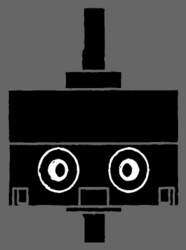


Rotary Actuator

Series CRB1

Vane Style/Size: 10, 15, 20, 30

Variations/Size: 10, 15, 20, 30

	Fluid			Air												Page
	Size			10				15				20, 30				
	Vane style	Single vane (S) Double vane (D)		Single vane (S)		Double vane (D)		Single vane (S)		Double vane (D)		Single vane (S)		Double vane (D)		
	Port location	Body side (–) Body axis direction (E)		Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	
Standard	Angle of rotation	90°		●	●	●	●	●	●	●	●	●	●	●	●	1.1-3 to 1.1-19
Standard	Angle of rotation	100°				●	●			●	●			●	●	
Standard	Angle of rotation	180°		●	●			●	●			●	●			
Standard	Angle of rotation	270°		●	●			●	●			●	●			
Standard	Shaft	Double shaft	W	●	●	●	●	●	●	●	●	●	●	●	●	
Standard	Cushion	Rubber bumper						●	●	●	●	●	●	●	●	
Standard	Variations	Basic		●	●	●	●	●	●	●	●	●	●	●	●	
Standard	Variations	With auto switch		●		●		●		●		●		●		
Standard	Variations	With angle adjuster		●		●		●		●		●		●		
Standard	Variations	With auto switch and angle adjuster		●		●		●		●		●		●		
Standard	Variations	Clean specification	10-	●	●			●	●	●	●	●	●	●	●	
Standard	Variations	Copper free	20-	●	●	●	●	●	●	●	●	●	●	●	●	
Option	Mounting bracket	With flange bracket	F	●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Shaft / Double shaft	Long shaft without one chamfering and short shaft with one chamfer	J	●	●	●	●	●	●	●	●	●	●	●	●	1.1-20 to 1.1-28
Made to Order	Shaft / Double shaft	Double long shaft, same size, both one chamfer	Y	●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Shaft / Double shaft	Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Shaft / Single shaft	One chamfer	S	●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Shaft / Single shaft	Single round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Pattern	Shaft patterns		●	●	●	●	●	●	●	●	●	●	●	●	
Made to Order	Pattern	Rotation angle patterns		●	●			●	●			●	●			

Rotary Actuator Vane Style
Series CRB1/Size: 10, 15, 20, 30

Rotation angles: 90°, 180°, 270°
Up to 270° is possible for the entire series

Through the adoption of specially designed seals and stoppers, a swing angle of 270° has been achieved for the first time in a compact vane style actuator.
(Single vane style)

Stainless steel shafts and bolts

(Carbon steel for size 30 and double-vane)

Low pressure operation made possible

The special sealing construction that has been adopted in the body supports a wide operating pressure range and enables the entire series to be used at low pressures.
Min. operating pressure
Size 10 : 0.2MPa
Size 15 to 30: 0.15MPa

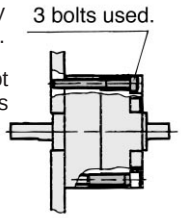
High reliability

To support thrust and radial loads, bearings are used throughout the series. In addition, rubber bumpers are used internally (except size 10) to further improve reliability.

Direct mount applications possible

The rotary actuator body can be mounted directly.

∗Direct mounting is not possible with unit sizes 10 to 30.



Double vane style standard: 90°, 100°

The outside diameter is identical to the single vane construction (except size 10); however, due to the double vane construction, twice the torque of the single vane style can be obtained.

Unrestricted auto switch mounting positions

Because the switch can be moved anywhere along the circumference, it can be mounted in a position that is most appropriate for the application.

Port positions: body side and axial direction

The positions can be selected for ease of use. (Those that are equipped with various styles of units can only be connected to the body side.)

(On the body side)

(Fittings are sold separately.)

(In the axial direction)

Block-built (units) adopted

Various styles of units that can be housed within the body's outside diameter can easily be retrofitted to the rotary actuator units of the entire series.

Basic + Switch unit	Basic + Angle adjusting unit	Basic + Angle adjusting unit + Switch unit
		

Rotary Actuator

Series CRB1

Vane Style/Size: 10, 15, 20, 30

How to Order

Standard

CRB1 [B] [W] [10] — [180] [S] [E]

Mounting

B	Basic
F*	Flange

*Option

(Refer to p.1.1-6 for further information.)

Shaft style

W	Double shaft, one chamfer (Standard)

Size

10
15
20
30

Rotation angle

Application	Symbol	Rotaion angle
Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

Vane style

S	Single vane
D	Double vane

Location of connecting port

—	Body side
E	Axial direction

Location of connecting port

Body side **Axial direction**

(Order fittings separately.)

Flange Brackets Part No.

(Refer to p.1.1-6 for further information on specifications.)

Model	Ass'y part No.
CRB1FW10	P211070-2
CRB1FW15	P211090-2
CRB1FW20	P211060-2
CRB1FW30	P211080-2

Lightweight (single vane 180°)

Size 10...ø29 X 15t (Body part), 26g

Size 20... ø42 X 29t (Body part), 105g

Rotation angle of 270° achieved

High reliability

(Bearings are used for supporting the shaft.)

Shaft and bolts made of stainless steel

(Carbon steel for size 30 and the double vane style)

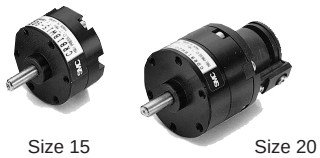
Body can be used as a flange

(Bolts used: sizes 10, 15: M2.5; size 20: M3; size 30: M4)

Two styles of port positions: body side and axial direction

Angle adjustment unit can be mounted

A style that can be housed within the body's outside diameter can perform angle adjustments of 0° to 240°.
(CRB1BW10: 0° to 230°)



Size 15 Size 20

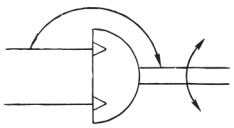
Single vane

Size 10 Size 15

Double vane

Order Made P.1.1-20 to 1.2-28

JIS symbol



Single Vane Specifications

Model (Size)		CRB1BW10-□S		CRB1BW15-□S		CRB1BW20-□S	CRB1BW30-□S
Vane style		Single vane					
Rotation 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 press. (MPa)		0.7					1.0
Min. operating press. (MPa)		0.2		0.15			
Speed range(1) (sec/90°)		0.03 to 0.3					0.04 to 0.3
Allowable kinetic energy(2) (J)		0.00015		0.001		0.003	0.02
				0.00025		0.0004	0.015
Shaft load (N)	Allowable radial load	15		15		25	30
	Allowable thrust load	10		10		20	25
Bearing		Ball bearing					
Port position		On the body side or in the axial direction					
Size	Body side	M5 X 0.8	M3 X 0.5	M5 X 0.8	M3 X 0.5	M5 X 0.8	
	Axial direction	M3 X 0.5				M5 X 0.8	
Shaft		Double shaft (One flat chamfering on each shaft)					
Angle adjustable range of the unit		0 to 230°		0 to 240°			
Mounting		Basic, Flange					
Auto switch		Mountable (Port: Only on the body side)					

Note 1) Make sure to operate within the adjustable speed range.
Exceeding the speed control upper limit (0.3 sec/90°) speed control could cause the unit to stick or not operate.
Note 2) In the chart, the upper section indicates the energy factor when the rubber bumper is used (at the end of the rotation); the lower section indicates the energy value when the rubber bumper is not used.

Double Vane Specifications

Model (Size)		CRB1BW10-□D	CRB1BW15-□D	CRB1BW20-□D	CRB1BW30-□D
Vane style		Double vane			
Rotation angle		90°, 100°			
Fluid		Air (Non-lube)			
Proof press (MPa)		1.05			1.5
Ambient and fluid temperature		5 to 60°C			
Max. operating press. (MPa)		0.7			1.0
Min. operating press. (MPa)		0.2	0.15		
Speed range(1) (sec/90°)		0.03 to 0.3			0.04 to 0.3
Allowable kinetic energy (J)		0.0003	0.0012	0.0033	0.02
Shaft load (N)	Allowable radial load	15	15	25	30
	Allowable thrust load	10	10	20	25
Bearing		Bearing			
Port position		On the body side or in the axial direction			
Port size (Body side, Axial direction)		M3 X 0.5		M5 X 0.8	
Shaft		Double shaft (One flat chamfering on each shaft)			
Mounting		Basic, Flange			
Auto switch		Mountable (Port: Only on the body side)			

Note 1) Make sure to operate within the adjustable speed range.
Exceeding the speed control upper limit (0.3 sec/90°) could cause the unit to stick or not operate.

Inner Volume

(cm³)

Vane style	Single vane												Double vane							
Model	CRB1BW10-□S			CRB1BW15-□S			CRB1BW20-□S			CRB1BW30-□S			CRB1BW10-□D		CRB1BW15-□D		CRB1BW20-□D		CRB1BW30-□D	
Rotation angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°
Inner 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	1.0	1.1	2.6	2.7	5.6	5.7	14.4	14.5

∗The values in ( ) indicate the internal volume of the air supply side at the time port A is pressurized.

Weights

(g)

Vane style	Single vane												Double vane							
Model	CRB1BW10-□S			CRB1BW15-□S			CRB1BW20-□S			CRB1BW30-□S			CRB1BW10-□D		CRB1BW15-□D		CRB1BW20-□D		CRB1BW30-□D	
Rotation angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	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	42	43	57	60	121	144	223	243
Flange bracket ass'y	9			10			19			25			9		10		19		25	
Auto switch unit + 2 switches	30			30			50			60			30		30		50		60	
Angle adjusting unit	30			47			90			150			30		47		90		150	

⚠ Precautions

Be sure to read before handling.
Refer to p.0-20 and 0-21 for Safety Instructions and common precautions for the products mentioned in this catalog, and refer to p.1.0-2 to 1.0-4 for precautions on every series.

Units Equipped with Angle Adjustment

⚠ Caution

① **If the rotary actuator body is used for a 90° or 180° application, the maximum angle will be limited by the rotation angle of the rotary actuator body. Make sure to take this into consideration when ordering equipment.**
If the rotary actuator body is used for a 90° or 180° application, making an angle adjustment at the maximum angle of 90° or 180°, respectively, is not feasible because the rotation angle of the rotary actuator body is $90°^{+4°}_{0}$ (or $180°^{+4°}_{0}$), respectively.
Therefore, in the case of the single vane type, use a rotary actuator body for 270°, and in the case of the double vane type, use a rotary actuator body for 100°. Furthermore, the "90°" and "180°" designations of the rotary actuator bodies are approximate; they should be used for angle adjustments within 85° and 175°, respectively.
② **All of the connecting port positions are on the body side.**
③ **The allowable kinetic energy is the same as that of the rotary actuator unit specifications.**

Copper Free

20 – CRB1BW | **Size** | **Rotation** | **Vane style** | **Port position**

Copper free

The entire standard series of the vane rotary actuators does not affect color CRTs due to copper ions or fluororesins.

Specification

Vane style	Single, Double			
Size	**10**	**15**	**20**	**30**
Operating press. range	0.2 to 0.7 MPa	0.15 to 0.7MPa		0.15 to 1.0MPa
Speed adjust. range	0.03 to 0.3s/90°			0.04 to 0.3s/90°
Port position	On the body side or in the axial direction			
Piping	Screw-in piping			
Mounting style	Basic only			
Variations	Basic style, With auto switch, With angle adjuster			

Clean Series

10 – CRB1BW | **Size** | **Rotation** | **Vane style** | **Port position**

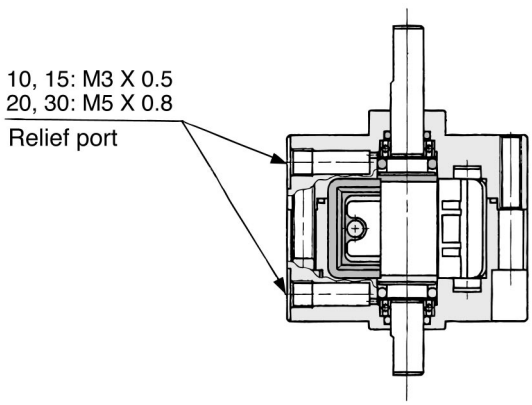
Clean series

This type can be used in a class 100 clean room due to the dual seal construction in the actuator shaft area and the ability to vent directly outside of the clean room through its relief port.

Specification

Vane style	Single	Single, Double		
Size	**10**	**15**	**20**	**30**
Operating press. range	0.2 to 0.7 MPa	0.15 to 0.7MPa		0.15 to 1.0MPa
Speed range	0.03 to 0.3s/90°			0.04 to 0.3s/90°
Port position	On the body side or in the axial direction			
Piping	Screw-in piping			
Relief port	M3 X 0.5		M5 X 0.8	
Mounting style	Basic only			
Variations	Basic style, With auto switch			

Construction



The inner dimension shows the single vane.

Option Specifications/Flange Brackets/Size: 10, 15, 20, 30

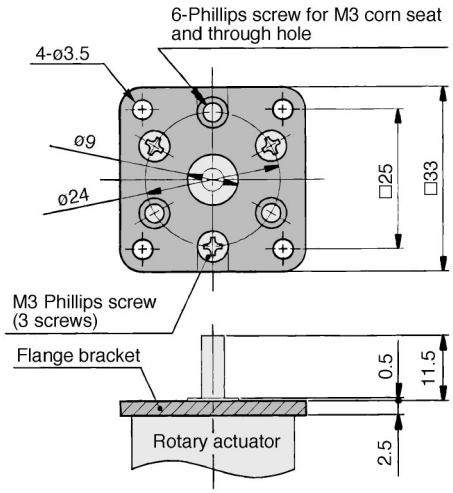
Model				Flange ass'y part No.
Basic style	With auto swicth	With angle adjuster	With angle adjuster and auto switch	
CRB1FW10	CDRB1FW10	CRB1FWU10	CDRB1FWU10	P211070-2
CRB1FW15	CDRB1FW15	CRB1FWU15	CDRB1FWU15	P211090-2
CRB1FW20	CDRB1FW20	CRB1FWU20	CDRB1FWU20	P211060-2
CRB1FW30	CDRB1FW30	CRB1FWU30	CDRB1FWU30	P211080-2

Notes) No flange metal fittings (with Phillips screw) are mounted when assembled in a factory. The mounting location of flange metal fittings onto the body of rotary actuator can be adjusted at 60-degree intervals.

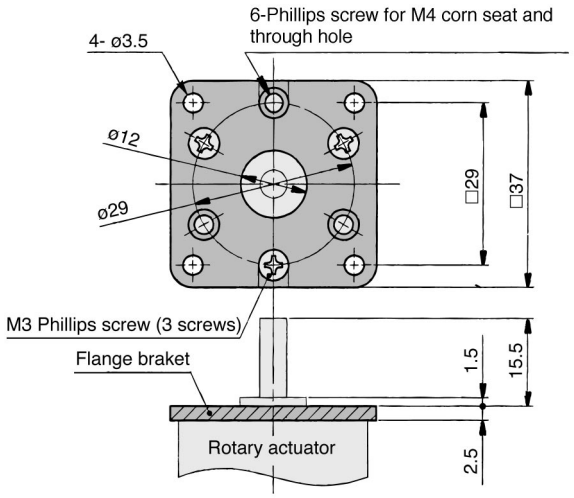
CAD

Basic (Side port) ····· C-CRB1FW Size Angle S ····· SCRB Size, #11 (#1+#11)
Basic (Axial direction port) ····· CRB1FW Size Angle SE····· SCRB Size, #12 (#3+#12)
W/ angle adjuster ····· C-CRB1FWU Size Angle S ····· SCRB Size, #13 (#5+#13)
W/ auto switch ····· C-DRB1FW Size Angle S ····· SCRB Size, #14 (#7+#14)
W/ angle adjuster and auto switch ···· CDRB1FWU Size Angle S ····· SCRB Size, #15 (#9+#15)

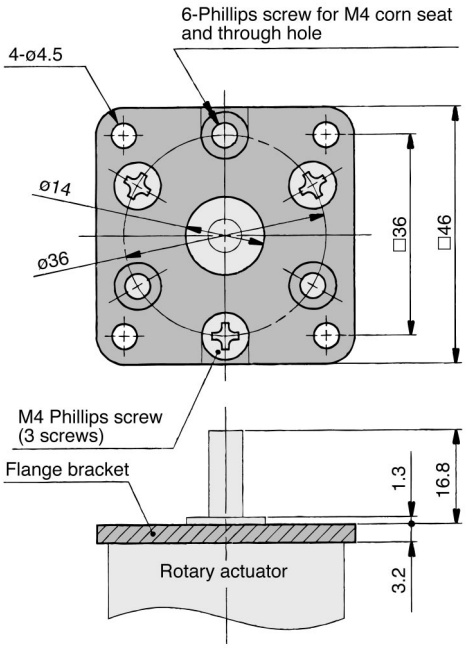
Ass'y Part Number: P211070-2 (For C□RB1FW□10)



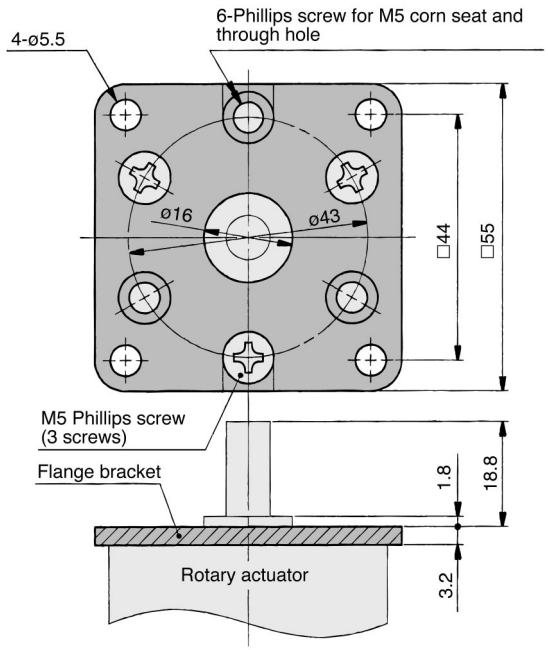
Ass'y Part Number: P211090-2 (For C□RB1FW□15)



Ass'y Part Number: P211060-2 (For C□RB1FW□20)

