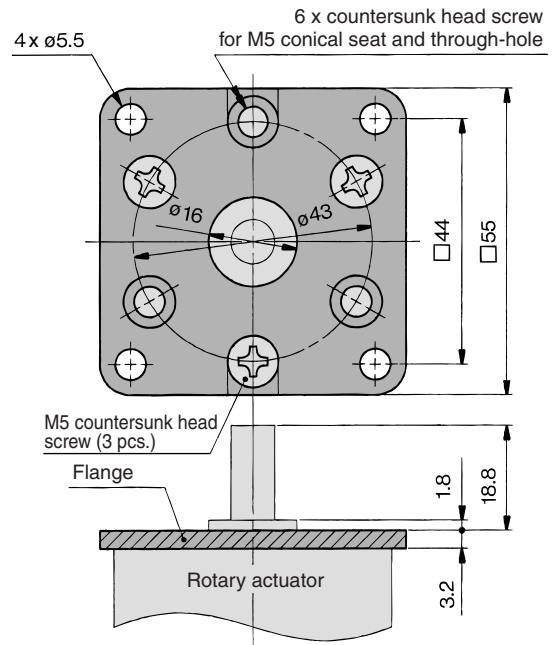
### Assembly Part No.: P211090-2 (for C□RB2FW□15)



### Assembly Part No.: P211060-2 (for C□RB2FW□20)



### Assembly Part No.: P211080-2 (for C□RB2FW□30)

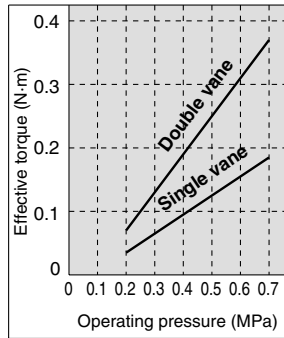




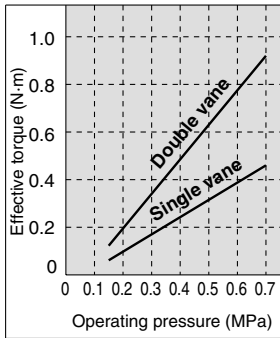
**Effective Output**

**Direct Mounting of Body**

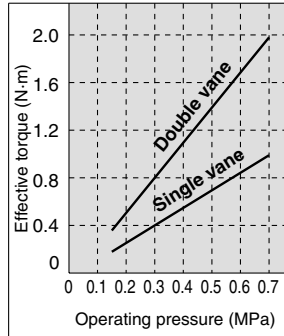
**CRB2BW10**



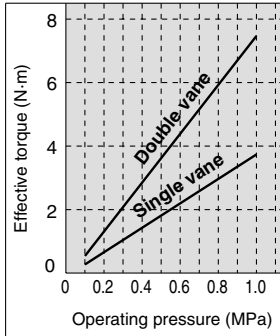
**CRB2BW15**



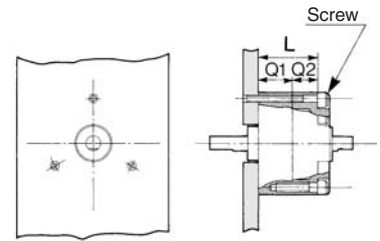
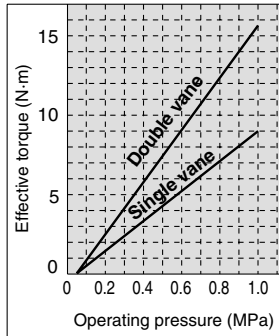
**CRB2BW20**



**CRB2BW30**



**CRB2BW40**



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.

| Model    | L      | Screw |
|----------|--------|-------|
| CRB2BW10 | 11.5 * | M2.5  |
| CRB2BW15 | 16     | M2.5  |
| CRB2BW20 | 24.5   | M3    |
| CRB2BW30 | 34.5   | M4    |
| CRB2BW40 | 39.5   | M4    |

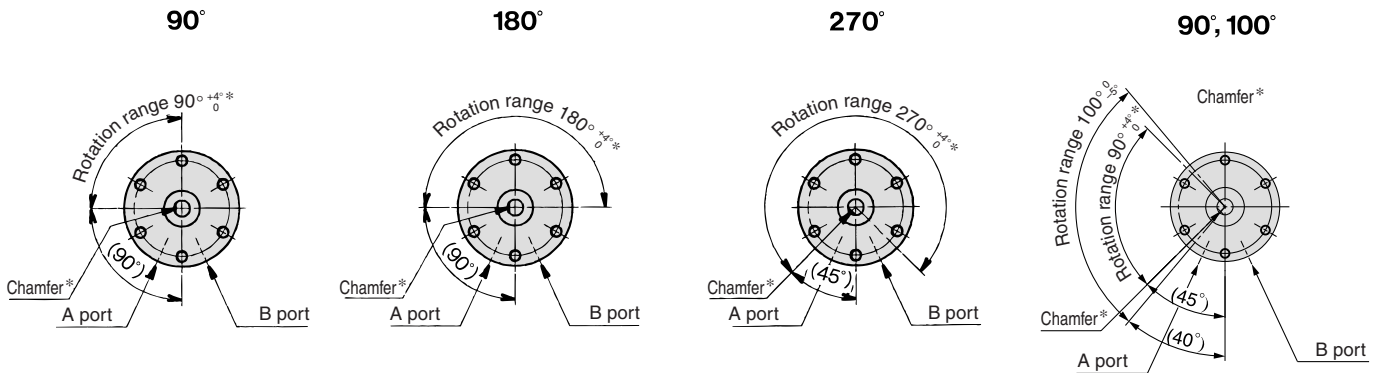
\* Only the size 10 actuators have different L dimensions for single and double vane.  
Double vane: L = 20.5  
\* Refer to page 56 for Q1 and Q2 dimensions.

**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 type**

**Double vane type**



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



Note 1) For single vane type, rotation tolerance of 90°, 180°, and 270° actuators will be  $^{+5}_{0}$  for size 10 actuators only.  
For double vane style, the tolerance of rotation angle of 90° will be  $^{+5}_{0}$  for size 10 only.  
Note 2) The chamfered position of the double vane type shows the 90° specification position.

- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

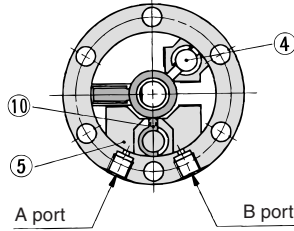
D-□

# Series CRB2

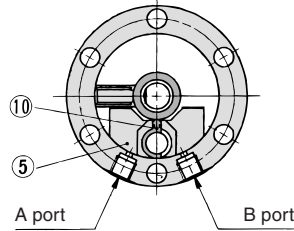
## Construction: 10, 15, 20, 30, 40

**Single vane type** • 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.

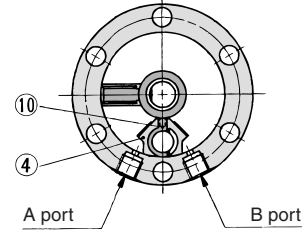
**For 90°**  
(Top view from long shaft side)



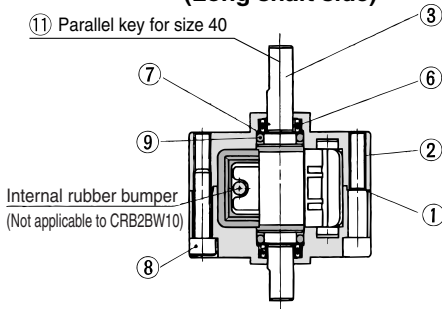
**For 180°**  
(Top view from long shaft side)



**For 270°**  
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

### Component Parts

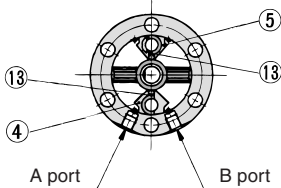
| No. | Description                   | Material                         | Note          |
|-----|-------------------------------|----------------------------------|---------------|
| 1   | Body (A)                      | Aluminum alloy                   | Anodized      |
| 2   | Body (B)                      | Aluminum alloy                   | Anodized      |
| 3   | Vane shaft                    | Stainless steel*                 |               |
| 4   | Stopper                       | Resin                            | For 270°      |
| 5   | Stopper                       | Resin                            | For 180°      |
| 6   | Bearing                       | High carbon chrome bearing steel |               |
| 7   | Back-up ring                  | Stainless steel                  |               |
| 8   | Hexagon socket head cap screw | Stainless steel                  | Special screw |
| 9   | O-ring                        | NBR                              |               |
| 10  | Stopper seal                  | NBR                              | Special seal  |
| 11  | Parallel key                  | Carbon steel                     | Size 40 only  |

\* Carbon steel for CRB2BW30 and CRB2BW40.

### Double vane type

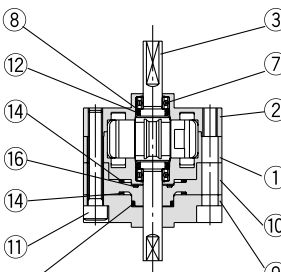
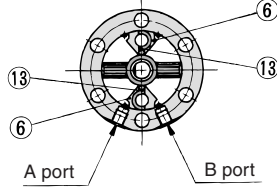
**CRB2BW10-□D**/Figures below show the intermediate rotation position when A or B port is pressurized.

**For 90°**  
(Top view from long shaft side)



(Long shaft side)

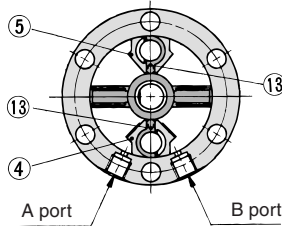
**For 100°**  
(Top view from long shaft side)



(Short shaft side)

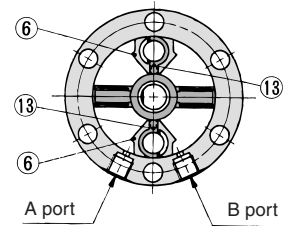
### CRB2BW15/20/30/40-□D

**For 90°**  
(Top view from long shaft side)

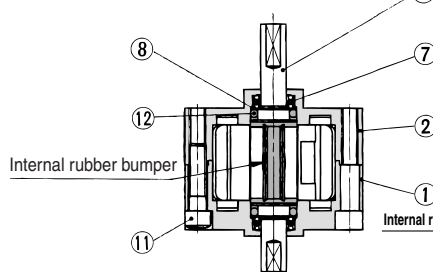


(Long shaft side)

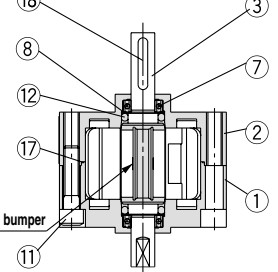
**For 100°**  
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)



(Short shaft side)  
For size 40

### Component Parts

| No. | Description  | Material                         | Note     |
|-----|--------------|----------------------------------|----------|
| 1   | Body (A)     | Aluminum alloy                   | Anodized |
| 2   | Body (B)     | Aluminum alloy                   | Anodized |
| 3   | Vane shaft   | Carbon steel                     |          |
| 4   | Stopper      | Stainless steel*                 |          |
| 5   | Stopper      | Resin                            |          |
| 6   | Stopper      | Stainless steel*                 |          |
| 7   | Bearing      | High carbon chrome bearing steel |          |
| 8   | Back-up ring | Stainless steel                  |          |
| 9   | Cover        | Aluminum alloy                   | Anodized |

\* For size 40, material for no. 4⑥ is die-cast aluminum.

### Component Parts

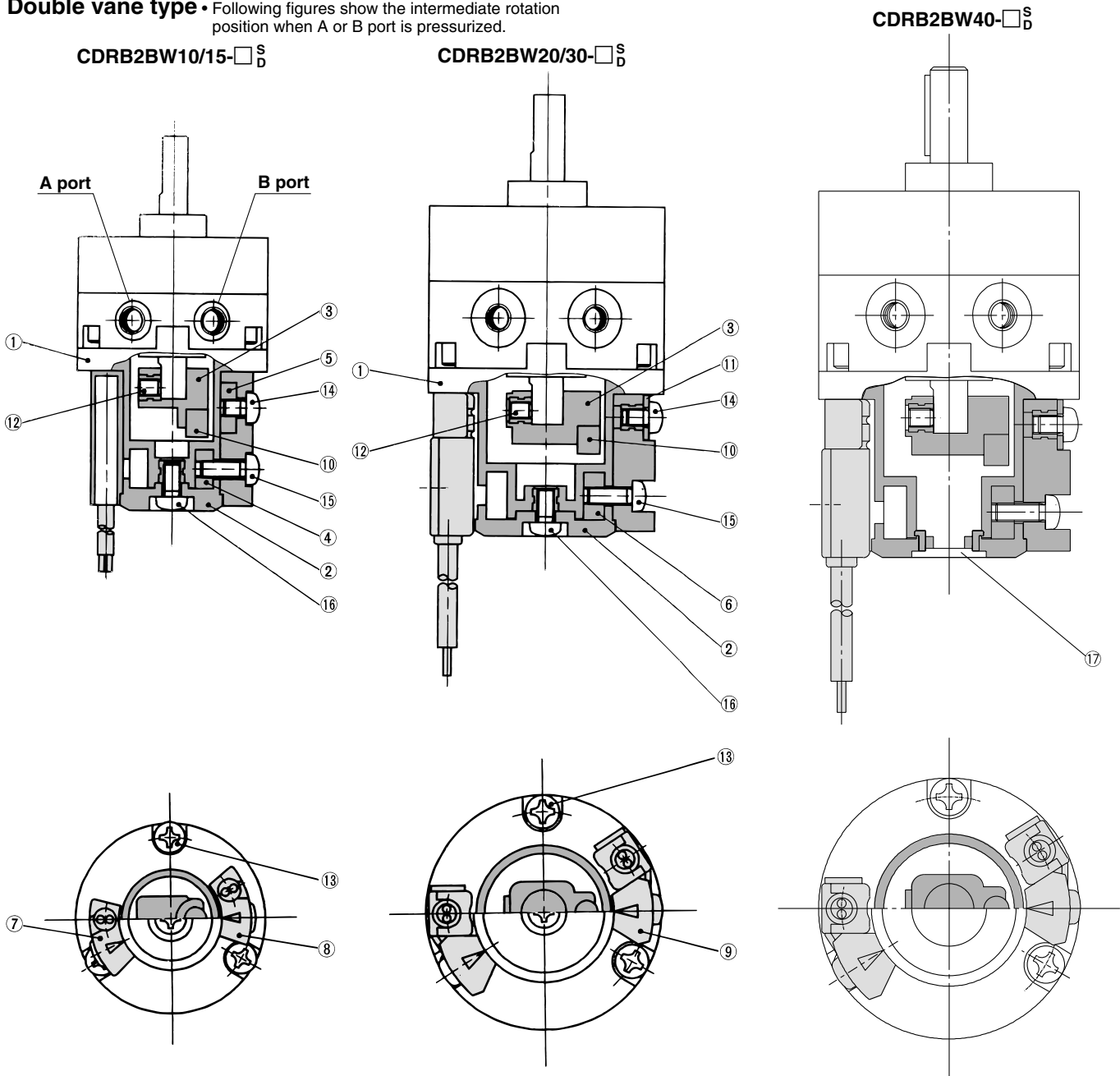
| No. | Description                   | Material        | Note             |
|-----|-------------------------------|-----------------|------------------|
| 10  | Plate                         | Resin           |                  |
| 11  | Hexagon socket head cap screw | Stainless steel | Special screw    |
| 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             | Double vane only |
| 18  | Parallel key                  | Carbon steel    | Size 40 only     |

## Construction (With auto switch unit)

**Single vane type** • Following figures show actuators for 90° and 180° when B port is pressurized.

(Same switch units are used for both single and double vane types.)

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



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

### Component Parts

| No. | Description       | Material       |
|-----|-------------------|----------------|
| 1   | Cover (A)         | Resin          |
| 2   | Cover (B)         | Resin          |
| 3   | Magnet lever      | Resin          |
| 4   | Holding block (A) | Aluminum alloy |
| 5   | Holding block (B) | Aluminum alloy |
| 6   | Holding block     | Aluminum alloy |
| 7   | Switch block (A)  | Resin          |
| 8   | Switch block (B)  | Resin          |
| 9   | Switch block      | Resin          |
| 10  | Magnet            | —              |

| No. | Description                   | Material        |
|-----|-------------------------------|-----------------|
| 11  | Arm                           | Stainless steel |
| 12  | Hexagon socket head set screw | Stainless steel |
| 13  | Round head Phillips screw     | Stainless steel |
| 14  | Round head Phillips screw     | Stainless steel |
| 15  | Round head Phillips screw     | Stainless steel |
| 16  | Round head Phillips screw     | Stainless steel |
| 17  | Rubber cap                    | NBR             |

\* For CDRB2BW10, 2 round head Phillips screws, ⑬, are required.

D-□

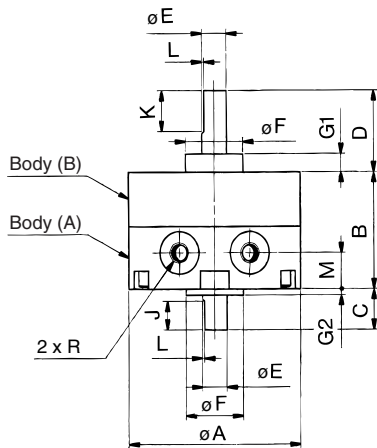
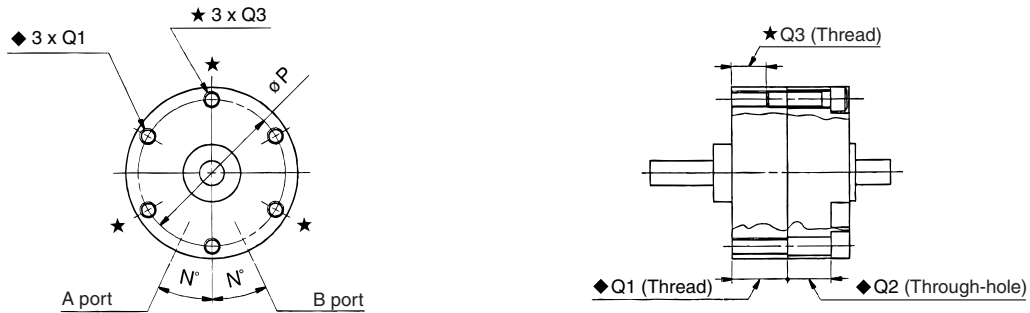
# Series CRB2

## Dimensions: 10, 15, 20, 30

**Single vane type** • Following figures show actuators for 90° and 180° when B port is pressurized.

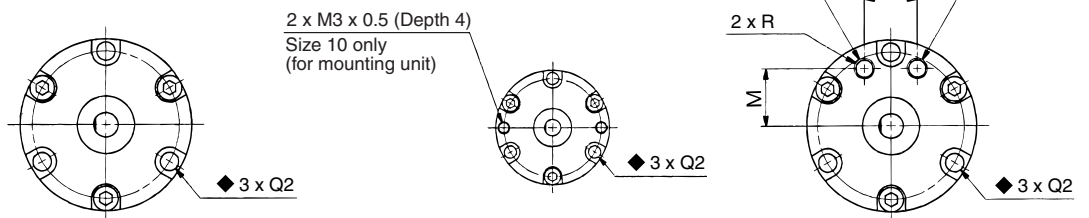
CRB2BW□-□S

<Port location: Side ported>



CRB2BW10-□S  
<Port location: Side ported>

CRB2BW□-□SE  
<Port location: Axial ported>



Note) Depths of Q1 and Q2 with the  $\blacklozenge$  mark indicate that the holes go through both bodies (A) and (B).

Note) The pre-drilled mounting threads for CRB2BW15, 20, and 30, 3 mounting holes depicted with the  $\star$  marks are for tightening the actuator and not to be used for external mounting.

