Rotary Actuator
Vane Style
Series CRB2
Size: 10, 15, 20, 30, 40

Series Variations

				10				15				20, 30				40			
	Fluid			Air															
	Size																		
	Vane type	Single vane (S) Double vane (D)		S		D		S		D		S		D		S		D	
	Port location	Side ported (Nil) 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
Standard	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	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	J													●	●	●	●
		Same length double long shaft with single flat on both shafts	Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Double shaft key	Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Shaft type / Single shaft type	Single flat	S													●	●	●	●
		Single shaft key	S													●	●	●	●
		Single round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Pattern	Shaft pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Rotation pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

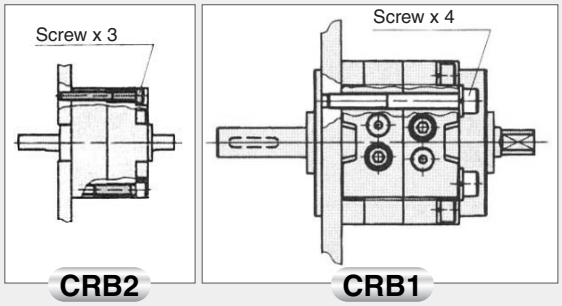
Rotating angle: 90°, 180°, 270° All series can rotate up to 270°.

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.



Excellent reliability and durability

The use of bearings in all series to support thrust and radial loads, along with the implementation of an internal rubber bumper (except size 10), improves reliability and durability.

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

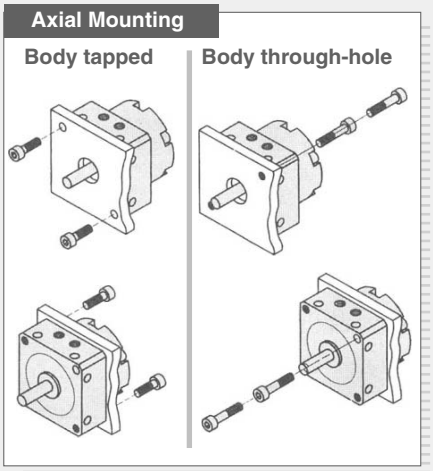
Size 15 to 100: 0.15 MPa

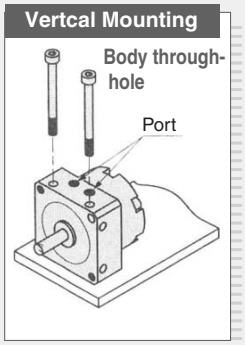
Unrestricted auto switch mounting position

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.

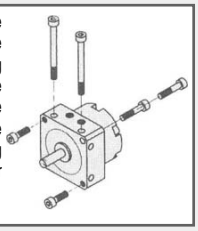
Direct mounting from 3 different directions is possible (CRBU2).

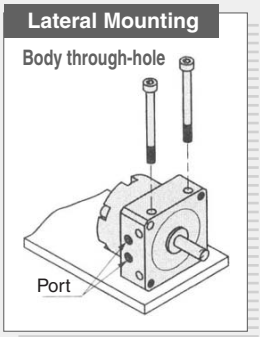
Series CRBU2 can be mounted in 3 directions: axial, vertical, and lateral. In the axial direction, there are 3 mounting variations.





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.





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

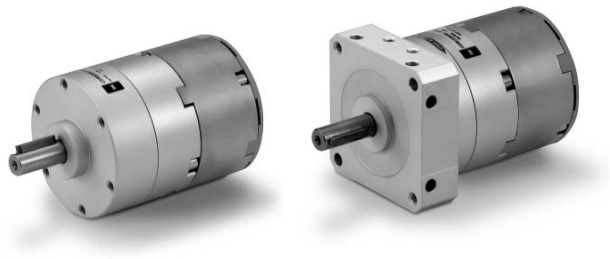
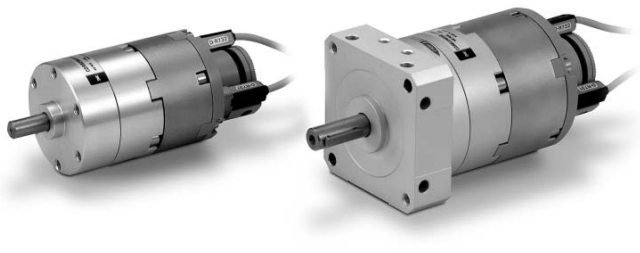
CRBU2/Size:
10, 15, 20, 30, 40

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

	Basic Type + Angle Adjuster	Basic Type + Angle Adjuster + Switch Unit
		

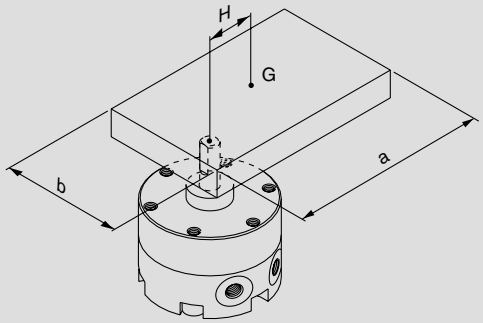
Series CRB2/CRBU2/CRB1
Model Selection

Selection Procedure	Formula	Selection Example

1 Operating conditions

Operating conditions are as follows:

- Model used
- Operating pressure
- Load type
  - Ts (N·m)
  - Tf (N·m)
  - Ta (N·m)
- Load configuration
- Rotation time t (s)
- Rotation
- Load mass m (kg)
- Distance between central axis and center of gravity H (mm)



Rotary actuator: CRB2BW30-90S, Pressure: 0.5 MPa
Mounting position: Vertical, Type of load: Inertial load Ta
Load configuration: 60 mm x 40 mm (Rectangular plate)
Rotation time (t): 0.3 s, Rotation: 90° ($\theta = \pi/2$)
Load mass (m): 0.15 kg, Distance between central axis and center of gravity (H): 30 mm

2 Required torque

Confirm the type of load as shown below, and select an actuator that satisfies the required torque.

- Static load: Ts
- Resistance load: Tf **Load type**
- Inertial load: Ta

Effective torque ≥ Ts
Effective torque ≥ (3 to 5) Tf
Effective torque ≥ 10 Ta
Effective torque

Inertial load
$10 \times Ta = 10 \times I \times \dot{\omega} = 10 \times 0.0002 \times \pi / 0.3^2$
= 0.07 N·m < Effective torque OK
Note) I is obtained by substituting the value of inertia moment ⑤.
$\dot{\omega} = \frac{2\theta}{t^2}$ ($\dot{\omega}$: Angular acceleration)

3 Rotation time

Confirm that it is within the adjustable range of rotation time.

Model	Rotation time adjustment range for stable operation S/90°
CRB2BW/CRBU2W10 to 20	0.03 to 0.3
CRB2BW/CRBU2W30	0.04 to 0.3
CRB2BW/CRBU2W40	0.07 to 0.5
CRB1BW50 to 100	0.1 to 1

0.3/90° OK

4 Allowable loads

Confirm that the radial load, thrust load, and moment are within the allowable ranges.

Thrust load: m x 9.8 ≤ Allowable load

Allowable load

0.15 x 9.8 = 1.47 N < Allowable load OK

5 Moment of inertia

Find the load's moment of inertia "I" for the energy calculation.

$I = m \times (a^2 + b^2) / 12 + m \times H^2$
Moment of inertia

$I = 0.15 \times (0.06^2 + 0.04^2) / 12 + 0.15 \times 0.03^2$
$= 0.0002\ kg \cdot m^2$

6 Kinetic energy

Confirm that the load's kinetic energy is within the allowable value.

$1/2 \times I \times \omega^2 =$ < Allowable energy
$\omega = 2\theta / t$ (ω: Terminal angular velocity)
θ: Rotation angle (rad)
t: Rotation time (s)
Allowable kinetic energy/Rotation time

1 / 2 x (0.0002) x (2 x (π / 2) / 0.3)^2 =
0.01096 J < Allowable energy OK

Effective Torque

(N·m)

Size	Vane type	Operating pressure (MPa)									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
10	Single vane	—	0.03	0.06	0.09	0.12	0.15	0.18	—	—	—
	Double vane	—	0.07	0.13	0.19	0.25	0.31	0.37	—	—	—
15	Single vane	0.06	0.10	0.17	0.24	0.32	0.39	0.46	—	—	—
	Double vane	0.13	0.20	0.34	0.48	0.65	0.79	0.93	—	—	—
20	Single vane	0.16	0.23	0.39	0.54	0.70	0.84	0.99	—	—	—
	Double vane	0.33	0.47	0.81	1.13	1.45	1.76	2.06	—	—	—
30	Single vane	0.44	0.62	1.04	1.39	1.83	2.19	2.58	3.03	3.40	3.73
	Double vane	0.90	1.26	2.10	2.80	3.70	4.40	5.20	6.09	6.83	7.49
40	Single vane	0.81	1.21	2.07	2.90	3.73	4.55	5.38	6.20	7.03	7.86
	Double vane	1.78	2.58	4.3	5.94	7.59	9.24	10.89	12.5	14.1	15.8
50	Single vane	1.20	1.86	3.14	4.46	5.69	6.92	8.14	9.5	10.7	11.9
	Double vane	2.70	4.02	6.60	9.21	11.8	14.3	16.7	19.4	21.8	24.2
63	Single vane	2.59	3.77	6.11	8.45	10.8	13.1	15.5	17.8	20.2	22.5
	Double vane	5.85	8.28	13.1	17.9	22.7	27.5	32.3	37.10	41.9	46.7
80	Single vane	4.26	6.18	10.4	14.2	18.0	21.9	25.7	30.0	33.8	37.6
	Double vane	8.70	12.6	21.1	28.8	36.5	44.2	51.8	60.4	68.0	75.6
100	Single vane	8.6	12.2	20.6	28.3	35.9	43.6	51.2	59.7	67.3	75
	Double vane	17.9	25.2	42.0	57.3	72.6	87.9	103	120	135	150

Load Type

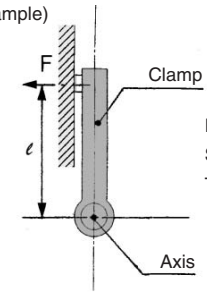
During examination if it is decided to consider the mass of the lever itself in the drawing below, it should be regarded as an inertial load.

● Static load: Ts

A load as represented by the clamp which requires pressing force only

(During examination if it is decided to consider the mass of the clamp itself in the drawing below, it should be regarded as an inertial load.)

(Example)



F: Pressing force (N)

Static torque calculation

Ts = F x ℓ (N·m)

● Resistance load: Tf

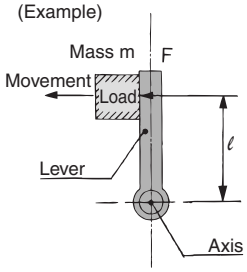
A load that is affected by external forces such as friction or gravity

Since the object is to move the load, and speed adjustment is necessary, allow an extra margin of 3 to 5 times in the effective torque.

∗ Actuator effective torque ≥ (3 to 5) Tf

(During examination if it is decided to consider the mass of the lever itself in the drawing below, it should be regarded as an inertial load.)

(Example)



Friction coefficient μ

F = μmg

Static torque calculation

Tf = F x ℓ (N·m)

g = 9.8 m/s²

● Inertial load: Ta

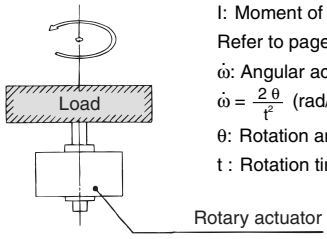
The load which must be rotated by the actuator

Since the object is to rotate the load, and speed adjustment is necessary, allow an extra margin of 10 times or more in the effective torque.

∗ Actuator effective torque ≥ S·Ta

(S is 10 times or more)

Accelerating torque calculation Ta = I·ω̇ (N·m)



I: Moment of inertia

Refer to page 11-1-30.

ω̇: Angular acceleration

$\dot{\omega} = \frac{2\theta}{t^2}$ (rad/s²)

θ: Rotation angle (rad)

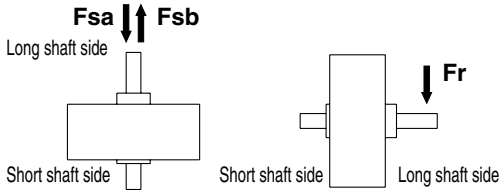
t : Rotation time (S)

Allowable Load

Application of the load on the axial direction is tolerated if no dynamic load is generated and the values are within what is shown in the table below. However, avoid such operation that the load is applied directly to the shaft.

(N)

Model	Load direction		
	Fsa	Fsb	Fr
CRB2BW, CRBU2W10	9.8	9.8	14.7
CRB2BW, CRBU2W15	9.8	9.8	14.7
CRB2BW, CRBU2W20	19.6	19.6	24.5
CRB2BW, CRBU2W30	24.5	24.5	29.4
CRB2BW, CRBU2W40	40	40	60
CRB1BW50	196	196	245
CRB1BW63	340	340	390
CRB1BW80	490	490	490
CRB1BW100	539	539	588



Rotary Actuator
Vane Style
Series CRB2

Size: 10, 15, 20, 30, 40

How to Order

Without auto switch
CRB2 **B W** ☐ – **180 S E**

With auto switch Size: 10, 15
CDRB2 **F W** ☐ – **180 S** – **90 L** ☐

With auto switch Size: 20, 30, 40
CDRB2 **B W** ☐ – **180 S** – **R73 L** ☐

With auto switch (With switch unit)

Size (CRB2)

10
15
20
30
40

Size (CDRB2, size 10, 15)

10
15

Size (CDRB2, size 20, 30, 40)

20
30
40

Mounting style

B	Basic style
F	Flange style

∗ F: Except size 40

Shaft type

W	Double shaft with single flat (Size 10 to 30)
	Long shaft key, Short shaft with single flat (Size 40)

Rotating angle

Vane type	Symbol	Rotating angle
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

Vane type

S	Single vane
D	Double vane

Connecting port location

Nil	Side ported
E	Axial ported

Side ported

Axial ported

∗ Fittings are sold separately.

Number of auto switches

S	1 pc. ∗
Nil	2 pcs.

∗ Right-hand auto switch will be used for actuators with 1 auto switch.

Electrical entry/Lead wire length

Nil	Grommet/Lead wire 0.5 m
L	Grommet/Lead wire: 3 m
C	Grommet/lead wire 0.5 m
CL	Grommet/Lead wire: 3 m
CN	Grommet/Without lead wire

∗ Connectors are available only for auto switch types D-R73, D-R80, D-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

Auto switch

Nil	Without auto switch

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

Applicable Auto Switch/Refer to page 11-1-1 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	Reed switch	Grommet	No	2-wire	24 V	5 V,12 V	5 V,12 V, 24 V	90	Parallel cord	●	●	●	–	IC circuit	Relay, PLC
						5 V,12 V, 100 V	5 V,12 V, 24 V,100 V	90A	Heavy-duty cord	●	●	●	–		
			Yes			–	–	97	Parallel cord	●	●	●	–	–	
							100 V	93A	Heavy-duty cord	●	●	●	–		
	Solid state switch					12 V	–	T99		●	●	–	–		
								T99V		●	●	–	–		
				3-wire (NPN)		5 V,12 V		S99		●	●	–	–	IC circuit	
								S99V		●	●	–	–		
				3-wire (NPN)				S9P		●	●	–	–		
								S9PV		●	●	–	–		
For 20, 30 and 40	Reed switch	Grommet	Yes	2-wire	24 V	–	100 V	R73	Heavy-duty cord	●	●	–	–	–	Relay, PLC
		Connector						R73C		●	●	●	●		
		Grommet	No			48 V, 100 V	24 V, 48 V, 100 V	R80		●	●	–	–	IC circuit	
		Connector						R80C		●	●	●	●		
	Solid state switch	Grommet	Yes			12 V	–	T79		●	●	–	–	–	
		Connector						T79C		●	●	●	●		
		Grommet		3-wire (NPN)		5 V,12 V		S79		●	●	–	–	IC circuit	
				3-wire (PNP)				S7P		●	●	–	–		

∗ 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 11-2-10.)