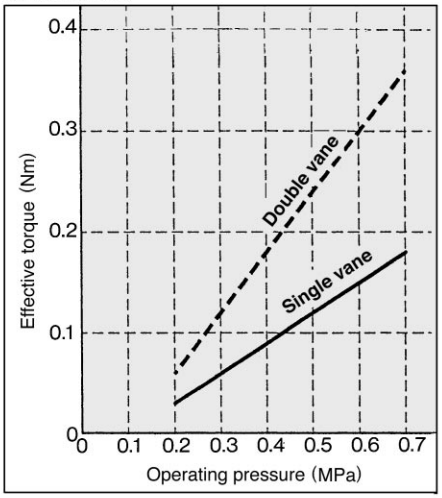


Ass'y Part Numer: P211080-2 (For C□RB1FW□30)

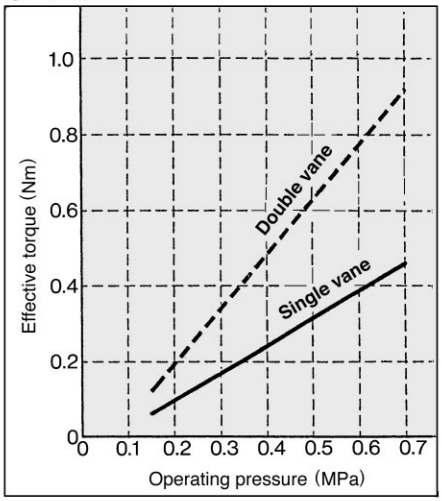


Effective Output

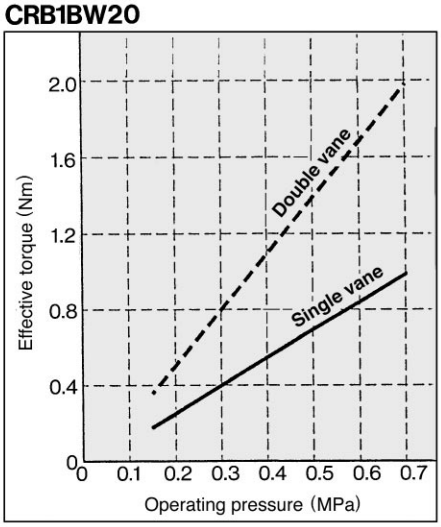
CRB1BW10



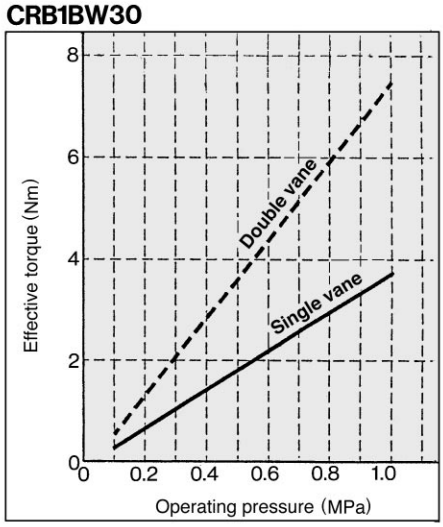
CRB1BW15



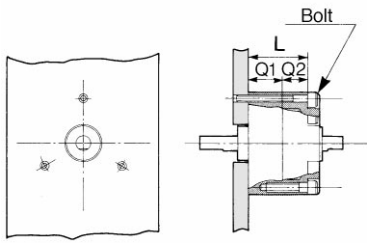
CRB1BW20



CRB1BW30



Direct Mounting of Body



L dimensions of the body are shown below. If hexagonal head cap screws as accordance of JIS standard are used, the head part of the bolt can be fit in the groove on the actuators.

Model	L	Bolt
CRB1BW10	11.5*	M2.5
CRB1BW15	16	M2.5
CRB1BW20	24.5	M3
CRB1BW30	34.5	M4

*Only the ones of size 10 have different types of vanes between single vane and double vane. Length (L) for double vane is 20.5.

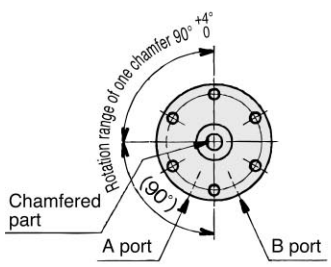
*Refer to p.1.1-9, and 1.1-10 for dimensions of Q1 and Q2.

Rotation Range/From long shaft side.

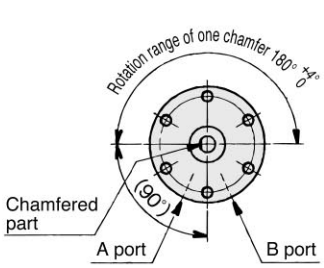
(The chamfering locations shown below indicate the states when pressurized from B port.)

Single Vane **Double Vane**

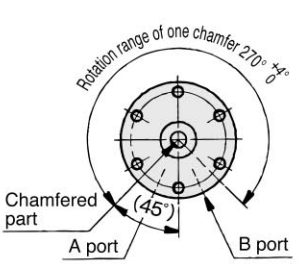
90°



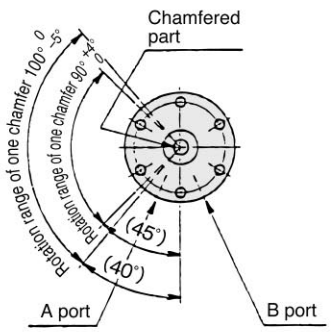
180°



270°



90°, 100°



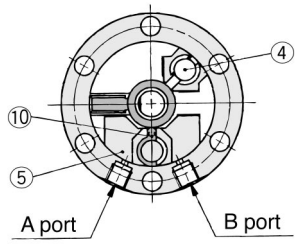
Note) For single and double vane styles: The cross angle rotation of 90°, 180°, and 270° will be $^{+5^\circ}_{0}$ only for size 10.

Construction/Size: 10, 15, 20, 30

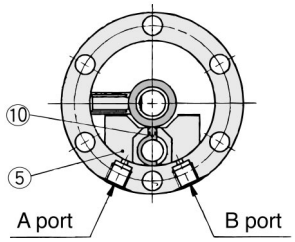
Single vane

- The dimensions below are of size 20.
- Dimensions for 90° and for 180° shows the pressurization to B port, and dimensions for 270° show the location of the ports during rotation.

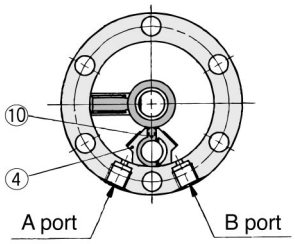
For 90°
(From long shaft side)



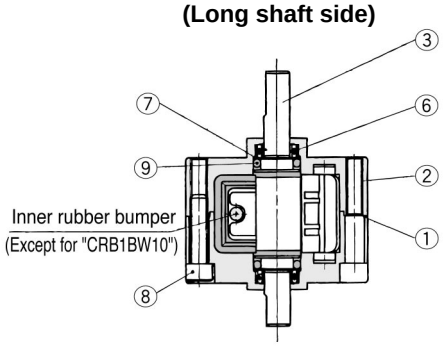
For 80°
(From long shaft side)



For 270°
(From long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

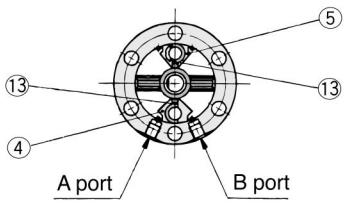
No.	Descroption	Material	Note
①	Body (A)	Aluminum alloy	Black
②	Body (B)	Aluminum alloy	Black
③	Vane shaft	Stainless steel*	
④	Stopper	Resin	For 270°
⑤	Stopper	Resin	For 180°
⑥	Bearing	High carbonate chrome steel	
⑦	Back-up ring	Stainless steel	Special bolt
⑧	Hexagon socket head cap screw	Stainless steel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

*Carbon steel for CRB1BW30.

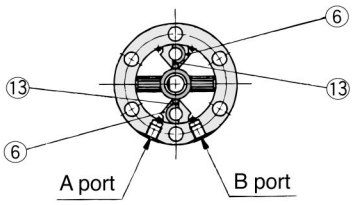
Double vane

CRB1BW10-□D/Dimensions below shows the middle locations of pressurization to A port or B port.

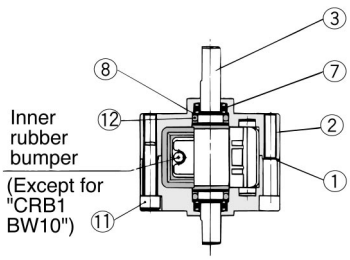
For 90°
(From long shaft side)



For 100°
(From long shaft side)



(Long shaft side)



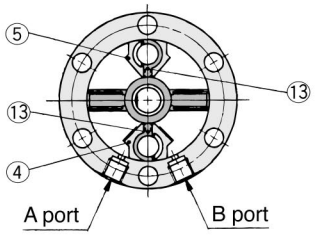
(Short shaft side)

Component Parts

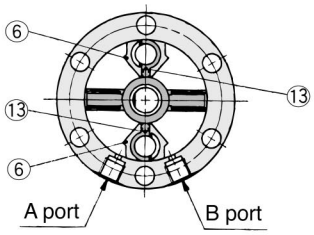
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	Black
②	Body (B)	Aluminum alloy	Black
③	Vane shaft	Carbon steel	
④	Stopper	Stainless steel	
⑤	Stopper	Resin	
⑥	Stopper	Stainless steel	
⑦	Bearing	High carbonate chrome steel	
⑧	Back-up ring	Stainless steel	

CRB1BW15/20/30-□D/Dimensions below are based on size 20.

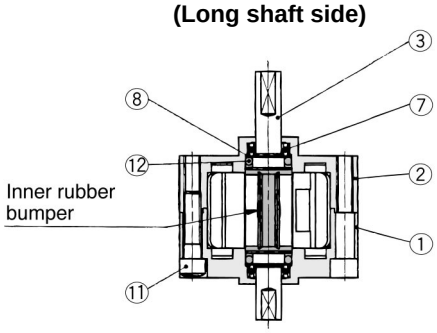
For 90°
(From long shaft side)



For 100°
(From long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

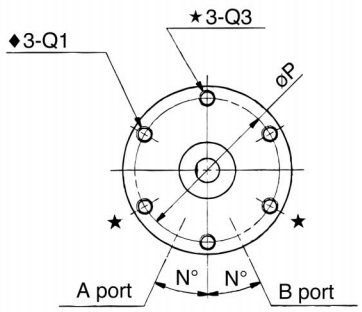
No.	Description	Material	Note
⑨	Cover	Aluminum alloy	Black
⑩	Plate	Resin	Black
⑪	Hexagon socket head cap screw	Stainless steel	Special bolt
⑫	O ring	NBR	
⑬	Stopper packing	NBR	Special packing
⑭	Gasket	NBR	Special packing
⑮	O ring	NBR	
⑯	O ring	NBR	

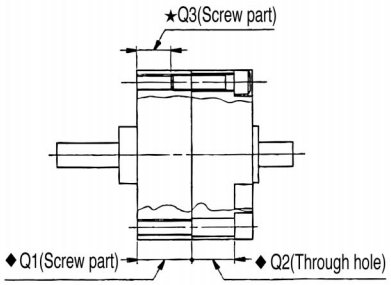
Series CRB1

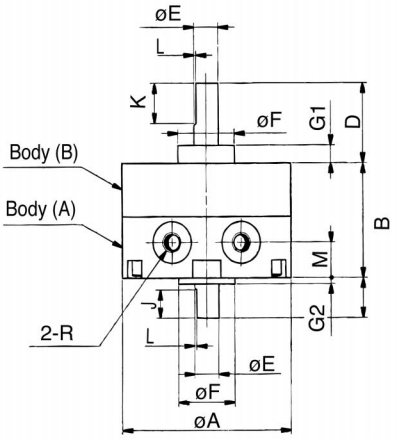
Size 10, 15, 20, 30

Single vane

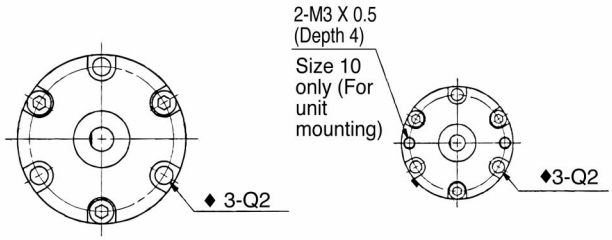
Port locations: Body side/
CRB1BW□-□S



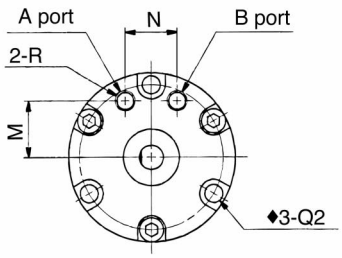




Port locations: Body side/
CRB1BW10-□S



Port locations: Axial direction/
CRB1BW□-□SE



The dimensions above show the pressurization state to B port of the one for 90° or 180°.
Refer to p.1.1-7 for further information.

Note) Depths of ♦ mark Q1, Q2 indicate that the body(A)/(B) are penetrated respectively.

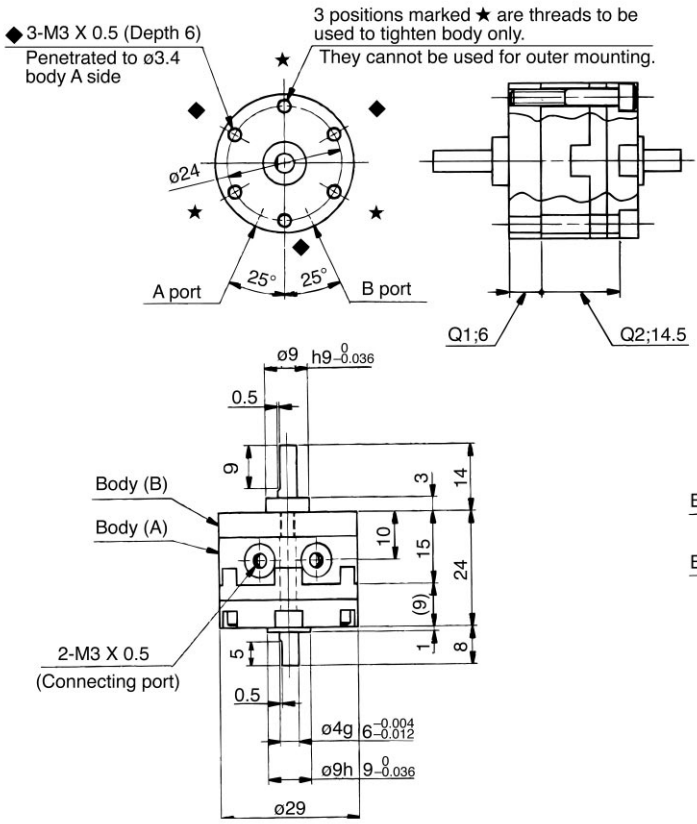
Note) There are port locations in ★parts for CRB1BW15, 20, 30.

Model	A	B	C	D	E(g6)	F(h9)	G1	G2	J	K	L	M	N	P	♦Q1	♦Q2	★Q3	R		
																		90°	180°	270°
CRB1BW10-□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
CRB1BW10-□SE												8.5	9.5					M3		
CRB1BW15-□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
CRB1BW15-□SE												11	10					M3		
CRB1BW20-□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		
CRB1BW20-□SE												14	13							
CRB1BW30-□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		
CRB1BW30-□SE												15.5	14							

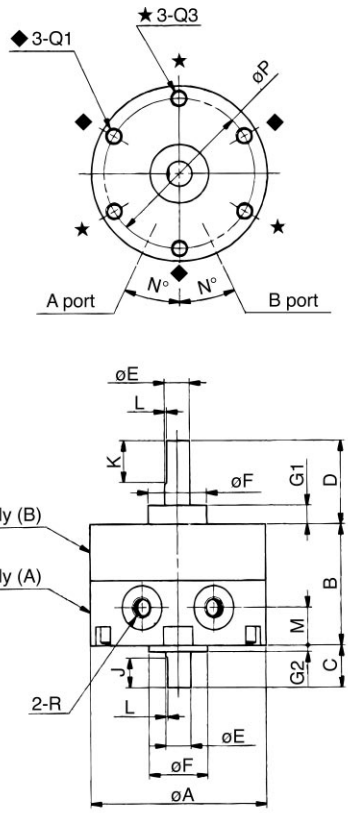
Port location: Body side
CRB1BW [Size] -□S·····SCRB [Size] , #1
Port location: Axial direction
CRB1BW [Size] -□SE·····SCRB [Size] , #3

Double vane

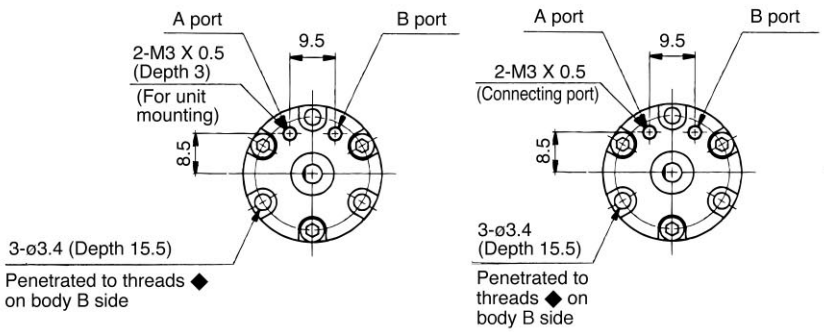
Port locations: Body side/
CRB1BW10-□D



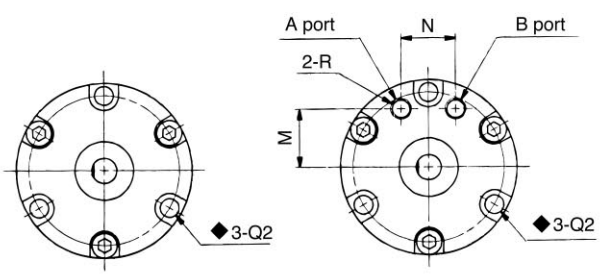
Port locations: Body side/
CRB1BW15, 20, 30-□D



Port direction:
Axial direction/
CRB1BW10-□DE



Port direction:
Axial direction/
CRB1BW15·20·30-□DE



The dimensions above show the rotation middle position during pressurization to A or B Port.

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°
CRB1BW15-□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	
CRB1BW15-□DE												11	10						
CRB1BW20-□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	
CRB1BW20-□DE												14	13						
CRB1BW30-□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	
CRB1BW30-□DE												15.5	14						

Rotary Actuator with Auto Switch

Series CDRB1

Vane Style/Size: 10, 15, 20, 30

How to Order

With auto switch Size 10, 15: CDRB1 F W 10 — 180 S — 90 L

With auto switch Size 20, 30: CDRB1 B W 20 — 180 S — R73 L

With auto switch (With switch unit)

Size

10	
15	

Mounting

B	Basic
F	Flange

Shaft style

W	Double shaft, one chamfer (standard)

Size

20	
30	

Rotation

Application	Symbol	Rotation
Single Vane	90	90°
	180	180°
	270	270°
Double Vane	90	90°
	100	100°

Vane style

S	Single
D	Double

Auto switch

—	Without auto switch

∗Refer to the table below for part numbers of applicable auto switch.