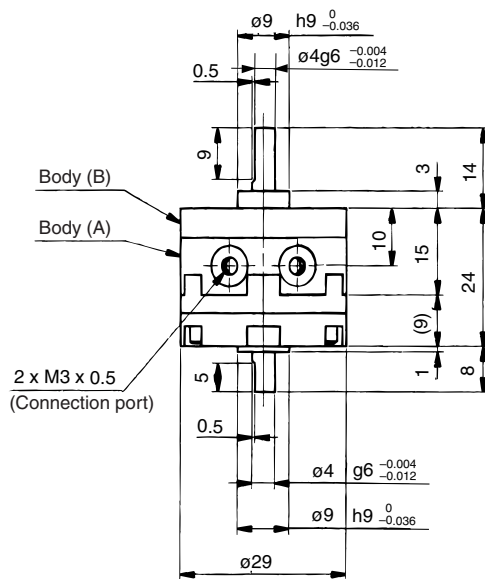
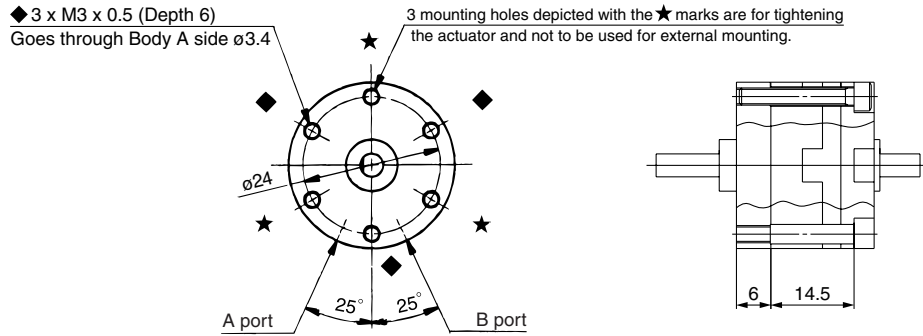
| Model        | A  | B  | C  | D  | E(g6)                                 | F(h9)                             | G1  | G2  | J | K  | L   | M    | N   | P  | Q (Depth) |        |       | R   |      |      |
|--------------|----|----|----|----|---------------------------------------|-----------------------------------|-----|-----|---|----|-----|------|-----|----|-----------|--------|-------|-----|------|------|
|              |    |    |    |    |                                       |                                   |     |     |   |    |     |      |     |    | ◆Q1       | ◆Q2    | ★Q3   | 90° | 180° | 270° |
| CRB2BW10-□S  | 29 | 15 | 8  | 14 | 4 <sup>-0.004</sup> <sub>-0.012</sub> | 9 <sup>0</sup> <sub>-0.036</sub>  | 3   | 1   | 5 | 9  | 0.5 | 5    | 25  | 24 | M3        | 3.4    | —     | M5  | M3   |      |
| CRB2BW10-□SE |    |    |    |    |                                       |                                   |     |     |   |    |     | 8.5  | 9.5 |    | (6)       | (5.5)  | M3    | M3  |      |      |
| CRB2BW15-□S  | 34 | 20 | 9  | 18 | 5 <sup>-0.004</sup> <sub>-0.012</sub> | 12 <sup>0</sup> <sub>-0.043</sub> | 4   | 1.5 | 6 | 10 | 0.5 | 5    | 25  | 29 | M3        | 3.4    | M3    | M5  | M3   |      |
| CRB2BW15-□SE |    |    |    |    |                                       |                                   |     |     |   |    |     | 11   | 10  |    | (6)       | (5)    | M3    | M3  |      |      |
| CRB2BW20-□S  | 42 | 29 | 10 | 20 | 6 <sup>-0.004</sup> <sub>-0.012</sub> | 14 <sup>0</sup> <sub>-0.043</sub> | 4.5 | 1.5 | 7 | 10 | 0.5 | 9    | 25  | 36 | M4        | 4.5    | M4    | M5  |      |      |
| CRB2BW20-□SE |    |    |    |    |                                       |                                   |     |     |   |    |     | 14   | 13  |    | (13.5)    | (11)   | (7.5) |     |      |      |
| CRB2BW30-□S  | 50 | 40 | 13 | 22 | 8 <sup>-0.005</sup> <sub>-0.014</sub> | 16 <sup>0</sup> <sub>-0.043</sub> | 5   | 2   | 8 | 12 | 1.0 | 10   | 25  | 43 | M5        | 5.5    | M5    | M5  |      |      |
| CRB2BW30-□SE |    |    |    |    |                                       |                                   |     |     |   |    |     | 15.5 | 14  |    | (18)      | (16.5) | (10)  |     |      |      |

**Dimensions: 10**

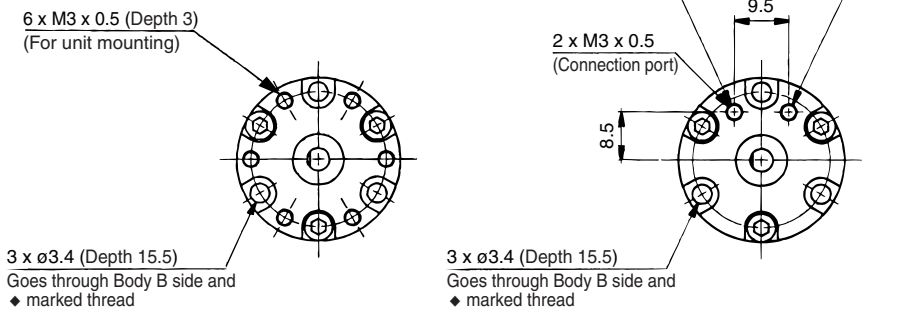
**Double vane type** • Following figures show the intermediate rotation position when A or B port is pressurized.

**CRB2BW10-□D**

<Port location: Side ported>



**CRB2BW10-□DE**  
<Port location: Axial ported>



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

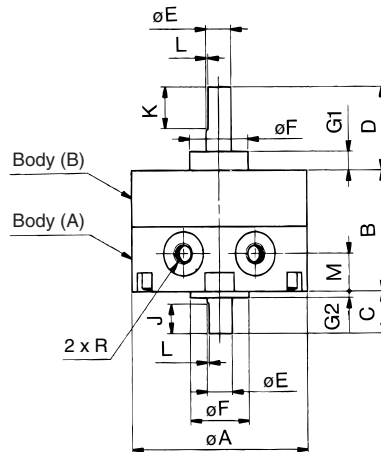
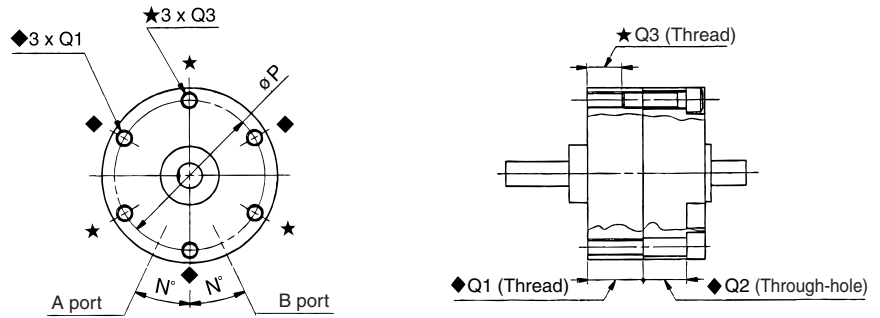
D-□

# Series CRB2

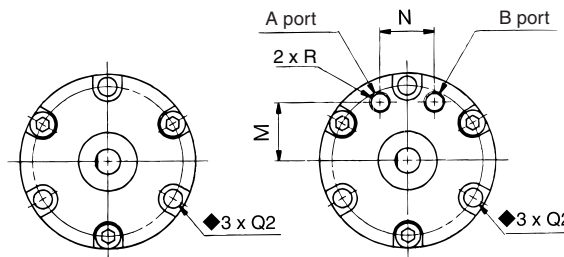
Dimensions: 15, 20, 30

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

**CRB2BW15/20/30-□D**  
 <Port location: Side ported>



**CRB2BW15/20/30-□DE**  
 <Port location: Axial ported>

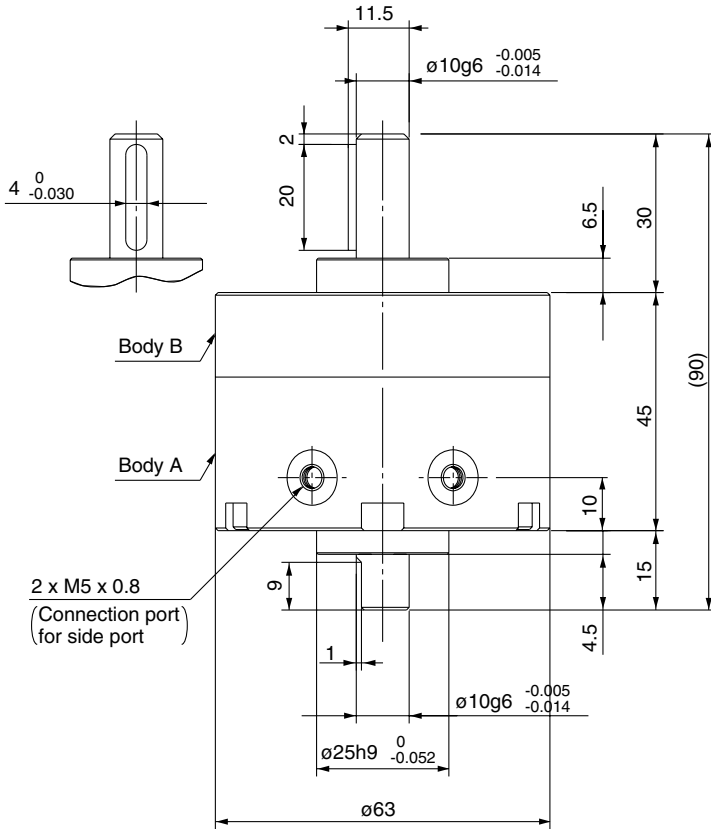
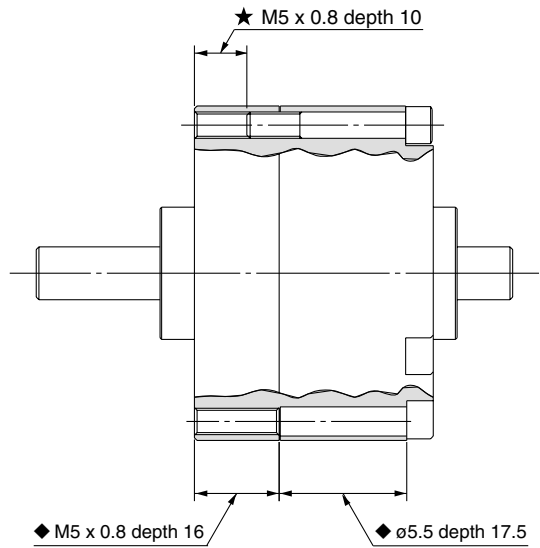
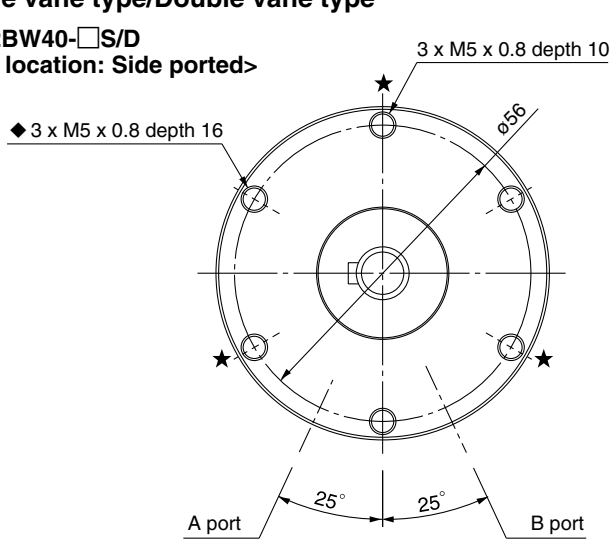


| Model        | A  | B  | C  | D  | E (g6)                                | F (h9)                            | G1  | G2  | J | K  | L   | M  | N      | P  | Q (Depth) |       |     | R   |      |
|--------------|----|----|----|----|---------------------------------------|-----------------------------------|-----|-----|---|----|-----|----|--------|----|-----------|-------|-----|-----|------|
|              |    |    |    |    |                                       |                                   |     |     |   |    |     |    |        |    | ◆Q1       | ◆Q2   | ★Q3 | 90° | 100° |
|              |    |    |    |    |                                       |                                   |     |     |   |    |     |    |        |    | mm        | mm    | mm  | mm  | mm   |
| CRB2BW15-□D  | 34 | 20 | 9  | 18 | 5 <sup>-0.004</sup> <sub>-0.012</sub> | 12 <sup>0</sup> <sub>-0.043</sub> | 4   | 1.5 | 6 | 10 | 0.5 | 5  | 25     | 29 | M3        | 3.4   | M3  | M3  |      |
| 11           |    |    |    |    |                                       |                                   |     |     |   |    |     | 10 | (6)    |    | (5)       |       |     |     |      |
| CRB2BW15-□DE | 42 | 29 | 10 | 20 | 6 <sup>-0.004</sup> <sub>-0.012</sub> | 14 <sup>0</sup> <sub>-0.043</sub> | 4.5 | 1.5 | 7 | 10 | 0.5 | 9  | 25     | 36 | M4        | 4.5   | M4  | M5  |      |
| 14           |    |    |    |    |                                       |                                   |     |     |   |    |     | 13 | (13.5) |    | (11)      | (7.5) |     |     |      |
| CRB2BW20-□D  | 50 | 40 | 13 | 22 | 8 <sup>-0.005</sup> <sub>-0.014</sub> | 16 <sup>0</sup> <sub>-0.043</sub> | 5   | 2   | 8 | 12 | 1.0 | 10 | 25     | 43 | M5        | 5.5   | M5  | M5  |      |
| 15.5         |    |    |    |    |                                       |                                   |     |     |   |    |     | 14 | (18)   |    | (16.5)    | (10)  |     |     |      |
| CRB2BW20-□DE | 50 | 40 | 13 | 22 | 8 <sup>-0.005</sup> <sub>-0.014</sub> | 16 <sup>0</sup> <sub>-0.043</sub> | 5   | 2   | 8 | 12 | 1.0 | 10 | 25     | 43 | M5        | 5.5   | M5  | M5  |      |
| 15.5         |    |    |    |    |                                       |                                   |     |     |   |    |     | 14 | (18)   |    | (16.5)    | (10)  |     |     |      |

**Dimensions: 40**

**Single vane type/Double vane type**

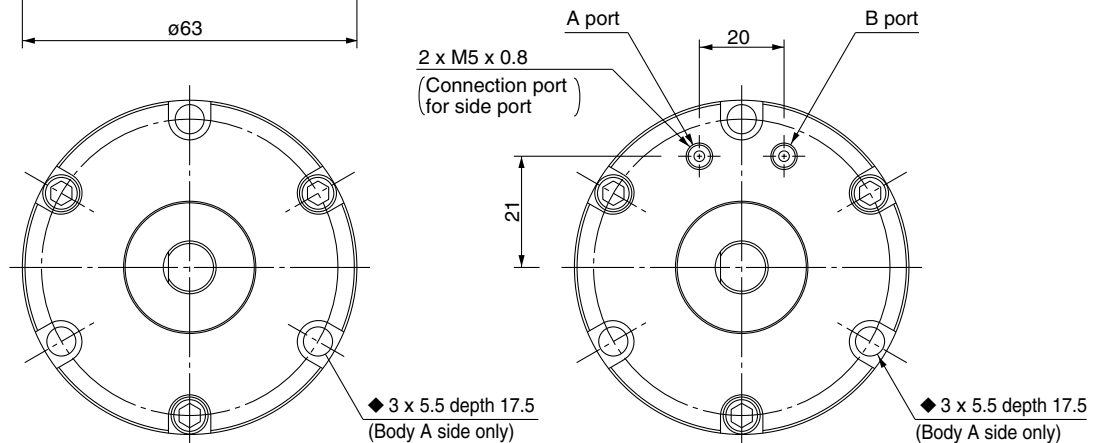
**CRB2BW40-□S/D**  
<Port location: Side ported>



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

| Keyway dimensions |   |   |    |
|-------------------|---|---|----|
| Series            | b (h9)                                      | h (h9)                                      | l  |
| CRB2BW40-□□□      | 4 $\begin{matrix} 0 \\ -0.030 \end{matrix}$ | 4 $\begin{matrix} 0 \\ -0.030 \end{matrix}$ | 20 |

**CRB2BW40-□SE/DE**  
<Port location: Axial ported>



- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

D-□

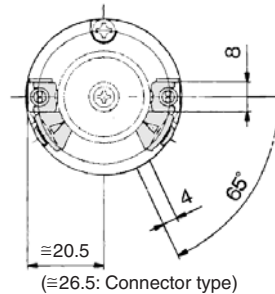
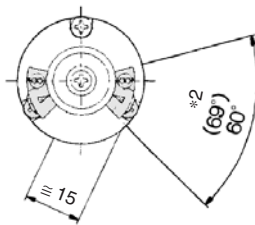
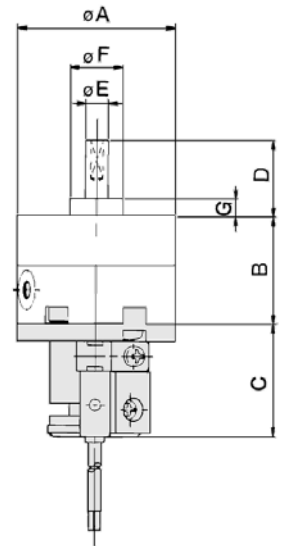
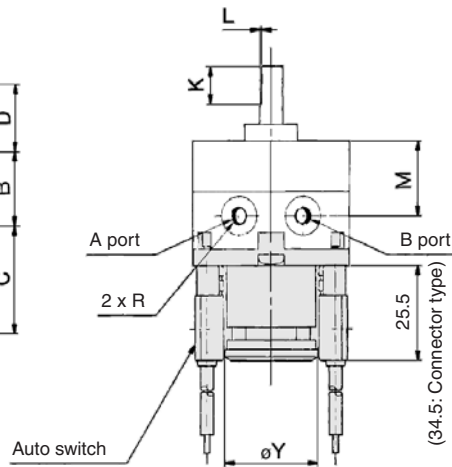
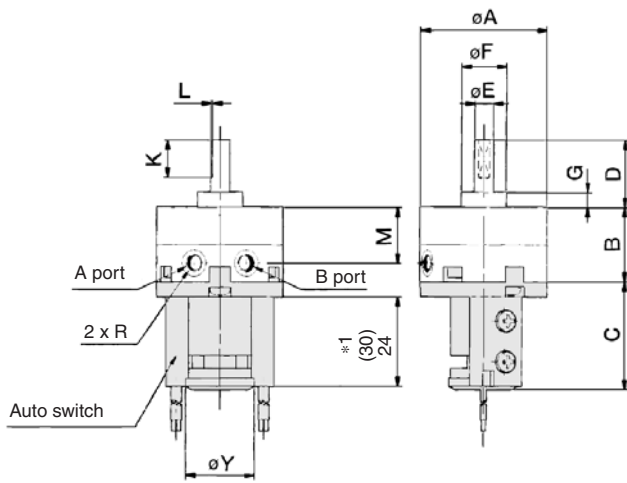
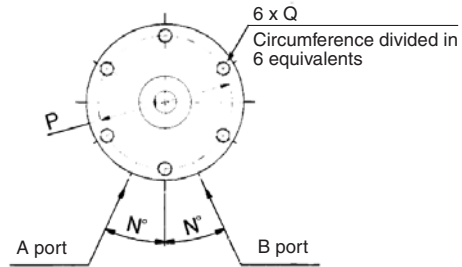
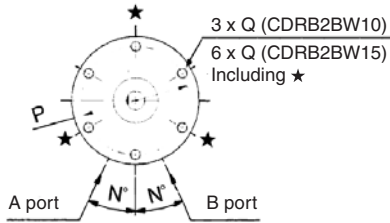
# Series CDRB2

## Dimensions: 10, 15, 20, 30 (With auto switch unit)

**Single vane type** • Following figures show actuators for 90° and 180° when B port is pressurized.

CDRB2BW10/15-□S

CDRB2BW20/30-□S



\* 1 The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)

The length is 30 when any of the following auto switches are used: D-97/93A

\* 2 The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A

The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Note) For rotary actuators with auto switch unit, connection ports are side ports only.

\* The above exterior view drawings illustrate rotary actuators with one right-hand and one left-hand switch.