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

Single Vane Specifications

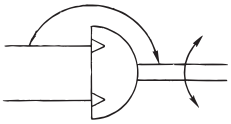
Model (Size)		CRB2BW10-□S		CRB2BW15-□S		CRB2BW20-□S	CRB2BW30-□S	CRB2BW40-□S
Vane type		Single vane						
Rotating angle		90°,180°	270°	90°,180°	270°	90°,180°, 270°		
Fluid		Air (Non-lube)						
Proof pressure (MPa)		1.05					1.5	
Ambient and fluid temperature		5 to 60°C						
Max. operating pressure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

Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 11-2-9.

Double Vane Specifications

Model (Size)		CRB2BW10-□D	CRB2BW15-□D	CRB2BW20-□D	CRB2BW30-□D	CRB2BW40-□D
Vane type		Double vane				
Rotating angle		90°, 100°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Speed adjustable range (sec/90°) (1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (J) (2)		0.0003	0.0012	0.0033	0.02	0.04
Shaft load (N)	Allowable radial load	15	15	25	30	60
	Allowable thrust load	10	10	20	25	40
Bearing type		Bearing				
Port location		Side ported or Axial ported				
Port size (Side ported, Axial ported)		M3 x 0.5		M5 x 0.8		
Shaft type		Double shaft (Double shaft with single flat on both shafts)				
Angle adjustable range (3)		0 to 90°				
Mounting		Basic style, Flange style				
Auto switch		Mountable (Side ported only)				

JIS Symbol



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 11-2-9.

Volume

(cm³)

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	
Rotation	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Volume	1 (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.

Weight

(g)

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	
Rotating angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
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	

Rotary Actuator: Replaceable Shaft

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

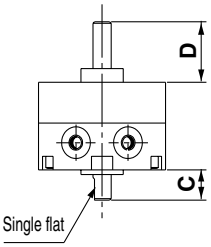
Without auto switch

CRB2B | **J** | **Size** | **Rotating angle** | **Vane type** | **Port location**

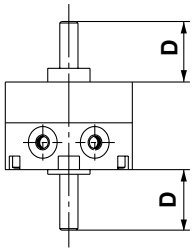
Shaft type

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 & 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					●

J

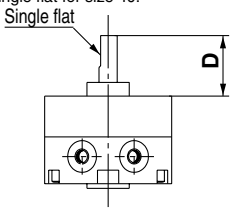


K

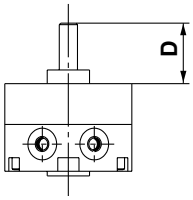


S

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

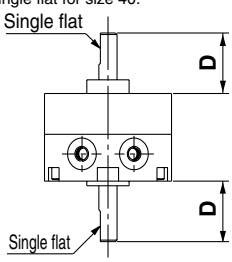


T



Y

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



(mm)

Size	10	15	20	30	40
C	8	9	10	13	15
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 keyway for size 40) are the same as the standard.

With auto switch With angle adjusted

CDRB2B J U | **Size** | **Rotating angle** | **Vane type** | **Auto switch**

With angle adjuster

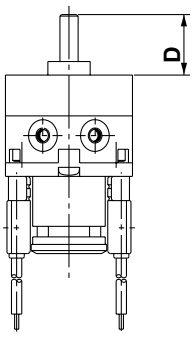
Shaft type

With auto switch

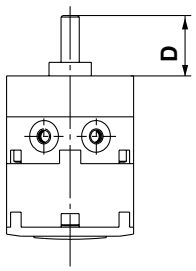
Symbol	Shaft type	Shaft-end shape	Size				
			10	15	20	30	40
J	Double shaft	Long shaft without single flat & with single flat	●	●	●	●	
		Long shaft without keyway & single flat					●

J

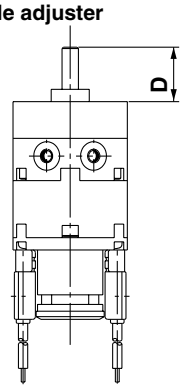
With auto switch



With angle adjusted



With auto switch and angle adjuster



(mm)

Size	10	15	20	30	40
C	8	9	10	13	15
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 keyway for size 40) are the same as the standard.

Copper-free

20–CRB2BW | Size | – | Rotating angle | Vane type | Port location

Copper-free

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

Specifications

Vane type	Single/Double vane				
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				
Piping	Screw-in type				
Mounting	Basic style only				
Variations	Basic type, With auto switch, With angle adjuster				

⚠ Precautions

Be sure to read before handling. Refer to pages 11-13-3 to 4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 11-1-4 to 6 for Precautions on every series.

Angle Adjuster

⚠ Caution

1. In case of a rotary actuator for a 90° or 180° application, the maximum angle will be limited by the rotation of the rotary actuator itself. Make sure to take this into consideration when ordering.
In case of a rotary actuator for a 90° or 180° application, angle adjustment at the maximum angle of 90° or 180°, respectively, is not feasible. This is due to the fact that the rotation of the rotary actuator is limited to $90^{\circ}\ ^{+4^{\circ}}_{0}$ or $180^{\circ}\ ^{+4^{\circ}}_{0}$, respectively. Therefore, for the single vane type, use a rotary actuator with a rotation angle of 270°, and for the double vane type, use a rotary actuator with a rotation of 100°. When operating a rotary actuator with a rotation of 90° or 180°, the rotation should be adjusted to within 85° and 175°, respectively, as a guide.

2. Connection ports are side ports only.

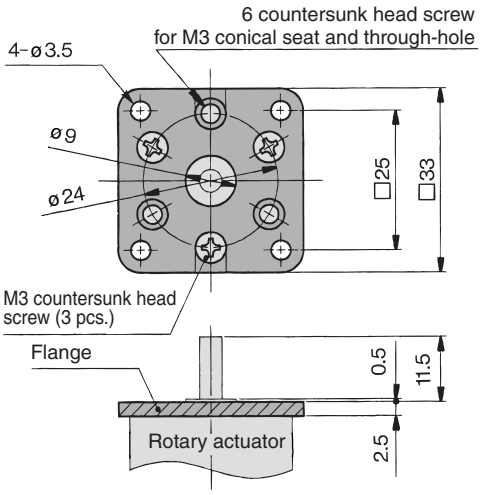
3. The allowable kinetic energy is the same as the specifications of the rotary actuator by itself (i.e., without angle adjuster).

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

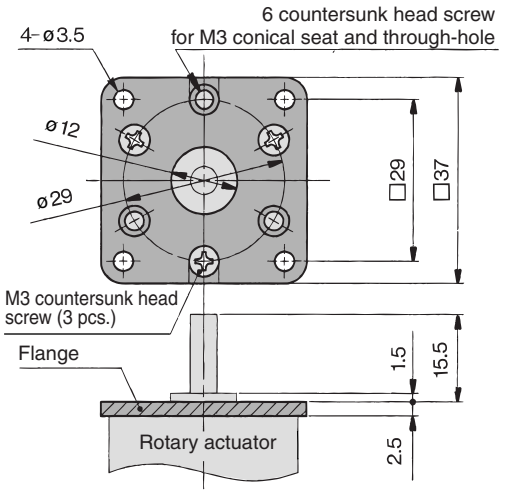
Type				Flange assembly part no.
Basic type	With auto switch	With angle adjuster	With angle adjuster and auto switch	
CRB2FW10	CDRB2FW10	CRB2FWU10	CDRB2FWU10	P211070-2
CRB2FW15	CDRB2FW15	CRB2FWU15	CDRB2FWU15	P211090-2
CRB2FW20	CDRB2FW20	CRB2FWU20	CDRB2FWU20	P211060-2
CRB2FW30	CDRB2FW30	CRB2FWU30	CDRB2FWU30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

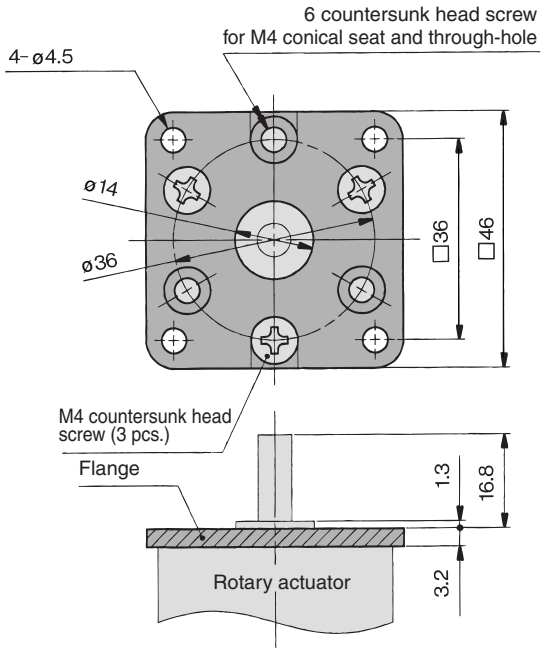
Assembly Part No.: P211070-2 (for C□RB2FW□10)



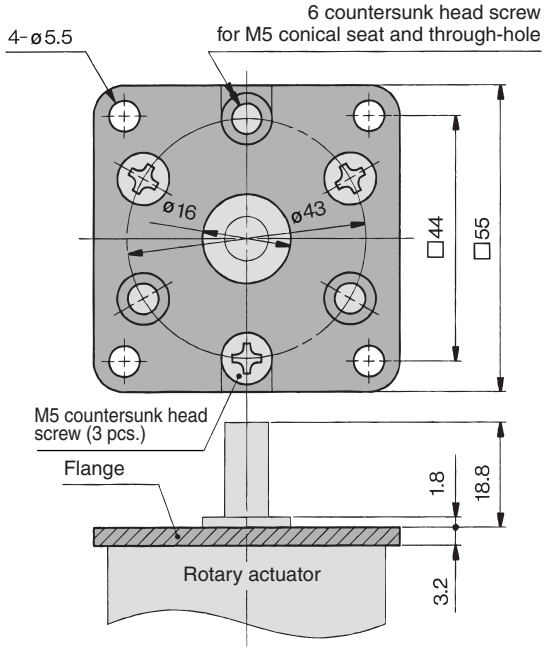
Assembly Part No.: P211090-2 (for C□RB2FW□15)



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

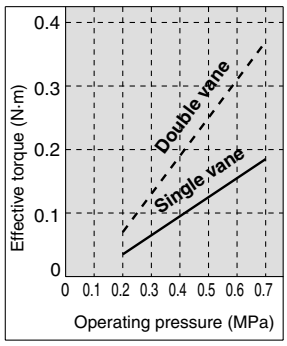


Assembly Part No.: P211080-2 (for C□RB2FW□30)

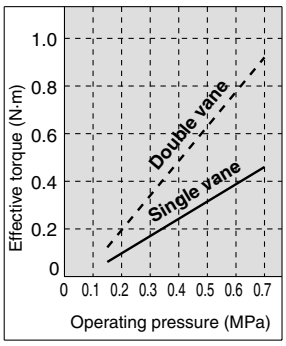


Effective Output

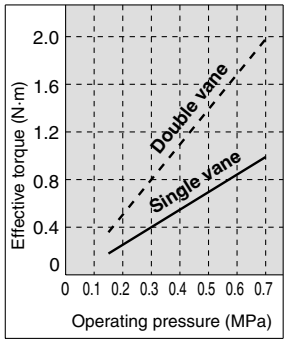
CRB2BW10



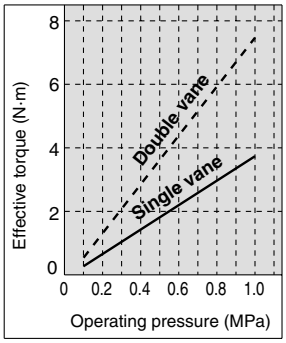
CRB2BW15



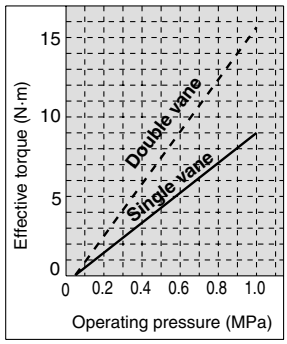
CRB2BW20



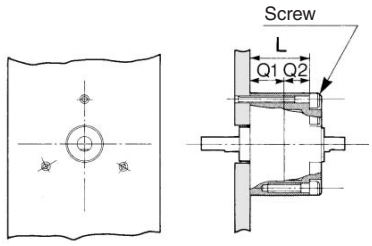
CRB2BW30



CRB2BW40



Direct Mounting of Body



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

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

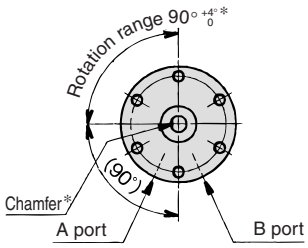
* Only the size 10 actuators have different L dimensions for single and double vane.
* Refer to pages 11-2-14 to 11-2-15 for Q1 and Q2 dimensions.

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

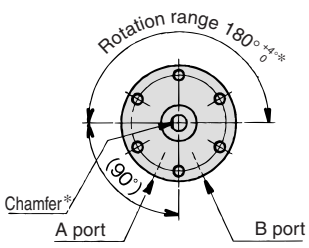
Chamfered positions shown below illustrate the conditions of actuators when B port is pressurized.

Single vane type

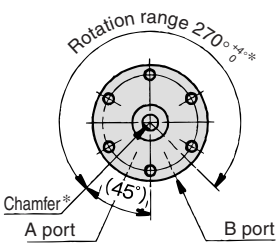
90˚



180˚

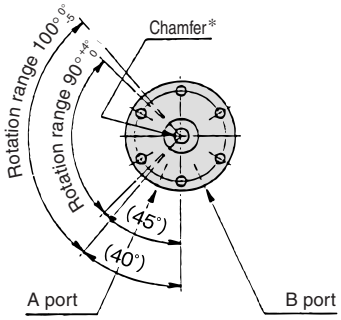


270˚



Double vane type

90˚, 100˚



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

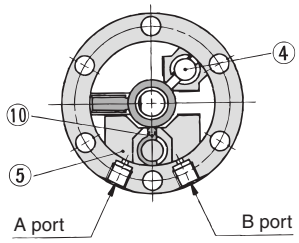
Note) For single vane type, rotation tolerance of 90°, 180°, and 270° actuators will be $^{+5°}_{0}$ for size 10 actuators only.
For double vane style, the tolerance of rotation angle of 90° will be $^{+5°}_{0}$ for size 10 only.

Construction: 10, 15, 20, 30, 40

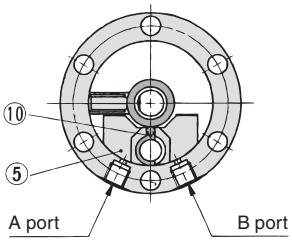
Single vane type

- Illustrations below show size 20 actuators.
- Illustrations for 90° and 180° show the condition of the actuators when B port is pressurized, and the illustration for 270° shows the position of the ports during rotation.