Electrical entry/Lead wire length

—	Grommet (Lead wire: 0.5m)
L	Grommet (Lead wire: 3m)
C	Connector (Lead wire: 0.5m)
CL	Connector (Lead wire: 3m)
CN	Connector, without lead wire

∗Connector style is applicable only to "R73", "R80" and T79".
∗∗Part numbers of lead wire with connector single unit
D-LC05: Lead wire 0.5m
D-LC30: Lead wire 3m
D-LC50: Lead wire 5m

No. of auto switches mounted

S	1
—	2

∗Right hand side operation auto switch is attached for the one with 1 auto switch.

Auto Switch Specifications/

Refer to p.2.11-1 for further specifications on auto switch single unit.

Applicable size	Style	Electrical entry	Indicator	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch part no.	Lead wire	Lead wire length∗ 0.5 (—)	3 (L)	5 (Z)	— (N)	Applicable load	
For 10/15	Reed switch	Grommet	No	2 wire	5V, 12V	5V, 12V, 24V	90	Parallel cord	●	●	●	—	IC	Relay PLC
					5V, 12V 100V	5V, 12V 24V, 100V	90A	Cab tire	●	●	●	—		
			Yes		——	——	97	Parallel cord	●	●	●	—		
						100V	93A	Cab tire	●	●	●	—	——	
	Solid state switch				12V	——	T99		●	●	—	—		
							T99V		●	●	—	—		
				3 wire (NPN)	5V, 12V		S99		●	●	—	—	IC	
							S99V		●	●	—	—		
				3 wire (PNP)			S9P		●	●	—	—		
							S9PV		●	●	—	—		
For 20/30	Reed switch	Grommet	Yes	2 wire	24V	——	100V	R73	Cab tire	●	●	—	—	——	Relay PLC
		Connector						R73C		●	●	●	●	
		Grommet	No			48V, 100V	24V, 48V, 100V	R80		●	●	—	—	IC
		Connector						R80C		●	●	●	●	
	Solid state switch	Grommet	Yes			12V	——	T79		●	●	—	—	——
		Connector						T79C		●	●	●	●	
		Grommet		3 wire (NPN)		5V, 12V		S79		●	●	—	—	IC
				3 wire (PNP)				S7P		●	●	—	—	

∗Lead wire length symbols 0.5m····· — Ex.) R73C
3m····· L Ex.) R73CL
5m····· Z Ex.) R73CZ
Not attached···· N Ex.) R73CN

●Operating time —— 1.2ms
●Shock resistance—— 300m/s^2 (Reed type), 1000m/s^2 (Solid state type)
●Operating temperature range ——— –10°C to 60°C

Aplicable Auto Switch

Applicable series	Auto switch models		Electrical entry	Page
CDRB1BW 10 CDRB1BW 15	Reed switch	D-90/90A	Grommet/2 wire style	2.11-12 2.11-14
		D-97/93A		
	Solid state switch	D-S99/S99V*	Grommet/3 wire style (NPN)	2.11-23
		D-S9P/S9PV*	Grommet/3 wire style (PNP)	
		D-T99/T99V	Grommet/2 wire style	
CDRB1BW 20 CDRB1BW 30	Reed switch	D-R73	Grommet/2 wire style	2.11-15
		D-R80	Connector/2 wire style	
	Solid state switch	D-S79*	Grommet/3 wire style (NPN)	2.11-24
		D-S7P*	Grommet/2 wire style (PNP)	
		D-T79	Grommet/2 wire style, Connector/2 wire style	

*No connector style for 3 wire without connecting section style.

How to Adjust Auto Switch

Refer to p.1.0-19 and 1.0-20 for further information on auto switch adjusting method.

Units

All units are mountable to series CDRB1. Refer to p.1.0-23 for 1.0-24 further information.

Combinable unit

①Auto switch unit

②Angle adjusting unit

*Switch block unit (Required when using 3 auto switches.)

③Angle adjusting unit with auto switch

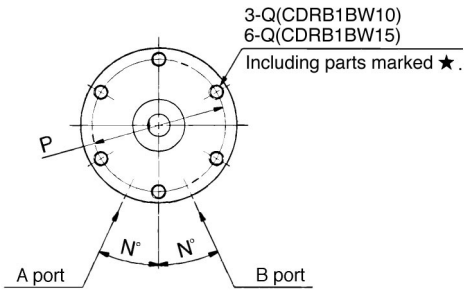
*Joint unit (Required when connecting auto switch to angle adjusting unit.)

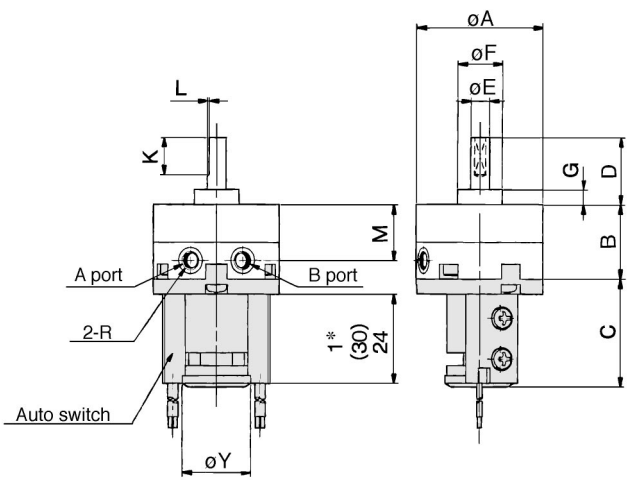
⚠ Precaution

Be sure to read before handling.
Refer to p.2.11-2 to 2.11-4 for common precautions of auto switch.

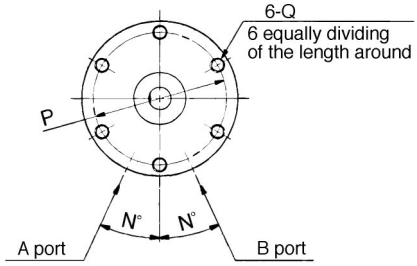
Size 10, 15, 20, 30/With auto switch

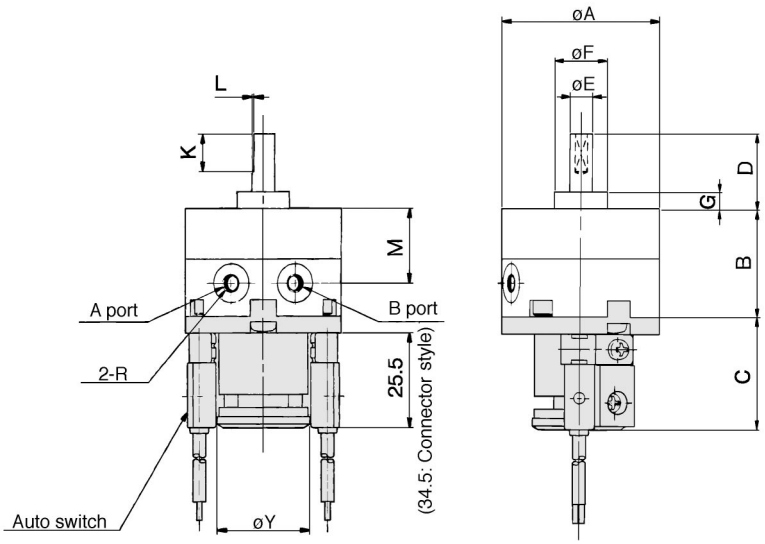
Single vane
CDRB1BW10/15-□ S

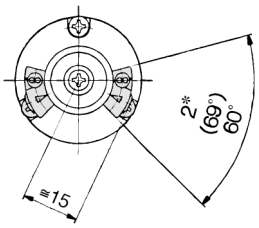


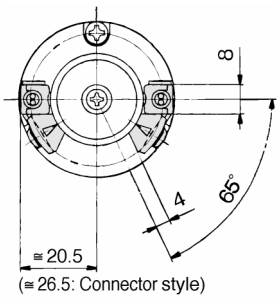


Single vane
CDRB1BW20/30-□S









The dimensions above show pressurization to B port for 90° and 180°.
Refer to p.1.1-7 for further information.

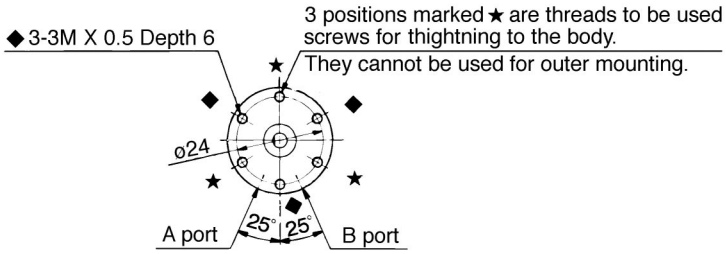
∗1. 24: When auto switches of "D-90", "90A", "S99(V)", "T99(V)", "S9P(V)", styles are being used.
30: When "D-97", "93A" styles are being used.
∗2. 60°: When auto switches of "D-90", "90A", "97", "93A" styles are being used.
69°: When auto switches of "D-S99(V)", "T99(V)", "S9P(V)" styles are being used.
Note) For auto switch attached style, positions for connecting ports are on body side.
∗The diagrams of outer appearances show the auto switches with 1 right hand operating switch and one left hand operating switch.

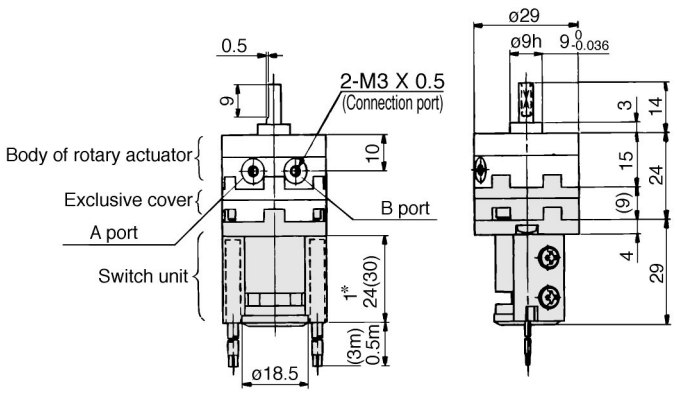
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M	N	P	Q	R 90°	R 180°	R 270°	Y
CDRB1BW10-□S	29	15	29	14	4	9	3	9	0.5	10	25	24	M3 X 0.5Depth5	M5 X 0.8		M3 X 0.5	18.5
CDRB1BW15-□S	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 X 0.5Depth5	M5 X 0.8		M3 X 0.5	18.5
CDRB1BW20-□S	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 X 0.7Depth7	M5 X 0.8			25
CDRB1BW30-□S	50	40	31	22	8	16	5	12	1	30	25	43	M5 X 0.8Depth10	M5 X 0.8			25

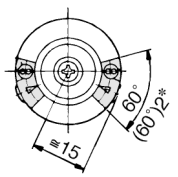
CAD CDRB1BW Size -S·····SCRB Size , #7

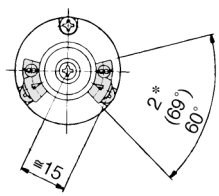
Double vane

CDRB1BW10-□D







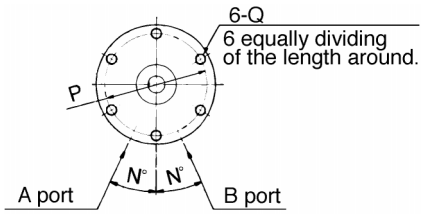


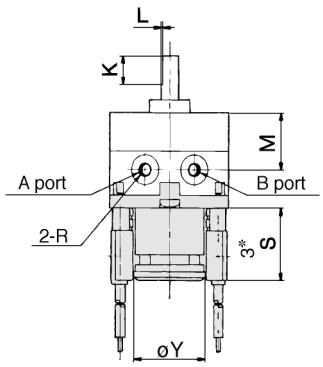
CDRB1BW15-□D

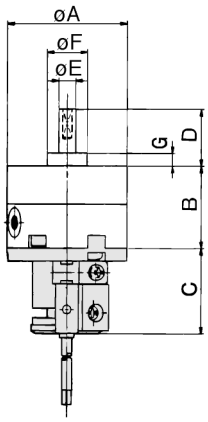
Double vane

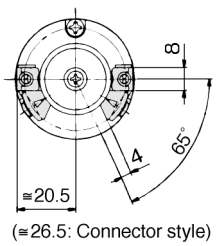
CRB1BW15/20/30-□D

(Same size as single vane style.)









CDRB1BW20/30-□D

The dimensions above show the rotation middle position during pressurization to A or B port.

∗1) 24: When auto switches of "D-90", "90A", "S99(V)", "T99(V)", "S9P(V)" styles are being used.
30: When "D-97", "93A", styles are being used.

∗2) 60°: When auto switches of "D-90", "90A", "97", "93A" styles are being used.
69°: When auto switches of "D-S99(V)", "T99(V)", "S9P(V)" styles are being used.

∗3) 25.5: When auto switches grommet "D-R73", "R80", "S79", "T79", and "S7P" styles are being used.
34.5: When auto switches "D-R73", "R80" and "T79" connector styles are being used.

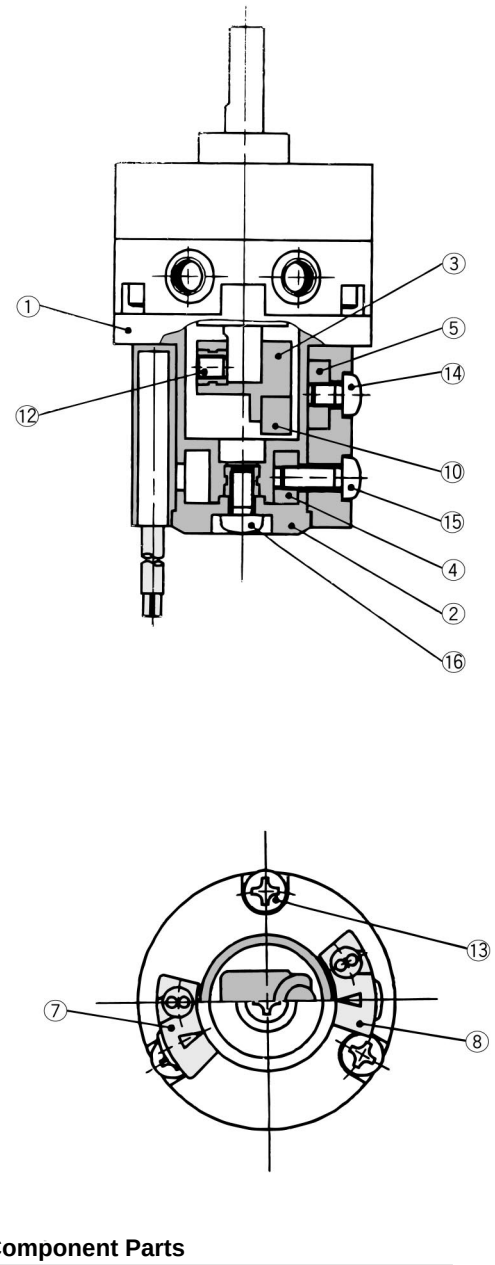
Model	A	B	C	D	E(g6)	F(h9)	G	K	L	M	N	P	Q	R		S		Y
														90°	100°			
CDRB1BW15-□D	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 X 0.5Depth5	M3 X 0.5		24∗1	30∗1	18.5
CDRB1BW20-□D	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 X 0.7Depth7	M5 X 0.8		25.5∗3	34.5∗3	25
CDRB1BW30-□D	50	40	31	22	8	16	5	12	1	30	25	43	M5 X 0.8Depth10	M5 X 0.8				25

Construction

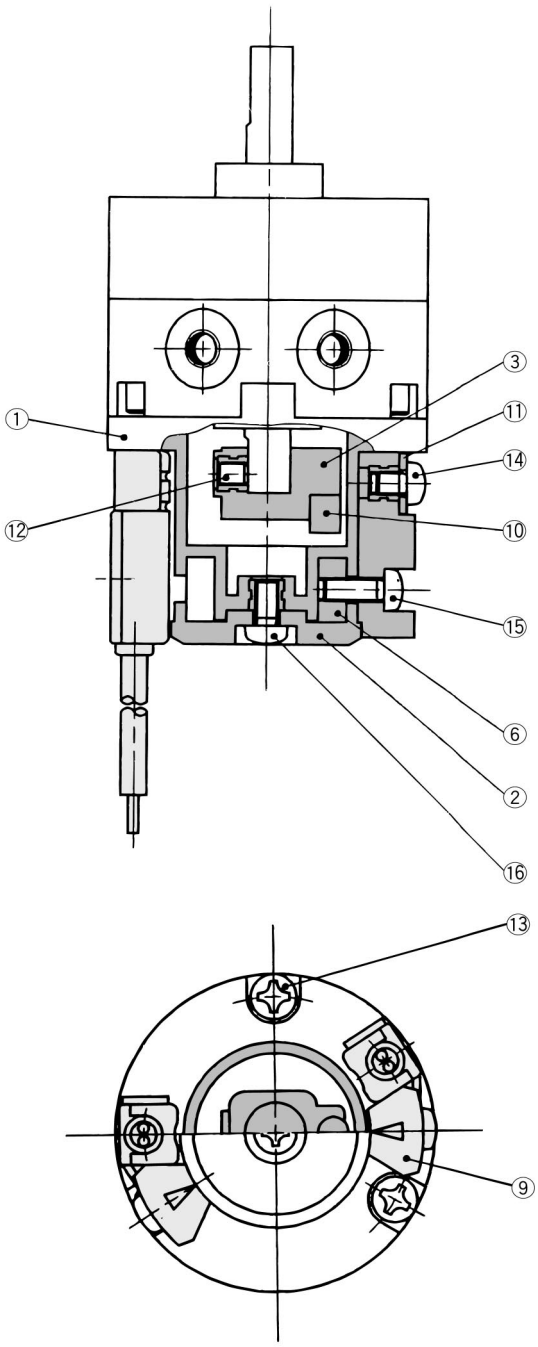
- Single vane
  The dimensions below show pressurization to B port of the switches for 90° and 180°.
- Double vane
  The dimensions below show the rotation middle position during pressurization to A port or B port.

(The unit is common to single vane and double vane styles.)