(mm)

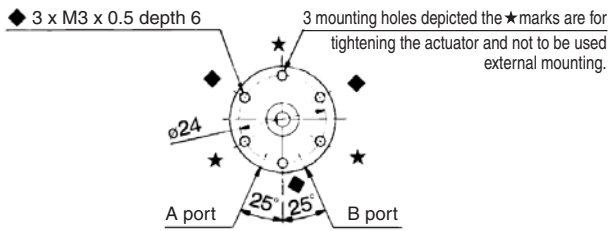
| Model        | A  | B  | C  | D  | E<br>(g6) | F<br>(h9) | G   | K  | L   | M  | N  | P  | Q                 | R        |          |      | Y |
|--------------|----|----|----|----|-----------|-----------|-----|----|-----|----|----|----|-------------------|----------|----------|------|---|
|              |    |    |    |    |           |           |     |    |     |    |    |    |                   | 90°      | 180°     | 270° |   |
| CDRB2BW10-□S | 29 | 15 | 29 | 14 | 4         | 9         | 3   | 9  | 0.5 | 10 | 25 | 24 | M3 x 0.5 depth 5  | M5 x 0.8 | M3 x 0.5 | 18.5 |   |
| CDRB2BW15-□S | 34 | 20 | 29 | 18 | 5         | 12        | 4   | 10 | 0.5 | 15 | 25 | 29 | M3 x 0.5 depth 5  | M5 x 0.8 | M3 x 0.5 | 18.5 |   |
| CDRB2BW20-□S | 42 | 29 | 30 | 20 | 6         | 14        | 4.5 | 10 | 0.5 | 20 | 25 | 36 | M4 x 0.7 depth 7  | M5 x 0.8 |          | 25   |   |
| CDRB2BW30-□S | 50 | 40 | 31 | 22 | 8         | 16        | 5   | 12 | 1   | 30 | 25 | 43 | M5 x 0.8 depth 10 | M5 x 0.8 |          | 25   |   |



## Dimensions: 10, 15, 20, 30 (With auto switch unit)

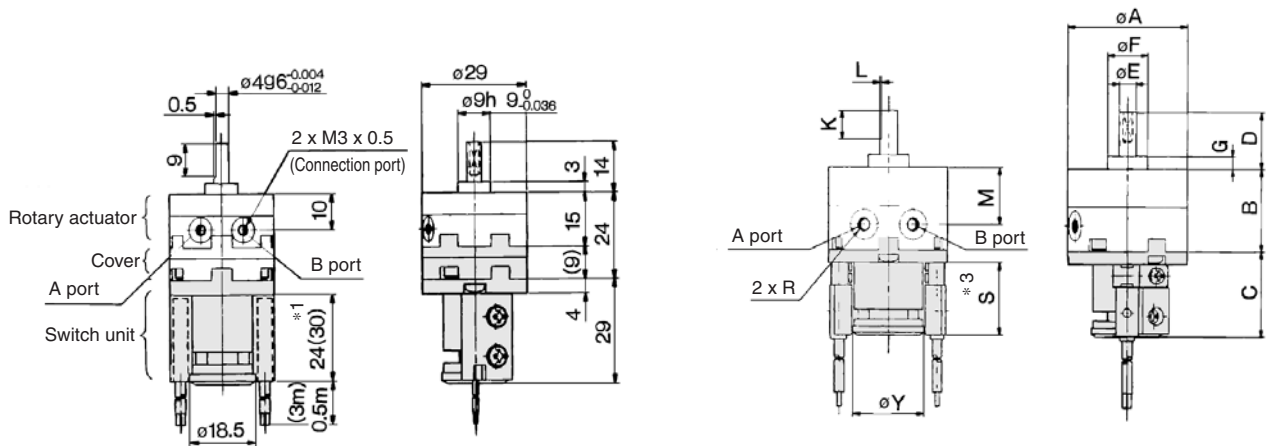
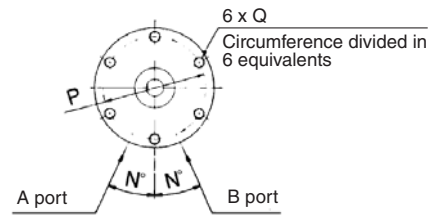
**Double vane type** • Figures below show the intermediate rotation position when A or B port is pressurized.

### CDRB2BW10-□D



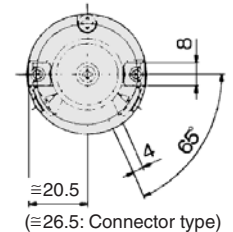
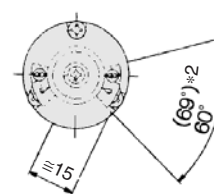
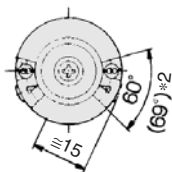
### CRB2BW15/20/30-□D

(Dimensions are the same as the single vane type.)



### CDRB2BW15-□D

### CDRB2BW20/30-□D



\* 1 The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)

The length is 30 when any of the following auto switches are used: D-97/93A

\* 2 The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A

The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

\* 3 The length (Dimension S) is 25.5 when any of the following grommet type auto switches are used: D-R73/R80/S79/T79/S7P

The length (Dimension S) is 34.5 when any of the following connector type auto switches are used: D-R73/R80/T79

| Model        | A  | B  | C  | D  | E (g6) | F (h9) | G   | K  | L   | M  | N  | P  | Q                 | R        |                    | S                  |                  | Y |
|--------------|----|----|----|----|--------|--------|-----|----|-----|----|----|----|-------------------|----------|--------------------|--------------------|------------------|---|
|              |    |    |    |    |        |        |     |    |     |    |    |    |                   | 90°      | 100°               | 24 <sup>+1</sup>   | 30 <sup>+1</sup> |   |
| CDRB2BW15-□D | 34 | 20 | 29 | 18 | 5      | 12     | 4   | 10 | 0.5 | 15 | 25 | 29 | M3 x 0.5 depth 5  | M3 x 0.5 | 24 <sup>+1</sup>   | 30 <sup>+1</sup>   | 18.5             |   |
| CDRB2BW20-□D | 42 | 29 | 30 | 20 | 6      | 14     | 4.5 | 10 | 0.5 | 20 | 25 | 36 | M4 x 0.7 depth 7  | M5 x 0.8 | 25.5 <sup>+3</sup> | 34.5 <sup>+3</sup> | 25               |   |
| CDRB2BW30-□D | 50 | 40 | 31 | 22 | 8      | 16     | 5   | 12 | 1   | 30 | 25 | 43 | M5 x 0.8 depth 10 | M5 x 0.8 | 25.5 <sup>+3</sup> | 34.5 <sup>+3</sup> | 25               |   |

(mm)

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

MRQ

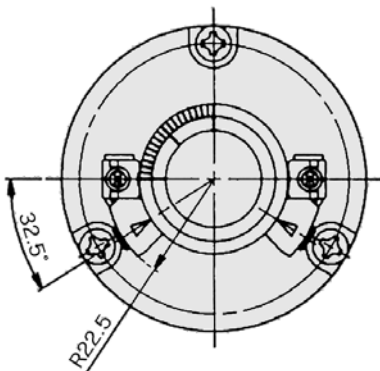
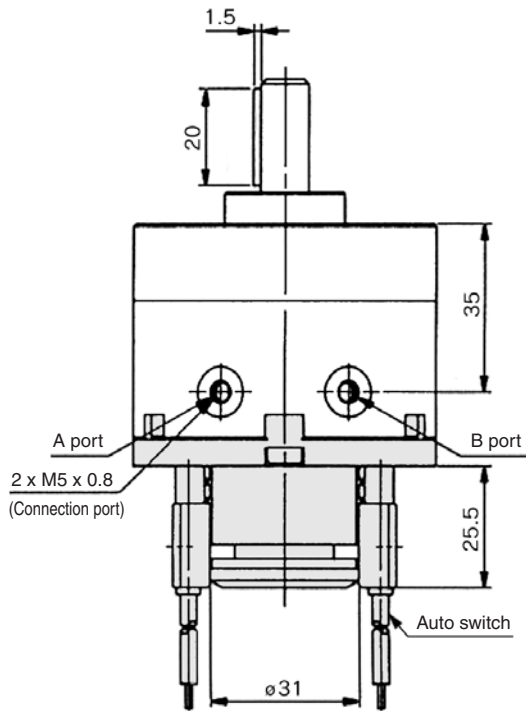
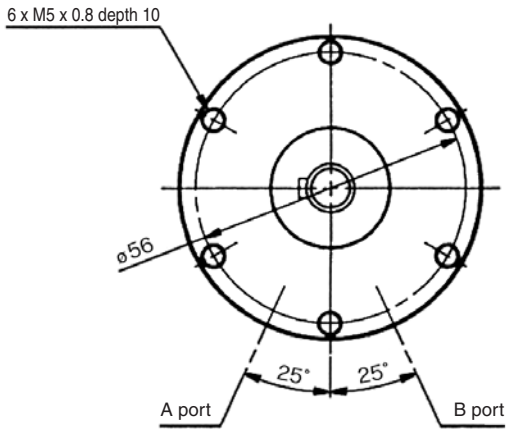
D-□

# Series CDRB2BW

## Dimensions: 40 (With auto switch unit)

Single vane type/Double vane type

CDRB2BW40-□S/D



● For single vane type:

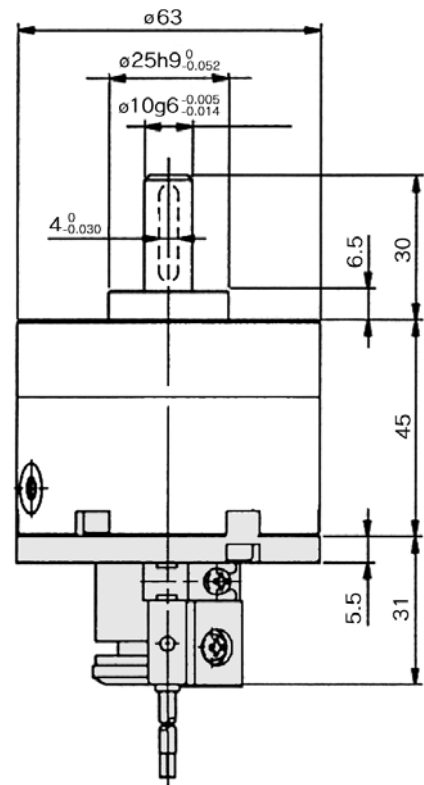
Figures show actuators for 90° and 180° when the B port is pressurized.

● For double vane type:

Figures show the intermediate rotation position when the A or B port is pressurized.

(mm)

| Series        | Keyway dimensions                |                                  |    |
|---------------|----------------------------------|----------------------------------|----|
|               | b (h9)                           | h (h9)                           | ℓ  |
| CDRB2BW40-□□□ | 4 <sup>0</sup> <sub>-0.030</sub> | 4 <sup>0</sup> <sub>-0.030</sub> | 20 |



# Rotary Actuator with Angle Adjuster Vane Style

# Series **CRB2BWU**

Size: 10, 15, 20, 30, 40



## How to Order

**Without auto switch**

CRB2 **B** WU [ ] **10** - **180** **S**

**With auto switch  
Size: 10, 15**

CDRB2 **F** WU [ ] **10** - **180** **S** - **T99** **L** [ ] - [ ]

**With auto switch  
Size: 20, 30, 40**

CDRB2 **B** WU [ ] **20** - **180** **S** - **T79** **L** [ ] - [ ]

**With auto switch**  
(With auto switch unit and built-in magnet)  
\* Refer to page 141 when the auto switch unit is needed separately.



**Mounting style**

|          |              |
|----------|--------------|
| <b>B</b> | Basic style  |
| <b>F</b> | Flange style |

\* F: Except size 40

**With angle adjuster**

**Pattern**

|            |                               |
|------------|-------------------------------|
| <b>Nil</b> | Standard                      |
| <b>P</b>   | Simple Specials/Made to Order |

\* For details, refer to pages 69 to 80.

**Size**

|    |
|----|
| 20 |
| 30 |
| 40 |

**Vane type**

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

**Rotating angle**

|             |            |      |
|-------------|------------|------|
| Single vane | <b>90</b>  | 90°  |
|             | <b>180</b> | 180° |
|             | <b>270</b> | 270° |
| Double vane | <b>90</b>  | 90°  |
|             | <b>100</b> | 100° |

**Auto switch**

|            |                                       |
|------------|---------------------------------------|
| <b>Nil</b> | Without auto switch (built-in magnet) |
|------------|---------------------------------------|

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

**Size**

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

**Made to Order**  
Refer to the table below for details.

**Number of auto switches**

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

\* S (1 auto switch) is shipped with a right-hand auto switch.

\*\* Nil (2 auto switches) is shipped with a right-hand and a left-hand switch.

**Electrical entry/Lead wire length**

|            |                             |       |
|------------|-----------------------------|-------|
| <b>Nil</b> | Grommet/Lead wire           | 0.5 m |
| <b>L</b>   | Grommet/Lead wire           | 3 m   |
| <b>C</b>   | Connector/Lead wire         | 0.5 m |
| <b>CL</b>  | Connector/Lead wire         | 3 m   |
| <b>CN</b>  | Connector/without lead wire |       |

\* Connectors are available only for auto switch types R73, R80 and 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

## Applicable Auto Switches/Refer to pages 761 to 809 for further information on auto switches.

| Applicable size   | Type               | Electrical entry | Indicator light | Wiring (Output) | Load voltage |         | Auto switch model | Lead wire type  | Lead wire length (m) * |       |       |          | Applicable load |            |
|-------------------|--------------------|------------------|-----------------|-----------------|--------------|---------|-------------------|-----------------|------------------------|-------|-------|----------|-----------------|------------|
|                   |                    |                  |                 |                 | DC           | AC      |                   |                 | 0.5 (Nil)              | 3 (L) | 5 (Z) | None (N) |                 |            |
| For 10 and 15     | Solid state switch | Grommet          | Yes             | 2-wire          | 24V          | 12V     | —                 | Heavy-duty cord | ●                      | ●     | —     | —        | IC circuit      | Relay, PLC |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   | Reed switch        | Grommet          | No              | 2-wire          | 24V          | 5V, 12V | 24 V or less      | Parallel cord   | ●                      | ●     | ●     | —        | IC circuit      | Relay, PLC |
|                   |                    |                  |                 |                 |              |         | 100 V or less     |                 | ●                      | ●     | ●     | —        |                 |            |
|                   |                    |                  |                 |                 |              |         | 100V              |                 | ●                      | ●     | ●     | —        |                 |            |
| For 20, 30 and 40 | Solid state switch | Grommet          | Yes             | 2-wire          | 24V          | 12V     | —                 | Heavy-duty cord | ●                      | ●     | —     | —        | IC circuit      | Relay, PLC |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | ●     | ●        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |
|                   | Reed switch        | Grommet          | Yes             | 2-wire          | 24V          | —       | 100V              | Parallel cord   | ●                      | ●     | —     | —        | IC circuit      | Relay, PLC |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | ●     | ●        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | ●     | ●        |                 |            |
|                   |                    |                  |                 |                 |              |         |                   |                 | ●                      | ●     | —     | —        |                 |            |



**Made to Order**

(Refer to pages 69 to 73, 79 and 80 for details.)

| Symbol             | Specifications/Description               |
|--------------------|--|
| <b>XA1 to XA24</b> | Shaft type pattern                       |
| <b>XC 1</b>        | Add connection port                      |
| <b>XC 2</b>        | Change threaded hole to through-hole     |
| <b>XC 3</b>        | Change the screw position                |
| <b>XC 4</b>        | Change rotation range                    |
| <b>XC 5</b>        | Change rotation range between 0 and 200° |
| <b>XC 6</b>        | Change rotation range between 0 and 110° |
| <b>XC 7</b>        | Reversed shaft                           |
| <b>XC30</b>        | Fluorine grease                          |

The above may not be selected when the product comes with an auto switch or angle adjustment unit. Refer to pages 69, 70 and 79 for details.

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

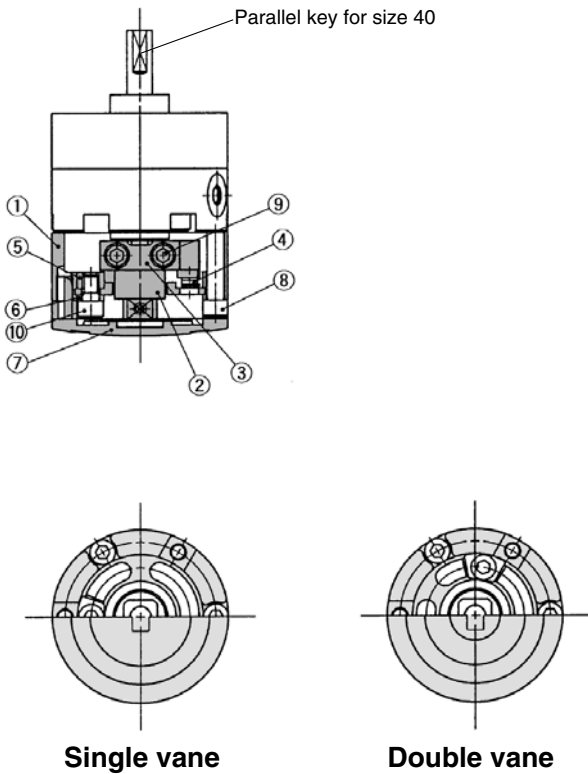
D-□

# Series CRB2BWU

**Construction** (Same switch units are used for both single and double vane type.)

**With angle adjuster**

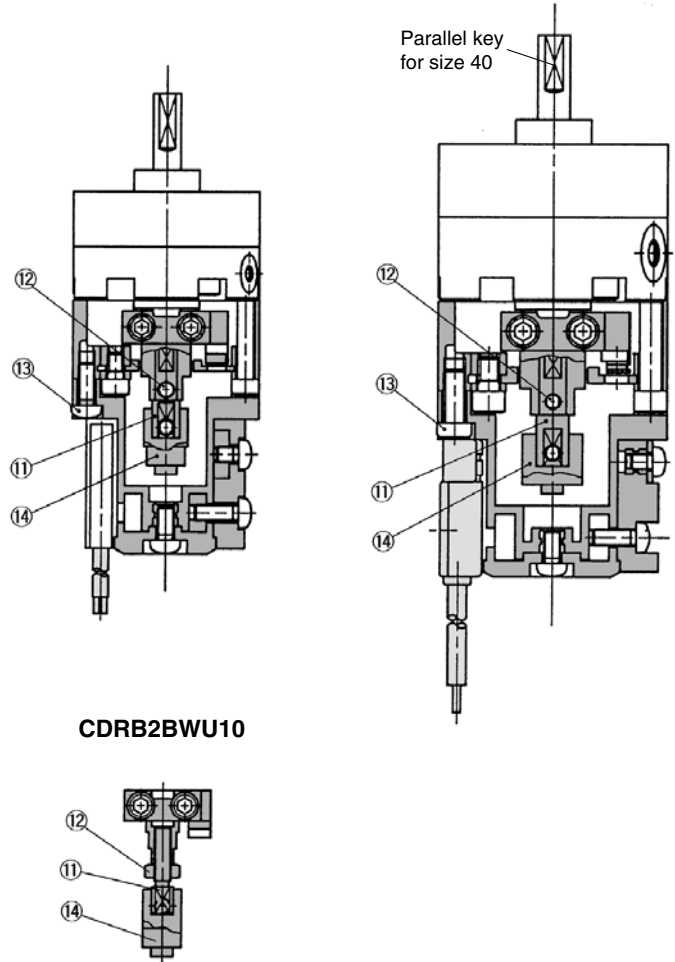
CRB2BWU10/15/20/30/40-□<sup>S</sup><sub>D</sub>



**With angle adjuster + Auto switch unit**

CDRB2BWU10/15-□<sup>S</sup><sub>D</sub>

CDRB2BWU20/30/40-□<sup>S</sup><sub>D</sub>



## Component Parts

| No. | Description                   | Material            | Note                                       |
|-----|-------------------------------|---------------------|--|
| 1   | Stopper ring                  | Aluminum die-casted | Electroless nickel plated                  |
| 2   | Stopper lever                 | Carbon steel        | Electroless nickel plated                  |
| 3   | Lever retainer                | Carbon steel        | Zinc chromated                             |
| 4   | Rubber bumper                 | NBR                 |  |
| 5   | Stopper block                 | Carbon steel        | Zinc chromated                             |
| 6   | Block retainer                | Carbon 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                         | Aluminum alloy      | Note) Zinc chromated                       |
| 12  | Hexagon socket head cap screw | Stainless steel     | Hexagon nut will be used for size 10 only. |
|     | Hexagon nut                   | Stainless steel     |  |
| 13  | Round head Phillips screw     | Stainless steel     | Note)                                      |
| 14  | Magnet lever                  | —                   | Note)                                      |

Note) These items (No. 11, 13, and 14) consist of auto switch unit and angle adjuster. Refer to pages 140 and 141 for detailed specifications. Stainless steel is used for size 10 only.

## ⚠ Precautions

Be sure to read before handling. Refer to front matters 38 and 39 for Safety Instructions and pages 4 to 13 for Rotary Actuator and Auto Switch Precautions.