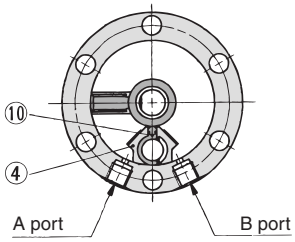
For 90°
(Top view from long shaft side)



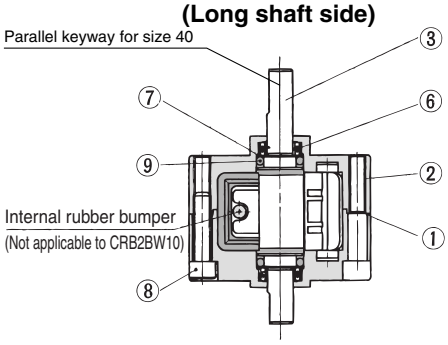
For 180°
(Top view from long shaft side)



For 270°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

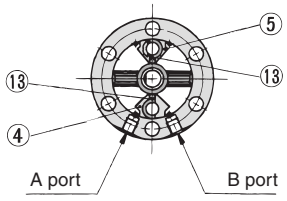
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	White
②	Body (B)	Aluminum alloy	White
③	Vane shaft	Stainless steel *	
④	Stopper	Resin	For 270°
⑤	Stopper	Resin	For 180°
⑥	Bearing	High carbon chrome bearing steel	
⑦	Back-up ring	Stainless steel	
⑧	Hexagon socket head cap screw	Stainless steel	Special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

* Carbon steel for CRB2BW30 and CRB2BW40.

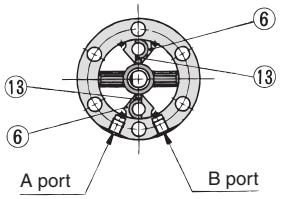
Double vane type

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

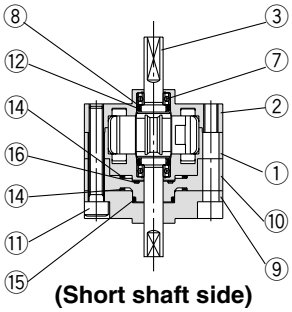
For 90°
(Top view from long shaft side)



For 100°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

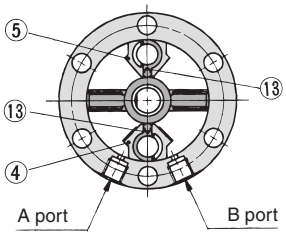
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	White
②	Body (B)	Aluminum alloy	White
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	White

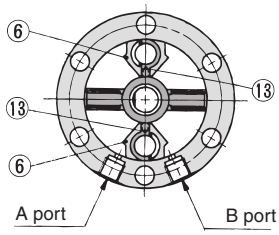
* For size 40, material for no. ④⑥ is die-cast aluminum.

CRB2BW15/20/30/40-□D/Illustrations below show size 20 actions.

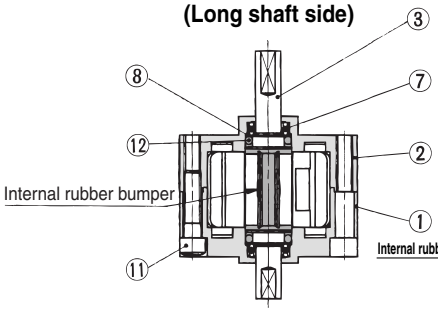
For 90°
(Top view from long shaft side)



For 100°
(Top view from long shaft side)

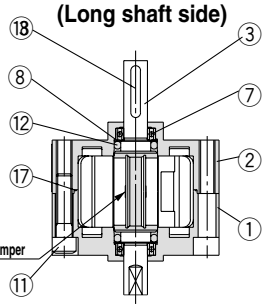


(Long shaft side)



(Short shaft side)

(Long shaft side)



(Short shaft side)
For size 40

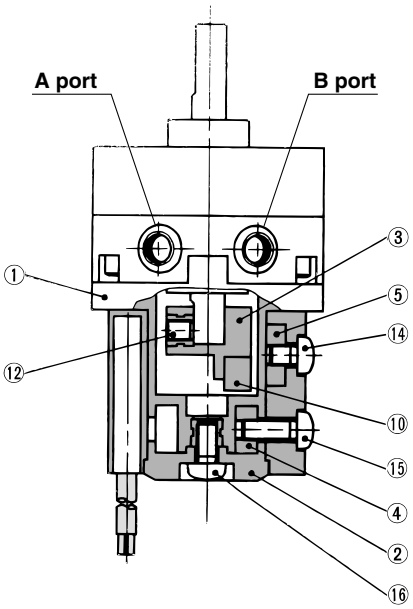
No.	Description	Material	Note
⑩	Plate	Resin	White
⑪	Hexagon socket head cap screw	Stainless steel	Special screw
⑫	O-ring	NBR	
⑬	Stopper seal	NBR	Special seal
⑭	Gasket	NBR	Special seal
⑮	O-ring	NBR	
⑯	O-ring	NBR	
⑰	O-ring	NBR	Double vane only
⑱	Parallel keyway	Carbon steel	Size 40 only

Construction (With auto switch unit)

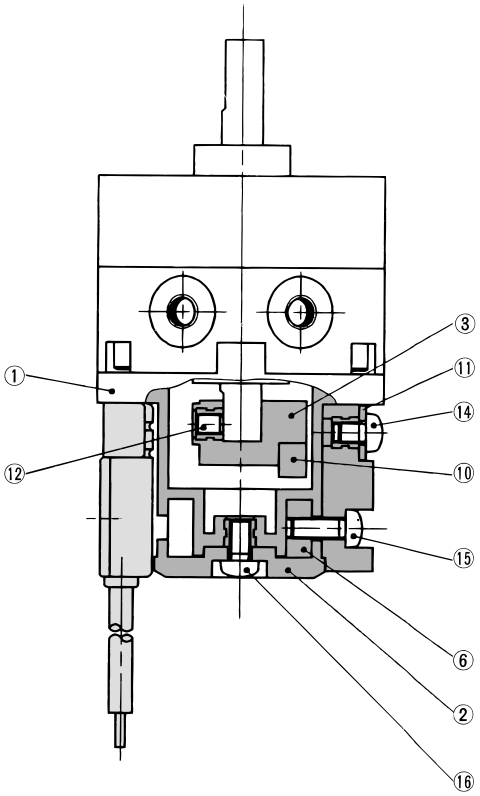
Single vane type • Following illustrations show actuators for 90° and 180° when B port is pressurized. (Same switch units are used for both single and double vane types.)

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

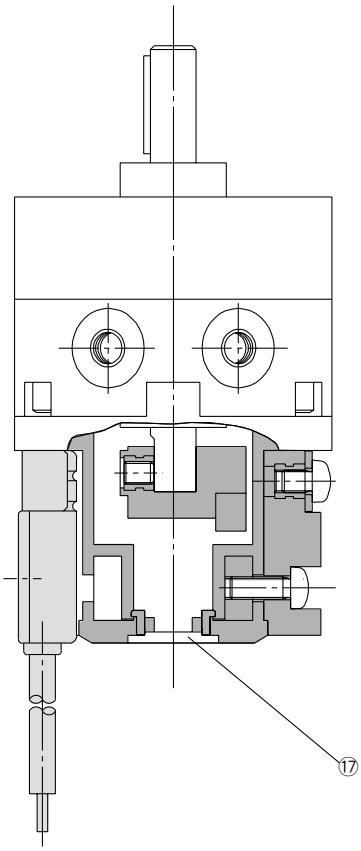
CDRB2BW10/15-□ S D

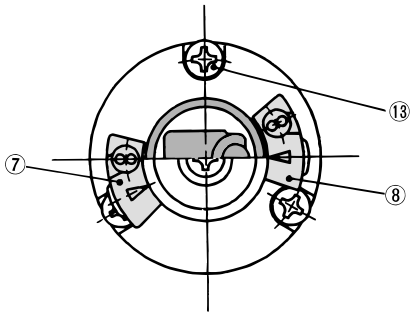


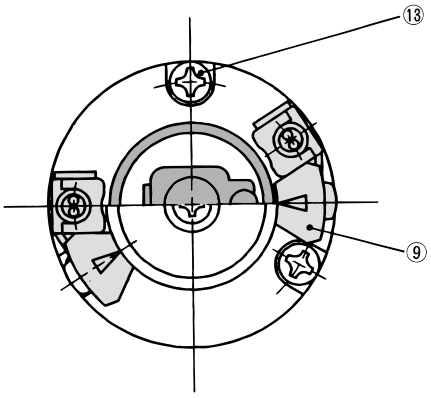
CDRB2BW20/30-□ S D

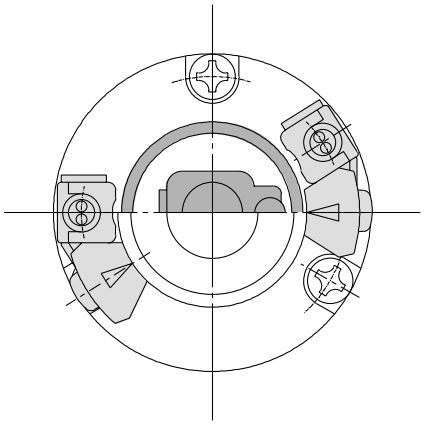


CDRB2BW40-□ S D









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	Magnetic body

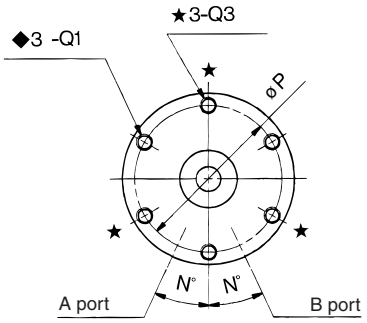
No.	Description	Material
⑪	Arm	Stainless steel
⑫	Hexagon socket head set screw	Stainless steel
⑬	Round head Phillips screw	Stainless steel
⑭	Round head Phillips screw	Stainless steel
⑮	Round head Phillips screw	Stainless steel
⑯	Round head Phillips screw	Stainless steel
⑰	Rubber cap	NBR

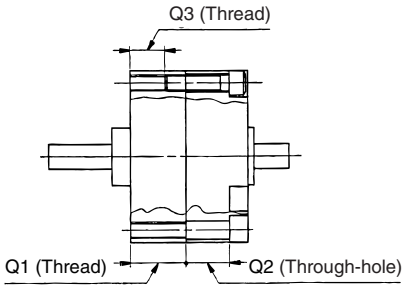
∗ For CDRB2BW10, 2 round head Phillips screws, ⑬, are required.

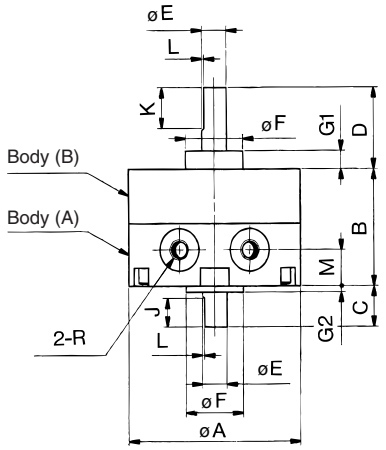
Dimensions: 10, 15, 20, 30

Single vane type ● Following illustrations show actuators for 90° and 180° when B port is pressurized.

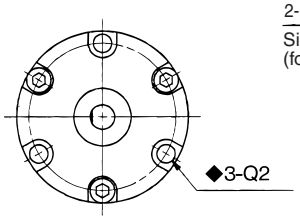
CRB2BW□-□S
<Port location: Side ported>

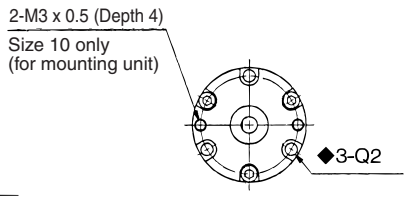




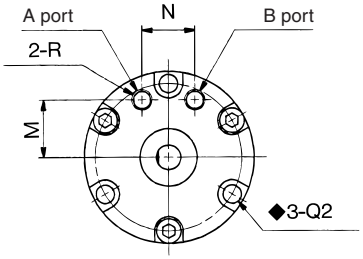


CRB2BW10-□S
<Port location: Side ported>





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



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

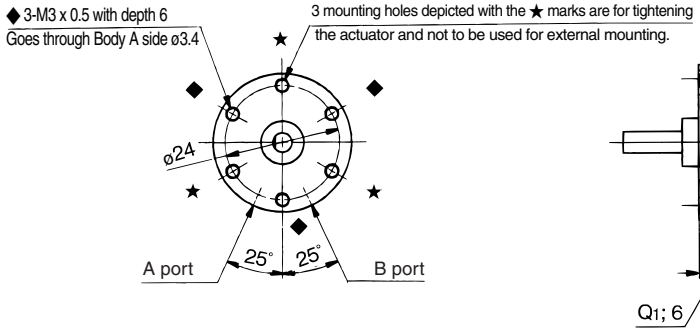
Note) The pre-drilled mounting threads for CRB2BW15, 20, and 30, 3 mounting holes depicted with the ★ marks are for tightening the actuator and not to be used for external mounting.

(mm)

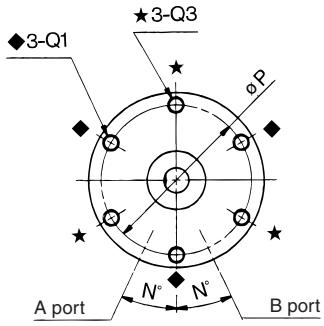
Model	A	B	C	D	E (g6)	F (h9)	G1	G2	J	K	L	M	N	P	◆Q1	◆Q2	★Q3	R 90°	R 180°	R 270°
CRB2BW10-□S	29	15	8	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	3	1	5	9	0.5	5	25	24	M3 (6)	3.4 (5.5)	—	M5		M3
CRB2BW10-□SE												8.5	9.5					M3		
CRB2BW15-□S	34	20	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	4	1.5	6	10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

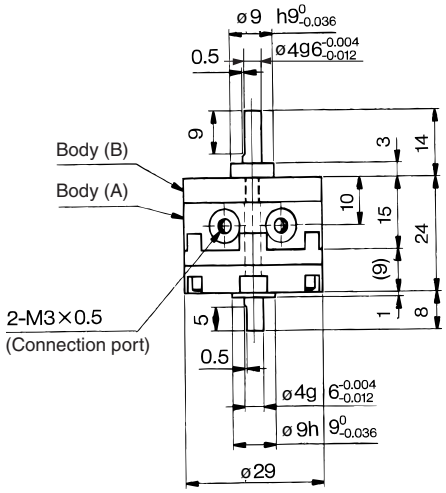
Double vane type ● Following illustrations show the intermediate rotation position when A or B port is pressurized.