CDRB1BW10/15-□$^{S}_{D}$



CDRB1BW20/30-□$^{S}_{D}$



Component Parts

No.	Description	Material
①	Cover (A)	Resin
②	Cover (B)	Resin
③	Magnet lever	Resin
④	Fixing block (A)	Aluminum alloy
⑤	Fixing block (B)	Aluminum alloy
⑥	Fixing block	Aluminum alloy
⑦	Switch block (A)	Resin
⑧	Switch block (B)	Resin
⑨	Switch block	Resin
⑩	Magnet	Magnetic substance

No.	Description	Material
⑪	Arm	Stainless steel
⑫	Hexagon socket head cap screw	Stainless steel
⑬	Cross-recessed head cap screw	Stainless steel
⑭	Cross-recessed head cap screw	Stainless steel
⑮	Cross-recessed head cap screw	Stainless steel
⑯	Cross-recessed head cap screw	Stainless steel

∗2 cross-recessed head cap screws ⑬ are attached for "CDRB1BW10".

Rotary Actuator with Angle Adjuster

Series CRB1BWU

Vane Style/Size:10, 15, 20, 30

How to order

Without auto switch

CRB1 [B] WU [10] — [180] [S]

Mounting

B	Basic
F	Flange

With angle adjusting unit

Size

10
15
20
30

Vane style

S	Single
D	Double

Rotation angle

Application	Symbol	Rotation angle
Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

With auto switch Size 10, 15

CDRB1 [F] WU [10] — [180] [S] — [90] [L] [ ]

With auto switch Size 20, 30

CDRB1 [B] WU [20] — [180] [S] — [R73] [L] [ ]

With auto switch
(With switch unit)

Mounting

B	Basic
F	Flange

With angle adjusting unit

Size

20
30

Rotation angle

Application	Symbol	Rotation angle
Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

Vane style

S	Single
D	Double

Auto switch

—	Without auto switch

∗Refer to the table below for part numbers of applicable auto switches.

No. of auto switches mounted

S	1∗
—	2

∗ The auto switch ordered with symbol "S" is right hand side operating type.

Electrical entry/Lead wire length

—	Grommet (Lead wire: 0.5m)
L	Grommet (Lead wire: 3m)
C	Connector (Lead wire: 0.5m)
CL	Connector (Lead wire: 3m)
CN	Connector, without lead wire

∗Connector is applicable only to "R73", "R80" and "T79".

∗∗ Single unit part number of lead wire with connector:
D-LC05: Lead wire 0.5m
D-LC30: Lead wire 3m
D-LC50: Lead wire 5m

Auto switch Specifications/ Refer to p.2.11-1 for further specifications on single unit of auto switch.

Applicable size	Style	Electrical entry	Indicator	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch part no.	Lead wire	Lead wire length∗ 0.5 (—)	3 (L)	5 (Z)	— (N)	Applicable load	
For 10/15	Reed switch	Grommet	No	2 wire	5V, 12V	≤24V AC	**90**	Parallel cord	●	●	●	—	IC	
						≤100V AC	**90A**	Cab tire	●	●	●	—		
			Yes		12V	—	**97**	Parallel cord	●	●	●	—		
						100V	**93A**		●	●	—	—	—	Relay PLC
	Solid state switch				24V —		**T99**		●	●	—	—		
							T99V		●	●	—	—		
				3 wire (NPN)	5V, 12V	—	**S99**	Cab tire	●	●	—	—	IC	
							S99V		●	●	—	—		
				3 wire (PNP)			**S9P**		●	●	—	—		
							S9PV		●	●	—	—		
For 20/30	Reed switch	Grommet	Yes	2 wire	12V	100V	**R73**	Cab tire	●	●	—	—	—	Relay PLC
		Connector				—	**R73C**		●	●	●	●		
		Grommet	No		5V, 12V	≤100V AC	**R80**		●	●	—	●	IC	
		Connector				≤24V AC	**R80C**		●	●	●	—		
	Solid state switch	Grommet	Yes		24V —		**T79**		●	●	—	●	—	
		Connector					**T79C**		●	●	●	—		
		Grommet		3 wire (NPN)	5V, 12V	—	**S79**		●	●	—	—	IC	
				3 wire (PNP)			**S7P**		●	●	—	—		

∗Lead wire length symbol 0.5m····· — Ex.) R73C
3m····· L Ex.) R73CL
5m····· Z Ex.) R73CZ
— ····· N Ex.) R73CN

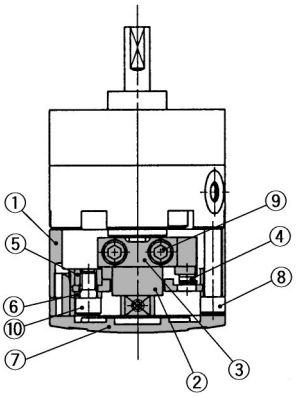
●Operating time — 1.2ms
●Shock resistance— 300m/s^2 (Reed switch), 1000m/s^2 (Solid state switch)

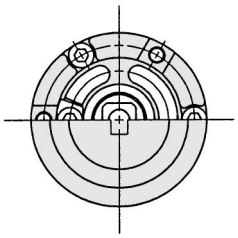
●Operating temperature range — –10°C to 60°C

Construction (Units are common for both the single vane and double vane.)

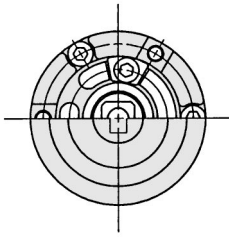
With angle adjusting unit

CRB1BWU10/15/20/30-□S/D





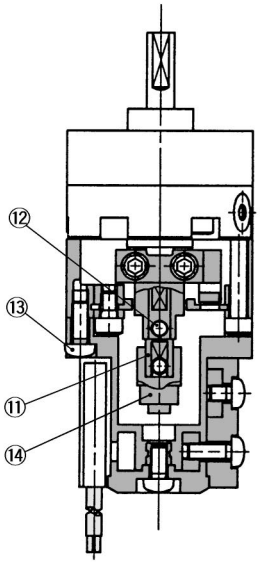
Single vane

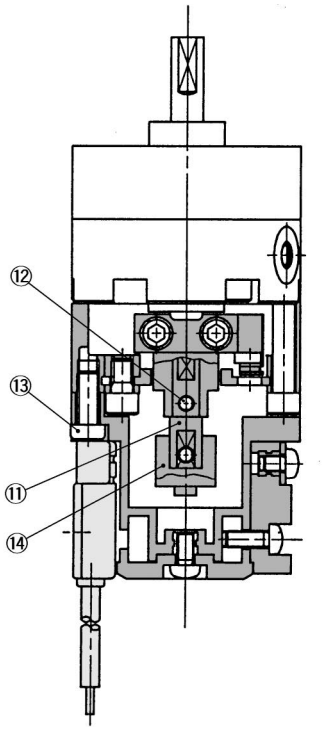


Double vane

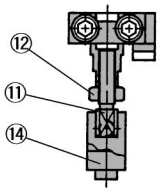
With angle adjusting unit and auto switch

CDRB1BWU10/15/-□S/D **CDRB1BWU20/30/-□S/D**





CDRB1BWU10



Component Parts

No.	Description	Material	Notes
①	Stopper ring	Aluminum die casting	
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 bolt	Stainless steel	Special bolt
⑨	Hexagon socket head cap bolt	Stainless steel	Special bolt
⑩	Hexagon socket head cap bolt	Stainless steel	Special bolt
⑪	Joint	Aluminum alloy	(1)
⑫	Hexagon socket head cap screw	Stainless steel	Only for CDRBUW10, the part indicated with no. 12 is a hexagon nut.
	Hexagon nut	Stainless steel	
⑬	Cross-recessed head cap screw	Stainless steel	(1)
⑭	Magnet lever	——	(1)

Note 1) Consists of the combination of an auto switch unit and an angle adjustment unit; for detailed specifications, refer to p.1.0-23 and 1.0-24.

⚠ Precautions

Be sure to read before handling.
Refer to p.0-20 and 0-21 for Safety Instructions and common precautions for the products mentioned in this catalog, and refer to p.1.0-2 to 1.0-4 for precautions on every series.

Unit with Angle Adjuster

⚠ Caution

①The maximum angle of the adjustable range of rotation angle will be restricted depending on the rotation angle of the rotary actuator body.

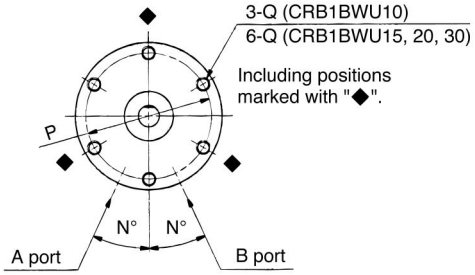
Rotation angle of rotary actuator body	Range of rotation angle
$270^{\circ}{}^{+4}_{0}$	0° to 230° (Size: 10)*1
	0° to 240° (size: 15, 20, 30)
$180^{\circ}{}^{+4}_{0}$	0° to 175°
$90^{\circ}{}^{+4}_{0}$	0° to 85°

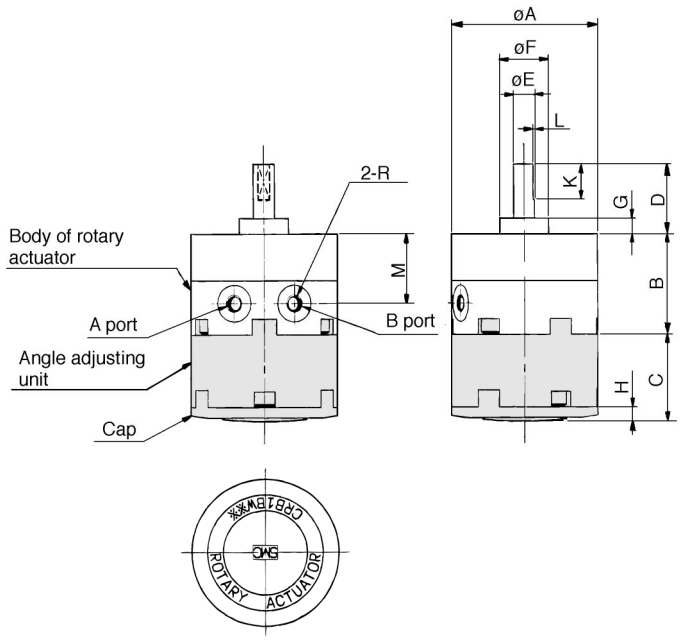
*1 The maximum adjustable angle of the angle adjustment unit for size 10 is 230°.
②All the positions of the connecting ports are on the body side.
③The allowable kinetic energy is the same as that of the specification of the rotary actuator unit.
④To make a 90° adjustment on the double vane type, use a rotary actuator for 100°.

Size 10, 15, 20, 30/With angle adjuster

Single vane

CRB1BWU10/15/20/30-□S

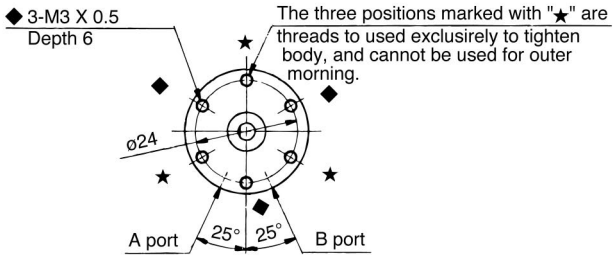


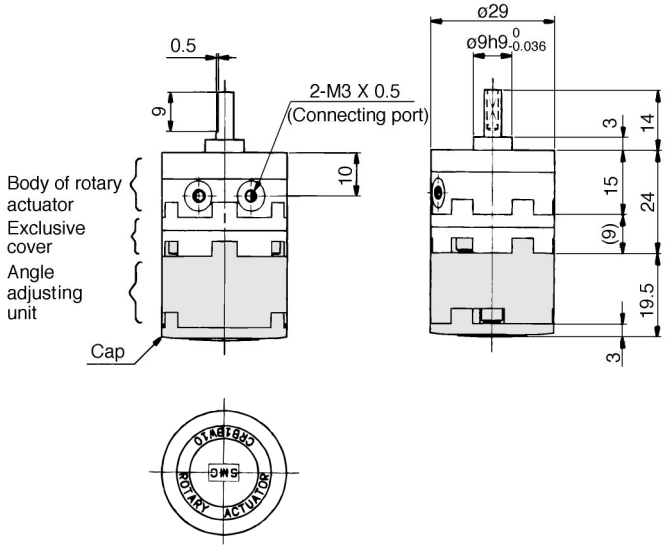


Dimensions below show pressurization to A port of the switches for 90°.
Refer to p.1.1-7.

Double vane

CRB1BWU10-□D





Dimensions below show the rotation middle position during pressurization to A port or B port.

Double vane

CRB1BWU15/20/30-□D

Size of double vane style: The outer dimensions of 15, 20, 30 and the sizes shown in the dimension table are same as those of single vane size 15, 20, 30 styles.

Model	A	B	C	D	E (g6)	F (h9)	G	H	K	L	M	N	P	Q
CRB1BWU10-□S	29	15	19.5	14	4	9	3	3	9	0.5	10	25	24	M3 X 0.5 Depth6
CRB1BWU15-□S	34	20	21.2	18	5	12	4	3.2	10	0.5	15	25	29	M3 X 0.5 Depth5
CRB1BWU15-□D														
CRB1BWU20-□S	42	29	25	20	6	14	4.5	4	10	0.5	20	25	36	M4 X 0.7 Depth7
CRB1BWU20-□D														
CRB1BWU30-□S	50	40	29	22	8	16	5	4.5	12	1	30	25	43	M5 X 0.8 Depth10
CRB1BWU30-□D														

Model	R			
	90°	100°	180°	270°
CRB1BWU10-□S	M5 X 0.8	——	M5 X 0.8	M3 X 0.5
CRB1BWU10-□D	Refer to the drawings above.*		—	
CRB1BWU15-□S	M5 X 0.8	——	M5 X 0.8	M3 X 0.5
CRB1BWU15-□D	M3 X 0.5		——	
CRB1BWU20-□S	M5 X 0.8	——	M5 X 0.8	
CRB1BWU20-□D	M5 X 0.8		——	
CRB1BWU30-□S	M5 X 0.8	——	M5 X 0.8	
CRB1BWU30-□D	M5 X 0.8		——	

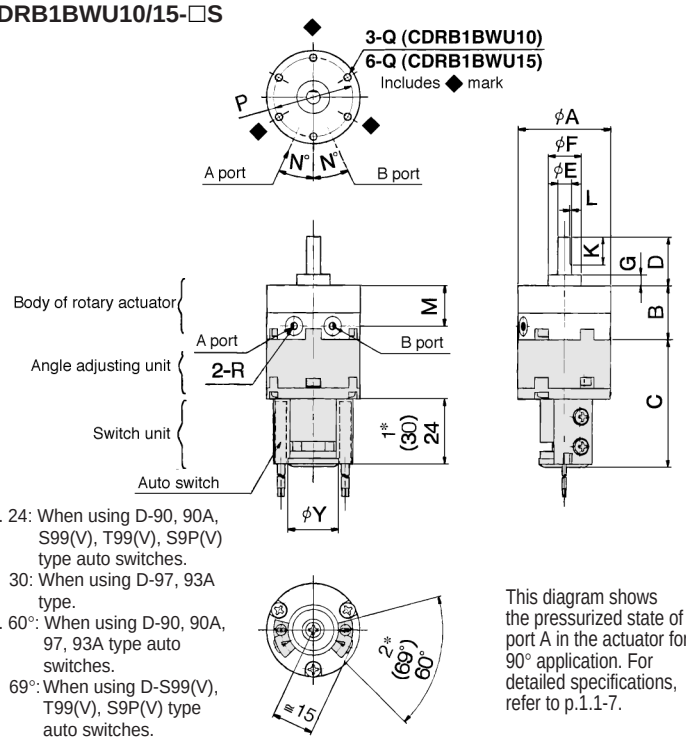
CAD CRB1BWU Size -S ·····SCRB Size , #5

Series CDRB1BWU

Size 10, 15, 20, 30/With angle adjuster and auto switch

Single vane

CDRB1BWU10/15-□S



∗1. 24: When using D-90, 90A, S99(V), T99(V), S9P(V) type auto switches.
30: When using D-97, 93A type.
∗2. 60°: When using D-90, 90A, 97, 93A type auto switches.
69°: When using D-S99(V), T99(V), S9P(V) type auto switches.

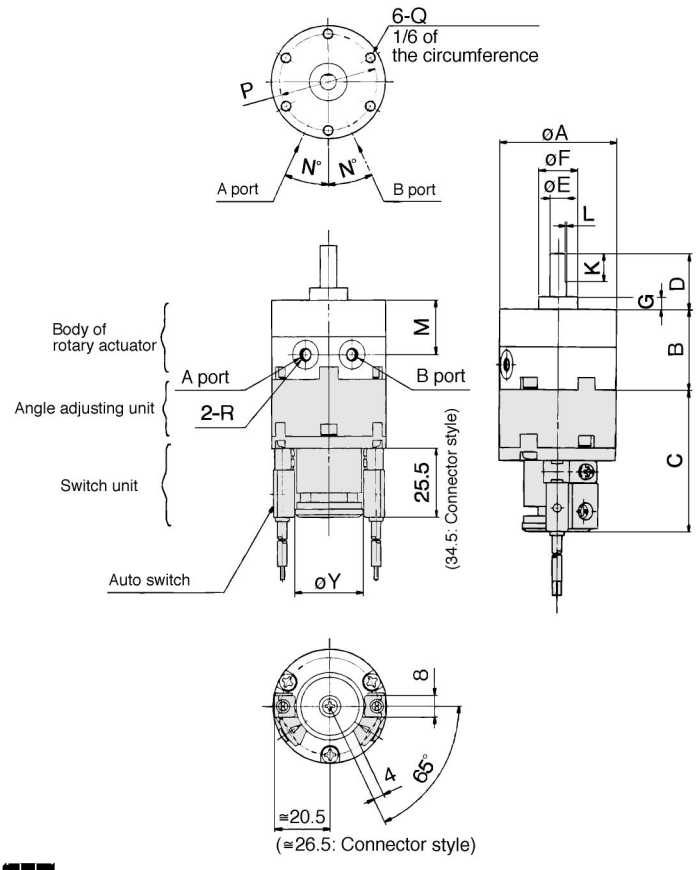
This diagram shows the pressurized state of port A in the actuator for 90° application. For detailed specifications, refer to p.1.1-7.

Note) The connecting port position for those equipped with an auto switch is on the body side.
∗The outside drawing indicates on each of the right-hand and left-hand switches.