## Angle Adjuster

### ⚠ Caution

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

| Rotating angle of the rotary actuator                       | Rotating angle adjustment range   |
|---|---|
| $270^{\circ} \begin{smallmatrix} +4 \\ 0 \end{smallmatrix}$ | $0^{\circ}$ to $230^{\circ}$ (Size: 10, 40) *1<br>$0^{\circ}$ to $240^{\circ}$ (Size: 15, 20, 30) |
| $180^{\circ} \begin{smallmatrix} +4 \\ 0 \end{smallmatrix}$ | $0^{\circ}$ to $175^{\circ}$  |
| $90^{\circ} \begin{smallmatrix} +4 \\ 0 \end{smallmatrix}$  | $0^{\circ}$ to $85^{\circ}$   |

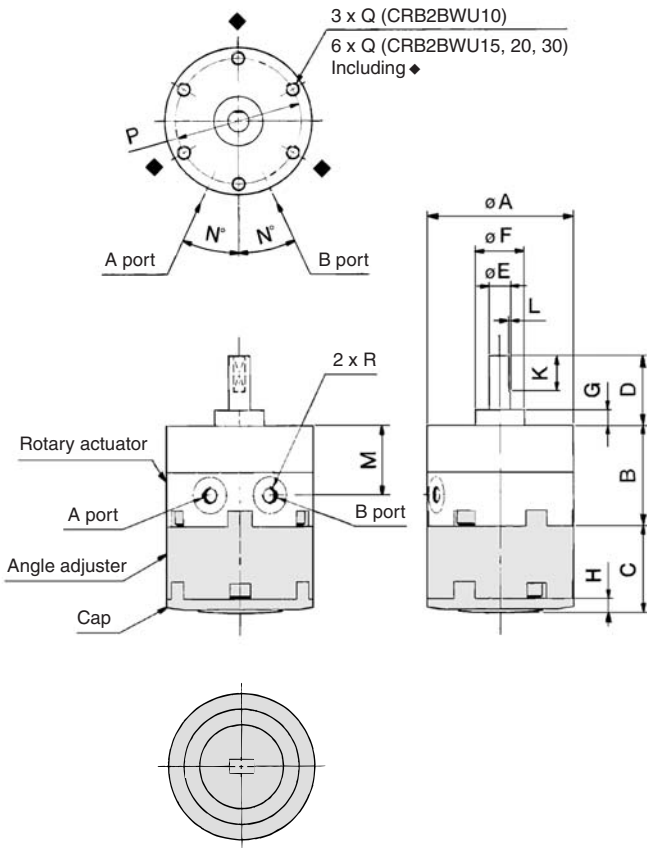
\*1 The maximum adjustment angle of the angle adjuster for size 10 and 40 is  $230^{\circ}$ .

2. Connection ports are side ports only.
3. The allowable kinetic energy is the same as the specifications of the rotary actuator by itself (i.e., without angle adjuster).
4. Use a  $100^{\circ}$  rotary actuator if you desire to adjust the angle to  $90^{\circ}$  using a double vane type.

**Dimensions: 10, 15, 20, 30 (With angle adjuster)**

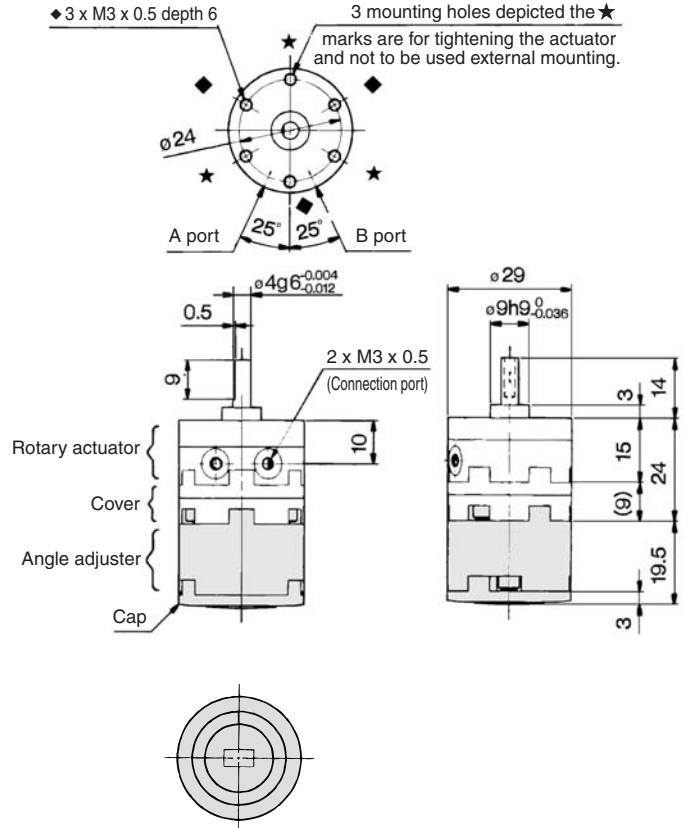
**Single vane type**  
**CRB2BWU10/15/20/30-□S**

• Following figures show actuator for 90° when A port is pressurized.



**Double vane type**  
**CRB2BWU10-□D**

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



**Double vane type**  
**CRB2BWU15/20/30-□D**

Dimensions for double vane type sizes 15, 20, and 30 are the same as those of single type.

- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

| Model        | (mm) |    |      |    |           |           |     |     |    |     |    |    |    |                   |
|--------------|------|----|------|----|-----------|-----------|-----|-----|----|-----|----|----|----|-------------------|
|              | A    | B  | C    | D  | E<br>(g6) | F<br>(h9) | G   | H   | K  | L   | M  | N  | P  | Q                 |
| CRB2BWU10-□S | 29   | 15 | 19.5 | 14 | 4         | 9         | 3   | 3   | 9  | 0.5 | 10 | 25 | 24 | M3 x 0.5 depth 6  |
| CRB2BWU15-□S | 34   | 20 | 21.2 | 18 | 5         | 12        | 4   | 3.2 | 10 | 0.5 | 15 | 25 | 29 | M3 x 0.5 depth 5  |
| CRB2BWU15-□D |      |    |      |    |           |           |     |     |    |     |    |    |    |                   |
| CRB2BWU20-□S | 42   | 29 | 25   | 20 | 6         | 14        | 4.5 | 4   | 10 | 0.5 | 20 | 25 | 36 | M4 x 0.7 depth 7  |
| CRB2BWU20-□D |      |    |      |    |           |           |     |     |    |     |    |    |    |                   |
| CRB2BWU30-□S | 50   | 40 | 29   | 22 | 8         | 16        | 5   | 4.5 | 12 | 1   | 30 | 25 | 43 | M5 x 0.8 depth 10 |
| CRB2BWU30-□D |      |    |      |    |           |           |     |     |    |     |    |    |    |                   |

| Model        | R                      |      |          |          |
|--------------|------------------------|------|----------|----------|
|              | 90°                    | 100° | 180°     | 270°     |
| CRB2BWU10-□S | M5 x 0.8               | —    | M5 x 0.8 | M3 x 0.5 |
| CRB2BWU10-□D | *Refer to the drawing. |      |          |          |
| CRB2BWU15-□S | M5 x 0.8               | —    | M5 x 0.8 | M3 x 0.5 |
| CRB2BWU15-□D | M3 x 0.5               |      | —        |          |
| CRB2BWU20-□S | M5 x 0.8               | —    | M5 x 0.8 |          |
| CRB2BWU20-□D | M5 x 0.8               |      | —        |          |
| CRB2BWU30-□S | M5 x 0.8               | —    | M5 x 0.8 |          |
| CRB2BWU30-□D | M5 x 0.8               |      | —        |          |

D-□

# Series CRB2BWU

## Dimensions: 40 (With angle adjuster)

Single vane type/Double vane type  
With angle adjuster

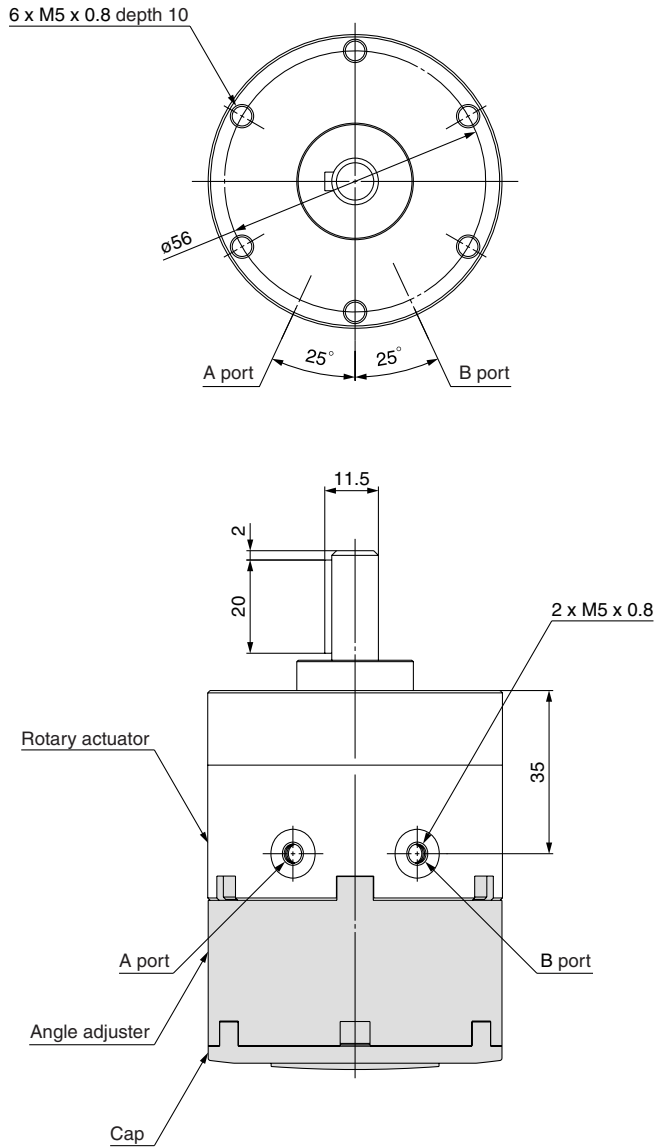
CRB2BWU40-□□S/D

● **For single vane type:**

Figures show actuators for 90° and 180° when the B port is pressurized.

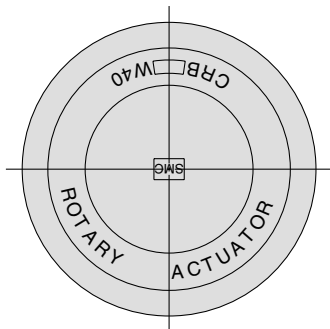
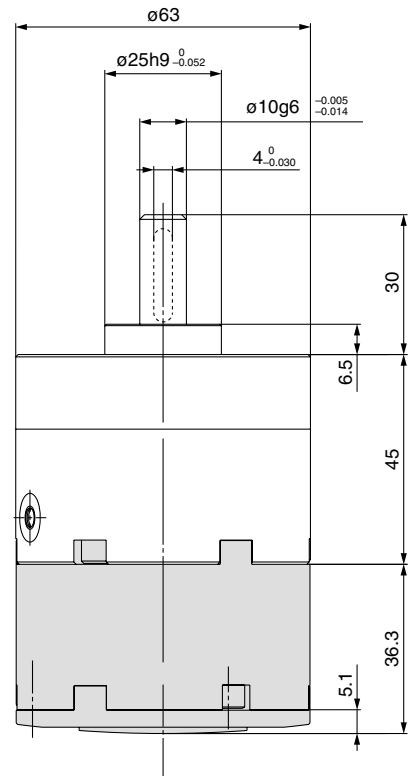
● **For double vane type:**

Figures show the intermediate rotation position when the A or B port is pressurized.



(mm)

| Keyway dimensions |                                  |                                  |    |
|-------------------|----------------------------------|----------------------------------|----|
| Model             | b (h9)                           | h (h9)                           | l  |
| CRB2BWU40-□□□     | 4 <sup>0</sup> <sub>-0.030</sub> | 4 <sup>0</sup> <sub>-0.030</sub> | 20 |

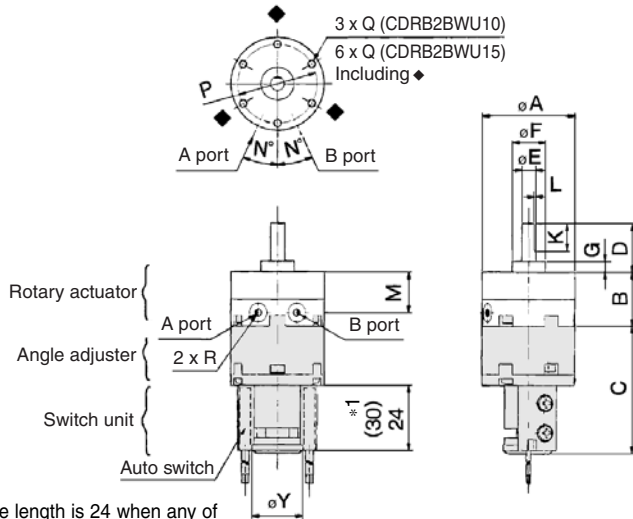


# Rotary Actuator with Angle Adjuster Vane Style **Series CRB2BWU**

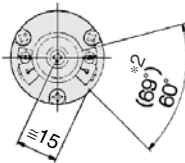
## Dimensions: 10, 15, 20, 30 (With angle adjuster and auto switch unit)

### Single vane type CDRB2BWU10/15-□S

• Following figures show actuator for 90° when A port is pressurized.

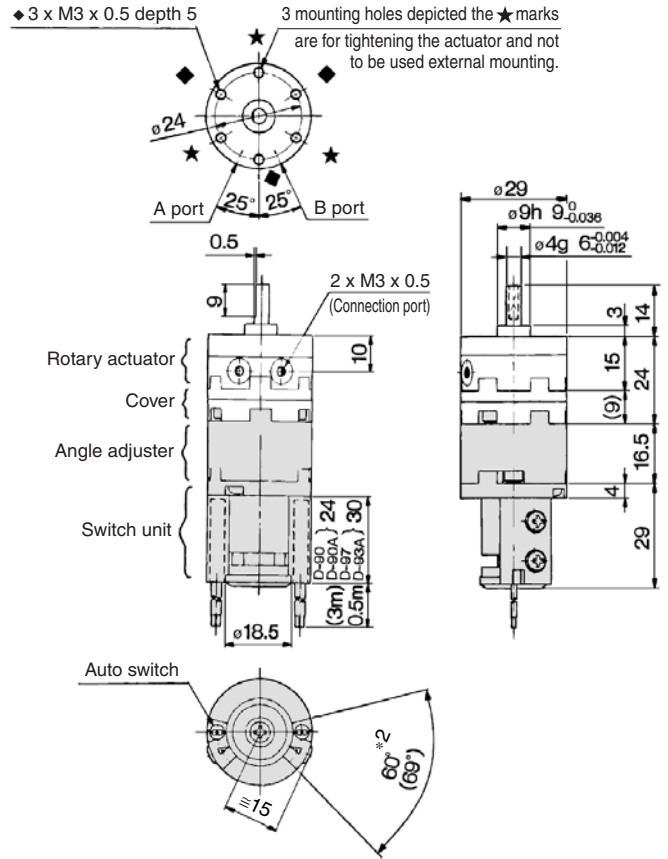


- \* 1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V). The length is 30 when any of the following auto switches are used: D-97/93A.
- \* 2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A. The angle is 69° when any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



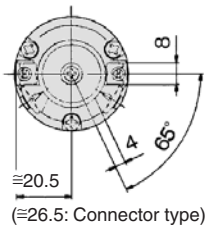
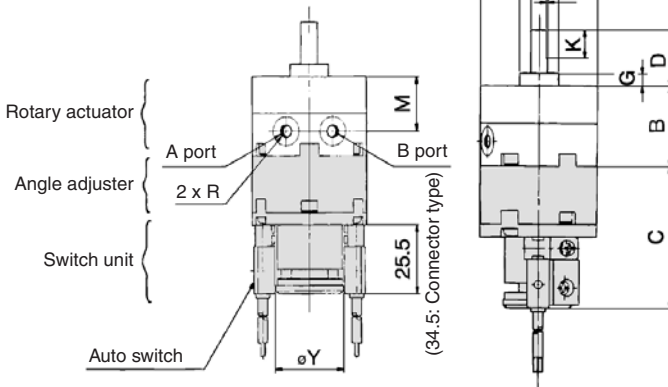
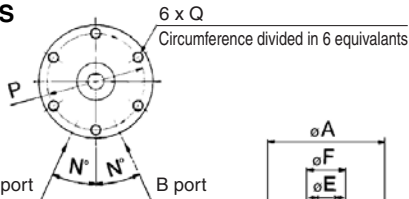
### Double vane type CDRB2BWU10-□D

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



- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

### Single vane type CDRB2BWU20/30-□S



### Double vane type CDRB2BWU15/20/30-□D

Dimensions for double vane type sizes 15, 20, and 30 are the same as those of single type.

| Model         | A  | B  | C    | D  | E (g6) | F (h9) | G   | K  | L   | M  |
|---------------|----|----|------|----|--------|--------|-----|----|-----|----|
| CDRB2BWU10-□S | 29 | 15 | 45.5 | 14 | 4      | 9      | 3   | 9  | 0.5 | 10 |
| CDRB2BWU15-□S | 34 | 20 | 47   | 18 | 5      | 12     | 4   | 10 | 0.5 | 15 |
| CDRB2BWU15-□D |    |    |      |    |        |        |     |    |     |    |
| CDRB2BWU20-□S | 42 | 29 | 51   | 20 | 6      | 14     | 4.5 | 10 | 0.5 | 20 |
| CDRB2BWU20-□D |    |    |      |    |        |        |     |    |     |    |
| CDRB2BWU30-□S | 50 | 40 | 55.5 | 22 | 8      | 16     | 5   | 12 | 1   | 30 |
| CDRB2BWU30-□D |    |    |      |    |        |        |     |    |     |    |

| Model         | N  | P  | Y    | Q                 | R                       |      |          |          |
|---------------|----|----|------|-------------------|-------------------------|------|----------|----------|
|               |    |    |      |                   | 90°                     | 100° | 180°     | 270°     |
| CDRB2BWU10-□S | 25 | 24 | 18.5 | M3 x 0.5 depth 6  | M5 x 0.8                | —    | M5 x 0.8 | M3 x 0.5 |
| CDRB2BWU10-□D |    |    |      |                   | * Refer to the drawing. |      |          |          |
| CDRB2BWU15-□S | 25 | 29 | 18.5 | M3 x 0.5 depth 5  | M5 x 0.8                | —    | M5 x 0.8 | M3 x 0.5 |
| CDRB2BWU15-□D |    |    |      |                   | M3 x 0.5                | —    | —        | —        |
| CDRB2BWU20-□S | 25 | 36 | 25   | M4 x 0.7 depth 7  | M5 x 0.8                | —    | M5 x 0.8 | —        |
| CDRB2BWU20-□D |    |    |      |                   | M5 x 0.8                | —    | —        | —        |
| CDRB2BWU30-□S | 25 | 43 | 25   | M5 x 0.8 depth 10 | M5 x 0.8                | —    | M5 x 0.8 | —        |
| CDRB2BWU30-□D |    |    |      |                   | M5 x 0.8                | —    | —        | —        |

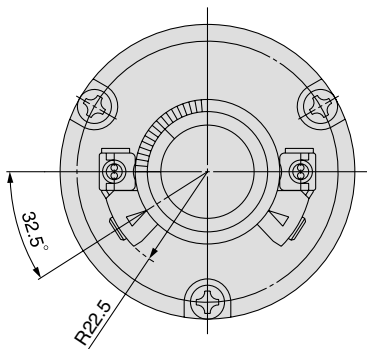
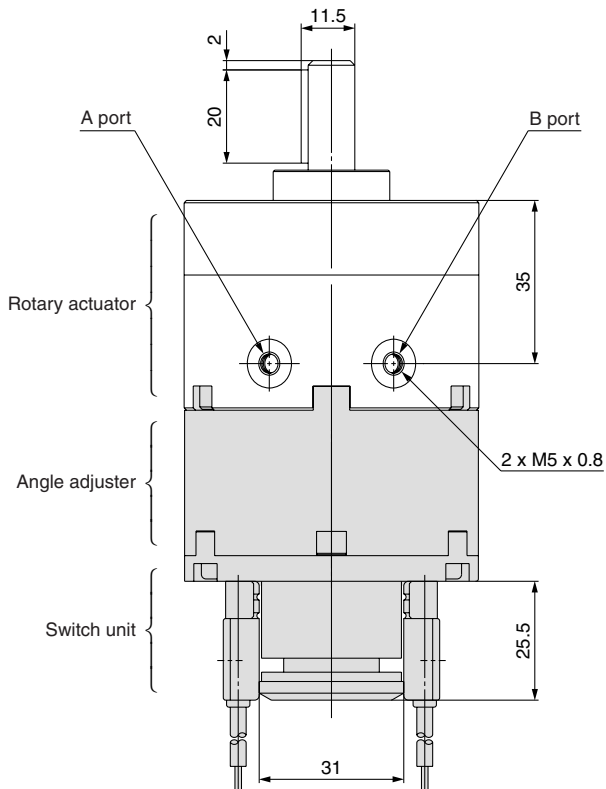
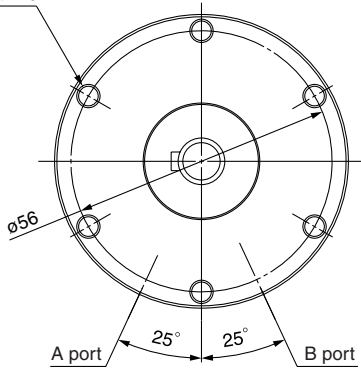
Note) • For rotary actuators with angle adjuster and auto switch unit, connection ports are side ports only.  
• The above exterior view drawings illustrate the rotary actuator equipped with one right-hand and one left-hand switch.