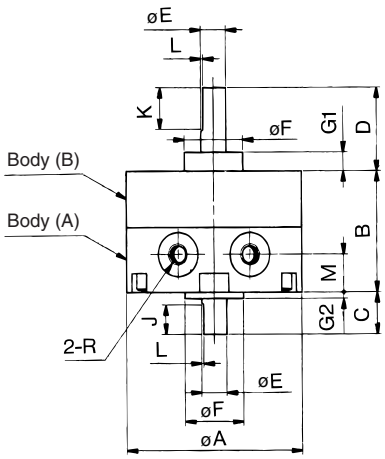
CRB2BW10-□D
<Port location: Side ported>



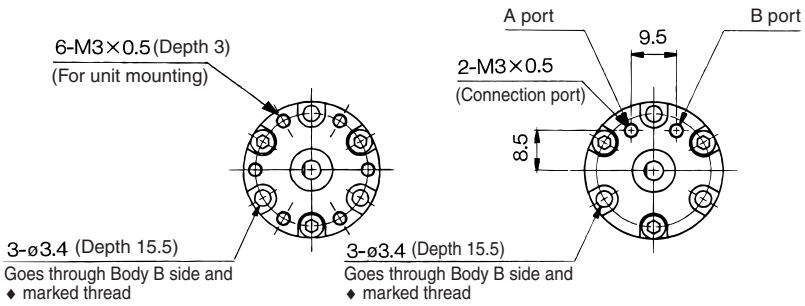
CRB2BW15/20/30-□D
<Port location: Side ported>



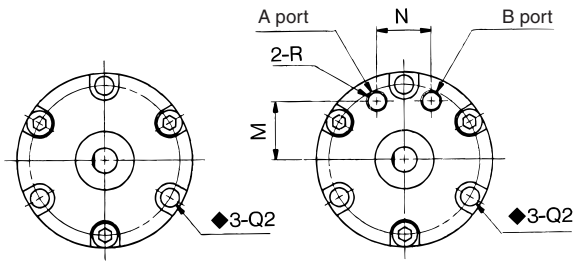




CRB2BW10-□DE
<Port location: Axial ported>



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

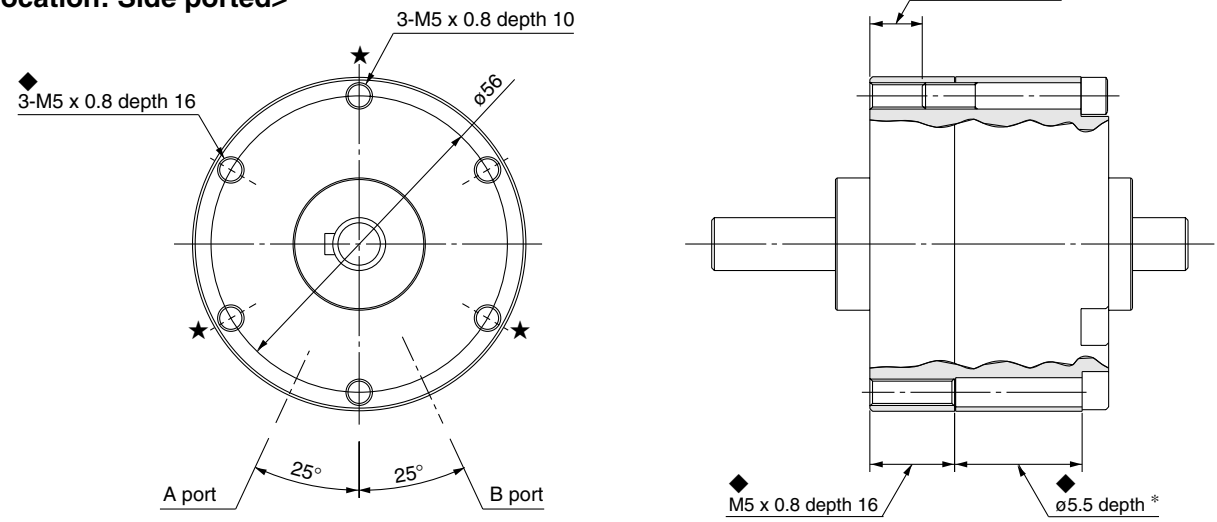


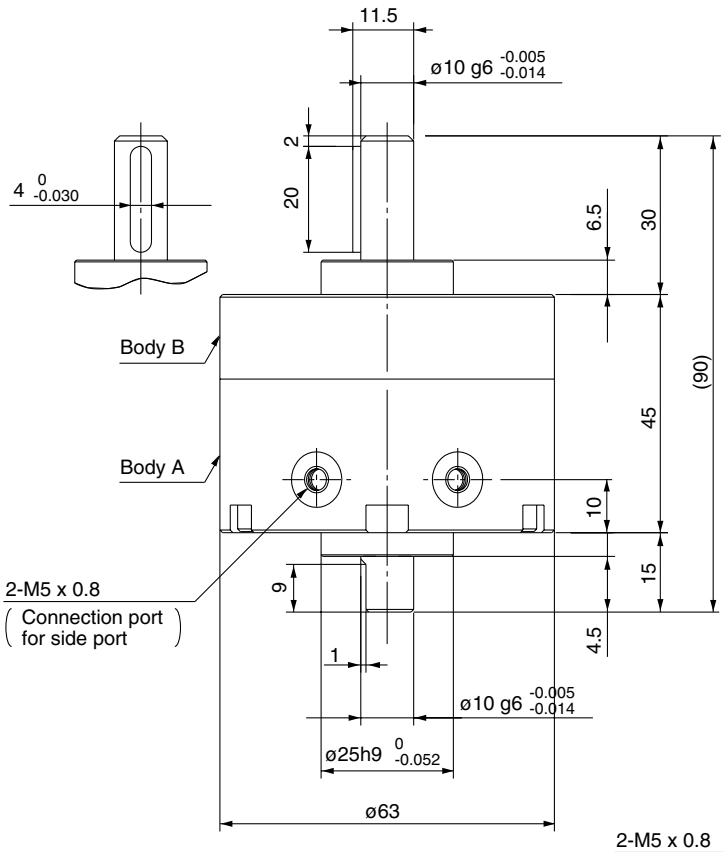
(mm)

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°
CRB2BW15-□D	34	20	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	4	1.5	6	10	0.5	5	25	29	M3 (10)	3.4 (6)	M3 (5)	M3	
CRB2BW15-□DE												11	10						
CRB2BW20-□D	42	29	10	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	4.5	1.5	7	10	0.5	9	25	36	M4 (13.5)	4.5 (11)	M4 (7.5)	M5	
CRB2BW20-□DE												14	13						
CRB2BW30-□D	50	40	13	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	5	2	8	12	1.0	10	25	43	M5 (18)	5.5 (16.5)	M5 (10)	M5	
CRB2BW30-□DE												15.5	14						

Dimensions: 40

Single vane type/Double vane type
CRB2BW40-□S/D
<Port location: Side ported>



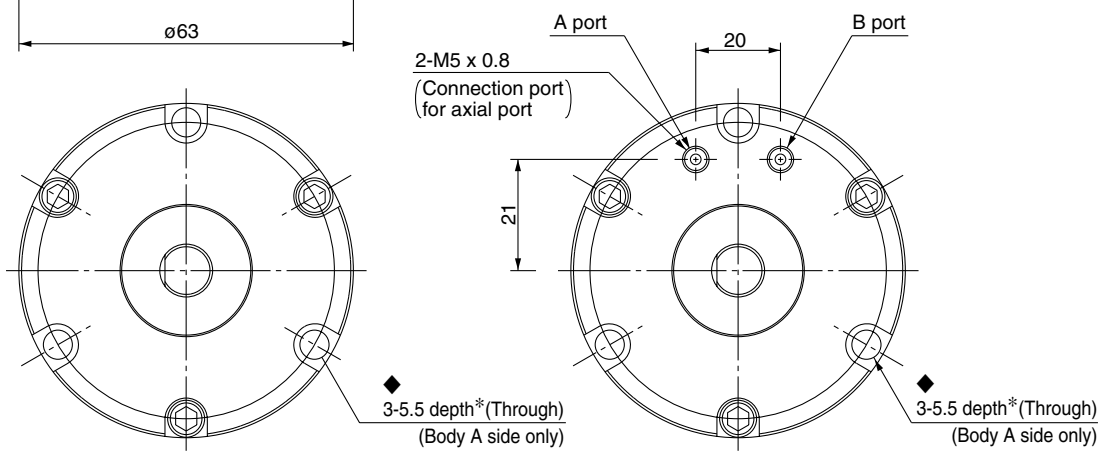


(mm)

Keyway dimensions	ℓ	h / b

Series	b (h9)	h (h9)	ℓ
CRB2BW40-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20

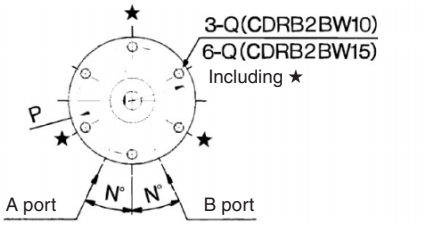
CRB2BW40-□SE/DE
<Port location: Axial ported>

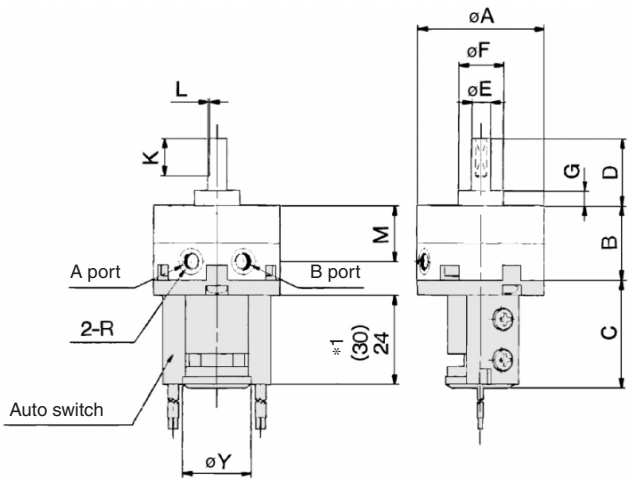


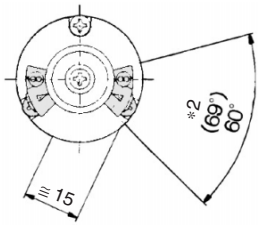
Dimensions: 10, 15, 20, 30 (With auto switch unit)

Single vane type ● Following illustrations show actuators for 90° and 180° when B port is pressurized.

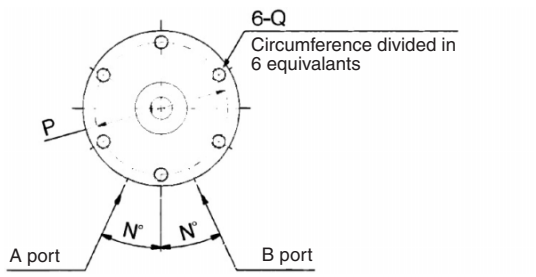
CDRB2BW10/15-□S

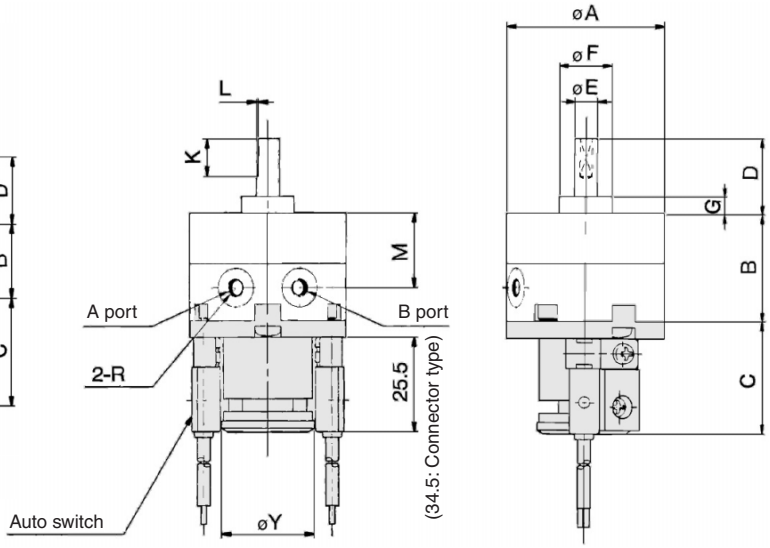


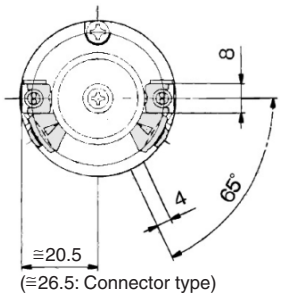




CDRB2BW20/30-□S







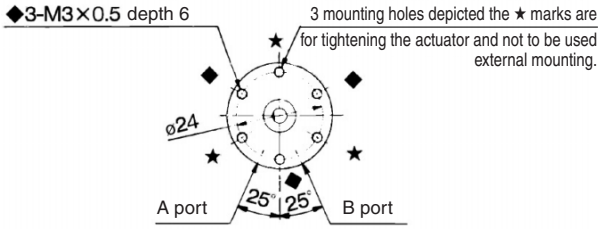
∗ 1 The length is 24 when any of the following auto switches are used: D-90, D-90A, D-S99(V), D-T99(V), and D-S9P(V)
The length is 30 when any of the following auto switches are used: D-97 and D-93A
∗ 2 The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A.
The angle is 69° when any of the following auto switches are used: D-S99(V), D-T99(V), and D-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 (g6)	F (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)

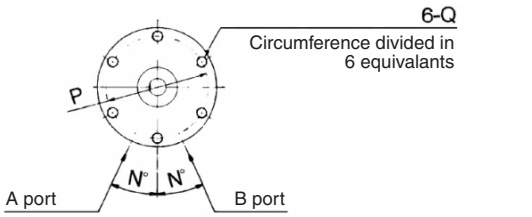
Double vane type ● Illustrations below show the intermediate rotation position when A or B port is pressurized.

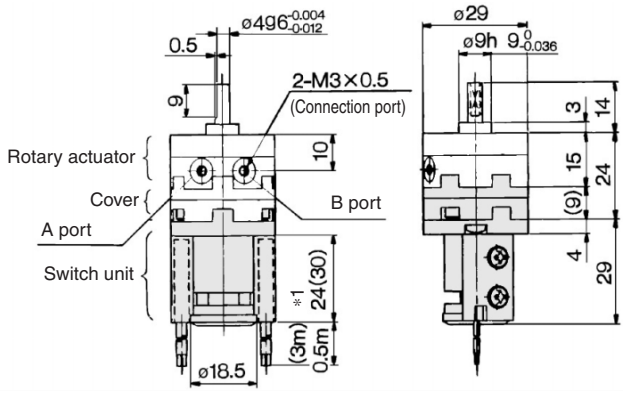
CDRB2BW10-□D

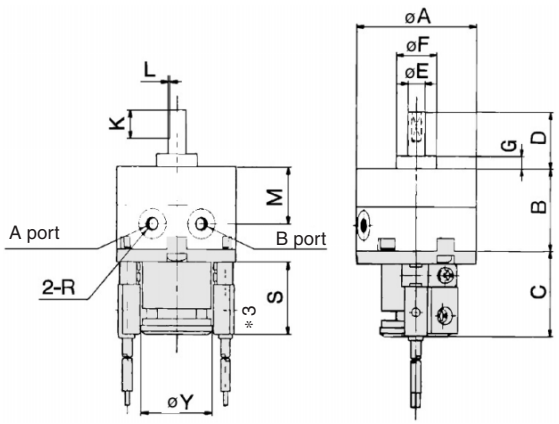


CDRB2BW15/20/30-□D

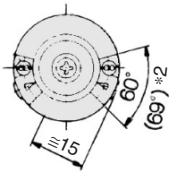
(Dimensions are the same as the single vane type.)