CAD **CDRB1BWU** Size **-S·····SCRB** Size **#9**

Single vane

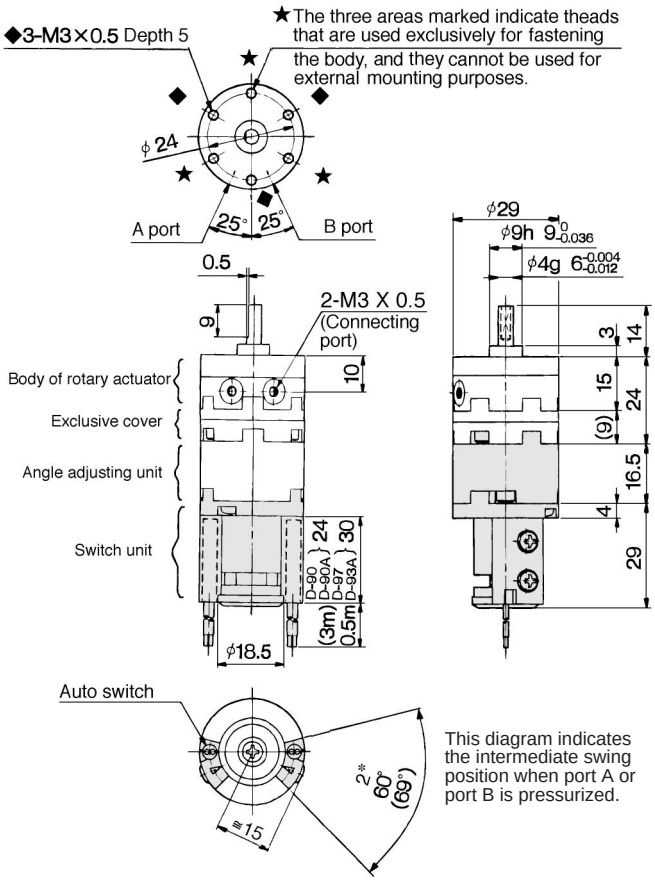
CDRB1BWU20/30-□S



CAD **CDRB1BWU** Size **-S·····SCRB** Size **#9**

Double vane

CDRB1BWU10-□D



This diagram indicates the intermediate swing position when port A or port B is pressurized.

Double vane

CDRB1BWU15/20/30-□D

The outside diameter dimension diagram and dimension table for sizes 15, 20, and 30 of the double vane style provide the same dimensions as those of sizes 15, 20, and 30 of the single vane style.

Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M
CDRB1BWU10-□S	29	15	45.5	14	4	9	3	9	0.5	10
CDRB1BWU15-□S	34	20	47	18	5	12	4	10	0.5	15
CDRB1BWU15-□D										
CDRB1BWU20-□S	42	29	51	20	6	14	4.5	10	0.5	20
CDRB1BWU20-□D										
CDRB1BWU30-□S	50	40	55.5	22	8	16	5	12	1	30
CDRB1BWU30-□D										

Model	N	P	Y	Q	R			
					90°	100°	180°	270°
CDRB1BWU10-□S	25	24	18.5	M3 X 0.5 Depth 6	M5 X 0.8	—	M5 X 0.8	M3 X 0.5
CDRB1BWU10-□D					Refer to the drawings.∗		—	
CDRB1BWU15-□S	25	29	18.5	M3 X 0.5 Depth 5	M5 X 0.8	—	M5 X 0.8	M3 X 0.5
CDRB1BWU15-□D					M3 X 0.5		—	
CDRB1BWU20-□S	25	36	25	M4 X 0.7 Depth 7	M5 X 0.8	—	M5 X 0.8	
CDRB1BWU20-□D					M5 X 0.8		—	
CDRB1BWU30-□S	25	43	25	M5 X 0.8 Depth10	M5 X 0.8	—	M5 X 0.8	
CDRB1BWU30-□D					M5 X 0.8		—	

Note) The connecting port position for those equipped with an angle adjustment unit or auto switch is on the body side.
Note) The outside drawing indicates one each of the right-hand and left-hand switches.

Series CRB1/ Size: 10, 15, 20, 30
Made to Order Specifications
Change of Shaft End Shape/-XA1 to XA47

Consult SMC for further information on specifications, dimensions and delivery.

Symbols

1 Change of shaft end shape -XA1 to XA47

A wide selection of models is now available, as non-standard shaft configurations for the CRB1 series (sizes: 10, 15, 20, and 30) are provided in 46 types of patterns.

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired values in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional charts for patterns A17 to A19 for reference.
- If equipped with an auto switch, the manufacturable patterns are those for shafts J and W.
- Consult SMC for made to order specifications other than those mentioned in "How to Order".
- Individual drawings for specific made to order models may not be available. Consult SMC separately if drawings are needed.

How to Order

Without auto switches 2 patterns (A1, C6)

CRB1 B W P 30 - [ ] S E - X A1 C6

Series (Vane type)

Mounting

B	Direct mounting
F	Flange

Shaft style

W	Double shaft (Standard)
J	Double shaft (Long shaft without one and one with flat chamfer)
Y	Double shaft with one flat chamfer
K	Double round shaft
S	Single shaft w/ one flat chamfer
T	Single round shaft

Provided in patterns

Size

10
15
20
30

Rotation angle

90°
180°
270°

Vane style

S	Single vane
D	Double vane

Connecting port positions

—	On the body side
E	In the shaft direction

Symbol for made to order specification

Pattern symbols

A 1 to A23
A31 to A47
C 1 to C 7
C30

With auto switches Only for pattern A1

C D RB1BW P 30 - [ ] S R73L - X A1

With auto switch unit

Provided in patterns

Auto switch

Refer to p.1.1-11 for further information.

Applicable patterns

Size	10, 15, 20, 30
Patterns	XA 1 to XA23, XA31 to XA34, XA37 to XA47, XC 1 to XC 7, XC30

Applicable shaft/Pattern combination table (Size: 10, 15, 20, 30)

Shaft Type/W: Double shafts (Standard)

Symbol	Description	Shaft direction Upper	Shaft direction Lower	Applicable size
-XA 1	Female thread at the shaft end	●	—	15, 20, 30
-XA 2	Female thread at the shaft end	—	●	
-XA 3	Male thread at the shaft end	●	—	10, 15, 20, 30
-XA 4	Male thread at the shaft end	—	●	
-XA 5	Round shaft with steps	●	—	
-XA 6	Round shaft with steps	—	●	
-XA 7	Round shaft with steps and male thread	●	—	
-XA 8	Round shaft with steps and male thread	—	●	
-XA 9	Change in length of std chamfered part	●	—	
-XA10	Change in length of std chamfered part	—	●	
-XA11	2 flats chamfering	●	—	
-XA12	2 flats chamfering	—	●	
-XA13	Shaft through-hole	●	●	15, 20, 30
-XA14	Shaft through-hole, female thread	●	—	
-XA15	Shaft through-hole, female thread	—	●	
-XA16	Shaft through-hole, female thread	●	●	
-XA17	Shortened shaft	●	—	10, 15, 20, 30
-XA18	Shortened shaft	—	●	
-XA19	Shortened shaft	●	●	
-XA20	Reverse mounting of the rotation axis	●	●	
-XA21	Round shaft with steps, 2 flats chamfered	●	—	
-XA22	Round shaft with steps, 2 flats chamfered	—	●	
-XA23	Right-angled chamfered	●	—	

Shaft Type/J, K, S, T, Y (Made to order)

Symbol	Specification	Shaft direction Upper	Shaft direction Lower	Shaft type J	K	S	T	Y	Applicable size
-XA31	Female thread at the shaft end	●	–	–	–	●	–	●	15, 20, 30
-XA32	Female thread at the shaft end	–	●	–	–	●	–	●	
-XA33	Female thread at the shaft end	●	–	●	●	–	●	–	
-XA34	Female thread at the shaft end	–	●	●	●	–	●	–	
-XA37	Round shaft with steps	●	–	●	●	–	●	–	10, 15, 20, 30
-XA38	Round shaft with steps	–	●	–	●	–	–	–	
-XA39	Shaft through-hole	●	●	–	–	●	–	●	15, 20, 30
-XA40	Shaft through-hole	●	●	–	●	–	●	–	
-XA41	Shaft through-hole	●	●	●	–	–	–	–	
-XA42	Shaft through-hole, female thread	●	●	–	–	●	–	●	
-XA43	Shaft through-hole, female thread	●	●	–	●	–	●	–	
-XA44	Shaft through-hole, female thread	●	●	●	–	–	—	–	
-XA45	Intermediate chamfer	●	–	●	●	–	●	–	10, 15, 20, 30
-XA46	Intermediate chamfer	–	●	–	●	–	–	–	
-XA47	Key groove	●	–	●	●	–	●	–	20, 30
-XC 1	Connecting port added to the side end of body (A)	–	–	●	●	●	●	●	10, 15, 20, 30
-XC 2	Use 2 screw parts on body (B) as through holes	–	–	●	●	●	●	●	
-XC 3	Position change of the tightening bolts on the body	–	–	●	●	●	●	●	
-XC 4	Position change of the rotation range (90° to the right from the starting point)	–	–	●	●	●	●	●	
-XC 5	Change of rotation (45° to the left of start)	–	–	●	●	●	●	●	
-XC 6	Change of rotation (90° to the left of start)	–	–	●	●	●	●	●	
-XC 7	Reverse mounting of the rotation shaft	–	–	●	–	–	–	–	
-XC30	Fluorine grease	–	–	●	●	●	●	●	

Note) Standard (Double rod: W) is also available for -XC1 to -XC30.

Series ***CRB1*** **Size: 10, 15, 20, 30**
Made to Order Specifications
Change of Shaft End Shape/-XA1 to XA8

Consult SMC for further information on specifications, dimensions and delivery.

Symbols

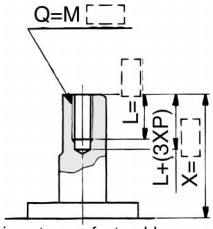
1 Change of shaft end shape — -XA2 to XA8

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
- M3 X 0.5; M4 X 0.7; M5 X 0.8
  Enter the desired figures in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A1

The shaft can be further shortened by machining female threads into the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



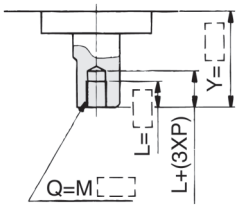
- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.
  Ex.) M3: L = 6mm

(mm)

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

Symbol: A2

The shaft can be further shortened by machining female threads into the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)



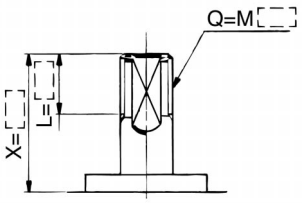
- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.
  Ex.) M3: L = 6mm

(mm)

Size	Y	Q
15	1.5 to 9	M3
20	1.5 to 10	M3, M4
30	2 to 13	M3, M4, M5

Symbol: A3

The shaft can be further shortened by machining male threads on the long end of the shaft.
(If the shaft is not to be shortened, leave the X dimension blank.)

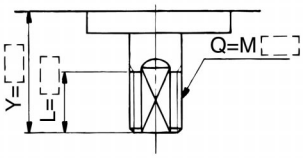


(mm)

Size	X	Lmax	Q
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: A4

The shaft can be further shortened by machining male threads on the short end of the shaft.
(If the shaft is not to be shortened, leave the Y dimension blank.)

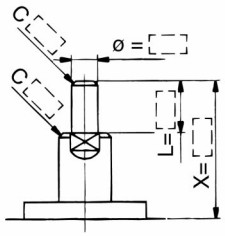


(mm)

Size	Y	Lmax	Q
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

Symbol: A5

The shaft can be further shortened by machining a round shoulder on the long end of the shaft.
(If the shaft is not to be shortened, leave the X dimension blank.)

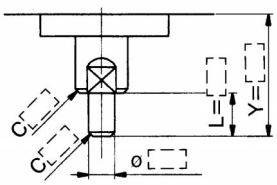


(mm)

Size	X	Lmax
10	4 to 14	X—3
15	5 to 18	X—4
20	6 to 20	X—4.5
30	6 to 22	X—5

Symbol: A6

The shaft can be further shortened by machining a round shoulder on the short end of the shaft.
(If the shaft is not to be shortened, leave the Y dimension blank.)

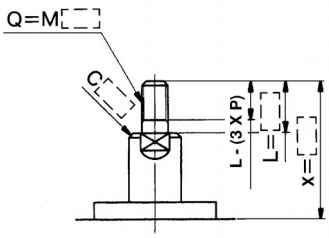


(mm)

Size	Y	Lmax
10	2 to 8	Y—1
15	3 to 9	Y—1.5
20	3 to 10	Y—1.5
30	3 to 13	Y—2

Symbol: A7

The shaft can be further shortened by machining a round shoulder and machining male threads on the long end of the shaft.
(If the shaft is not to be shortened, leave the X dimension blank.)

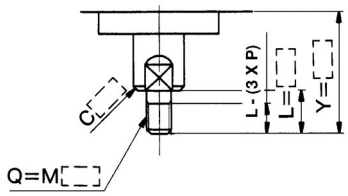


(mm)

Size	X	Lmax	Q
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

Symbol: A8

The shaft can be further shortened by machining a round shoulder and machining male threads on the short end of the shaft.
(If the shaft is not to be shortened, leave the Y dimension blank.)



(mm)

Size	Y	Lmax	Q
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

Series CRB1/ Size: 10, 15, 20, 30

Made to Order Specifications

Change of Shaft End Shape/-XA9 to XA17

Consult SMC for further information on specifications, dimensions and delivery.

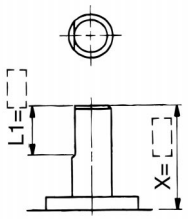
Symbols

1 Change of shaft and shape

-XA9 to XA17

Symbol: A9

The shaft can be further shortened by changing the length of the standard flat of the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

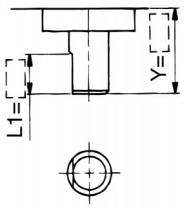


(mm)

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: A10

The shaft can be further shortened by changing the length of the standard flat of the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

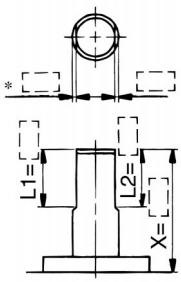


(mm)

Size	Y	L1
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)

Symbol: A11

The shaft can be further shortened by milling double flats on the long end of the shaft. (If no changes are to be made to the standard flat, and the shaft is not to be shortened, leave the L1 and X dimensions blank.)



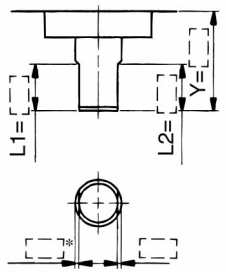
*: 0.5mm or more
L1: Standard chamfering part

(mm)

Size	X	L1	L2max
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: A12

The shaft can be further shortened by milling double flats on the short end of the shaft.
(If no changes are to be made to the standard flat, and the shaft is not to be shortened, leave the L1 and Y dimensions blank.)



*: 0.5mm or more
L1: Standard chamfering part

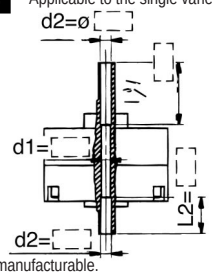
(mm)

Size	Y	L1	L2max
10	3 to 8	5–(8–Y) to (Y–1)	Y–1
15	3 to 9	6–(9–Y) to (Y–1.5)	Y–1.5
20	3 to 10	7–(10) to (Y–1.5)	Y–1.5
30	5 to 13	8–(13–Y) to (Y–2)	Y–2

Symbol: A13

Applicable to the single vane style only.

Shaft through hole



- Size 10mm is not manufacturable.
- For size 15mm, d1 = ø2.5, L1 = max. 18.
- For size 15mm only, inscribe the L1, L2, and d1 dimensions when = d2 is ø2.6 or more.
- Sizes 20mm and 30mm are d1 = d2.
- The minimum range of the machinable dimension for the d2 area is 0.1mm.

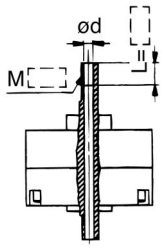
(mm)

Size	d1	d2
15	ø2.5	ø2.5 to ø3
20	———	ø2.5 to ø4
30	———	ø2.5 to ø4.5

Symbol: A14

Applicable to the single vane style only.

Machine a special end (at the long end of the shaft), and machine female threads in the through hole at the long end of the shaft, thus creating a through hole to serve as the pilot.



- Size 10 is not manufacturable.
- The L dimension (maximum), is, as a rule, twice the size of the bolt.
  Example: For M3 bolt: L max. = 6mm

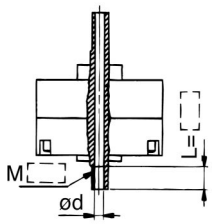
(mm)

Size	**15**	**20**	**30**
M3 X 0.5	ø2.5	ø2.5	ø2.5
M4 X 0.7	———	ø3.3	ø3.3
M5 X 0.8	———	———	ø4.2

Symbol: A15

Applicable to the single vane style only.

Machine a special end (at the short end of the shaft), and machine female threads in the through hole at the short end of the shaft, thus creating a through hole to serve as the pilot.



- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  Example: For M4 bolt: L max = 8mm

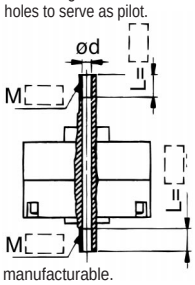
(mm)

Size	**15**	**20**	**30**
M3 X 0.5	ø2.5	ø2.5	ø2.5
M4 X 0.7	———	ø3.3	ø3.3
M5 X 0.8	———	———	ø4.2

Symbol: A16

Applicable to the single vane style only.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as pilot.



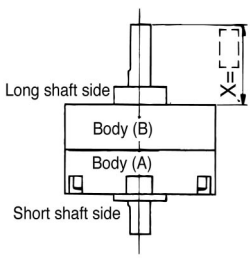
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  Example: For M5 bolt: L max. = 10 mm

(mm)

Size	**15**	**20**	**30**
M3 X 0.5	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 end of the shaft.



(mm)

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

Series CRB1/ Size: 10, 15, 20, 30
Made to Order Specifications
Change of Shaft End Shape/-XA18 to XA23

Consult SMC for further information on specifications, dimensions and delivery.

1 Change of shaft end shape

Symbols

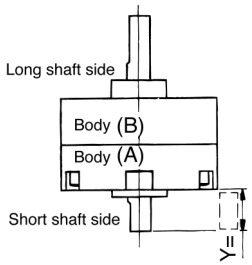
-XA18 to XA23

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the ☐☐☐ portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A18

Shorten the short end of the shaft.