# Series CRB2BWU

## Dimensions: 40 (With angle adjuster and auto switch unit)

### Single vane type/Double vane type CDRB2BWU40-□S/D

6 x M5 x 0.8 depth 10



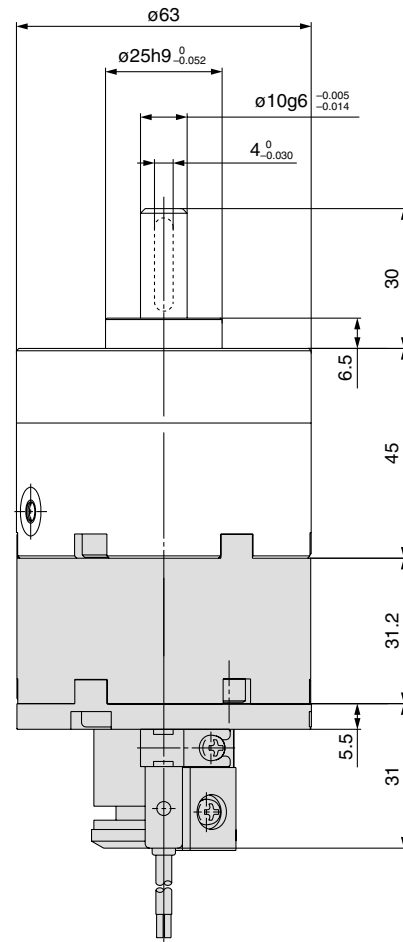
#### ● For single vane type:

Figures show actuators for 90° and 180° when the B port is pressurized.

#### ● For double vane type:

Figures show the intermediate rotation position when the A or B port is pressurized.

| Keyway dimensions | (mm)                             |                                  |    |
|-------------------|----------------------------------|----------------------------------|----|
|                   | b (h9)                           | h (h9)                           | ℓ  |
| Model             | 4 <sup>0</sup> <sub>-0.030</sub> | 4 <sup>0</sup> <sub>-0.030</sub> | 20 |
| CDRB2BWU40-□□□    |                                  |                                  |    |





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

## Simple Specials:

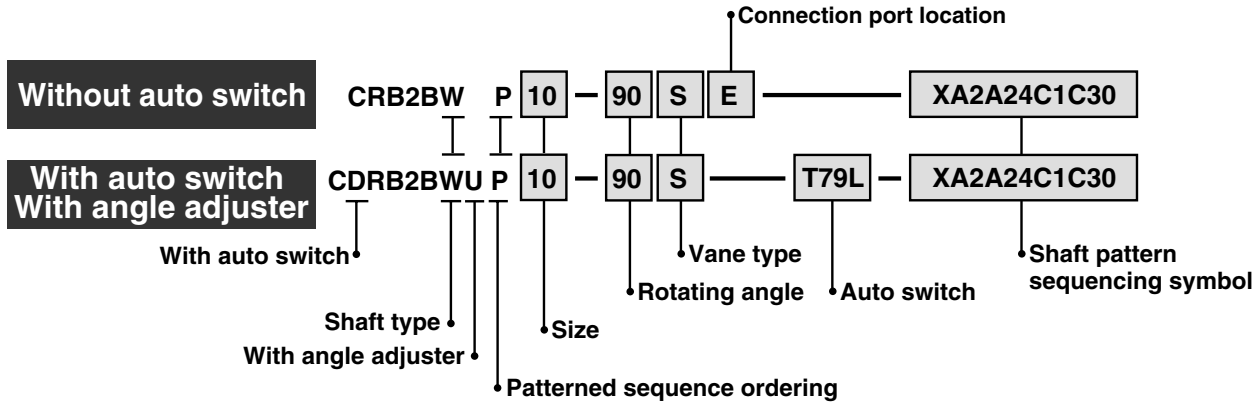
### -XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system. (Refer to front matter 33). Please contact SMC for a specification sheet when placing an order.

#### Shaft Pattern Sequencing I

**-XA1 to XA24**

Applicable shaft type: W (Standard)



#### Shaft Pattern Sequencing Symbol

##### ● Axial: Top (Long shaft side)

| Symbol | Description                                   | Applicable size |    |    |    |    |
|--------|---|-----------------|----|----|----|----|
|        |   | 10              | 15 | 20 | 30 | 40 |
| XA 1   | Shaft-end female thread                       |                 | ●  | ●  | ●  |    |
| XA 3   | Shaft-end male thread                         | ●               | ●  | ●  | ●  |    |
| XA 5   | Stepped round shaft                           | ●               | ●  | ●  | ●  |    |
| XA 7   | Stepped round shaft with male thread          | ●               | ●  | ●  | ●  |    |
| XA 9   | Modified length of standard chamfer           | ●               | ●  | ●  | ●  |    |
| XA11   | Two-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 unit and angle adjuster.

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

| Symbol | Description                                   | Applicable size |    |    |    |    |
|--------|---|-----------------|----|----|----|----|
|        |   | 10              | 15 | 20 | 30 | 40 |
| XA 2*  | Shaft-end female thread                       |                 | ●  | ●  | ●  | ●  |
| XA 4*  | Shaft-end male thread                         | ●               | ●  | ●  | ●  | ●  |
| XA 6*  | Stepped round shaft                           | ●               | ●  | ●  | ●  | ●  |
| XA 8*  | Stepped round shaft with male thread          | ●               | ●  | ●  | ●  | ●  |
| XA10*  | Modified length of standard chamfer           | ●               | ●  | ●  | ●  | ●  |
| XA12*  | Two-sided chamfer                             | ●               | ●  | ●  | ●  | ●  |
| XA15*  | Shaft through-hole + Shaft-end female thread  |                 | ●  | ●  | ●  | ●  |
| XA18*  | 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                                      | ●               | ●  | ●  | ●  | ●  |

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

MRQ

D-□

# Series CRB2

## Combination

### XA□ Combination

| Symbol | Combination |     |     |     |     |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
|--------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|---|---|---|---|---|---|---|---|---|---|---|--|
| XA 1   | XA1         |     |     |     |     |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 2   | ●           | XA2 |     |     |     |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 3   | —           | ●   | XA3 |     |     |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 4   | ●           | —   | ●   | XA4 |     |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 5   | —           | ●   | —   | ●   | XA5 |     |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 6   | ●           | —   | ●   | —   | ●   | XA6 |     |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 7   | —           | ●   | —   | ●   | —   | ●   | XA7 |     |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 8   | ●           | —   | ●   | —   | ●   | —   | ●   | XA8 |     |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA 9   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | XA9 |      |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA10   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | XA10 |      |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA11   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | XA11 |      |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA12   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | XA12 |      |   |   |   |   |   |   |   |   |   |   |   |  |
| XA13   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | ●    | ●    | XA13 |   |   |   |   |   |   |   |   |   |   |   |  |
| XA14   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | ●    | ●    | —    | — | — | — | — | — | — | — | — | — | — | — |  |
| XA15   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | ●    | ●    | —    | — | — | — | — | — | — | — | — | — | — | — |  |
| XA16   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | —    | — | — | — | — | — | — | — | — | — | — | — |  |
| XA17   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | —    | ● | — | ● | — | ● | — | ● | — | ● | — | ● |  |
| XA18   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | —    | ●    | — | ● | — | ● | — | ● | — | ● | — | ● | — |  |
| XA19   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | —    | — | — | — | — | — | — | — | — | — | — | — |  |
| XA20   | —           | —   | —   | —   | —   | —   | —   | —   | —   | —    | —    | —    | —    | — | — | — | — | — | — | — | — | — | — | — |  |
| XA21   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | —    | ● | — | ● | — | ● | — | ● | — | ● | — | ● |  |
| XA22   | ●           | —   | ●   | —   | ●   | —   | ●   | —   | ●   | —    | ●    | —    | ●    | — | ● | — | ● | — | ● | — | ● | — | ● | — |  |
| XA23   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | —    | ● | — | ● | — | ● | — | ● | — | ● | — | ● |  |
| XA24   | —           | ●   | —   | ●   | —   | ●   | —   | ●   | —   | ●    | —    | ●    | —    | ● | — | ● | — | ● | — | ● | — | ● | — | ● |  |

A combination of up to two XA□s are available.  
 Example: -XA2A24

### XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.  
 Refer to pages 79 to 80 for details of made-to-order specifications.

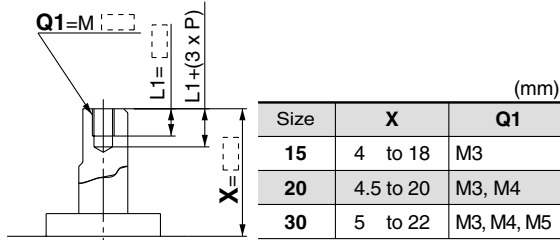
| Symbol | Description                             | Applicable size    | Combination |
|--------|---|--------------------|-------------|
|        |   |                    | XA1 to XA24 |
| XC 1*  | Add connection port location            | 10, 15, 20, 30, 40 | ●           |
| XC 2*  | Change threaded hole to through-hole    | 15, 20, 30, 40     | ●           |
| XC 3*  | Change the screw position               | 10, 15, 20, 30, 40 | ●           |
| XC 4   | Change rotation range                   |                    | ●           |
| XC 5*  | Change rotation range between 0 to 200° |                    | ●           |
| XC 6*  | Change rotation range between 0 to 110° |                    | ●           |
| XC 7*  | Reversed shaft                          |                    | —           |
| XC30   | Fluorine grease                         |                    | ●           |

\* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.  
 A total of four XA□ and XC□ combinations is available.  
 Example: -XA2A24C1C30  
 -XA2C1C4C30

## Axial: Top (Long shaft side)

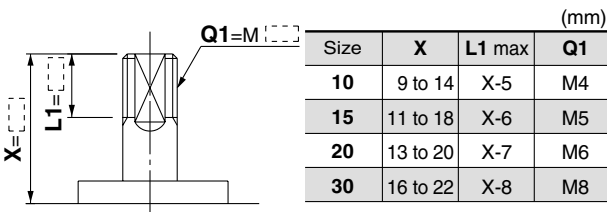
**Symbol: A1** The long shaft can be further shortened by machining female threads into it.

- (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



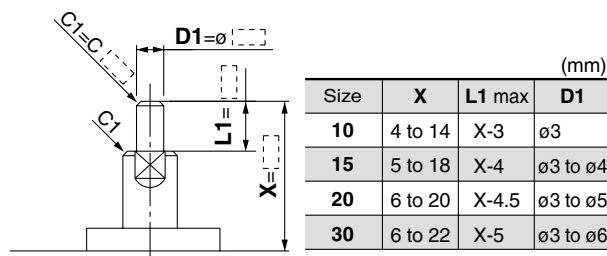
**Symbol: A3** The long shaft can be further shortened by machining male threads into it.

- (If shortening the shaft is not required, indicate "\*" for dimension X.)
- Applicable shaft type: W



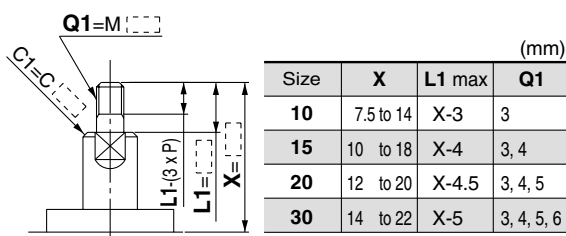
**Symbol: A5** The long shaft can be further shortened by machining it into a stepped round shaft.

- (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 C1, indicate "\*" instead.)



**Symbol: A7** The long shaft can be further shortened by machining it into a stepped round shaft with male threads.

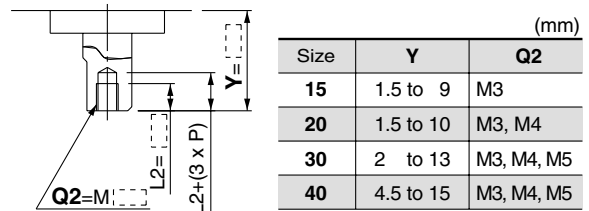
- (If shortening the shaft is not required, indicate "\*" for dimension X.)
- Applicable shaft type: W
  - Equal dimensions are indicated by the same marker. (If not specifying dimension C1, indicate "\*" instead.)



## Axial: Bottom (Short shaft side)

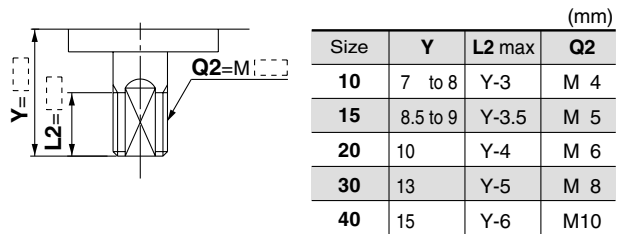
**Symbol: A2** The short shaft can be further shortened by machining female threads into it.

- (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



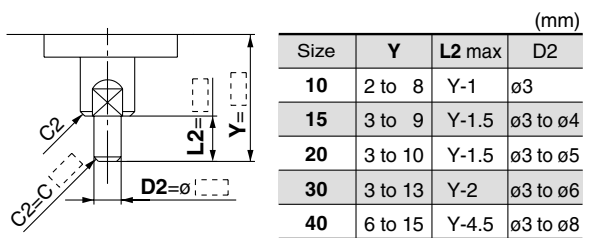
**Symbol: A4** The short shaft can be further shortened by machining male threads into it.

- (If shortening the shaft is not required, indicate "\*" for dimension Y.)
- Applicable shaft type: W



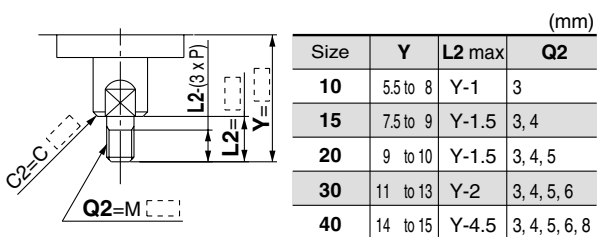
**Symbol: A6** The short shaft can be further shortened by machining it into a stepped round shaft.

- (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 C2, indicate "\*" instead.)



**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 C2, indicate "\*" instead.)



**CRB2**

**CRBU2**

**CRB1**

**MSU**

**CRJ**

**CRA1**

**CRQ2**

**MSQ**

**MSZ**

**CRQ2X**

**MSQX**

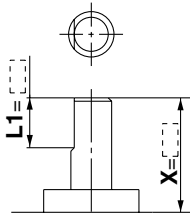
**MRQ**

**D-□**

## Axial: Top (Long shaft side)

**Symbol: A9** The long shaft can be further shortened by changing the length of the standard chamfer on the long shaft side.

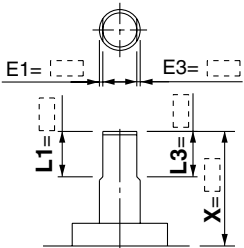
(If shortening the shaft is not required, indicate "\*" for dimension X.)  
 • Applicable shaft type: W



| Size | X        | L1                   |
|------|----------|----------------------|
| 10   | 5 to 14  | 9-(14-X) to (X-3)    |
| 15   | 8 to 18  | 10-(18-X) to (X-4)   |
| 20   | 10 to 20 | 10-(20-X) to (X-4.5) |
| 30   | 10 to 22 | 12-(22-X) to (X-5)   |

**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  $\phi 30$ .  
 • Applicable shaft type: W

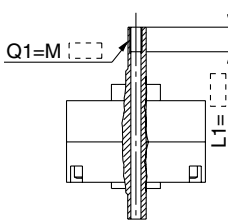


| Size | X        | L1                   | L3 max |
|------|----------|----------------------|--------|
| 10   | 5 to 14  | 9-(14-X) to (X-3)    | X-3    |
| 15   | 8 to 18  | 10-(18-X) to (X-4)   | X-4    |
| 20   | 10 to 20 | 10-(20-X) to (X-4.5) | X-4.5  |
| 30   | 10 to 22 | 12-(22-X) to (X-5)  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

**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.

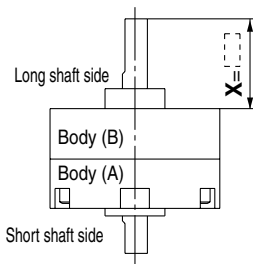
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 max. = 6 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



| Thread   | Size | 15         | 20         | 30         | 40         |
|----------|------|------------|------------|------------|------------|
| M3 x 0.5 |      | $\phi 2.5$ | $\phi 2.5$ | $\phi 2.5$ | $\phi 2.5$ |
| M4 x 0.7 |      | —          | $\phi 3.3$ | $\phi 3.3$ | —          |
| M5 x 0.8 |      | —          | —          | $\phi 4.2$ | —          |

**Symbol: A17** Shorten the long shaft.

- Applicable shaft type: W

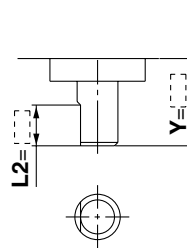


| Size | X         |
|------|-----------|
| 10   | 3 to 14   |
| 15   | 4 to 18   |
| 20   | 4.5 to 20 |
| 30   | 5 to 22   |
| 40   | 18 to 33  |

## Axial: Bottom (Short shaft side)

**Symbol: A10** The short shaft can be further shortened by changing the length of the standard chamfer.

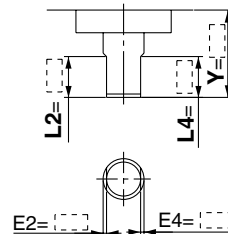
(If shortening the shaft is not required, indicate "\*" for dimension Y.)  
 • Applicable shaft type: W



| Size | 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)   |

**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 sizes of  $\phi 30$  or  $\phi 40$ .  
 • Applicable shaft type: W

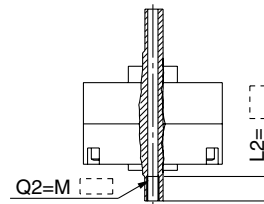


| Size | Y       | L2                  | L4 max |
|------|---------|---------------------|--------|
| 10   | 3 to 8  | 5-(8-Y) to (Y-1)    | Y-1    |
| 15   | 3 to 9  | 6-(9-Y) to (Y-1.5)  | Y-1.5  |
| 20   | 3 to 10 | 7-(10-Y) to (Y-1.5) | Y-1.5  |
| 30   | 5 to 13 | 8-(13-Y) to (Y-2)   | Y-2    |
|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

**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.

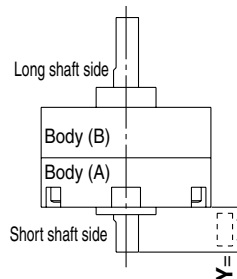
- A parallel key is used on the long shaft for size 40.
- Not available for size 10.
- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M4: L2 max. = 8 mm
- Applicable shaft type: W



| Thread   | Size | 15         | 20         | 30         | 40         |
|----------|------|------------|------------|------------|------------|
| M3 x 0.5 |      | $\phi 2.5$ | $\phi 2.5$ | $\phi 2.5$ | $\phi 2.5$ |
| M4 x 0.7 |      | —          | $\phi 3.3$ | $\phi 3.3$ | —          |
| M5 x 0.8 |      | —          | —          | $\phi 4.2$ | —          |

**Symbol: A18** Shorten the short shaft.

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



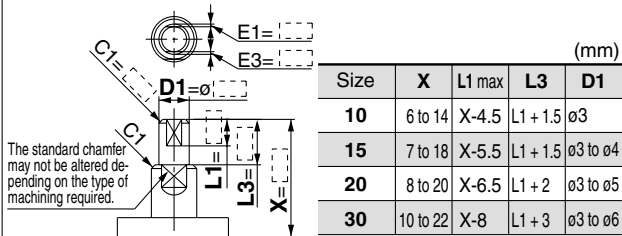
| Size | Y         |
|------|-----------|
| 10   | 1 to 8    |
| 15   | 1.5 to 9  |
| 20   | 1.5 to 10 |
| 30   | 2 to 13   |
| 40   | 4.5 to 15 |

## Axial: Top (Long shaft side)

**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 C1, indicate "\*" instead.)

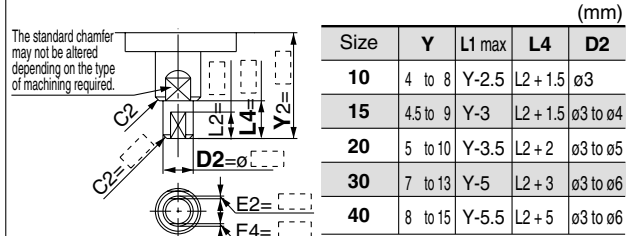


## Axial: Bottom (Short shaft side)

**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 C2, indicate "\*" instead.)

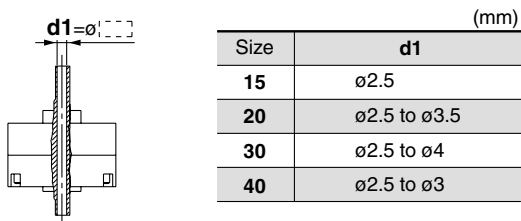


## Double Shaft

**Symbol: A13** Applicable to single vane type only

Shaft with through-hole

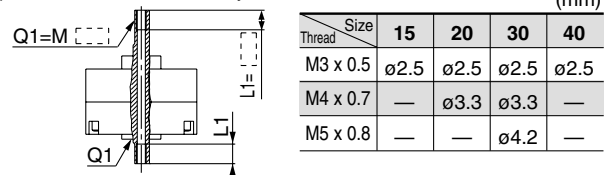
- Not available for size 10.
- Minimum machining diameter for d1 is 0.1 mm.
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



**Symbol: A16** Applicable to single vane type only

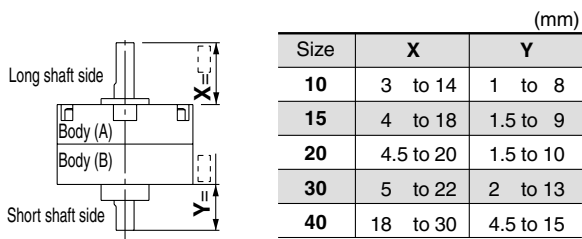
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- 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.