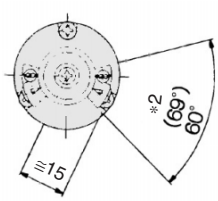


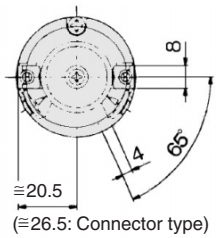




CDRB2BW15-□D CDRB2BW20/30-□D







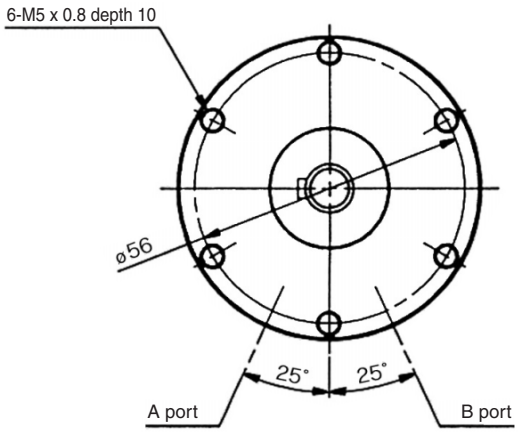
∗ 1 The length is 24 when any of the following auto switches are used: D-90, D-90A, D-S99(V), D-T99(V), and D-S9P(V)
The length is 30 when any of the following auto switches are used: D-97 and D-93A
∗ 2 The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A
The angle is 69° when any of the following auto switches are used: D-S99(V), D-T99(V), and D-S9P(V)
∗ 3 The length (Dimension S) is 25.5 when any of the following grommet type auto switches are used: D-R73, D-R80, D-S79, D-T79, and D-S7P
The length (Dimension S) is 34.5 when any of the following connector type auto switches are used: D-R73, D-R80, and D-T79

(mm)

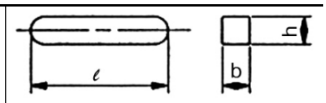
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M	N	P	Q	R		S		Y
														90°	100°			
CDRB2BW15-□D	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 x 0.5 depth 5	M3 x 0.5		24*1	30*1	18.5
CDRB2BW20-□D	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 x 0.7 depth 7	M5 x 0.8		25.5*3	34.5*3	25
CDRB2BW30-□D	50	40	31	22	8	16	5	12	1	30	25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

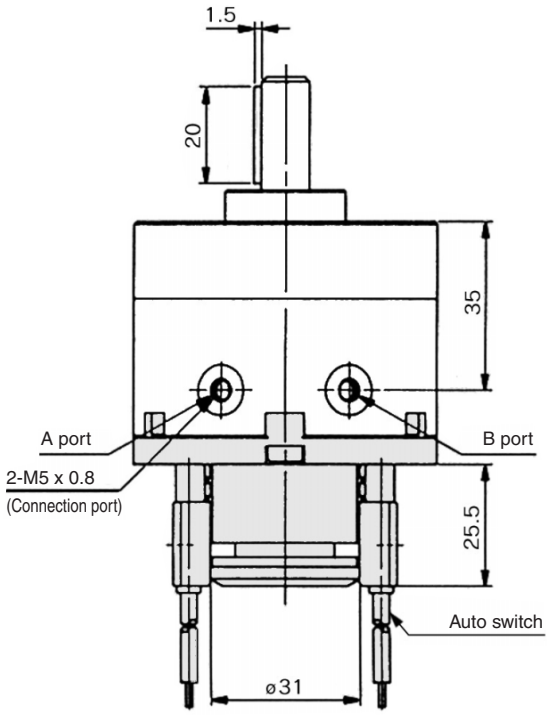
Dimensions: 40 (With auto switch unit)

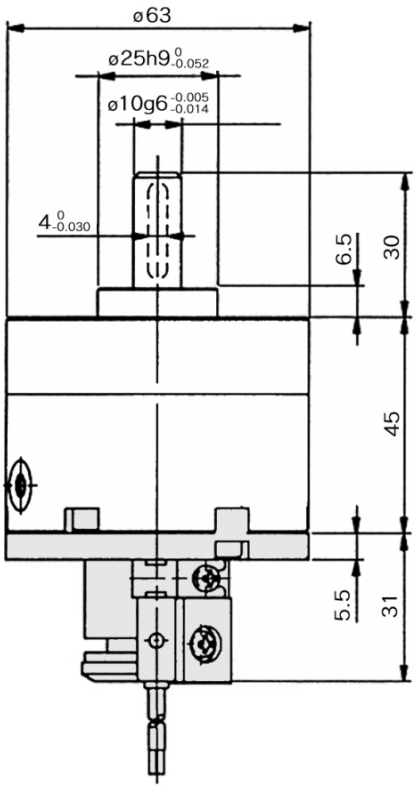
Single vane type/Double vane type
CDRB2BW40-□S/D

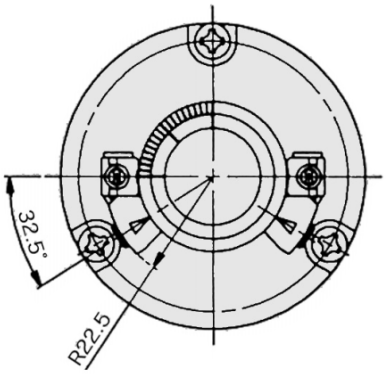


(mm)

Keyway dimensions			
Series	b (h9)	h (h9)	ℓ
CDRB2BW40-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20







Rotary Actuator with Angle Adjuster
Vane Style
Series CRB2BWU
Size: 10, 15, 20, 30, 40

How to Order

Without auto swithch

CRB2 B WU 10 — 180 S

With auto switch Size: 10, 15

CDRB2 F WU 10 — 180 S — 90 L

With auto switch Size: 20, 30, 40

CDRB2 B WU 20 — 180 S — R73 L

Size

10
15
20
30
40

Size

10
15

Size

20
30
40

With auto switch
(With switch unit)

Mounting style

B	Basic style
F	Flange style

∗ F: Except size 40

With angle adjuster

Rotating angle

Applicable	Symbol	Rotating angle
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

Vane type

S	Single vane
D	Double vane

Auto switch

Nil	Without auto switch

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

Number of auto switches

S	1 pc.∗
Nil	2 pcs.

∗ Right-hand auto switch will be used for actuators with 1 auto switch.

Electrical entry/Lead wire length

Nil	Grommet/Lead wire 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/without lead wire

∗ Connectors are available only for auto switch types -R73, -R80, -T79.
∗∗ Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

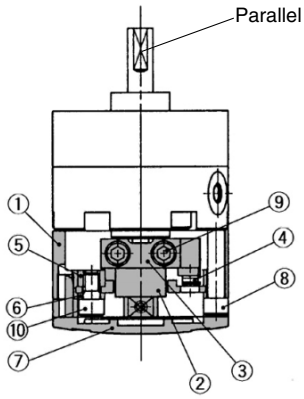
Applicabie Auto Switch/Refer to page 11-1-1 for further information on auto switches.

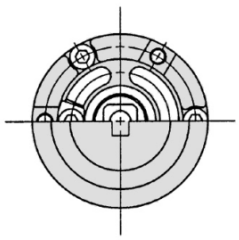
Applicable size	Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire type	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
For 10 and 15	Reed switch	Grommet	No	2-wire	24 V	5 V, 12 V	24 V or less	90	Parallel cord	●	●	●	—	IC circuit	Relay, PLC
							100 V or less	90A	Heavy-duty cord	●	●	●	—		
			Yes			12 V	—	97	Parallel cord	●	●	●	—	—	
							100 V	93A	Heavy-duty cord	●	●	—	—		
	Solid state switch					—	—	T99		●	●	—	—		
								T99V		●	●	—	—		
				3-wire (NPN)		5 V, 12 V	—	S99		●	●	—	—	IC circuit	
				3-wire (PNP)				S99V		●	●	—	—		
								S9P		●	●	—	—		
								S9PV		●	●	—	—		
For 20, 30 and 40	Reed switch	Grommet	Yes	2-wire	24 V	12 V	100 V	R73	Heavy-duty cord	●	●	—	—	—	Relay, PLC
		Connector					—	R73C		●	●	●	●		
		Grommet	No			5 V, 12 V	100 V or less	R80		●	●	—	—	IC circuit	
		Connector					24 V or less	R80C		●	●	●	●		
	Solid state switch	Grommet	Yes			—	—	T79		●	●	—	—	—	
		Connector						T79C		●	●	●	●		
		Grommet		3-wire (NPN)		5 V, 12 V	—	S79		●	●	—	—	IC circuit	
				3-wire (PNP)				S7P		●	●	—	—		

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

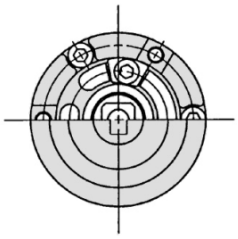
Construction (Same switch units are used for both single and double vane type.)

With angle adjuster
CRB2BWU10/15/20/30/40-□$^{S}_{D}$



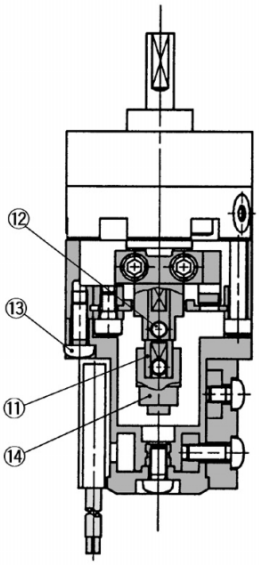


Single vane

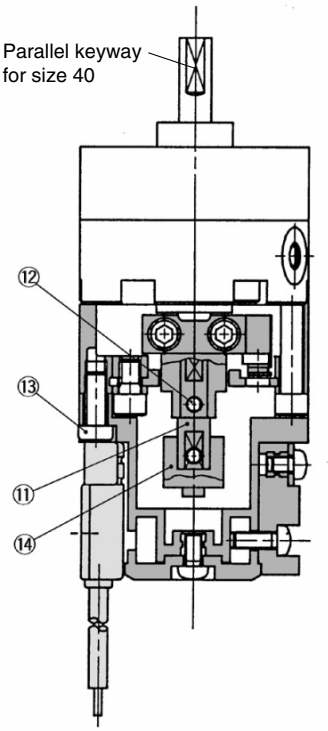


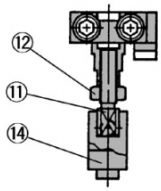
Double vane

With angle adjuster + Auto switch unit
CDRB2BWU10/15-□$^{S}_{D}$ **CDRB2BWU20/30/40-□$^{S}_{D}$**



CDRB2BWU10





Component Parts

No.	Description	Material	Note
①	Stopper ring	Aluminum die-casted	
②	Stopper lever	Carbon steel	
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)
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 11-4-20 to 11-4-21 for detailed specifications.

⚠ Precautions

Be sure to read before handling. Refer to pages 11-13-3 to 4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 11-1-4 to 6 for Precautions on every series.

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° $^{+4}_{0}$	0° to 230° (Size: 10, 40) *
	0° to 240° (Size: 15, 20, 30)
180° $^{+4}_{0}$	0° to 175°
90° $^{+4}_{0}$	0° to 85°

* The maximum adjustment angle of the angle adjuster for size 10 and 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.

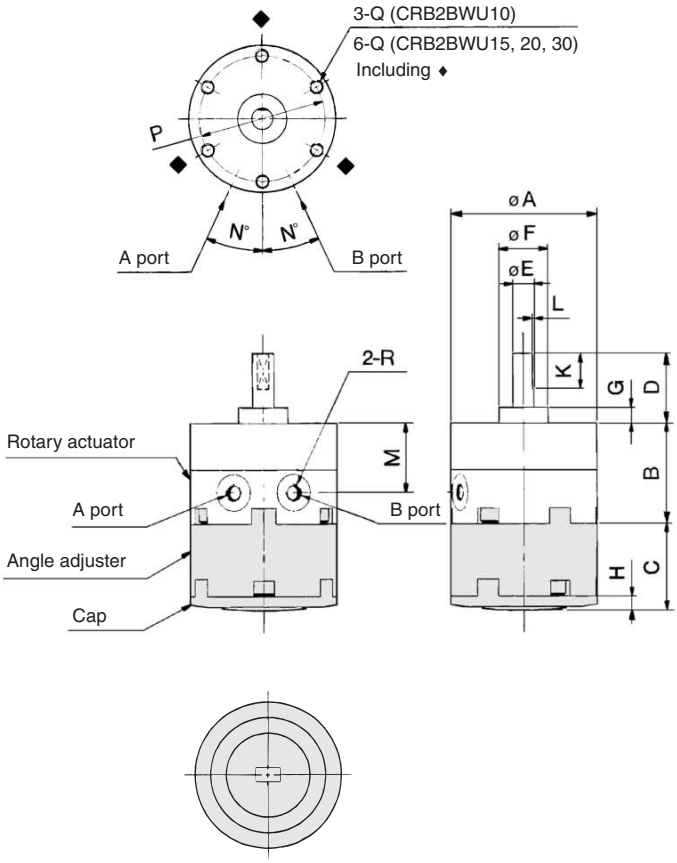
Dimensions: 10, 15, 20, 30 (With angle adjuster)

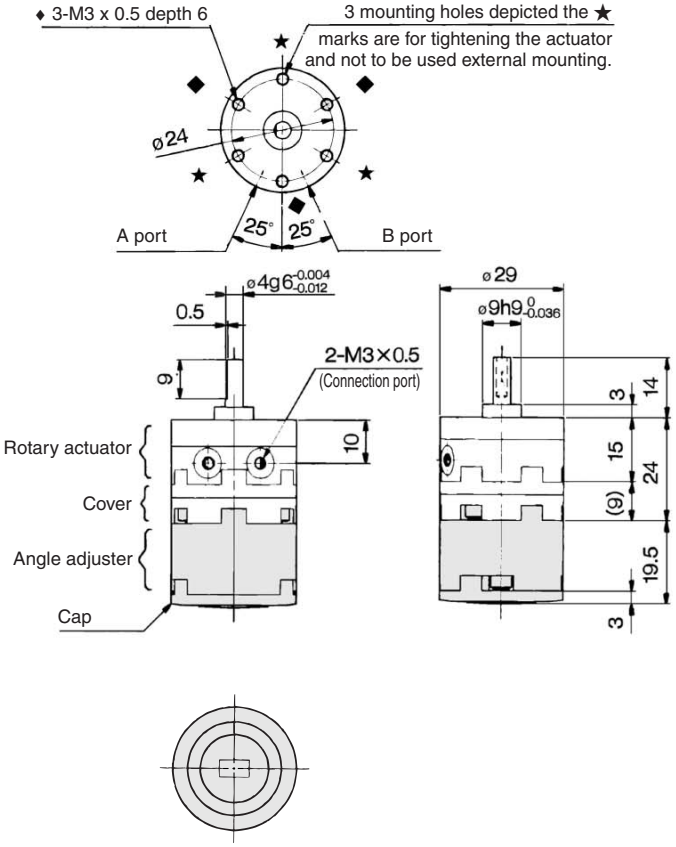
Single vane type
CRB2BWU10/15/20/30-□S

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

Double vane type
CRB2BWU10-□D

• Following illustrations 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.