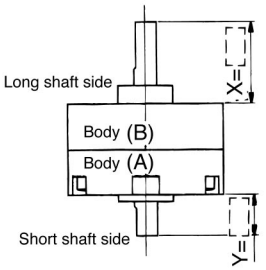


(mm)

Size	Y
10	1 to 8
15	1.5 to 9
20	1.5 to 10
30	2 to 13

Symbol: A19

Shorten both the long and the short end of the shaft.

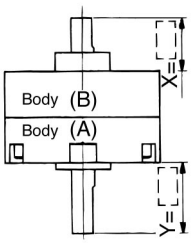


(mm)

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

Symbol: A20

Reverse the assembly of the shaft (thus shortening the long end and the short end of the shaft.)

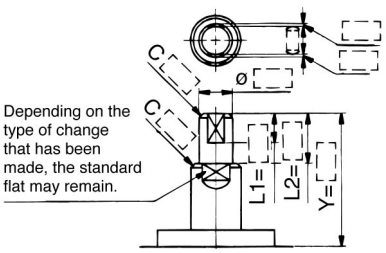


(mm)

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

Symbol: A21

The shaft can be further shortened by machining a round shoulder and double flats on the long end of the shaft. (If the shaft is not to be shortened, leave X dimension blank.)

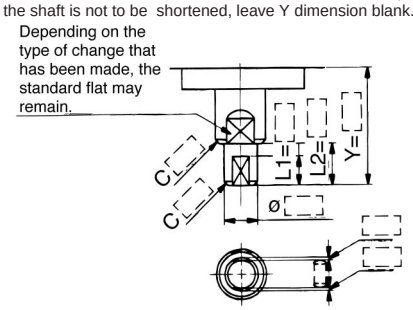


(mm)

Size	X	L1max	L2
10	6 to 14	X—4.5	L1+1.5
15	7 to 18	X—5.5	L1+1.5
20	8 to 20	X—6.5	L1+2
30	10 to 22	X—8	L1+3

Symbol: A22

The shaft can be further shortened by machining a round shoulder and double flats on the short end of the shaft. (If the shaft is not to be shortened, leave Y dimension blank.)



(mm)

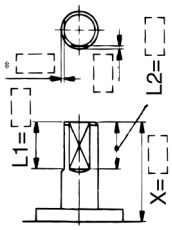
Size	Y	L1max	L2
10	4 to 8	Y-2.5	L1+1.5
15	4.5 to 9	Y-3	L1+1.5
20	5 to 10	Y-3.5	L1+2
30	7 to 13	Y-5	L1+3

Symbol: A23

The shaft can be further shortened by milling perpendicular double flats on the long end of the shaft. (If no changes are to be made to the standard flat and the shaft is not to be shortened, leave the L1 and X dimensions blank.)

The "*" mark indicates 0.5 minimum.

L1 is the standard flat.



(mm)

Size	X	L1	L2max
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

Made to Order Specifications
Change of Shaft End Shape/-XA31 to XA40

Consult SMC for further information on specifications, dimensions and delivery.

2 Change of shaft end shape/Applicable shaft style: Shaft J, K, S, T, Y

Symbols
-XA31 to XA40

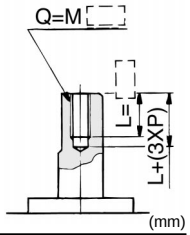
Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A31

Machine female threads into the long end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M3 bolt: L max. = 6mm)
- Applicable shaft styles — shafts S, Y



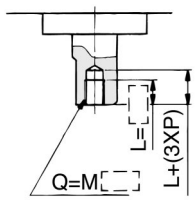
(mm)

Size \ Shaft	Q	
	S	Y
10	Not manufacturable	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A32

Machine female threads into the short end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt. (If M5 only 1.5 times)
  (Example: For M4 bolt: L max. = 8mm)
- Applicable shaft styles — shafts S, Y



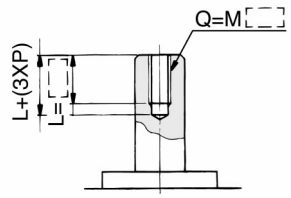
(mm)

Size \ Shaft	Q	
	S	Y
10	Not manufacturable	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A33

Machine female threads into the long end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M3 bolt: L max. = 6mm)
- Applicable shaft styles — shafts J, K, T



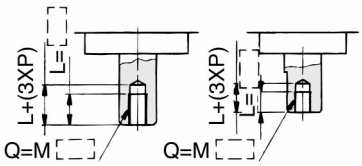
(mm)

Size \ Shaft	Q		
	J	K	T
10	Not manufacturable		
15	M3		
20	M3, M4		
30	M3, M4, M5		

Symbol: A34

Machine female threads into the short end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M3 bolt: L max. = 6mm)
  However, in the case of the M5 bolt for shaft T, it is 1.5 times the size of the bolt.
- Applicable shaft styles — shafts J, K, T



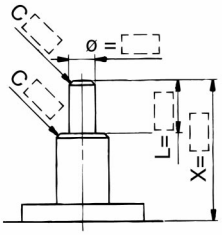
(mm)

Size \ Shaft	Q		
	J	K	T
10	Not manufacturable		
15	M3		
20	M3, M4		
30	M3, M4, M5		

Symbol: A37

The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

- Applicable shaft styles — shafts J, K, T



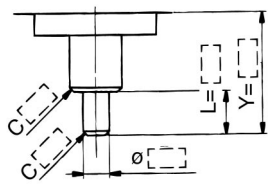
(mm)

Size \ Shaft	J	K	T	J	K	T
	X			Lmax		
10	4 to 14			X–3		
15	5 to 18			X–4		
20	6 to 20			X–4.5		
30	6 to 22			X–5		

Symbol: A38

The shaft can be further shortened by machining a round shoulder on the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

- Applicable shaft styles — shaft K



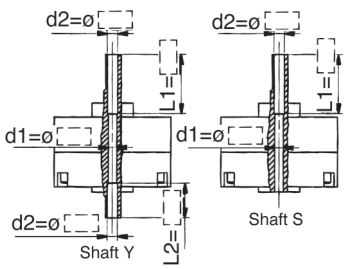
(mm)

Size	Y	Lmax
10	2 to 14	Y–1
15	3 to 18	Y–1.5
20	3 to 20	Y–1.5
30	3 to 22	Y–2

Symbol: A39

Applicable to the single vane type only.

Shaft through hole (shafts S, Y additionally machined)



- Size 10 is not manufacturable. For size 15 is d1 = ø2.5, L1 = max. X 18 The minimum range of the machinable dimension for the d2 area is 0.1mm.
- For sizes 20 and 30 are d1 = d2.
- With size 15, enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- Applicable shaft styles —shafts S, Y

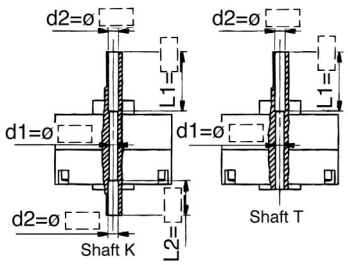
(mm)

Size \ Shaft	S	Y	S	Y
	d1		d2	
15	2.5		2.5 to 3	
20	—		2.5 to 4	
30	—		2.5 to 4.5	

Symbol: A40

Applicable to the single vane only.

Shaft through hole (shafts K, T additionally machined)



- Size 10 is not manufacturable. For size 15 is d1 = ø2.5, L1 = max. X 18 The minimum range of the machinable dimension for the d2 area is 0.1mm.
- For sizes 20 and 30 are d1 = d2.
- With size 15, enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- Applicable shaft styles —shafts S, Y

(mm)

Size \ Shaft	K	T	K	T
	d1		d2	
15	2.5		2.5 to 3	
20	—		2.5 to 4	
30	—		2.5 to 4.5	

Series CRB1/ Size: 10, 15, 20, 30
Made to Order Specifications
Change of Shaft End Shape/-XA41 to XA47

Consult SMC for further information on specifications, dimensions and delivery.

Symbols

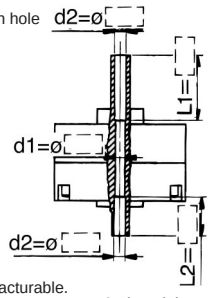
2 Change of shaft end shape/Applicable shaft style: Shaft style J, K, S, T, Y-XA41 to XA47

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensions, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the ⬚ portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A41
Applicable only to single vane.

Shaft through hole d2=ø⬚



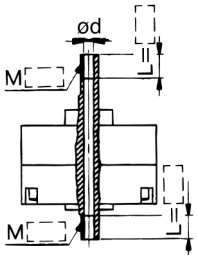
- Size 10 is not manufacturable.
- For size 15 is d1 = 2.5, L1 = max. 18 The minimum range of the machinable dimension for the d2 area is 0.1mm. Enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- For sizes 20 and 30 are d1 = d2.
- Applicable shaft styles — shaft J

(mm)

Size	d1	d2
15	2.5	2.5 to 3
20	———	2.5 to 4
30	———	2.5 to 4.5

Symbol: A42
Applicable only to single vane.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



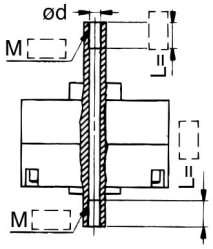
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.) However, for the short end of shaft S: For M5 bolt: L max. = 7.5mm.
- Applicable shaft styles — shafts S, Y

(mm)

Thread \ Size / Shaft	15 S	15 Y	20 S	20 Y	30 S	30 Y
M3 X 0.5	2.5		2.5		2.5	
M4 X 0.7	———		3.3		3.3	
M5 X 0.8	———		———		4.2	

Symbol: A43
Applicable only to single vane.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



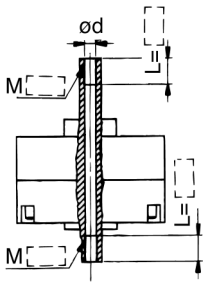
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.) However, for the short end of shaft T: For M5 bolt: L max. = 7.5mm.
- Applicable shaft styles — shafts K, T

(mm)

Thread \ Size / Shaft	15 K	15 T	20 K	20 T	30 K	30 T
M3 X 0.5	2.5		2.5		2.5	
M4 X 0.7	———		3.3		3.3	
M5 X 0.8	———		———		4.2	

Symbol: A44
Applicable only to single vane.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



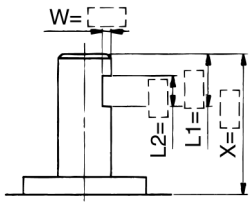
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.)
- Applicable shaft styles— shaft J

(mm)

Thread \ Size	15	20	30
M3 X 0.5	2.5	2.5	2.5
M4 X 0.7	———	3.3	3.3
M5 X 0.8	———	———	4.2

Symbol: A45

The shaft can be further shortened by machining an intermediate flat on the long end of the shaft (the position is that of the standard flat).



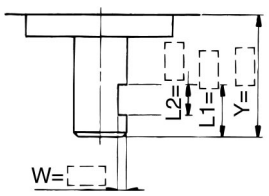
- Applicable shaft styles — shafts J, K, T

(mm)

Size \ Shaft	X J	X K	X T	W J	W K	W T	L1max J	L1max K	L1max T	L2max J	L2max K	L2max 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		

Symbol: A46

The shaft can be further shortened by machining an intermediate flat on the short end of the shaft (the position is that of the standard flat).



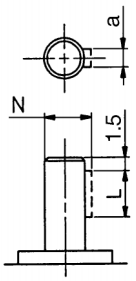
- Applicable shaft styles — shaft K

(mm)

Size	Y	W	L1max	L2max
10	4.5 to 14	0.5 to 2	Y — 1	L1 — 1
15	5.5 to 18	0.5 to 2.5	Y — 1.5	L1 — 1
20	6 to 20	0.5 to 3	Y — 1.5	L1 — 1
30	8.5 to 22	0.5 to 4	Y — 2	L1 — 2

Symbol: A47

Machining a key groove in the long end of the shaft (the position is that of the standard flat). A key must be ordered separately.



- Applicable shaft styles — shafts J, K, T

(mm)

Size	a	L	N
20	$2h9^{0}_{-0.025}$	10	6.8
30	$3h9^{0}_{-0.025}$	14	9.2

⚠Caution

Symbols: A45, A46 and dimensions W and L1-L2

The intermediate flat may interfere with the center hole if dimensions W and (L1-L2) are at the measurements given below.

Size	W	L1 — L2
ø10	1 to 2	1 to 3
ø15	1.5 to 2.5	1 to 3
ø20	2 to 3	1 to 3
ø30	3 to 4	2 to 3

Series CRB1/ Size: 10, 15, 20, 30

Made to Order Specifications

-XC1 to -XC4

Consult SMC for further information on specifications, dimensions and delivery.

3 Additional connecting port to the end of the body (A) side

Symbol -XC1

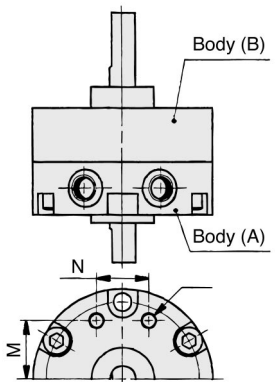
CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC1

Symbols

Connecting port is added to the body (A) side.

∗Not available for models with auto switch.

As the additional process part is not treated, the surface material is white aluminum.



(mm)

Size	Q	M	N
10	M3	8.5	9.5
15	M3	11	10
20	M5	14	13
30	M5	15.5	14

4 Three holes in the body (B) to penetrate screws.

Symbol -XC2

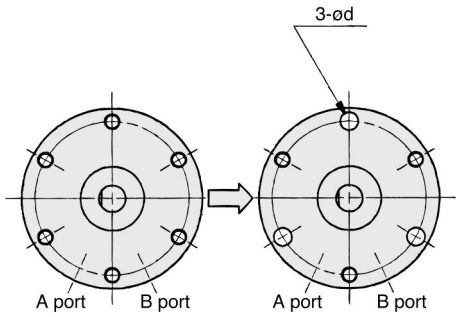
CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC2

Symbols

Three holes in screw parts of the body (B) to penetrate screws.

∗Not available for models with auto switch.

As the additional process part is not treated, the surface material to white aluminum.



(Standard) **(-XC2)**

Diagram viewed from the long shaft side.

(mm)

Size	d
15	3.4
20	4.5
30	5.5

(Except for size 10)

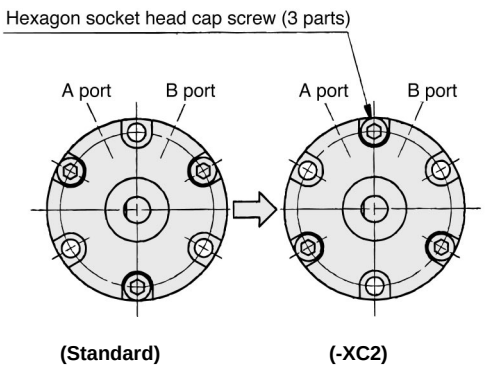
5 Location change of body tightening bolt

Symbol -XC3

CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC3

Symbols

Location change of body tightening bolt



(Standard) **(-XC2)**

Diagram viewed from the short shaft side

6 Location change of rotation range (Rotation range 90°)

Symbol -XC4

CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC4

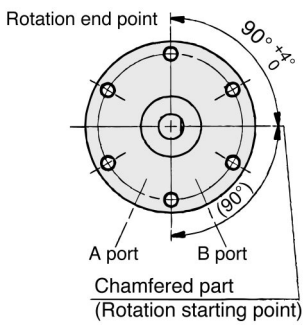
Symbols

Location change of the rotation range (90° to the right from the starting point)

Applicable only to single vane.

Rotation starting point is located on the horizontal line (90° to the right).

Angle error of "CRB1BW10" is 0° to +5°.



Rotation starting point is one chamfered position during pressurization from A port.

Diagram viewed from the long shaft side

Change in Angle of Rotation/-XC5 to -XC6
Reverse Mounting of Rotation Shaft/-XC7, Fluoride grease/-XC30

Consult SMC for further information on specifications, dimensions and delivery.

7 Change in angle of rotation — Symbols: -XC5 and XC6

CRB1BWP | Refer to "How to Order" on p.1.1-20. | – XC5 / – XC6

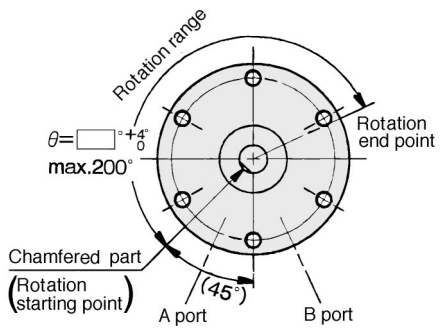
Symbol

-XC5	45°
-XC6	90°

∗Write required angle in □ below.

Symbol: XC5 Applicable only to single vane style.

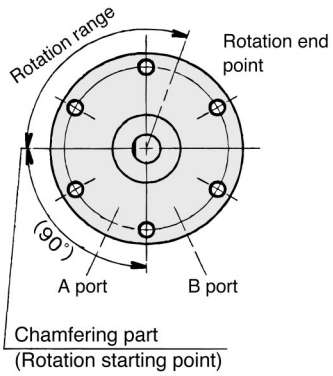
Rotation starting point is located at the angle of 45°.
Angle error of "CRB1BW10" is from 0° to +5°.
Port sizes of "CRB1BW10" and "CRB1BW15" are M3.



Symbol: XC6 Applicable only to single vane style.

Rotation starting point is located on horizontal line (left at the angle of 90°).
Angle error of "CRB1BW10" is from 0° to +5°.

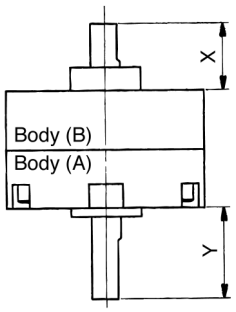
θ=□°+4 0
max.110°



8 Reverse mounting of rotation shaft — Symbol: -XC7

CRB1BWP | Refer to "How to Order" on p.1.1-20. | – XC7

Dimensions



mm

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

9 Fluorine grease — Symbol: -XC30

CRB1BWP | Refer to "How to Order" on p.1.1-20. | – XC30

Fluorine grease

Fluorine grease is used for lubricant for seal part of packing and inner wall of the actuator.