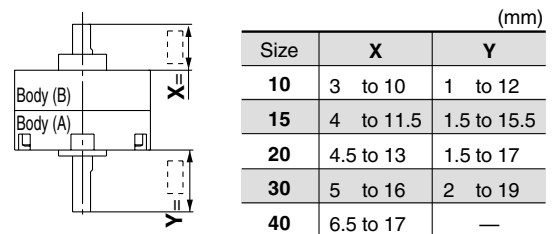
**Symbol: A19** Both the long shaft and short shaft are shortened.

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



**Symbol: A20** The rotation axis is reversed.

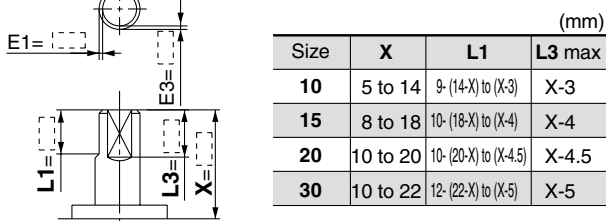
- (The long shaft and short shaft are shortened.)
- A parallel key is used on the long shaft for size 40.
  - Applicable shaft type: W



**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.)

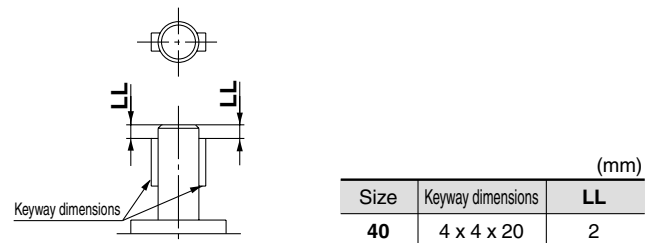
- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore sizes of ø30 or ø40.
- Applicable shaft type: W



**Symbol: A24** Double key

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

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



**CRB2**

**CRBU2**

**CRB1**

**MSU**

**CRJ**

**CRA1**

**CRQ2**

**MSQ**

**MSZ**

**CRQ2X**

**MSQX**

**MRQ**

**D-□**

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

## Simple Specials:

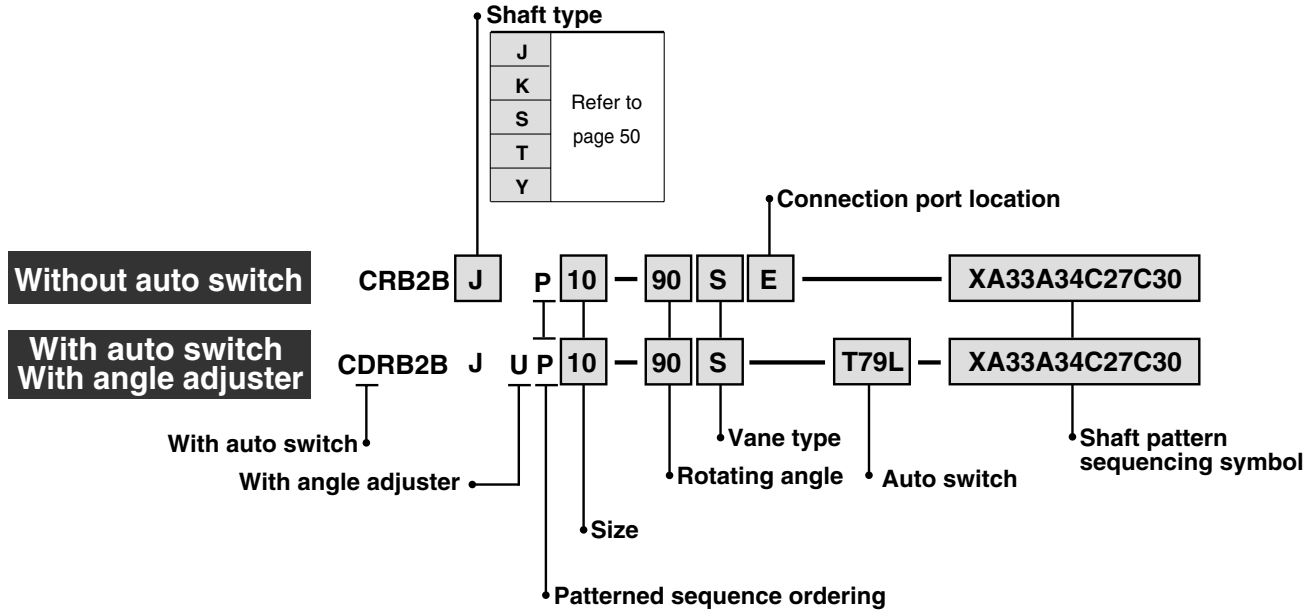
### -XA31 to -XA58: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system. (Refer to front matter 33). Please contact SMC for a specification sheet when placing an order.

#### Shaft Pattern Sequencing II

-XA31 to XA58

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



#### 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 unit and angle adjuster.

## Combination

### XA□ Combination

| Symbol | Description                                   | Axial direction |      | Applicable shaft type |   |   |   |   | Combination |  |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------|---|-----------------|------|-----------------------|---|---|---|---|-------------|--|------|-------|------|-------|------|----|----|----|--|--|------|------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|        |   | Up              | Down | J                     | K | S | T | Y |             |  |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA31   | Shaft-end female thread                       | ●               |      |                       |   | ● |   | ● | XA31        | * Corresponding shafts type available for combination. |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA32   | Shaft-end female thread                       |                 | ●    |                       |   | ● |   | ● | XA32        |  |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA33   | Shaft-end female thread                       | ●               |      | ●                     | ● | ● |   |   | XA33        |  |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA34   | Shaft-end female thread                       |                 | ●    | ●                     | ● | ● |   |   | ●           | XA34   |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA37   | Stepped round shaft                           | ●               |      | ●                     | ● | ● |   |   | ●           | XA37   |      |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA38   | Stepped round shaft                           |                 | ●    | ●                     |   |   |   |   | K*          | K*   | XA38 |       |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA39   | Shaft through-hole                            | ●               | ●    |                       |   | ● |   | ● |             |  |      | XA39  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA40   | Shaft through-hole                            | ●               | ●    |                       |   | ● |   | ● |             |  |      | XA40  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA41   | Shaft through-hole                            | ●               | ●    | ●                     |   |   |   |   |             |  |      | XA41  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA42   | Shaft through-hole + Shaft-end female thread  | ●               | ●    |                       |   | ● |   | ● |             |  |      | XA42  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA43   | Shaft through-hole + Shaft-end female thread  | ●               | ●    |                       |   | ● |   | ● |             |  |      | XA43  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA44   | Shaft through-hole + Shaft-end female thread  | ●               | ●    | ●                     |   |   |   |   |             |  |      | XA44  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA45   | Middle-cut chamfer                            | ●               |      | ●                     | ● | ● |   |   |             |  |      | XA45  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA46   | Middle-cut chamfer                            |                 | ●    | ●                     | ● |   |   |   |             |  |      | XA46  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA47   | Machined keyway                               | ●               | ●    | ●                     |   | ● |   |   |             |  |      | XA47  |      |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA48   | Change of long shaft length                   | ●               |      |                       |   | ● |   | ● |             |  |      | ●     | XA48 |       |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA49   | Change of short shaft length                  |                 | ●    |                       |   |   |   | ● | Y*          |  |      | Y*    | Y*   | XA49  |      |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA50   | Change of double shaft length                 | ●               | ●    |                       |   |   |   | ● |             |  |      | Y*    | Y*   | ●     | XA50 |    |    |    |  |  |      |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA51   | Change of long shaft length                   | ●               |      | ●                     | ● | ● |   |   |             | ●  |      | K, T* | J*   | K, T* | J*   | ●  | K* | ●  |  |  | XA51 |      |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA52   | Change of short shaft length                  |                 | ●    |                       | ● |   |   |   |             |  |      | K*    |      | K*    |      | K* | K* | K* |  |  | K*   | XA52 |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA53   | Change of double shaft length                 | ●               | ●    | ●                     |   |   |   |   |             |  |      | K*    |      | K*    | K*   | K* |    |    |  |  | K*   | ●    | XA53 |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA55   | Change of short shaft length                  | ●               | ●    | ●                     |   |   |   |   |             |  |      | J*    |      | J*    | J*   | J* |    |    |  |  | J*   |      | XA55 |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA57   | Change of double shaft length                 | ●               | ●    | ●                     |   |   |   |   |             | J*   |      | J*    |      | J*    | J*   | J* |    |    |  |  | J*   |      | ●    | XA57 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XA58   | Reversed shaft, Change of double shaft length | ●               | ●    | ●                     |   |   |   |   |             |  |      | J*    |      | J*    | J*   | J* |    |    |  |  | J*   |      | J*   | J*   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

A combination of up to two XA□s are available.  
Example: XA31A32

### XA□, XC□ Combination

Combination other than XA□, such as Made to Order (XC□), is also available.  
Refer to pages 79 to 80 for details of made-to-order specifications.

| Symbol | Description                             | Applicable size    | Combination  |
|--------|---|--------------------|--------------|
|        |   |                    | XA31 to XA58 |
| XC 1*  | Add connection port location            | 10, 15, 20, 30, 40 | ●            |
| XC 2*  | Change threaded hole to through-hole    | 15, 20, 30, 40     | ●            |
| XC 3*  | Change the screw position               | 10, 15, 20, 30, 40 | ●            |
| XC 4   | Change rotation range                   |                    | ●            |
| XC 5*  | Change rotation range between 0 to 200° |                    | ●            |
| XC 6*  | Change rotation range between 0 to 110° |                    | ●            |
| XC 7*  | Reversed shaft                          |                    | —            |
| XC30   | Fluorine grease                         |                    | ●            |

\* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.  
A total of four XA□ and XC□ combinations is available.  
Example: XA33A34C5C30

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

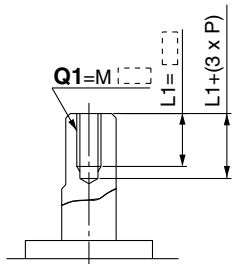
D-□

## 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

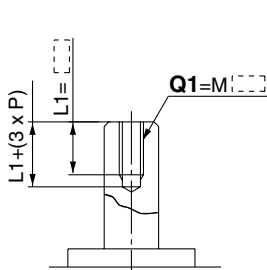


| Size | Q1            |   |
|------|---------------|---|
|      | S             | Y |
| 10   | Not available |   |
| 15   | M3            |   |
| 20   | M3, M4        |   |
| 30   | M3, M4, M5    |   |

### 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

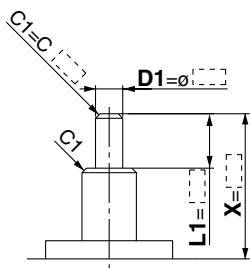


| Size | Q1            |   |   |
|------|---------------|---|---|
|      | J             | K | T |
| 10   | Not available |   |   |
| 15   | M3            |   |   |
| 20   | M3, M4        |   |   |
| 30   | M3, M4, M5    |   |   |
| 40   | M3, M4, M5    |   |   |

### 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 C1, indicate "\*" instead.)



| Size | X       | L1 max | D1         |
|------|---------|--------|------------|
|      |         |        |            |
| 15   | 5 to 18 | X-4    | ø3 to ø4.9 |
| 20   | 6 to 20 | X-4.5  | ø3 to ø5.9 |
| 30   | 6 to 22 | X-5    | ø3 to ø7.9 |
| 40   | 8 to 30 | X-6.5  | ø3 to ø9.9 |

### 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 "\*" for dimension X.)
- Applicable shaft types: J, K, T

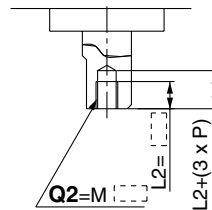
| Size | X          |   |   |   |   |   |   |   |   |            |   |   | L1 max | L3 max |   |   |   |   |  |  |
|------|------------|---|---|---|---|---|---|---|---|------------|---|---|--------|--------|---|---|---|---|--|--|
|      | J          |   |   | K |   |   | T |   |   | J          |   |   |        |        | K |   |   | T |  |  |
|      | J          | K | T | 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   |   |   |   |   |  |  |

## 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

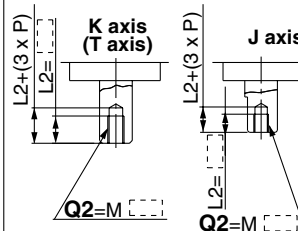


| Size | Q2            |   |
|------|---------------|---|
|      | S             | Y |
| 10   | Not available |   |
| 15   | M3            |   |
| 20   | M3, M4        |   |
| 30   | M3, M4, M5    |   |

### 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

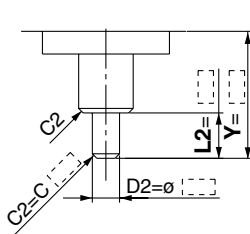


| Size | Q2            |   |   |
|------|---------------|---|---|
|      | J             | K | T |
| 10   | Not available |   |   |
| 15   | M3            |   |   |
| 20   | M3, M4        |   |   |
| 30   | M3, M4, M5    |   |   |
| 40   | M3, M4, M5    |   |   |

### 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 C2, indicate "\*" instead.)



| Size | Y       | L2 max | Q2         |
|------|---------|--------|------------|
|      |         |        |            |
| 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 |

### 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 "\*" for dimension Y.)
- Applicable shaft type: K

| Size | Y          |   |   |   |   |   |   |   |   |            |   |   | L2 max | L4 max |   |   |   |   |  |  |
|------|------------|---|---|---|---|---|---|---|---|------------|---|---|--------|--------|---|---|---|---|--|--|
|      | J          |   |   | K |   |   | T |   |   | J          |   |   |        |        | K |   |   | T |  |  |
|      | J          | K | T | J | K | T | J | K | T | J          | K | T |        |        | J | K | T |   |  |  |
| 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   |   |   |   |   |  |  |

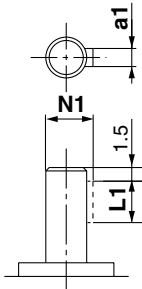


## Axial: Top (Long shaft side)

**Symbol: A47**

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

- Applicable shaft types: J, K, T

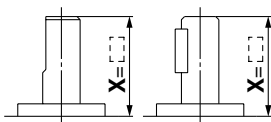


| Size | a1  | L1 | N1  |
|------|---|----|-----|
| 20   | 2h9 <sub>0</sub> <sup>0</sup> / <sub>-0.025</sub> | 10 | 6.8 |
| 30   | 3h9 <sub>0</sub> <sup>0</sup> / <sub>-0.025</sub> | 14 | 9.2 |

**Symbol: A48**

Shorten the long shaft.

- Applicable shaft types: S, Y



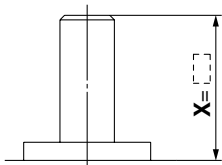
Size: 10 to 30      Size: 40

| Size | X         |
|------|-----------|
| 10   | 3 to 14   |
| 15   | 4 to 18   |
| 20   | 4.5 to 20 |
| 30   | 5 to 22   |
| 40   | 18 to 30  |

**Symbol: A51**

Shorten the long shaft.

- Applicable shaft types: J, K, T



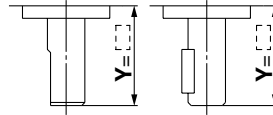
| Size | X         |
|------|-----------|
| 10   | 3 to 14   |
| 15   | 4 to 18   |
| 20   | 4.5 to 20 |
| 30   | 5 to 22   |
| 40   | 6.5 to 30 |

## Axial: Bottom (Short shaft side)

**Symbol: A49**

Shorten the short shaft.

- Applicable shaft type: Y



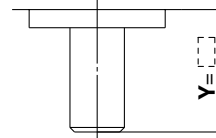
Size: 10 to 30      Size: 40

| Size | 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**

Shorten the short shaft.

- Applicable shaft type: K

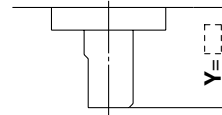


| Size | Y         |
|------|-----------|
| 10   | 1 to 14   |
| 15   | 1.5 to 18 |
| 20   | 1.5 to 20 |
| 30   | 2 to 22   |
| 40   | 4.5 to 30 |

**Symbol: A55**

Shorten the short shaft.

- Applicable shaft type: J



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

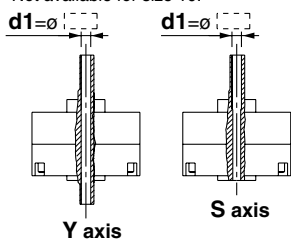
## Double Shaft

**Symbol: A39**

Applicable to single vane type only

Shaft with through-hole (Additional machining of S, Y shaft)

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



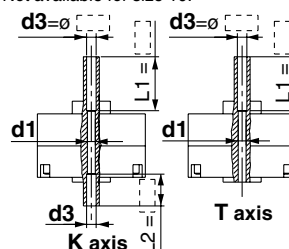
| Size | Shaft type   |   |
|------|--------------|---|
|      | S            | Y |
| 15   | d1           |   |
| 20   | ø2.5         |   |
| 30   | ø2.5 to ø3.5 |   |
| 40   | ø2.5 to ø4   |   |
| 40   | ø2.5 to ø3   |   |

**Symbol: A40**

Applicable to single vane type only

Shaft with through-hole (Additional machining of K, T shaft)

- Applicable shaft types: 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 sizes 20 to 40.



| Size | Shaft type   |   |
|------|--------------|---|
|      | K            | T |
| 15   | d1           |   |
| 20   | ø2.5 to ø3   |   |
| 30   | ø2.5 to ø4   |   |
| 40   | ø2.5 to ø4.5 |   |
| 40   | ø2.5 to ø5   |   |

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

MRQ

D-□

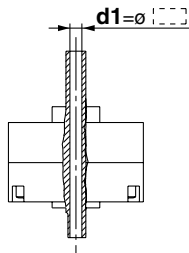
# Series CRB2

## 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.



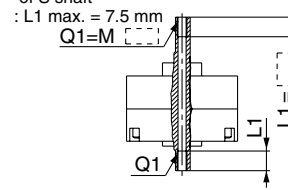
| Size | d1 (mm)      |
|------|--------------|
| 15   | ø2.5         |
| 20   | ø2.5 to ø3.5 |
| 30   | ø2.5 to ø4   |
| 40   | ø2.5 to ø4.5 |

## 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.
- 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 types: S, Y
- Equal dimensions are indicated by the same marker.



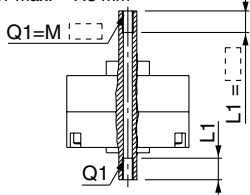
| Thread   | Size 15 |      | Size 20 |      | Size 30 |      | Size 40 |      |
|----------|---------|------|---------|------|---------|------|---------|------|
|          | S       | Y    | S       | Y    | S       | Y    | S       | Y    |
| M3 x 0.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 |
| M4 x 0.7 | —       | —    | ø3.3    | ø3.3 | ø3.3    | ø3.3 | —       | —    |
| M5 x 0.8 | —       | —    | —       | —    | ø4.2    | ø4.2 | —       | —    |

## 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 types: K, T
- Equal dimensions are indicated by the same marker.



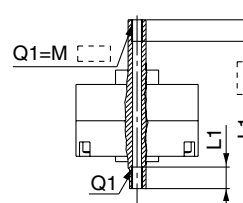
| Thread   | Size 15 |      | Size 20 |      | Size 30 |      | Size 40 |      |
|----------|---------|------|---------|------|---------|------|---------|------|
|          | K       | T    | K       | T    | K       | T    | K       | T    |
| M3 x 0.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 |
| M4 x 0.7 | —       | —    | ø3.3    | ø3.3 | ø3.3    | ø3.3 | ø3.3    | ø3.3 |
| M5 x 0.8 | —       | —    | —       | —    | ø4.2    | ø4.2 | 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
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.