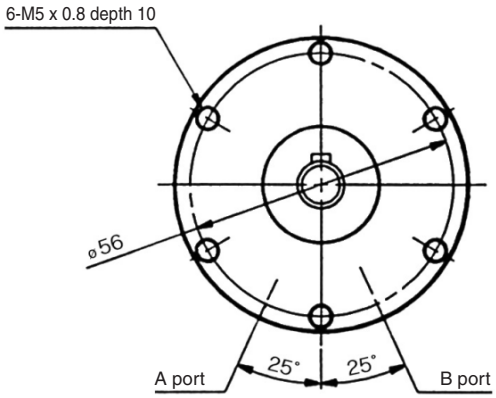
(mm)

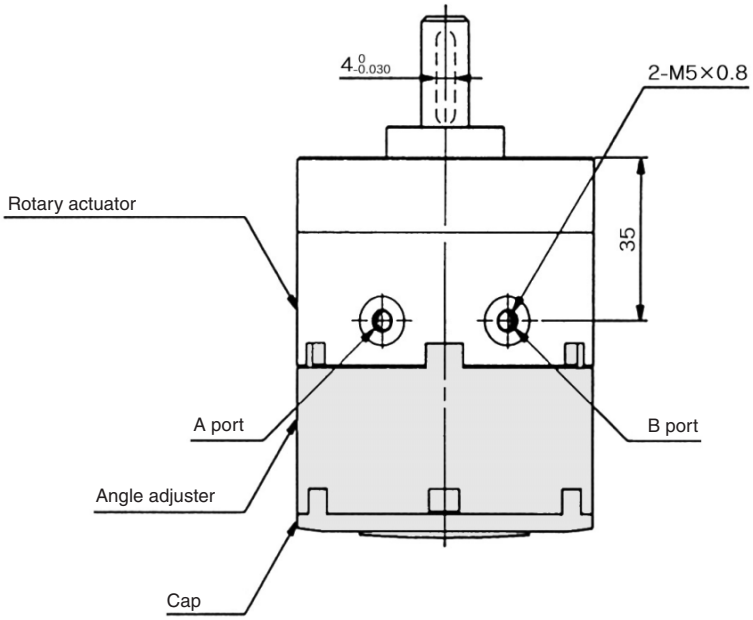
Model	A	B	C	D	E (g6)	F (h9)	G	H	K	L	M	N	P	Q
CRB2BWU10-□S	29	15	19.5	14	4	9	3	3	9	0.5	10	25	24	M3 x 0.5 depth 5
CRB2BWU15-□S	34	20	21.2	18	5	12	4	3.2	10	0.5	15	25	29	M3 x 0.5 depth 5
CRB2BWU15-□D														
CRB2BWU20-□S	42	29	25	20	6	14	4.5	4	10	0.5	20	25	36	M4 x 0.7 depth 7
CRB2BWU20-□D										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

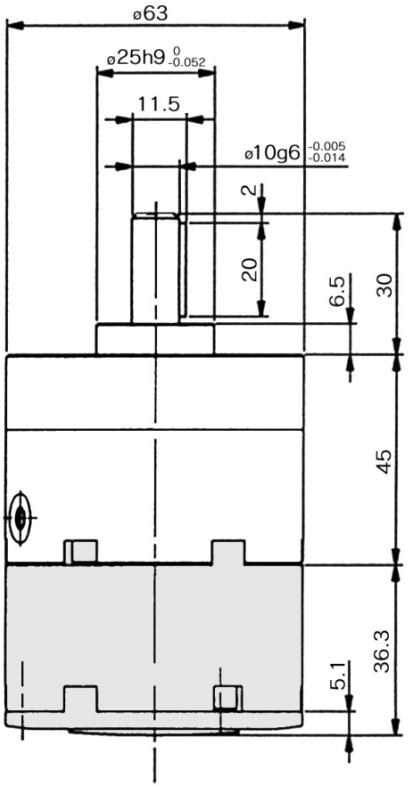
Model	R			
	90°	100°	180°	270°
CRB2BWU10-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU10-□D	∗Refer to the drawing.		—	
CRB2BWU15-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU15-□D	M3 x 0.5		—	
CRB2BWU20-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU20-□D	M5 x 0.8		—	
CRB2BWU30-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU30-□D	M5 x 0.8		—	

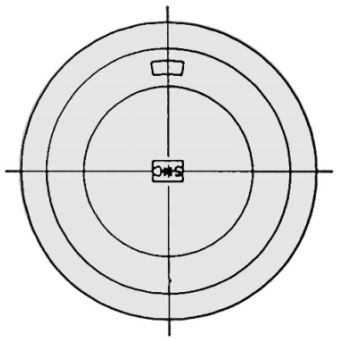
Dimensions: 40 (With angle adjuster)

Single vane type/Double vane type
With angle adjuster
CRB2BWU40-□S/D









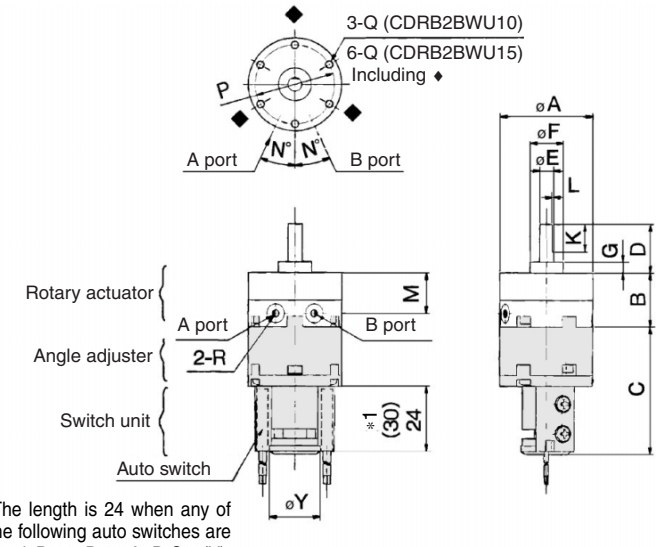
(mm)

Keyway dimensions			
Model	**b (h9)**	**h (h9)**	**ℓ**
CRB2BWU40-□□□	4 0 -0.030	4 0 -0.030	20

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

Single vane type
CDRB2BWU10/15-□S

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

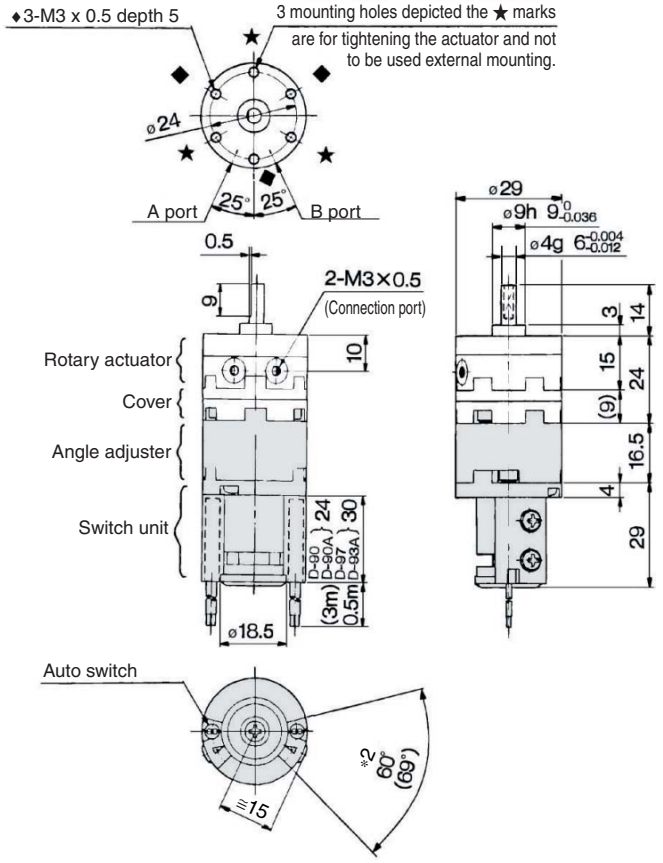


∗ 1. The length is 24 when any of the following auto switches are used: D-90, D-90 A, D-S99(V), D-T99(V), and D-S9P(V).
The length is 30 when any of the following auto switches are used: D-97 and D-93A.

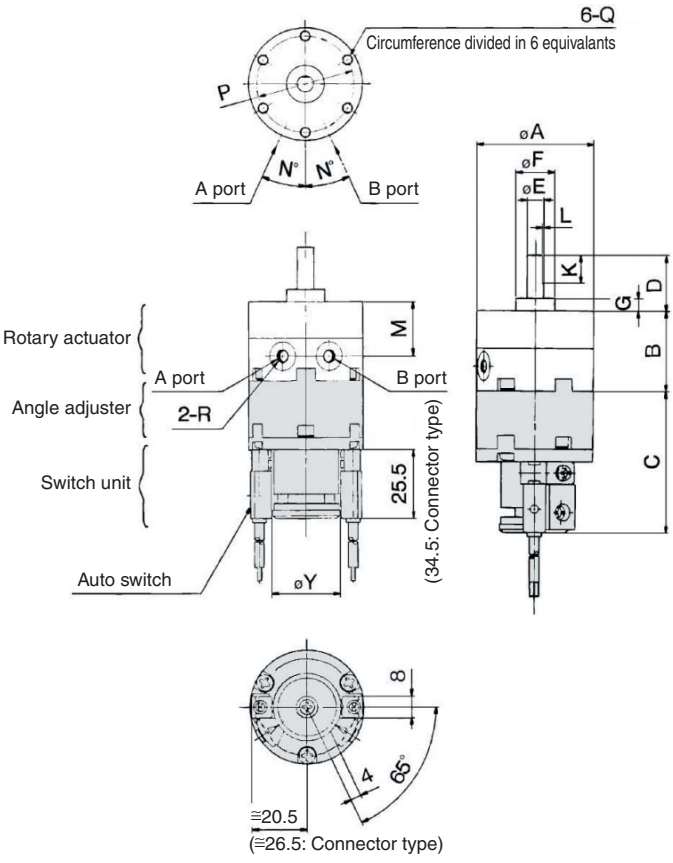
∗ 2. The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A.
The angle is 69° when any of the following auto switches are used: D-S99(V), D-T99(V), and D-S9P(V).

Double vane type
CDRB2BWU10-□D

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



Single vane type



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.

(mm)

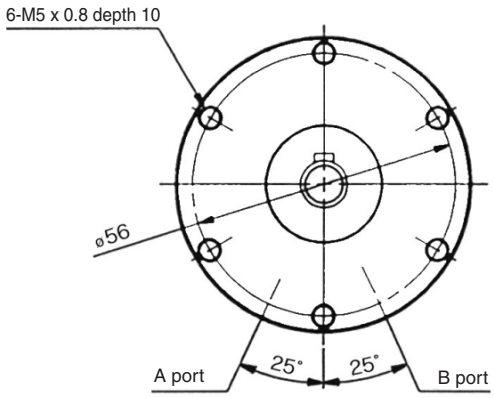
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M
CDRB2BWU10-□S	29	15	45.5	14	4	9	3	9	0.5	10
CDRB2BWU15-□S	34	20	47	18	5	12	4	10	0.5	15
CDRB2BWU15-□D										
CDRB2BWU20-□S	42	29	51	20	6	14	4.5	10	0.5	20
CDRB2BWU20-□D										
CDRB2BWU30-□S	50	40	55.5	22	8	16	5	12	1	30
CDRB2BWU30-□D										

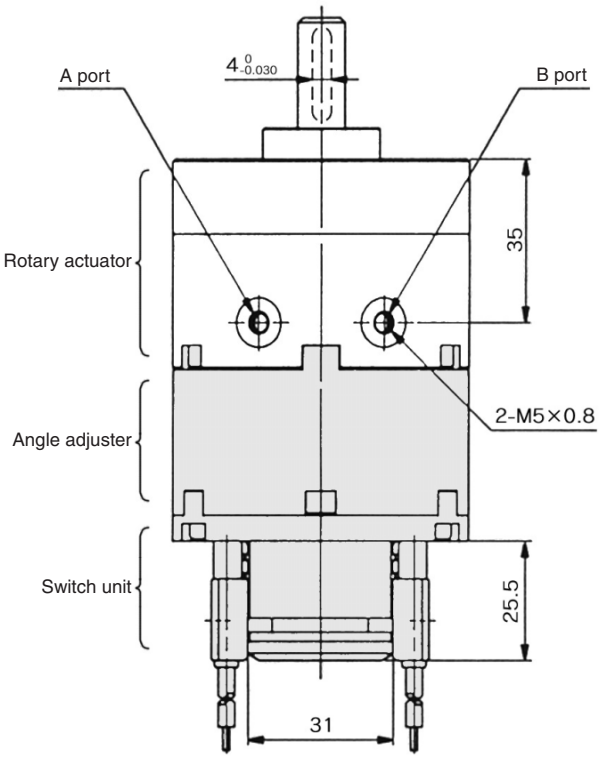
Model	N	P	Y	Q	R			
					90°	100°	180°	270°
CDRB2BWU10-□S	25	24	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
CDRB2BWU10-□D					∗ Refer to the drawing.		—	
CDRB2BWU15-□S	25	29	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
CDRB2BWU15-□D					M3 x 0.5		—	
CDRB2BWU20-□S	25	36	25	M4 x 0.7 depth 7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

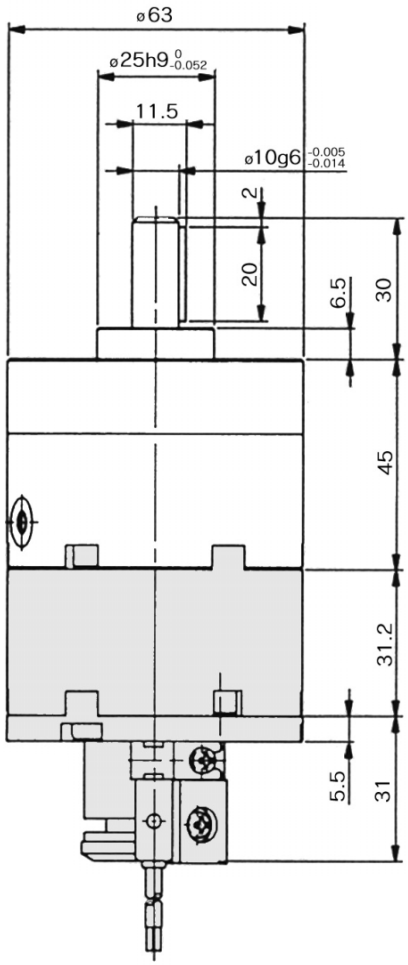
Note) • For rotary actuators with angle adjuster and auto switch unit, connection ports are side ports only.
• The above exterior view drawings illustrate the rotary actuator equipped with one right-hand and one left-hand switch.