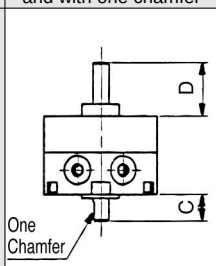
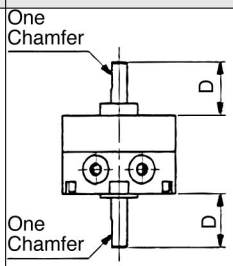
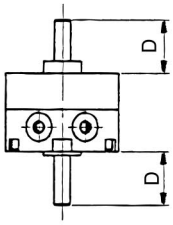
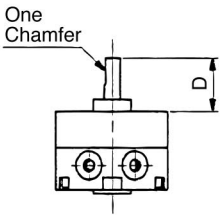
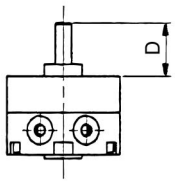
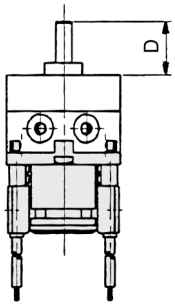
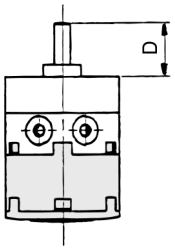
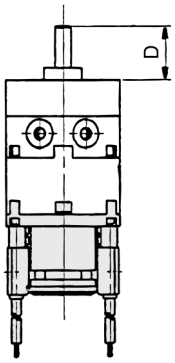
Series CRB1/Size: 10, 15, 20, 30
Made to Order Specifications
Shaft Variations/Shaft Styles: J, Y, K, S, T

Consult SMC for further information on specifications, dimensions and delivery.

Symbol

10 Shaft Variations — Shaft style: J, Y, K, S, T

Shaft styles of series CRB1 except for standard shaft style (W).

Symbols for shaft styles	J	Y	K	S	T
Shaft classification	Double shaft			Single shaft	
Shaft style variation	Long shaft without one and with one chamfer	One chamfer	Round shaft	One chamfer	Round shaft
Standard					
With auto switch					
With angle adjusting unit					
With auto switch and angle adjusting unit					

Refer to "How to Order" on p.1.1-3 for further information.

Basic CRB1B **Shaft style** **Size** **Angle of rotation** **S** **Port location**

Vane style

S	Single
D	Double

Shaft style

J	Double shaft (Long shaft without one and with one chamfer)
Y	Double shaft with one chamfer
K	Both round shaft
S	Single shaft with one chamfer
T	One round shaft

∗Only J type is applicable for auto switch attached type and angle adjusting unit attached type.

Refer to "How to Order" on p.1.1-16 for further information.

With unit CDRB1BJU **Size** **Angle of rotation** **S** ☐ ☐

With auto switch unit

With angle adjusting unit

J only

No. of auto switches mounted

Auto switch

Vane style

S	Single
D	Double

(mm)

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

Note 1) For unit attached style, port locations are only on the body side.
Note 2) Shaft size and one chamfer dimensions are same as that of the standard product. Refer to p.1.1-9 and 1.1-10.

Rotary Actuator
Vane Style
Series CRB1
Size: 50, 63, 80, 100

Series Variations

	Fluid			**Air**															
	Size			**50**				**63**				**80**				**100**			
	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°		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		180°		●	●			●	●			●	●			●	●		
		270°		●	●			●	●			●	●			●	●		
		Option	100°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			190°	●	●			●	●			●	●			●	●		
			280°	●	●			●	●			●	●			●	●		
	Shaft type	Double shaft	W	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Cushion	Rubber bumper		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Variations	Basic type		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		With auto switch		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		With One-touch fittings		●	●	●	●												
		Clean series	10-	●	●	●	●	●	●	●	●								
		Copper-free	20-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Option	Mounting style	With foot bracket	L	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Made to Order	Material	Stainless steel specifications for main parts		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Shaft type	Double shaft type	Double shaft (Long shaft with four chamfers) J	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Double shaft with four chamfers Z	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Double shaft key Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Double round shaft K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Single shaft type	Single shaft key S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Single round shaft T	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Single shaft with four chamfers X	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Pattern	Shaft pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Rotation pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	With solenoid valve			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Rotary Actuator
Vane Style
Series CRB1
Size: 50, 63, 80, 100

How to Order

Without auto switch CRB1 B W 80 – 90 S

With auto switch CDRB1 B W 80 – 90 S – R73

With auto switch

Mounting style

B	Basic style
L	Foot style

Refer to Table (1) below if only foot assembly is required separately.

Table (1): Foot Assembly Part No.

Model	Unit part no.
CRB1LW50	P411020-5
CRB1LW63	P411030-5
CRB1LW80	P411040-5
CRB1LW100	P411050-5

Shaft type

W	Double shaft (Long shaft key & Four chamfers)

Size

50
63
80
100

Rotating angle

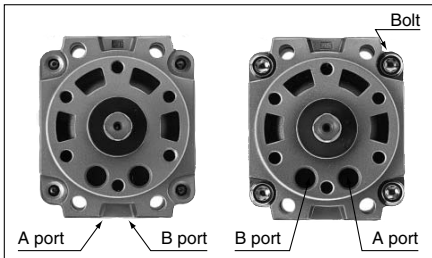
Classification	Symbol	Single vane	Double vane
Standard	**90**	90°	90°
	180	180°	—
	270	270°	—
Option	**100**	100°	100°
	190	190°	—
	280	280°	—

Vane type

S	Single vane
D	Double vane

Connection port location

Nil	Side ported
E	Axial ported



Auto switch

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

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

Number of auto switches

S	1 pc. ∗
Nil	2 pcs.

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

Applicable Auto Switch/Refer to page 11-11-1 for detailed auto switch switches.

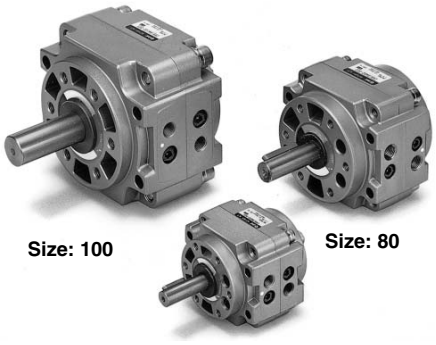
Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
Reed switch	Grommet	No	2-wire	24 V	48 V, 100 V	24 V, 48 V, 100 V	**R80**	●	●	—	—	IC circuit	Relay, PLC
	Connector						**R80C**	●	●	●	●		
	Grommet	Yes			—	100 V	**R73**	●	●	—	—	—	
	Connector						**R73C**	●	●	●	●		
Solid state switch	Grommet	Yes	2-wire	24 V	12 V	—	**T79**	●	●	—	—	—	Relay, PLC
	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

■ **Excellent reliability and durability**
The use of bearings to support thrust and radial loads improves reli-ability and durability.

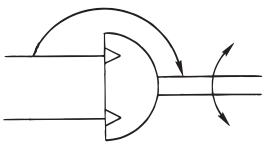
■ **The body of the rotary actuator can be mounted directly.**

■ **Two different port locations**



Size: 100 **Size: 80** **Size: 50**

JIS Symbol



Specifications

Size		CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100	CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100
Vane type		Single vane (S)				Double vane (D)			
Rotating angle	Standard	$90^{\circ}{}^{+4}_{0}$, $180^{\circ}{}^{+4}_{0}$, $270^{\circ}{}^{+4}_{0}$				$90^{\circ}{}^{+4}_{0}$			
	Option	$100^{\circ}{}^{+4}_{0}$, $190^{\circ}{}^{+4}_{0}$, $280^{\circ}{}^{+4}_{0}$				$100^{\circ}{}^{+4}_{0}$			
Fluid		Air (Non-lube)							
Proof pressure		1.5 MPa							
Ambient and fluid temperature		5 to 60°C							
Max. operating pressure		1.0 MPa							
Min. operating pressure		0.15 MPa							
Speed regulation range (s/90°)		0.1 to 1							
Allowable kinetic energy		0.082 J	0.12 J	0.398 J	0.6 J	0.112 J	0.16 J	0.54 J	0.811 J
Shaft load	Allowable radial load	245 N	390 N	490 N	588 N	245 N	390 N	490 N	588 N
	Allowable thrust load	196 N	340 N	490 N	539 N	196 N	340 N	490 N	539 N
Bearing		Bearing							
Port location		Side ported or Axial ported							
Size	Side ported	Rc $^{1}/_{8}$		Rc $^{1}/_{4}$		Rc $^{1}/_{8}$		Rc $^{1}/_{4}$	
	Axial ported	Rc $^{1}/_{8}$		Rc $^{1}/_{4}$		Rc $^{1}/_{8}$		Rc $^{1}/_{4}$	
Mounting		Basic style, Foot style							

Volume

(cm^3)

Classification	Rotating angle	Single vane (S)				Double vane (D)			
		CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100	CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100
Standard	90°	30	70	88	186	48	98	136	272
	180°	49	94	138	281	—	—	—	—
	270°	66	118	188	376	—	—	—	—
Option	100°	32	73	93	197	52	104	146	294
	190°	51	97	143	292	—	—	—	—
	280°	68	121	193	387	—	—	—	—

Weight

(g)

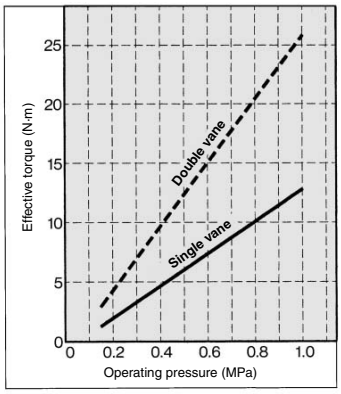
Model	Rotating angle	Single vane (S)				Double vane (D)			
		CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100	CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100
Main body	90°	810	1365	2070	3990	830	1410	2120	4150
	180°	790	1330	2010	3880	—	—	—	—
	270°	770	1290	1950	3760	—	—	—	—
	100°	808	1360	2065	3980	822	1400	2100	4100
	190°	788	1325	2005	3870	—	—	—	—
	280°	766	1285	1940	3735	—	—	—	—
Auto switch unit + 2 switches		65	85	95	165	65	85	95	165
Foot bracket assembly		384	785	993	1722	384	785	993	1722

⚠ Caution

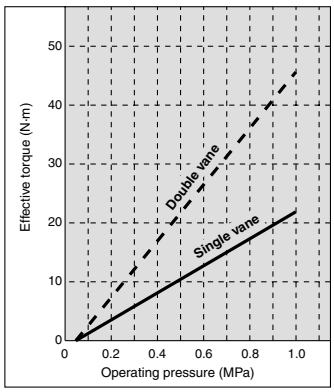
Be sure to read before handling. Refer to pages 11-13-3 to 11-13-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 11-1-4 to 11-1-6 for Precautions on every series.

Effective Output

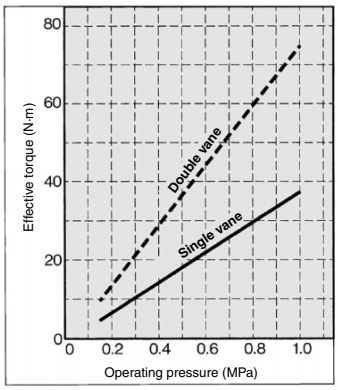
CRB1BW50



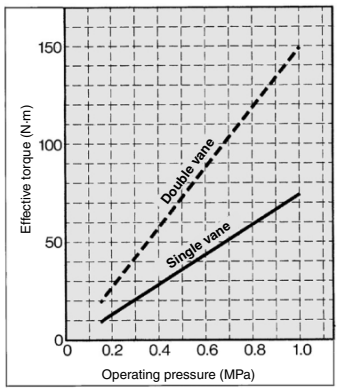
CRB1BW63



CRB1BW80



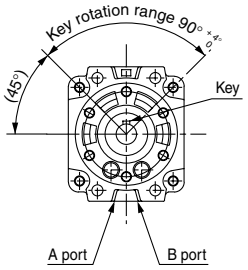
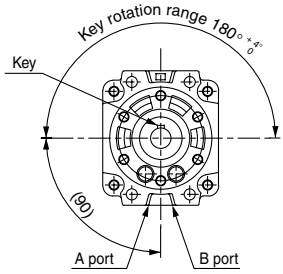
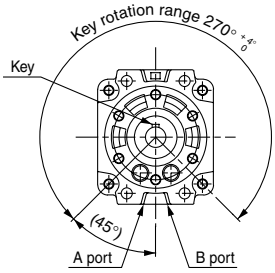
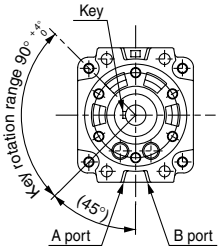
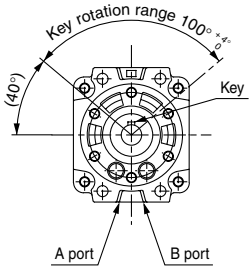
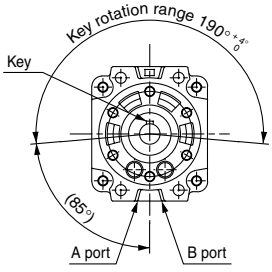
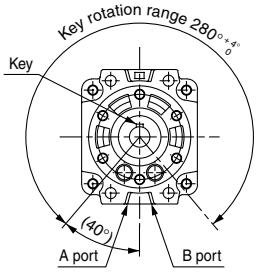
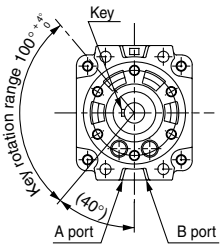
CRB1BW100



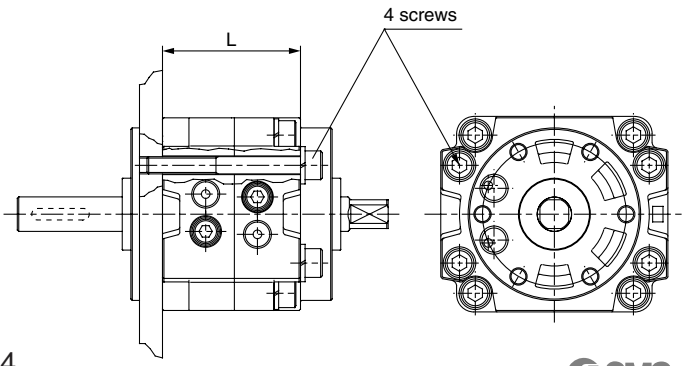
Key Position and Rotation Range

Key positions in the illustrations below show the intermediate rotation position when A or B port is pressurized.

Top View from Long Shaft Side

	Single vane type			Double vane type
	90°	**180°**	**270°**	**90°**
Standard				
	100°	**190°**	**280°**	**100°**
Option				

Direct Mounting of Body



Model	L	Screw
CRB1BW50	48	M6
CRB1BW63	52	M8
CRB1BW80	60	M8
CRB1BW100	80	M10

With One-touch Fittings

CRB1 [Mounting] **W50F** — [Rotating angle] [Vane type] [Port location]

With One-touch fittings

With One-touch fittings facilitate the piping work and greatly reduce the installation space.

Specifications

Vane type	Single vane	Double vane
Size	**50**	
Operating pressure range (MPa)	0.15 to 1.0	
Speed regulation range (s/90°)	0.1 to 1	
Port location	Side ported or Axial ported	
Piping	With One-touch fittings	
Mounting	Basic style, Foot style	
Variations	Basic style, With auto switch	

Applicable Tubing and Size

Applicable tubing O.D/I.D (mm)	ø6/ø4
Applicable tubing material	Nylon, Soft nylon, Polyurethane

Refer to page 11-4-8 for construction drawing.
Refer to page 11-4-12 for external dimensions.

Clean Series

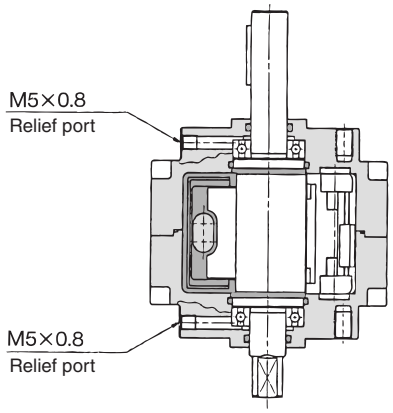
10 — CRB1BW [Size] — [Rotating angle] [Vane type] [Port location]

Clean Series, With relief port

The double-seal construction of the actuator shaft section of these series to channel exhaust through the relief ports directly to the outside of a clean room environment allows operation of these cylinders in a class 100 clean room.

Specifications

Vane type	Single vane	Double vane
Size	**50, 63**	
Operating pressure range (MPa)	0.15 to 1.0	
Speed regulation range (s/90°)	0.1 to 1	
Port location	Side ported or Axial ported	
Piping	Screw-in type	
Relief port size	M5 x 0.8	
Mounting	Basic style	
Variations	Basic style, With auto switch	



The internal construction of the illustration above shows a single vane style.

For further specifications, refer to “Pneumatic Clean Series” catalog.

Copper-free

20 — CRB1 [Mounting] **W** [Size] — [Rotating angle] [Vane type] [Port location]

Copper-free

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

Specifications

Vane type	Single vane	Double vane
Size	**50, 63, 80, 100**	
Operating pressure range (MPa)	0.15 to 1.0	
Speed regulation range (s/90°)	0.1 to 1	
Port location	Side ported or Axial ported	
Piping	Screw-in type	
Mounting	Basic style, Foot style	
Variations	Basic style, With auto switch	

Rotary Actuator with Solenoid Valve

How to Order

CD V RB1BW 80 – 90 S

With solenoid valve

With VZ3000 (CVRB1BW50/63)
With VZ5000 (CVRB1BW80/100)

Mounting style

B	Basic style
L	Foot style

Size

50
63
80
100

Auto switch

Nil	None
D	With auto switch

∗ Refer to page 11-4-2 for "How to Order", since it is possible to make a product with auto switch.

Rotating angle

90	90°
100	100°
180	180°
190	190°
270	270°
280	280°

Rotations for double vane style are 90° and 100° only.