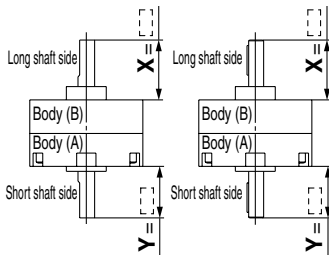


| Thread   | Size 15 |      | Size 20 |      | Size 30 |      | Size 40 |      |
|----------|---------|------|---------|------|---------|------|---------|------|
|          | S       | Y    | S       | Y    | S       | Y    | S       | Y    |
| M3 x 0.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 | ø2.5    | ø2.5 |
| M4 x 0.7 | —       | —    | ø3.3    | ø3.3 | ø3.3    | ø3.3 | ø3.3    | ø3.3 |
| M5 x 0.8 | —       | —    | —       | —    | ø4.2    | ø4.2 | ø4.2    | ø4.2 |

## Symbol: A50

Shorten both long and short shafts.

- Applicable shaft type: Y



Size: 10 to 30

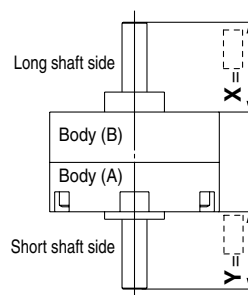
Size: 40

| Size | X (mm)    | Y (mm)    |
|------|-----------|-----------|
| 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: A53

Shorten both long and short shafts.

- Applicable shaft type: K

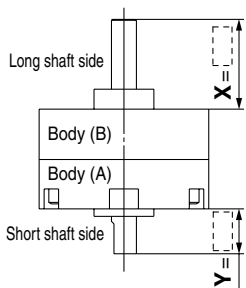


| Size | X (mm)    | Y (mm)    |
|------|-----------|-----------|
| 10   | 3 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   |
| 40   | 6.5 to 30 | 4.5 to 30 |

## Symbol: A57

Shorten both long and short shafts.

- Applicable shaft type: J



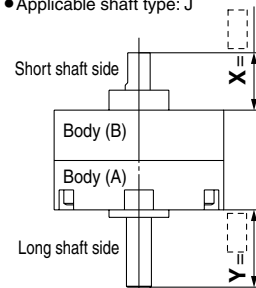
| Size | X (mm)    | Y (mm)    |
|------|-----------|-----------|
| 10   | 3 to 14   | 1 to 14   |
| 15   | 4 to 18   | 1.5 to 18 |
| 20   | 4.5 to 20 | 1.5 to 20 |
| 30   | 5 to 22   | 2 to 22   |
| 40   | 6.5 to 30 | 4.5 to 30 |

## Symbol: A58

The rotation axis is reversed. The long shaft and short shaft are shortened.

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

- Applicable shaft type: J

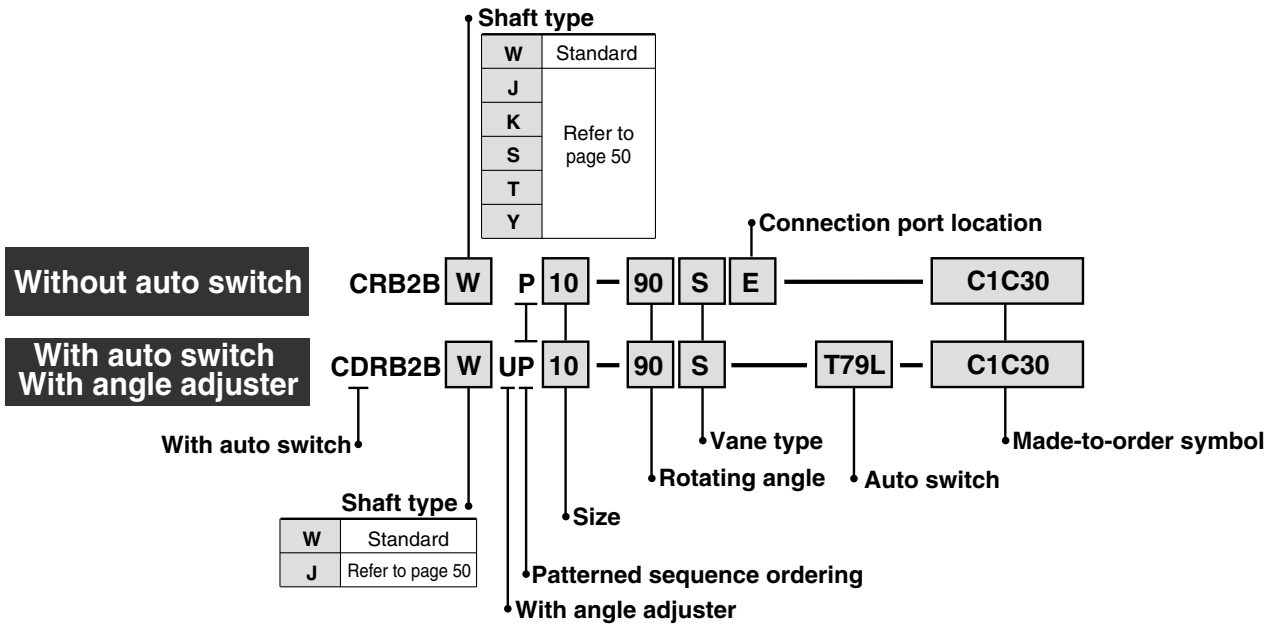


| Size | X (mm)    | Y (mm)      |
|------|-----------|-------------|
| 10   | 3 to 10   | 1 to 12     |
| 15   | 4 to 11.5 | 1.5 to 15.5 |
| 20   | 4.5 to 13 | 1.5 to 17   |
| 30   | 5 to 16   | 2 to 19     |
| 40   | 6.5 to 17 | 4.5 to 28   |

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

## Made to Order Specifications: XC1, 2, 3, 4, 5, 6, 7, 30

**XC1 to XC7, XC30**



- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

### Made to Order Symbol

| Symbol | Description                             | Applicable shaft type | Applicable size |
|--------|---|-----------------------|-----------------|
|        |   | W, J, K, S, T, Y      |                 |
| XC 1*  | Add connection port                     | ●                     | 10              |
| XC 2*  | Change threaded holes to through-hole   | ●                     |                 |
| XC 3*  | Change the screw position               | ●                     |                 |
| XC 4   | Change rotation range                   | ●                     | 20              |
| XC 5*  | Change rotation range between 0 to 200° | ●                     |                 |
| XC 6*  | Change rotation range between 0 to 110° | ●                     | 30              |
| XC 7*  | Reversed shaft                          | W, J                  |                 |
| XC30   | Fluorine grease                         | ●                     | 40              |

\* For products with auto switch; angle adjustment unit cannot be selected.

### Combination

| Symbol | Combination |     |     |     |     |     |     |
|--------|-------------|-----|-----|-----|-----|-----|-----|
| XC 1   | XC1         |     |     |     |     |     |     |
| XC 2   | ●           | XC2 |     |     |     |     |     |
| XC 3   | ●           | —   | XC3 |     |     |     |     |
| XC 4   | ●           | ●   | ●   | XC4 |     |     |     |
| XC 5   | ●           | ●   | ●   | —   | XC5 |     |     |
| XC 6   | ●           | ●   | ●   | —   | —   | XC6 |     |
| XC 7   | ●           | ●   | ●   | ●   | ●   | —   | XC7 |
| XC30   | ●           | ●   | ●   | ●   | ●   | ●   | ●   |

**Symbol: C1** Add connecting ports on Body (A).  
(An additionally machined port will have an aluminum surface since it will be left unfinished.)

- Parallel key is used on the long shaft for size 40.
- This specification is not available for the rotary actuator with auto switch unit.

| Size | 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: C2** Change 3 threaded holes on Body (B) into through holes.  
(An additionally machined port will have an aluminum surface since it will be left unfinished.)

- This specification is not available for the rotary actuator with auto switch unit.

| Size | d   |
|------|-----|
| 15   | 3.4 |
| 20   | 4.5 |
| 30   | 5.5 |
| 40   | 5.5 |

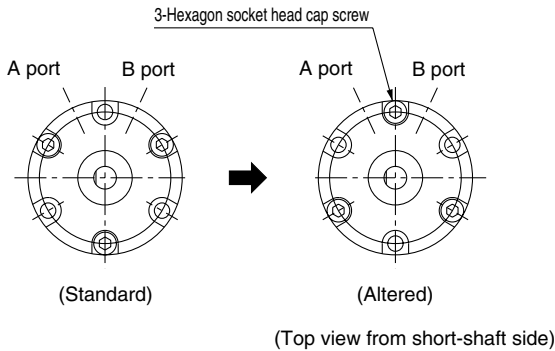
(Top view from long shaft side)

D-□

# Series CRB2

## Symbol: C3

Change the position of the screws for tightening the actuator body.

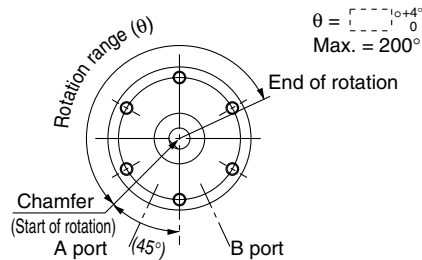


## Symbol: C5

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  $^{+5^\circ}_0$ .
- Port size for CRB2BW10, 15 is M3.
- A parallel key is used instead of chamfer for size 40.

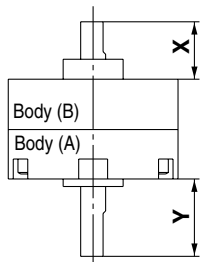


Start of rotation is the position of the chamfer (key) when B port is pressurized.  
(Top view from long shaft side)

## Symbol: C7

The shafts are reversed.

- Parallel key is used on the long shaft for size 40.



| Size | Y    | X    |
|------|------|------|
| 10   | 12   | 10   |
| 15   | 15.5 | 11.5 |
| 20   | 17   | 13   |
| 30   | 19   | 16   |
| 40   | 28   | 17   |

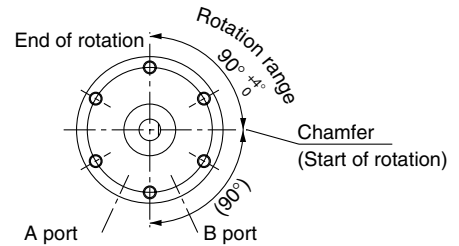
## Symbol: C4

Applicable to single vane type only

Change rotation range to 90°.

Rotation starts from the horizontal line (90° down from the top to the right side)

- Rotation tolerance for CRB2BW10 is  $^{+5^\circ}_0$ .
- A parallel key is used instead of chamfer for size 40.



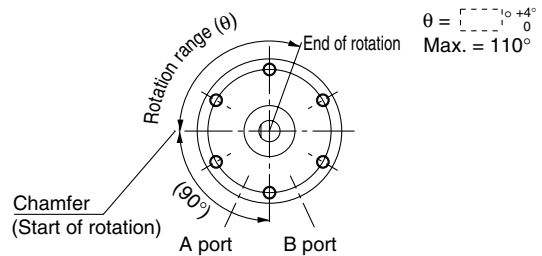
Start of rotation is the position of the chamfer (key) when A port is pressurized.  
(Top view from long shaft side)

## 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  $^{+5^\circ}_0$ .
- A parallel key is used instead of chamfer for size 40.



Start of rotation is the position of the chamfer (key) when B port is pressurized.  
(Top view from long shaft side)

## Symbol: C30

Change the standard grease to fluoro grease  
(Not for low-speed specification.)

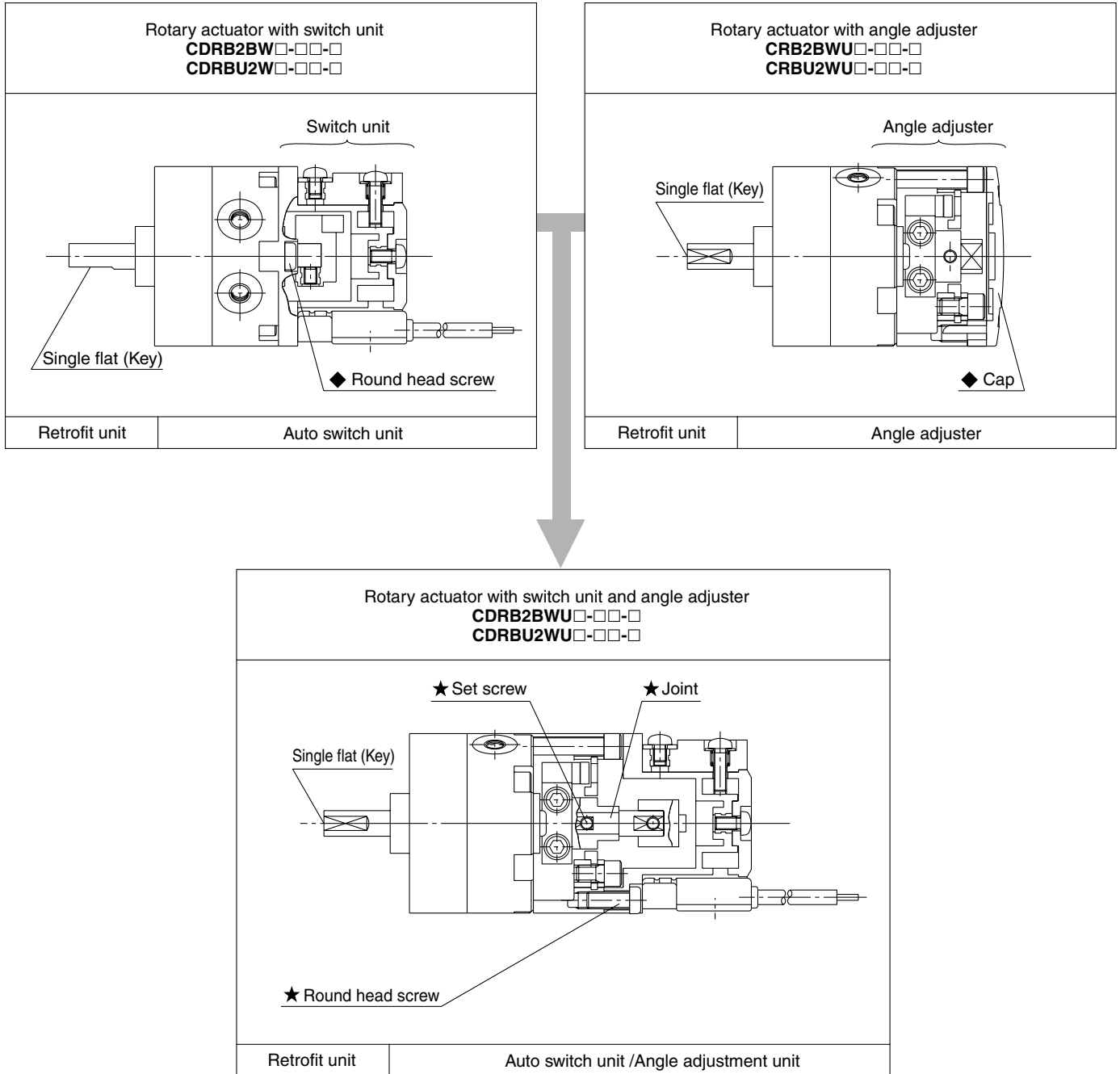
# Rotary Actuators

## Series *CRB2/CRBU2/CRB1*

# Component Unit

### Auto Switch Unit and Angle Adjuster

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



\* For rotary actuator with switch unit and angle adjuster is basically a combination of a switch unit and an angle adjuster. The items marked with ★ are additionally required parts for connection (joint unit parts), and the items marked with ◆ will not be in use.

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

Note) Illustrations above show Series CRB2BW.

## 1 Auto Switch Unit Part No.

Each unit can be retrofitted to the rotary actuator.

| Series                                 | Model      | Vane type          | Unit part no. |
|--|------------|--------------------|---------------|
| <i>Series CRB2</i>                     | CDRB2BW 10 | Single/Double type | P611070-1     |
|  | CDRB2BW 15 |                    | P611090-1     |
|  | CDRB2BW 20 |                    | P611060-1     |
|  | CDRB2BW 30 |                    | P611080-1     |
|  | CDRB2BW 40 |                    | P611010-1     |
| Free mount type<br><i>Series CRBU2</i> | CDRB2W 10  | Single/Double type | P611070-1     |
|  | CDRB2W 15  |                    | P611090-1     |
|  | CDRB2W 20  |                    | P611060-1     |
|  | CDRB2W 30  |                    | P611080-1     |
|  | CDRB2W 40  |                    | P611010-1     |
| <i>Series CRB1</i>                     | CDRB1BW 50 | Single/Double type | P411020-1     |
|  | CDRB1BW 63 |                    | P411030-1     |
|  | CDRB1BW 80 |                    | P411040-1     |
|  | CDRB1BW100 |                    | P411050-1     |

\* Auto switch unit can be ordered separately if the rotary actuator with auto switch unit is required after the product being delivered. Auto switch itself will not be included. Please order separately.

## 2 Switch Block Unit Part No.

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.

| Series                                 | Model            | Unit part no. |           |
|--|------------------|---------------|-----------|
| <i>Series CRB2</i>                     | CDRB2BW10,15     | Right-handed  | P611070-8 |
|  |                  | Left-handed   | P611070-9 |
|  | CDRB2BW20,30     | Right-handed  | P611060-8 |
|  |                  | Left-handed   |           |
|  | CDRB2BW40        | Right-handed  | P611010-8 |
|  |                  | Left-handed   | P611010-9 |
| Free mount type<br><i>Series CRBU2</i> | CDRB2W10,15      | Right-handed  | P611070-8 |
|  |                  | Left-handed   | P611070-9 |
|  | CDRB2W20,30      | Right-handed  | P611060-8 |
|  |                  | Left-handed   |           |
|  | CDRB2W40         | Right-handed  | P611010-8 |
|  |                  | Left-handed   | P611010-9 |
| <i>Series CRB1</i>                     | CDRB1BW50        | Right-handed  | P411020-8 |
|  |                  | Left-handed   | P411020-9 |
|  | CDRB1BW63,80,100 | Right-handed  | P411040-8 |
|  |                  | Left-handed   | P411040-9 |

\* Solid state switch for size 10 and 15 requires no switch block, therefore the unit part no. will be P211070-13.

## 3 Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

| Series                                 | Model     | Vane type          | Unit part no. |
|--|-----------|--------------------|---------------|
| <i>Series CRB2</i>                     | CRB2BWU10 | Single/Double type | P611070-3     |
|  | CRB2BWU15 |                    | P611090-3     |
|  | CRB2BWU20 |                    | P611060-3     |
|  | CRB2BWU30 |                    | P611080-3     |
|  | CRB2BWU40 |                    | P611010-3     |
| Free mount type<br><i>Series CRBU2</i> | CRBU2WU10 | Single/Double type | P611070-3     |
|  | CRBU2WU15 |                    | P611090-3     |
|  | CRBU2WU20 |                    | P611060-3     |
|  | CRBU2WU30 |                    | P611080-3     |
|  | CRBU2WU40 |                    | P611010-3     |

## 4 Auto Switch Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

| Series                                 | Model      | Vane type          | Unit part no. |
|--|------------|--------------------|---------------|
| <i>Series CRB2</i>                     | CDRB2BWU10 | Single/Double type | P611070-4     |
|  | CDRB2BWU15 |                    | P611090-4     |
|  | CDRB2BWU20 |                    | P611060-4     |
|  | CDRB2BWU30 |                    | P611080-4     |
|  | CDRB2BWU40 |                    | P611010-4     |
| Free-mount type<br><i>Series CRBU2</i> | CDRB2WU10  | Single/Double type | P611070-4     |
|  | CDRB2WU15  |                    | P611090-4     |
|  | CDRB2WU20  |                    | P611060-4     |
|  | CDRB2WU30  |                    | P611080-4     |
|  | CDRB2WU40  |                    | P611010-4     |

## 5 Joint Unit Part No.

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

| Series                                 | Model      | Vane type          | Unit part no. |
|--|------------|--------------------|---------------|
| <i>Series CRB2</i>                     | CDRB2BWU10 | Single/Double type | P211070-10    |
|  | CDRB2BWU15 |                    | P211090-10    |
|  | CDRB2BWU20 |                    | P211060-10    |
|  | CDRB2BWU30 |                    | P211080-10    |
|  | CDRB2BWU40 |                    | P211010-10    |
| Free mount type<br><i>Series CRBU2</i> | CDRB2WU10  | Single/Double type | P211070-10    |
|  | CDRB2WU15  |                    | P211090-10    |
|  | CDRB2WU20  |                    | P211060-10    |
|  | CDRB2WU30  |                    | P211080-10    |
|  | CDRB2WU40  |                    | P211010-10    |

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

# Series CRB2/CRBU2

# Installation of Angle Adjuster

## Specifications

### Single Vane Type

| Model                | Rotation adjustment range | Rubber bumper |
|----------------------|---------------------------|---------------|
| CRB2BWU10, CRBU2WU10 | 0 to 230°                 | Yes           |
| CRB2BWU15, CRBU2WU15 | 0 to 240°                 |               |
| CRB2BWU20, CRBU2WU20 |                           |               |
| CRB2BWU30, CRBU2WU30 |                           |               |
| CRB2BWU40, CRBU2WU40 | 0 to 230°                 |               |

Note 1) Use rotary actuator for 270°.