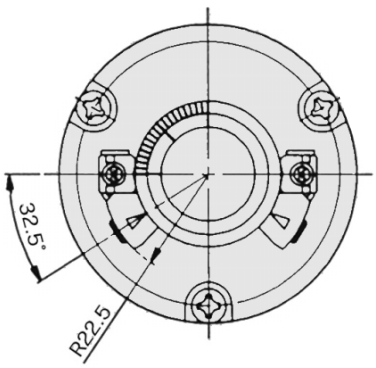
Dimensions: 40 (With angle adjuster and auto switch unit)

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

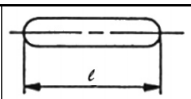








(mm)

Keyway dimensions			
Model	b (h9)	h (h9)	ℓ
CDRB2BWU40-□□□	4 0 -0.030	4 0 -0.030	20

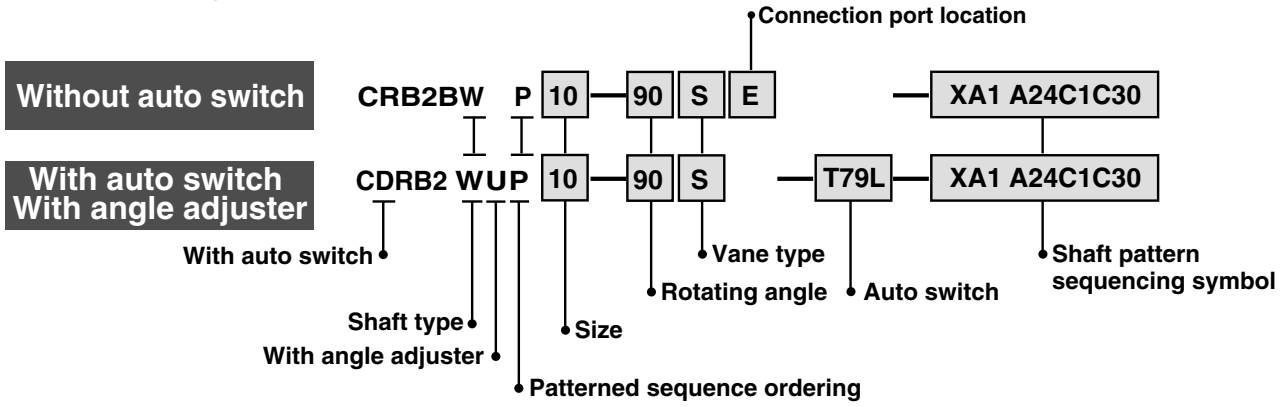
Series CRB2 (Size: 10, 15, 20, 30, 40)

Simple Specials:
-XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system.
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
XA1	Shaft-end female thread		●	●	●	
XA3	Shaft-end male thread	●	●	●	●	
XA5	Stepped round shaft	●	●	●	●	
XA7	Stepped round shaft with male thread	●	●	●	●	
XA9	Modified length of standard chamfer	●	●	●	●	
XA11	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
XA2 *	Shaft-end female thread		●	●	●	●
XA4 *	Shaft-end male thread	●	●	●	●	●
XA6 *	Stepped round shaft	●	●	●	●	●
XA8 *	Stepped round shaft with male thread	●	●	●	●	●
XA10 *	Modified length of standard chamfer	●	●	●	●	●
XA12 *	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	●	●	●	●	●

Combination

XA□ Combination

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

A combination of up to two XA□s are available.
Example: -XA1 A24

XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.
Refer to pages 11-2-34 to 11-2-35 for details of made-to-order specifications.

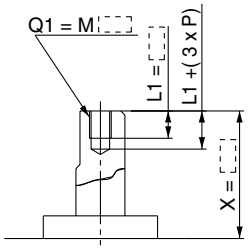
Symbol	Description	Applicable size	Combination
			XA1 to XA24
XC1 *	Change connection port location	10, 15, 20, 30, 40	●
XC2 *	Change threaded hole to through-hole	15, 20, 30, 40	●
XC3 *	Change the screw position	10, 15, 20, 30, 40	●
XC4	Change rotation range		●
XC5	Change rotation range between 0 to 200°		●
XC6	Change rotation range between 0 to 110°		●
XC7 *	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: -XA1A24C1C30
-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

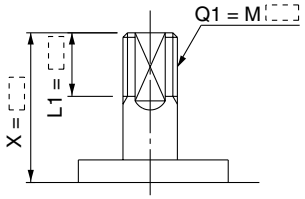


(mm)

Size	X	Q1
15	4 to 18	M3
20	4.5 to 20	M3, M4
30	5 to 22	M3, M4, M5

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

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

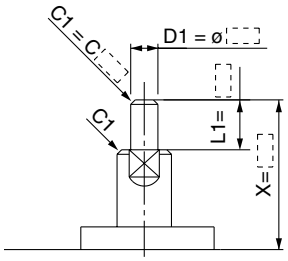


(mm)

Size	X	L1 max	Q1
10	9 to 14	X – 5	M4
15	11 to 18	X – 6	M5
20	13 to 20	X – 7	M6
30	16 to 22	X – 8	M8

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

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

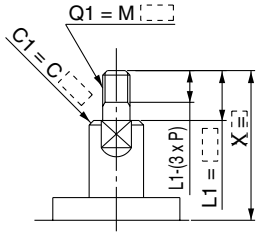


(mm)

Size	X	L1 max	D1
10	4 to 14	X – 3	ø3
15	5 to 18	X – 4	ø3 to ø4
20	6 to 20	X – 4.5	ø3 to ø5
30	6 to 22	X – 5	ø3 to ø6

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.)



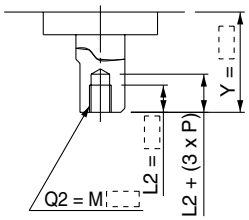
(mm)

Size	X	L1 max	Q1
10	7.5 to 14	X – 3	M3
15	10 to 18	X – 4	M3, M4
20	12 to 20	X – 4.5	M3, M4, M5
30	14 to 22	X – 5	M3, M4, M5, M6

Axial: Bottom (Short shaft side)

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

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

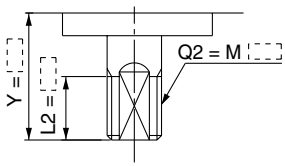


(mm)

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

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

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

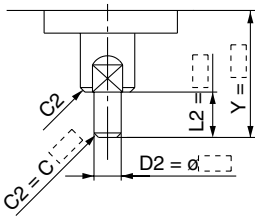


(mm)

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

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

(If shortening the shaft is not required, indicate "∗" for dimension Y.)
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C2, indicate "∗" instead.)

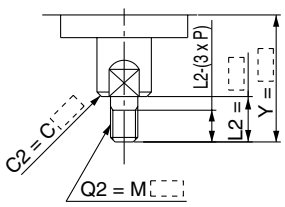


(mm)

Size	Y	L2 max	Q2
10	2 to 8	Y – 1	ø3
15	3 to 9	Y – 1.5	ø3 to ø4
20	3 to 10	Y – 1.5	ø3 to ø5
30	3 to 13	Y – 2	ø3 to ø6
40	6 to 15	Y – 4.5	ø3 to ø8

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.)



(mm)

Size	Y	L2 max	Q2
10	5.5 to 8	Y – 1	M3
15	7.5 to 9	Y – 1.5	M3, M4
20	9 to 10	Y – 1.5	M3, M4, M5
30	11 to 13	Y – 2	M3, M4, M5, M6
40	14 to 15	Y – 4.5	M3, M4, M5, M6, M8

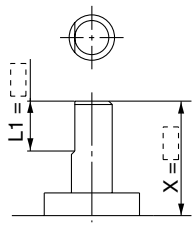
Axial: Top (Long shaft side)

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



(mm)

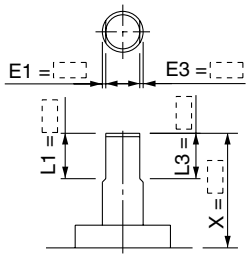
Size	X	L1
10	5 to 14	9 – (14 – X) to (X – 3)
15	8 to 18	10 – (18 – X) to (X – 4)
20	10 to 20	10 – (20 – X) to (X – 4.5)
30	10 to 22	12 – (22 – X) to (X – 5)

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 ø30.
- Applicable shaft type: W



(mm)

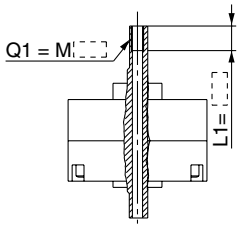
Size	X	L1	L3 max
10	5 to 14	9 – (14 – X) to (X – 3)	X – 3
15	8 to 18	10 – (18 – X) to (X – 4)	X – 4
20	10 to 20	10 – (20 – X) to (X – 4.5)	X – 4.5
30	10 to 22	12 – (22 – X) to (X – 5)	X – 5

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 keyway is used on the long shaft for size 40.
- Applicable shaft type: W



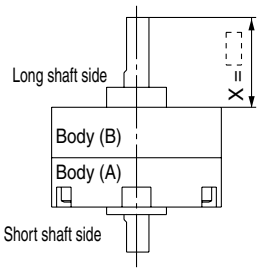
(mm)

M \ Size	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: **A17**

Shorten the long shaft.

- Applicable shaft type: W



(mm)

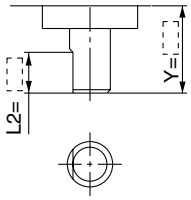
Size	X
10	3 to14
15	4 to18
20	4.5 to 20
30	5 to 22

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.)



(mm)

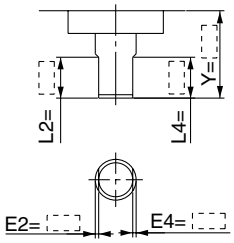
Size	Y	L2
10	3 to 8	5 – (8 – Y) to (Y – 1)
15	3 to 9	6 – (9 – Y) to (Y – 1.5)
20	3 to 10	7 – (10 – Y) to (Y – 1.5)
30	5 to 13	8 – (13 – Y) to (Y – 2)
40	7 to 15	9 – (15 – Y) to (Y – 2)

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 ø30 or ø40.
- Applicable shaft type: W



(mm)

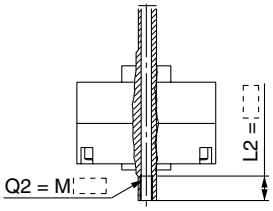
Size	Y	L2	L4 max
10	3 to 8	5 – (8 – Y) to (Y – 1)	Y – 1
15	3 to 9	6 – (2 – Y) to (Y – 1.5)	Y – 1.5
20	3 to 10	7 – (10 – Y) to (Y – 1.5)	Y – 1.5
30	5 to 13	8 – (13 – Y) to (Y – 2)	Y – 2
40	7 to 15	9 – (15 – Y) to (Y – 4.5)	Y – 4.5

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 keyway 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



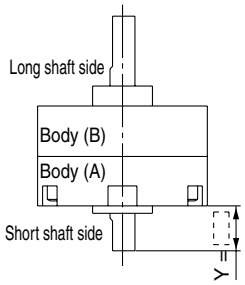
(mm)

M \ Size	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: **A18**

Shorten the short shaft.

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



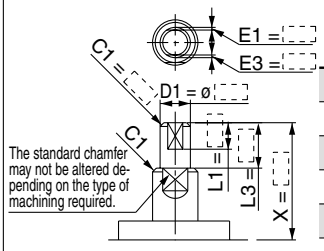
(mm)

Size	Y
10	1 to 8
15	1.5 to 9
20	1.5 to10
30	2 to13
40	4.5 to15

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.)



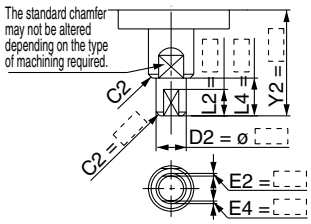
(mm)

Size	X	L1 max	L3	D1
10	6 to 14	X – 4.5	L1 + 1.5	ø3
15	7 to 18	X – 5.5	L1 + 1.5	ø3 to ø4
20	8 to 20	X – 6.5	L1 + 2	ø3 to ø5
30	10 to 22	X – 8	L1 + 3	ø3 to ø6

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.)



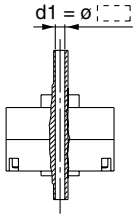
(mm)

Size	Y	L1 max	L4	D2
10	4 to 8	Y – 2.5	L2 + 1.5	ø3
15	4.5 to 9	Y – 3	L2 + 1.5	ø3 to ø4
20	5 to 10	Y – 3.5	L2 + 2	ø3 to ø5
30	7 to 13	Y – 5	L2 + 3	ø3 to ø6
40	8 to 15	Y – 5.5	L2 + 5	ø3 to ø6

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 keyway is used on the long shaft for size 40.
- Applicable shaft type: W

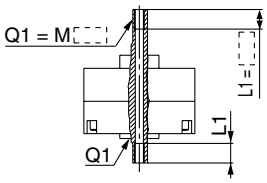


(mm)

Size	d1
15	ø2.5
20	ø2.5 to ø3.5
30	ø2.5 to ø4
40	ø2.5 to ø3

Symbol: A16 Applicable to single vane type only

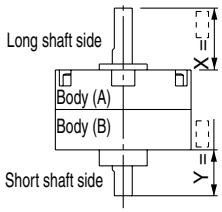
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 max. = 10 mm
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



(mm)

M \ Size	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: A19 Both the long shaft and short shaft are shortened.
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: W

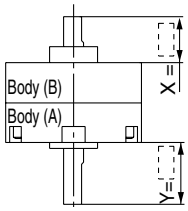


(mm)

Size	X	Y
10	3 to14	1 to 8
15	4 to18	1.5 to 9
20	4.5 to 20	1.5 to10
30	5 to 22	2 to13

Symbol: A20 The rotation axis is reversed.

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

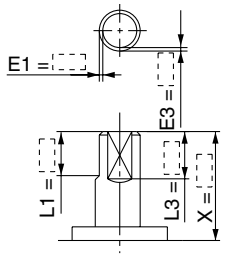


(mm)

Size	X	Y
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	—

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

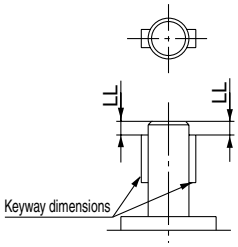


(mm)

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: 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.



(mm)

Size	Keyway dimensions	LL
40	4 x 4 x 20	2

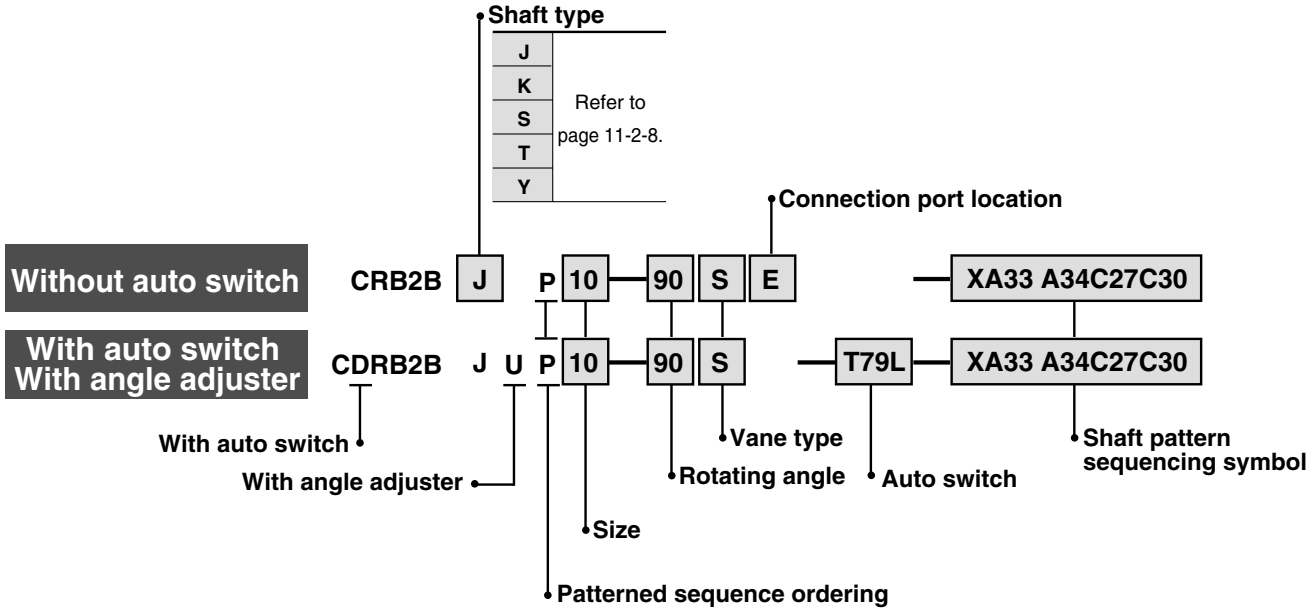
Series CRB2 (Size: 10, 15, 20, 30, 40)

Simple Specials: -XA31 to -XA47: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing II — -XA31 to XA47

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			●	●	

● 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	●	●	●	●	●

● 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		●	●	●	●

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

Combination

XA□ Combination

Symbol	Combination					
XA31	**XA31**					
XA32	SY	**XA32**				
XA33	—	JKT	**XA33**			
XA34	—	—	JKT	**XA34**		
XA37	—	—	—	JKT	**XA37**	
XA38	—	—	K	—	K	**XA38**

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 page 11-2-34 to 11-2-35 for details of made-to-order specifications.

Symbol	Description	Applicable size	Combination
			XA31 to XA47
XC1	Change connection port location	10, 15, 20, 30, 40	●
XC2	Change threaded hole to through-hole	15, 20, 30, 40	●
XC3	Change the screw position	10, 15, 20, 30, 40	●
XC4	Change rotation range		●
XC5	Change rotation range between 0 to 200°		●
XC6	Change rotation range between 0 to 110°		●
XC7	Reversed shaft		—
XC30	Fluorine grease		●

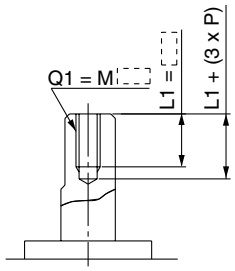
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.
A total of four XA□ and XC□ combinations is available.
Example: -XA33A34C27C3C

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



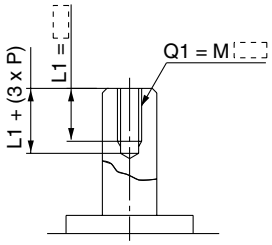
(mm)

Size \ Shaft type	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



(mm)

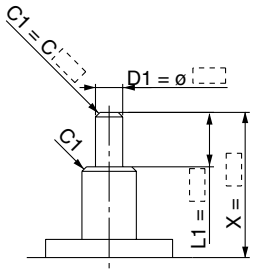
Size \ Shaft type	Q1		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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.)



(mm)

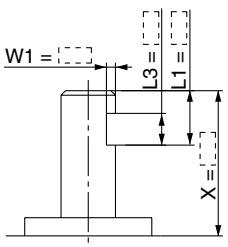
Size	X	L1 max	D1
10	4 to 14	X – 3	ø3 to ø3.9
15	5 to 18	X – 4	ø3 to ø3.9
20	6 to 20	X – 4.5	ø3 to ø5.9
30	6 to 22	X – 5	ø3 to ø7.9
40	8 to 30	X – 6.5	ø3 to ø9.9

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



(mm)

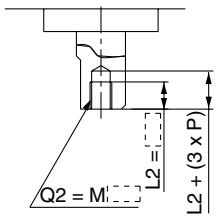
Size \ Shaft type	X			W1			L1 max			L3 max		
	J	K	T	J	K	T	J	K	T	J	K	T
10	6.5 to 14			0.5 to 2			X – 3			L1-1		
15	8 to 18			0.5 to 2.5			X – 4			L1-1		
20	9 to 20			0.5 to 3			X – 4.5			L1-1		
30	11.5 to 22			0.5 to 4			X – 5			L1-2		
40	15.5 to 30			0.5 to 5			X – 5.5			L1-2		

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



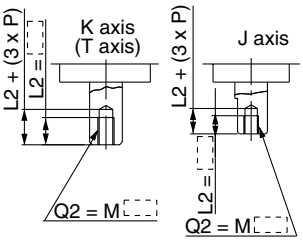
(mm)

Size \ Shaft type	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



(mm)

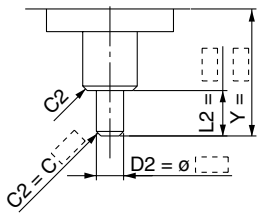
Size \ Shaft type	Q2		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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.)



(mm)

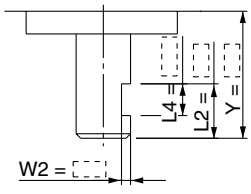
Size	Y	L2 max	Q2
10	2 to 14	Y – 1	ø3 to ø3.9
15	3 to 18	Y – 1.5	ø3 to ø4.9
20	3 to 20	Y – 1.5	ø3 to ø5.9
30	3 to 22	Y – 2	ø3 to ø7.9
40	6 to 30	Y – 4.5	ø5 to ø9.9

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



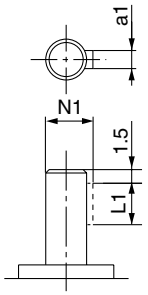
(mm)

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

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



(mm)

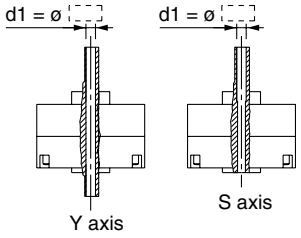
Size	a1	L1	N1
20	$2h9\ ^{0}_{-0.025}$	10	6.8
30	$3h9\ ^{0}_{-0.025}$	14	9.2

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
- Equal dimensions are indicated by the same marker.
- Not available for size 10.
- A parallel keyway is used on the long shaft for size 40.
- Minimum machining diameter for d1 is 0.1 mm.



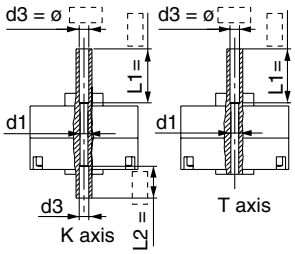
(mm)

Size \ Shaft type	S	Y
	d1	
15	ø2.5	
20	ø2.5 to ø3.5	
30	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.



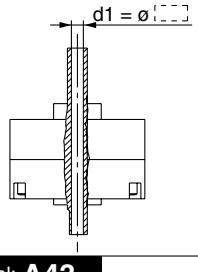
(mm)

Size \ Shaft type	K	T	K	T
	d1		d3	
15	ø2.5		ø2.5 to ø3	
20	—		ø2.5 to ø4	
30	—		ø2.5 to ø4.5	
40	—		ø2.5 to ø5	

Symbol: A41 Applicable to single vane type only

Shaft with through-hole

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



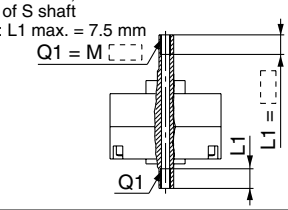
(mm)

Size	d1
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. (Example) For M5: L1 max. = 10 mm However, for M5 on the short shaft of S shaft : L1 max. = 7.5 mm
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft types: S, Y
- Equal dimensions are indicated by the same marker.



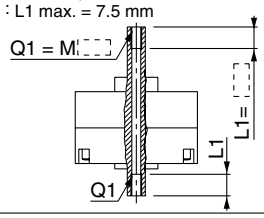
(mm)

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

Symbol: 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.



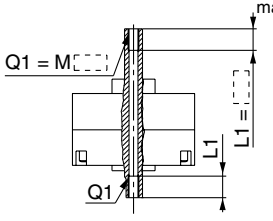
(mm)

Size / Shaft type / Thread	15 K	15 T	20 K	20 T	30 K	30 T	40 K	40 T
M3 x 0.5	ø2.5		ø2.5		ø2.5		ø2.5	
M4 x 0.7	—		ø3.3		ø3.3		ø3.3	
M5 x 0.8	—		—		ø4.2		ø4.2	

Symbol: A44 Applicable to single vane type only

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

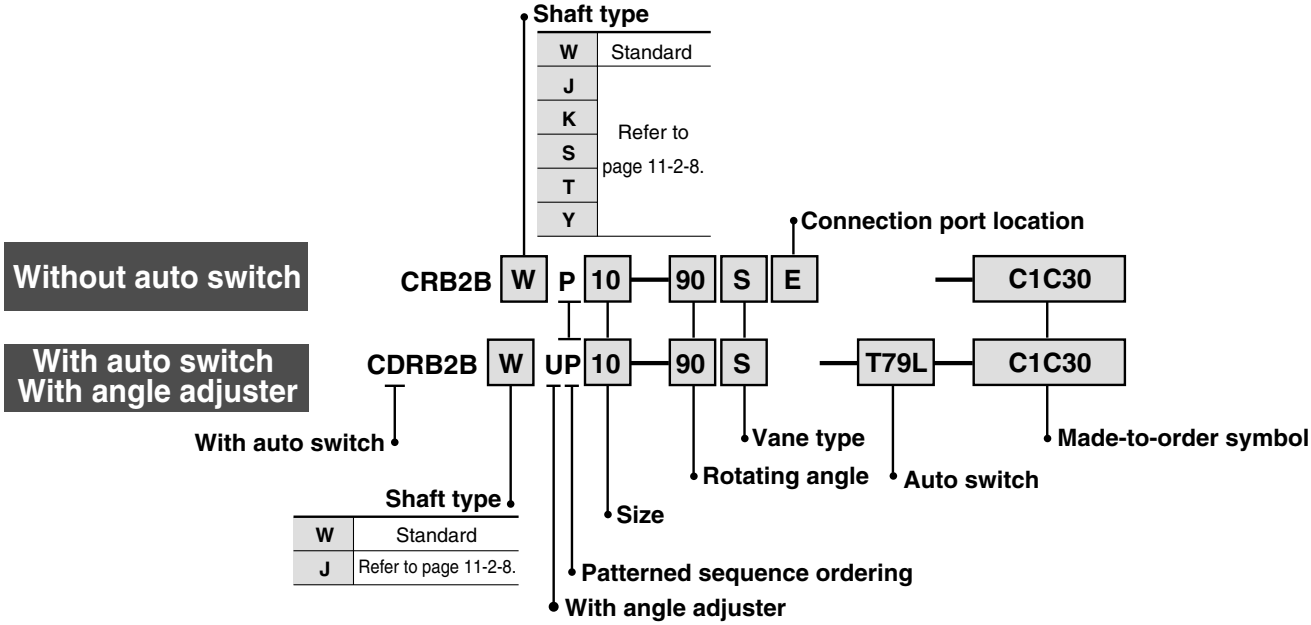
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



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

Series ***CRB2*** **(Size: 10, 15, 20, 30, 40)**
Made to Order Specifications: -XC1, 2, 3, 4, 5, 6, 7, 30

-XC1 to XC7, -XC30



Made to Order Symbol

Symbol	Description	Applicable shaft type W, J, K, S, T, Y	Applicable size
XC1 *	Add connection port	●	10 15 20 30 40
XC2 *	Change threaded holes to through-hole	●	
XC3 *	Change the screw position	●	
XC4	Change of rotation range and direction	●	
XC5	Change of rotation range and direction	●	
XC6 *	Change of rotation range and direction	●	
XC7	Reversed shaft	W, J	
XC30	Fluoro grease	●	

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

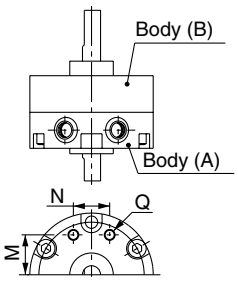
Combination

Symbol	Combination						
XC1	**XC1**						
XC2	●	**XC2**					
XC3	●	—	**XC3**				
XC4	●	●	●	**XC4**			
XC5	●	●	●	—	**XC5**		
XC6	●	●	●	—	—	**XC6**	
XC7	●	●	●	●	●	—	**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 keyway is used on the long shaft for size 40.
- This specification is not available for the rotary actuator with auto switch unit.



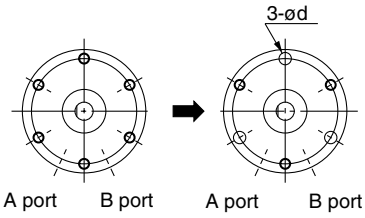
(mm)

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.

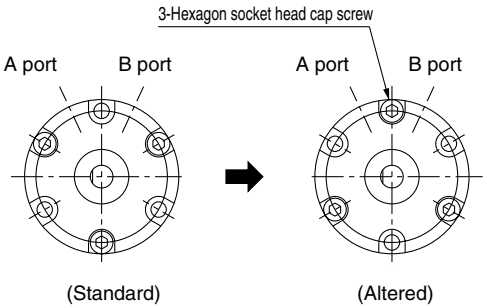


(mm)

Size	d
15	3.4
20	4.5
30	5.5
40	5.5

(Top view from long shaft side)

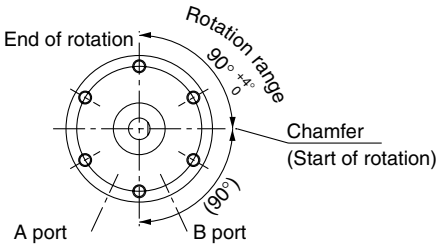
Symbol: C3 Change the position of the screws for tightening the actuator body.



(Top view from short-shaft side)

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 keyway is used instead of chamfer for size 40.

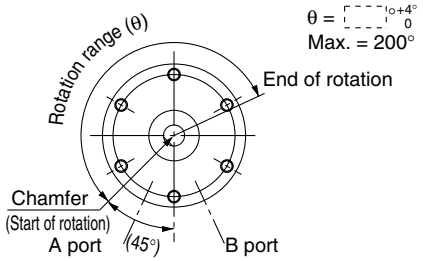


Start of rotation is the position of the chamfer (keyway) when A port is pressurized.

(Top view from long shaft side)

Symbol: C5 Applicable to single vane type only

Start of rotation is 45° up from the bottom of the vertical line to the left side
- Rotation tolerance for CRB2BW10 is $^{+5^\circ}_{0}$.
- Port size for CRB2BW10, 15 is M3.
- A parallel keyway is used instead of chamfer for size 40.

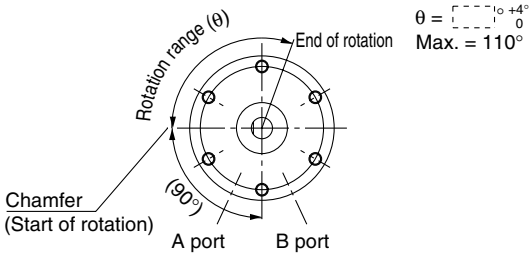


Start of rotation is the position of the chamfer (keyway) when B port is pressurized.

(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 keyway is used instead of chamfer for size 40.

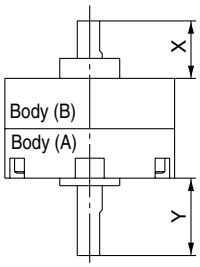


Start of rotation is the position of the chamfer (keyway) when B port is pressurized.

(Top view from long shaft side)

Symbol: C7 The shafts are reversed.

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



(mm)

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

Symbol: C30 Change the standard grease to fluoro grease (Not for low-speed specification.)