Note 2) Connection ports are side ports only.

Note 3) The allowable kinetic energy is the same as the specifications of the rotary actuator by itself.

### Double Vane Type

| Model                | Rotation adjustment range | Rubber bumper |
|----------------------|---------------------------|---------------|
| CRB2BWU10, CRBU2WU10 | 0 to 90°C                 | Yes           |
| CRB2BWU15, CRBU2WU15 |                           |               |
| CRB2BWU20, CRBU2WU20 |                           |               |
| CRB2BWU30, CRBU2WU30 |                           |               |
| CRB2BWU40, CRBU2WU40 |                           |               |

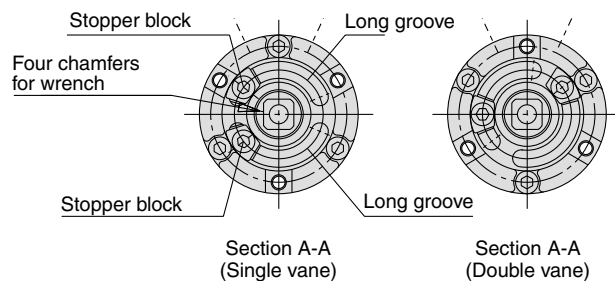
Note 1) Since the maximum angle of the rotation adjustment range will be limited by the rotation when using a rotary actuator for 90°, make sure to take this into consideration when ordering. Rotary actuator for 90° should be used to adjust the angle of 85° or less as a guide.

Note 2) Connection ports are side ports only.

Note 3) The allowable kinetic energy is the same as the specifications of the rotary actuator by itself.

## Rotation 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 rotation and rotation position. Protruding four chamfers for wrench on the output shaft that rotates allows manual operation and convenient positioning. (Refer to the rotation setting examples shown in the next page for details.)



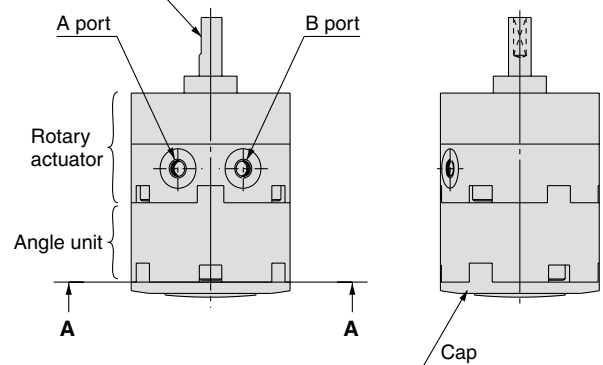
Note) For size 40, each stopper block comes with 2 holding bolts.

## Recommended Tightening Torque for Holding Stopper Block

| Model                | Tightening torque (N·m) |
|----------------------|-------------------------|
| CRB2BWU10, CRBU2WU10 | 1.0 to 1.2              |
| CRB2BWU15, CRBU2WU15 |                         |
| CRB2BWU20, CRBU2WU20 | 2.5 to 2.9              |
| CRB2BWU30, CRBU2WU30 | 3.4 to 3.9              |
| CRB2BWU40, CRBU2WU40 |                         |

Note) Stopper block is tightened temporarily at the time of shipment. Angle is not adjusted before shipment.

Output shaft with single flat (Key is used for size 40)



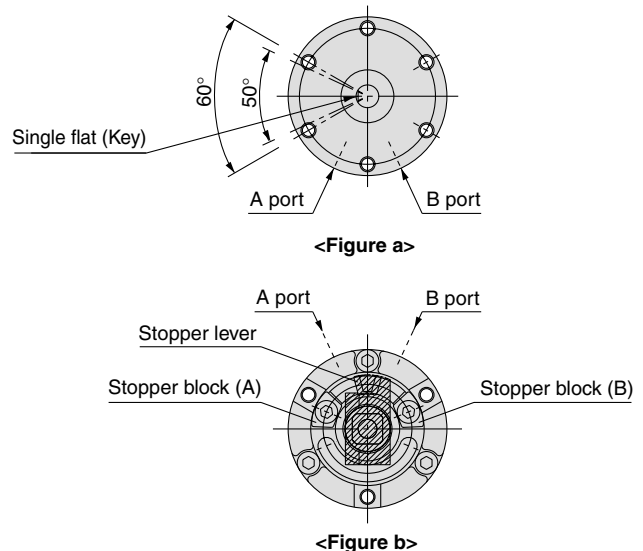
## Other Operating Method

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 a single long groove

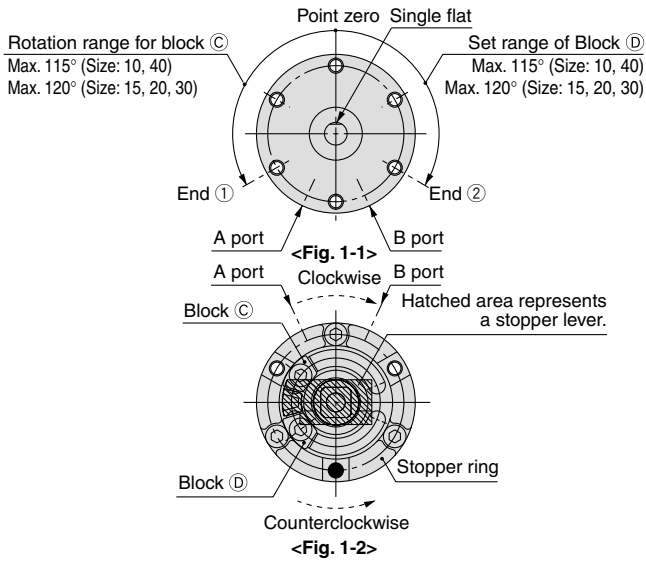
Size: 10, 40 .....50°  
Size: 15, 20, 30 .....60°

As shown in <Figure b>, when mounting 2 pcs. stopper blocks in the 1 pc. long groove, by revolving each stopper block (A)(B), the rotating range of the output shaft with single flat (key) is adjustable, as described in <Figure a>, within either left 50° and 60° against port A and B. (Rotating range of single flat (key) when mounting 2 pcs. stopper blocks on the other side's groove is the opposite side from <Figure a> and the setting range is within either right 50° and 60° against port A and B.)



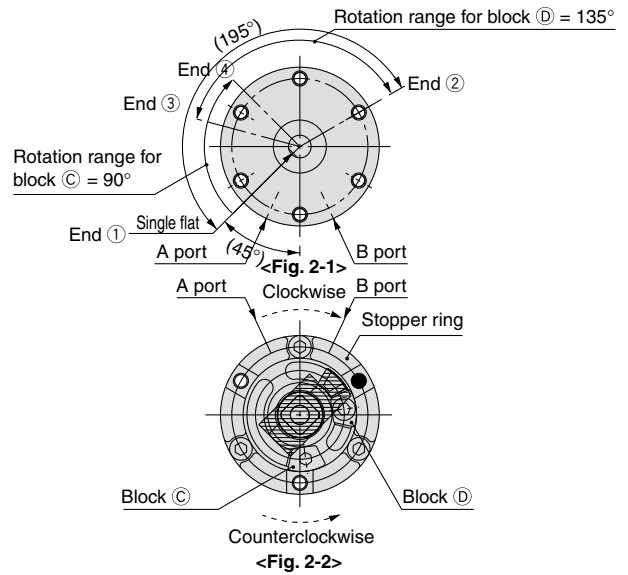
## Rotation Setting Example

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



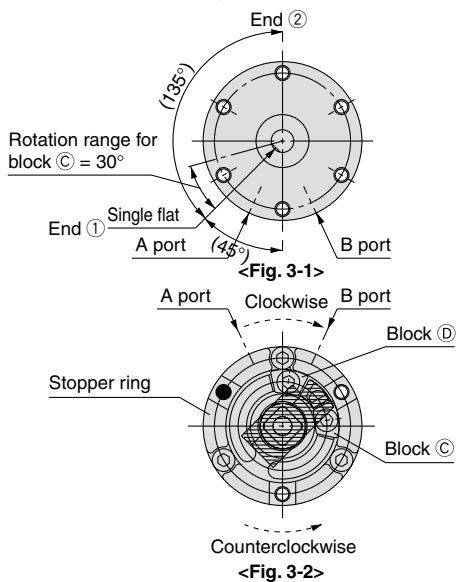
Lock block ④ in Fig. 1-2, and move block ③ clockwise to allow the rotation of the shaft with single flat in Fig. 1-1 from point zero to end of rotation ①. When block ③ is locked and block ④ is moved counterclockwise, the shaft with single flat in Fig. 1-1 rotates from point zero to end of rotation ②. 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 rotation is 0°).

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



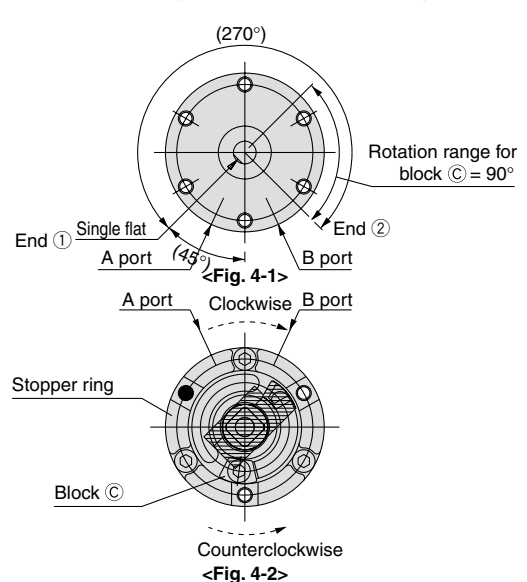
The maximum rotation range of the shaft with single flat in Fig. 2-2 is 195°, from end of rotation ① to end of rotation ②. The rotation range decreases to the range between end of rotation ② and ③ as in 2-1 when moving block ③ in Fig. 2-2 clockwise, and similarly when block ④ is moved counterclockwise,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

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



Lock block ③ in Fig. 3-2 and move block ④ counterclockwise to allow the rotation of the shaft with single flat in Fig. 3-1 from end of rotation ① to end of rotation ②. However, since the internal stopper will come into contact with the vane at end of rotation ①, make sure that the stopper lever stops at block ③ when adjusting. End of rotation side ① can be adjusted within 30° by turning block ③ counterclockwise.

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



The maximum rotation range of the shaft with single flat is 270°, from end of rotation ① to end of rotation ②, when using the actuator for 270° and end of rotation ① side in Fig. 4-1 is stopped by the internal stopper and end of rotation ② side is adjusted using block ③. The rotation can be adjusted within 90° from end of rotation ②. Note that block ③ cannot be moved and set 90° 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, and 4 are not applicable for size 10.
- Note 2) ● marks in the illustrations above indicate the position of the stopper ring assembly.
- Note 3) Select the appropriate rotation of the rotary actuator by itself after careful consideration of the content of "installation of angle adjuster".
- Note 4) For size 40, each block comes with 2 holding bolts.

CRB2

CRBU2

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# Series CDRB2/CDRBU2/CRB1 With Auto Switch

## Applicable Auto Switch

| Applicable series  | Auto switch model  |                 | Electrical entry                   |
|--|--------------------|-----------------|------------------------------------|
| CDRB2BW10/15<br>CDRBU2W10/15                             | Reed switch        | D-90, D-90A     | Grommet, 2-wire                    |
|  |                    | D-97, D-93A     |                                    |
|  | Solid state switch | D-S99, D-S99V * | Grommet, 3-wire (NPN)              |
|  |                    | D-S9P, D-S9PV * | Grommet, 3-wire (PNP)              |
| D-T99, D-T99V  |                    | Grommet, 2-wire |                                    |
| CDRB2BW20/30/40<br>CDRBU2W20/30/40<br>CRB1BW50/63/80/100 | Reed switch        | D-R73           | Grommet, 2-wire                    |
|  |                    | D-R80           | Connector, 2-wire                  |
|  | Solid state switch | D-S79 *         | Grommet, 3-wire (NPN)              |
|  |                    | D-S7P *         | Grommet, 3-wire (PNP)              |
|  |                    | D-T79           | Grommet, 2-wire; Connector, 2-wire |

\* Solid state switch with 3-wire type has no connector type.

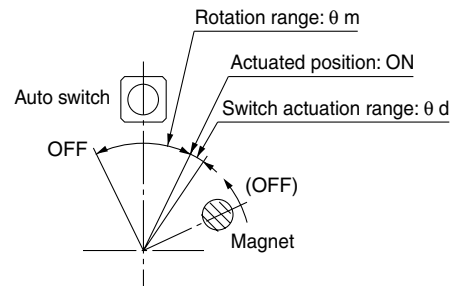
## Operating Range and Hysteresis

### \* 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 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.

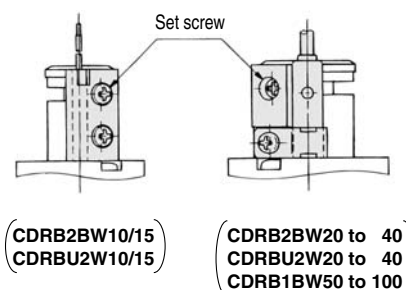


| Model            | Operating range: $\theta$ m | Switch actuation range: $\theta$ d |
|------------------|-----------------------------|------------------------------------|
| CDRB2BW10/15     | 110°                        | 10°                                |
| CDRBU2W10/15     |                             |                                    |
| CDRB2BW20/30     | 90°                         | 8°                                 |
| CDRBU2W20/30     |                             |                                    |
| CDRB2BW40        | 52°                         | 7°                                 |
| CDRBU2W40        |                             |                                    |
| CDRB1BW50        |                             |                                    |
| CDRB1BW63 to 100 | 38°                         | 7°                                 |

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 Detecting Position of Auto Switch

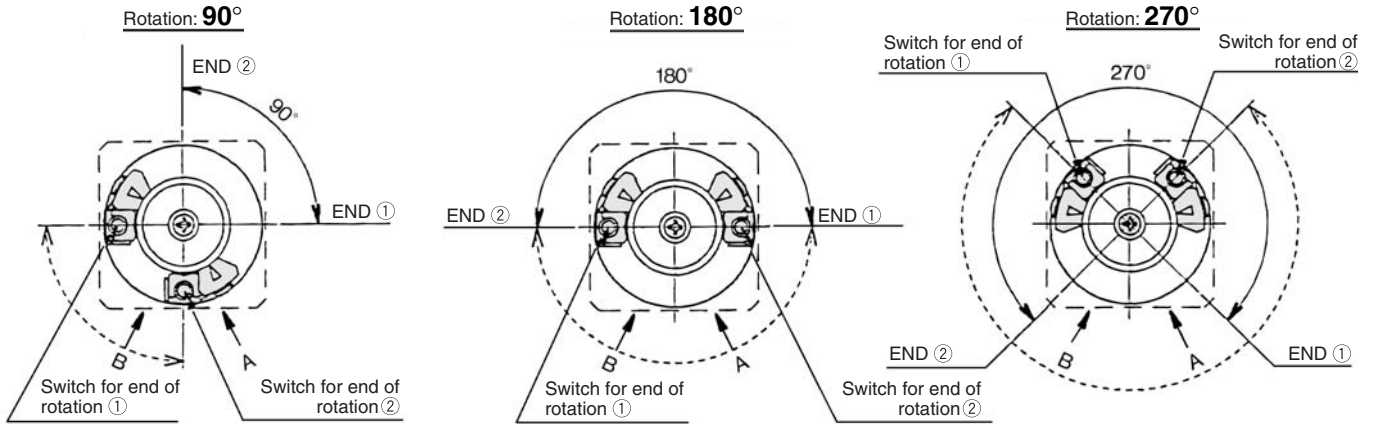
\* When setting the detection location, loosen the tightening screw a bit and move the auto switch to the preferred location and then tighten again and fix it. At this time, if tightened too much, screw can become damaged and unable to fix location. Be sure to set the tightening torque around 0.49 N·m.



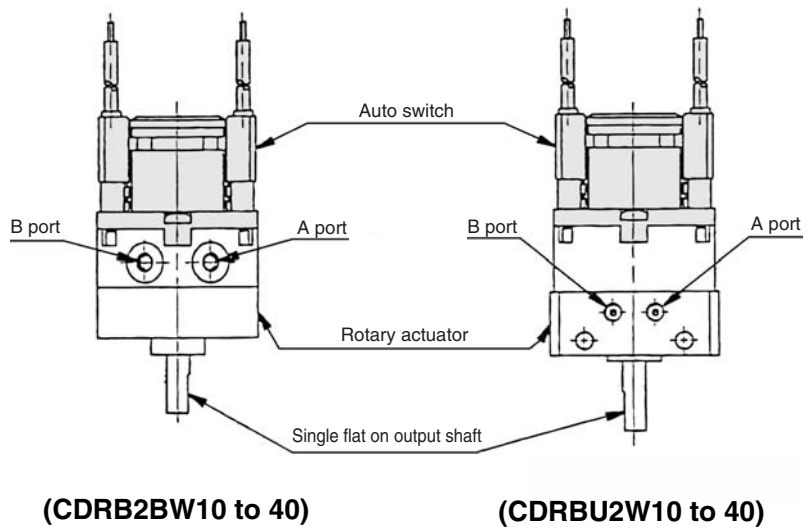
## Adjustment of Auto Switch

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

<Single vane>



- \* Solid-lined curves indicate the rotation range of the output shaft with single flat (key). When the single flat (key) is pointing to end of rotation ①, the switch for end of rotation ① will operate, and when the single flat (key) is pointing to end of rotation ②, the switch for end of rotation ② will operate.
- \* Broken-lined curves indicate the rotation range of the built-in magnet. Rotation range of the switch can be decreased by either moving the switch for end of rotation ① clockwise or moving the switch for end of rotation 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.



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

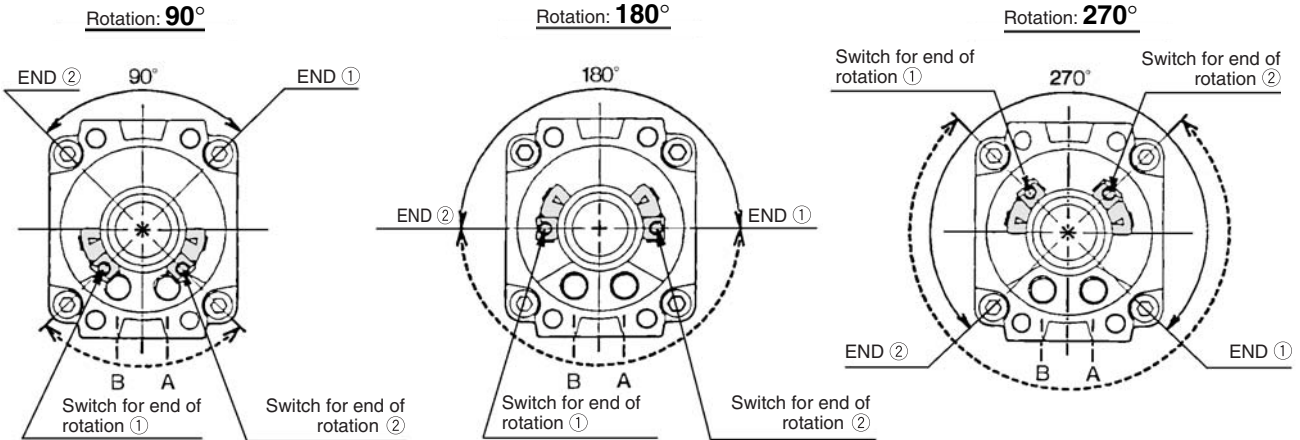
# Series CDRB2/CDRBU2/CRB1

## Adjustment of Auto Switch

Rotation range of the output key (keyway) and auto switch mounting position

Size: 50, 63, 80, 100

<Single vane>



- \* Solid-lined curves indicate the rotation range of the output key (keyway). When the key is pointing to end of rotation ① the switch for end of rotation ① will operate, and when the key is pointing to end of rotation ②, the switch for end of rotation ② will operate.
- \* Broken-lined curves indicate the rotation range of the built-in magnet. Rotation range of the switch can be decreased by either moving the switch for end of rotation ② clockwise or moving the switch for end of rotation 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.
- \* The magnet position can be checked with a convenient ► indication by removing a rubber cap when adjusting the auto switch position.
- \* Since four chamfers are machined into the axis of rotation, a magnet position can be readjusted at 90° intervals.