Vane type

S	Single vane
D	Double vane

Specifications

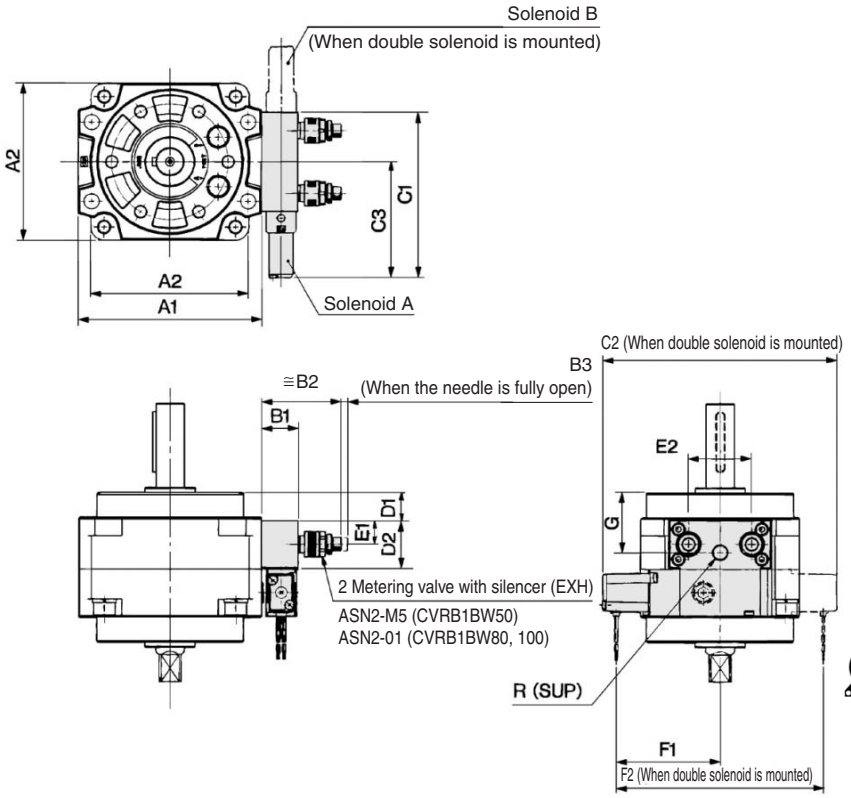
Fluid	Air
Operating pressure (MPa)	0.15 to 0.7
Rotating angle	Standard: 90°, 180°, 270°; Option: 100°, 190°, 280°
Rotation time adjustment range (s/90°)	0.3 to 1.0
Applicable solenoid valve	Size 50, 63: VZ3000, Size 80, 100: VZ5000
Operating voltage	100 VAC, 200 VAC, 24 VDC
Electrical entry	L plug connector, DIN terminal M plug connector

Allowable Kinetic Energy

Size	Vane style	Allowable kinetic energy
50	Single vane	0.082 J
	Double vane	0.112 J
63	Single vane	0.120 J
	Double vane	0.160 J
80	Single vane	0.398 J
	Double vane	0.54 J
100	Single vane	0.6 J
	Double vane	0.811 J

∗ Speed regulation range: 0.3 to 1 s/90°

Dimensions



Note 1) Solenoid valve in external appearance is in the case of VZ$^{3}_{5}$140-1G.
Note 2) Solenoid valve dimensions are for 2 position, and dimensions in ( ) are for 3 position.
Note 3) Make sure to indicate the type of solenoid valve when ordering.

(mm)

Model (size)	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F1	F2	G	R
CVRB1BW50	78	67	18	36	2.8	82.5	120 (136.5)	60 (61)	12	24	11.5	30	52 (53)	104 (120.5)	25	1/8
CVRB1BW63	98	82	18	36	2.8	82.5	102 (136.5)	60 (61)	16	24	11.5	30	52 (53)	104 (120.5)	27.5	1/8
CVRB1BW80	110	95	22	48	4	100	140 (155)	70 (71)	17	29	14	38	62 (63)	124 (139)	36	1/8
CVRB1BW100	140	125	22	48	4	100	140 (155)	70 (71)	23.5	29	14	38	62 (63)	124 (139)	42.5	1/8

Rotary Actuator: Replaceable Shaft

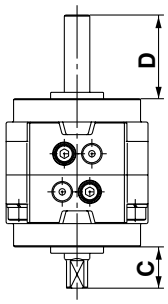
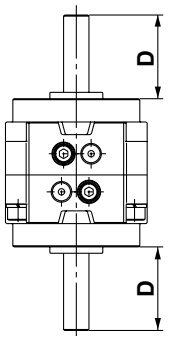
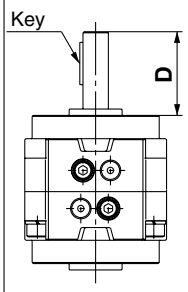
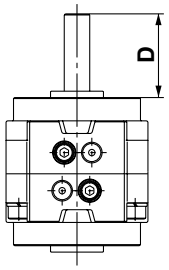
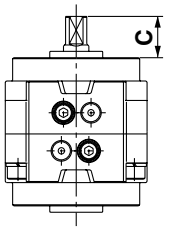
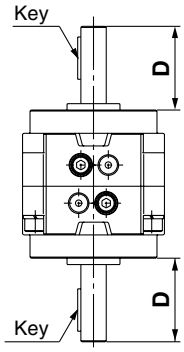
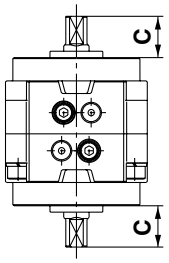
A shaft can be replaced with a different shaft type except for standard shaft type (W).

Without auto switch **CRB1B** **J** **Size** — **Rotating angle** **Vane type** **Port location**

Shaft type

J	Double shaft (Long shaft without keyway & Four chamfers)
K	Double round shaft
S	Single shaft key
T	Single round shaft
X	Single shaft with four chamfers
Y	Double shaft key
Z	Double shaft with four chamfers

CRB2
CRBU2
CRB1
MSU
CRJ
CRA1
CRQ2
MSQ
MRQ
D-
20-

J	K	S	T	X	Y	Z
						

(mm)

Nominal size	C	D
50	19.5	39.5
63	21	45
80	23.5	53.5
100	30	65

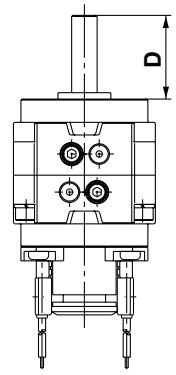
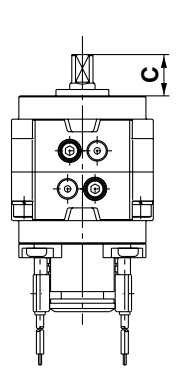
Note) Dimensions and tolerance of the shaft and keyway are the same as the standard.

With auto switch **CDRB1B** **J** **Size** — **Rotating angle** **Vane type** **Port location** — **Auto switch**

With auto switch

Shaft type

J	Double shaft (Long shaft without keyway & Four chamfers)
Z	Double shaft with four chamfers

J	Z
	

(mm)

Nominal size	C	D
50	19.5	39.5
63	21	45
80	23.5	53.5
100	30	65

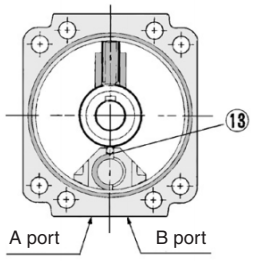
Note) Dimensions and tolerance of the shaft and keyway are the same as the standard.

Construction

Standard (Keys in the illustrations below show the intermediate rotation position.)

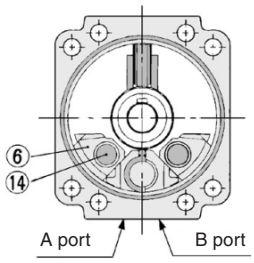
For 270° (Top view from long shaft side)

Single vane



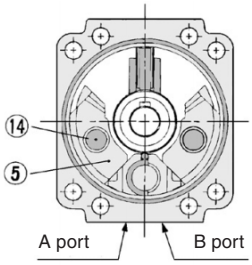
For 180° (Top view from long shaft side)

Single vane



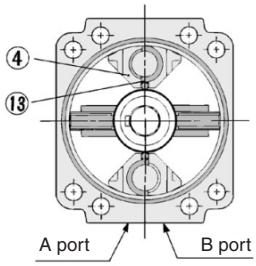
For 90° (Top view from long shaft side)

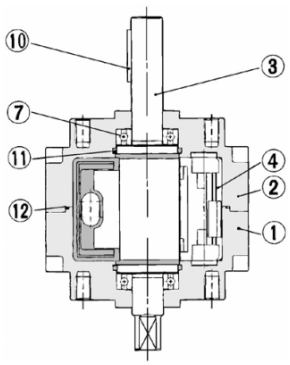
Single vane

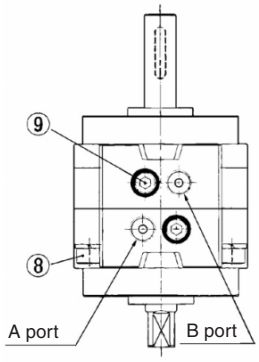


For 90° (Top view from long shaft side)

Double vane



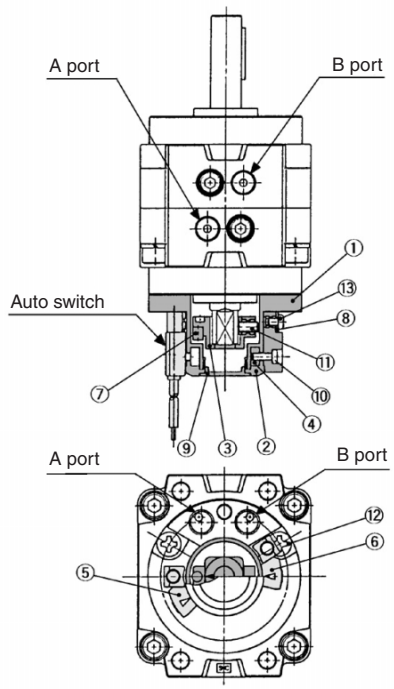




(Short shaft side)

With auto switch

(Keys in the illustrations below show the actuator for 180° when A port is pressurized.)



Component Parts

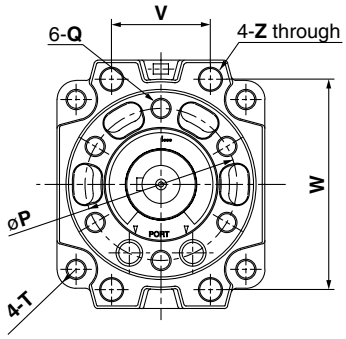
No.	Description	Material	Note
①	Body (A)	Aluminum die-casted	CRB1BW50/63/80, painted
		Cast aluminum	CRB1BW100, painted
②	Body (B)	Aluminum die-casted	CRB1BW50/63/80, painted
		Cast aluminum	CRB1BW100, painted
③	Vane shaft	Carbon steel	
④	Stopper	Aluminum die-casted	
⑤	Stopper	Resin	For 90°
⑥	Stopper	Resin	For 180°
⑦	Bearing	High carbon chrome bearing steel	
⑧	Hexagon socket (with washer)	Carbon steel	
⑨	Fuji lock bolt	Carbon steel	
⑩	Parallel keyway	Carbon steel	
⑪	O-ring	NBR	
⑫	O-ring	NBR	Special O-ring
⑬	Stopper seal	NBR	Special seal
⑭	Holding rubber	NBR	

Component Parts

No.	Description	Material	Note
①	Cover (A)	Resin	
②	Cover (B)	Resin	
③	Magnet lever	Resin	
④	Holding block	Aluminum alloy	
⑤	Switch block (A)	Resin	
⑥	Switch block (B)	Resin	
⑦	Magnet	Magnetic body	
⑧	Arm	Stainless steel	
⑨	Rubber cap	NBR	
⑩	Round head Phillips screw	Stainless steel	
⑪	Hexagon socket head set screw	Stainless steel	
⑫	Round head Phillips screw	Carbon steel	For CDRB1BW50/63/80
	Hexagon socket head cap screw	Carbon steel	For CDRB1BW100
⑬	Round head Phillips screw	Stainless steel	

Dimensions: 50, 63, 80, 100

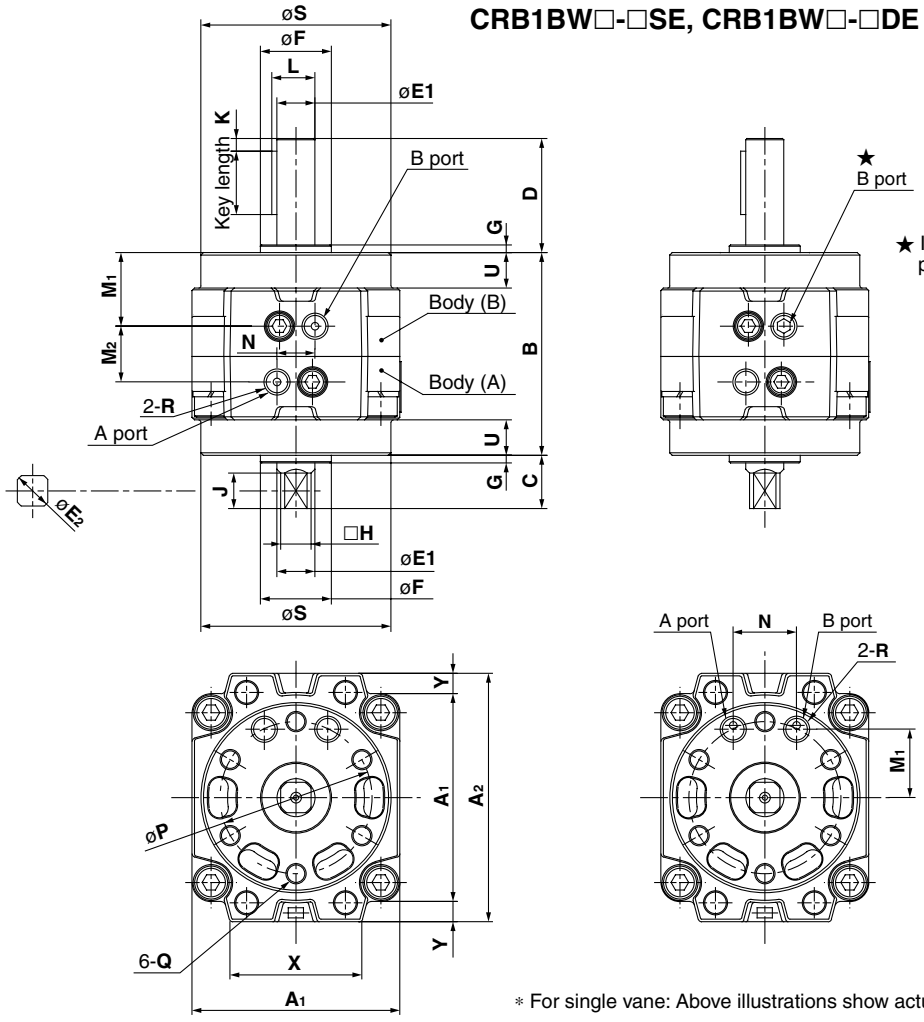
Single vane type/Double vane type
CDRB1BW□-□S/D
<Port location: Side ported>



(mm)

Keyway dimension	ℓ	h	b
Model	b (h9)	h (h9)	ℓ
CRB1BW50-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20
CRB1BW63-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	25
CRB1BW80-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	36
CRB1BW100-□□□	$7^{0}_{-0.036}$	$7^{0}_{-0.036}$	40

CRB1BW□-□SE, CRB1BW□-□DE <Port location: Axial ported>



★ If B port of Body (B) is machined, the port is plugged with Rc 1/8.

∗ For single vane: Above illustrations show actuators for 180° when B port is pressurized.

(mm)

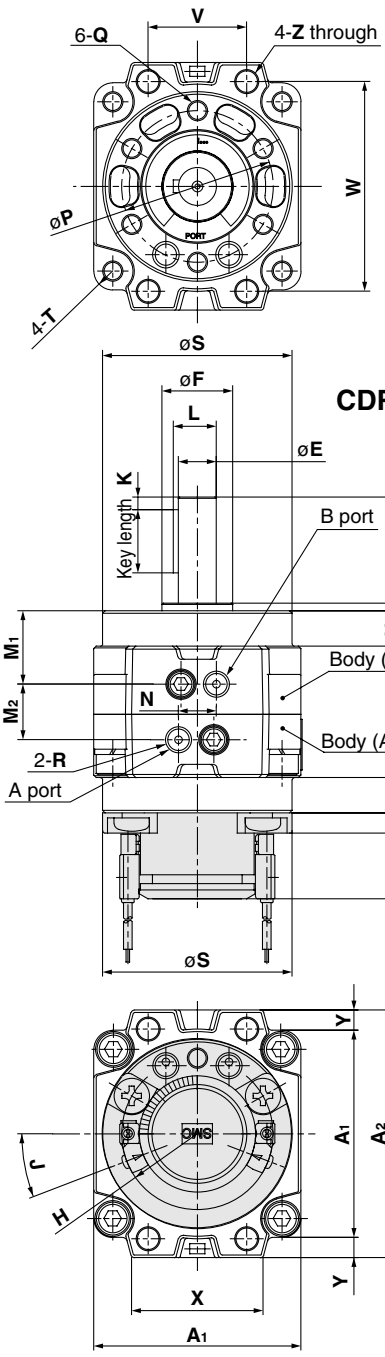
Model	A1	A2	B	C	D	E1 (g6)	E2 (h9)	F (h9)	G	H	J	K	L	M1	M2	N	P	Q	R (Rc)	S	T	U	V	W	X	Y	Z
CRB1BW50-□□	67	78	70	19.5	39.5	$12^{-0.006}_{-0.017}$	$11.9^{0}_{-0.043}$	$25^{0}_{-0.052}$	3	10	13	5	13.5	26	18	14	50	M6 x 1 depth 9	1/8	60	R6	11	34	66	46	5.5	6.5
CRB1BW50-□□E														21	—	18											
CRB1BW63-□□	82	98	80	21	45	$15^{-0.006}_{-0.017}$	$14.9^{0}_{-0.043}$	$28^{0}_{-0.052}$	3	12	14	5	17	29	22	15	60	M8 x 1.25 depth 10	1/8	75	R7.5	14	39	83	52	8	9
CRB1BW63-□□E														27	—	25											
CRB1BW80-□□	95	110	90	23.5	53.5	$17^{-0.006}_{-0.017}$	$16.9^{0}_{-0.043}$	$30^{0}_{-0.052}$	3	13	16	5	19	30	30	20	70	M8 x 1.25 depth 12	1/4	88	R8	15	48	94	63	7.5	9
CRB1BW80-□□E														29	—	30											
CRB1BW100-□□	125	140	103	30	65	$25^{-0.007}_{-0.020}$	$24.9^{0}_{-0.052}$	$45^{0}_{-0.062}$	4	19	22	5	28	35.5	32	24	80	M10 x 1.5 depth 13	1/4	108	R11	11.5	60	120	78	7.5	11
CRB1BW100-□□E														38	—	38											

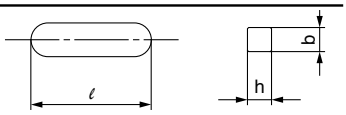
∗ For single vane: Above illustrations show actuators for 180° when B port is pressurized.

Dimensions: 50, 63, 80, 100 (With auto switch unit)

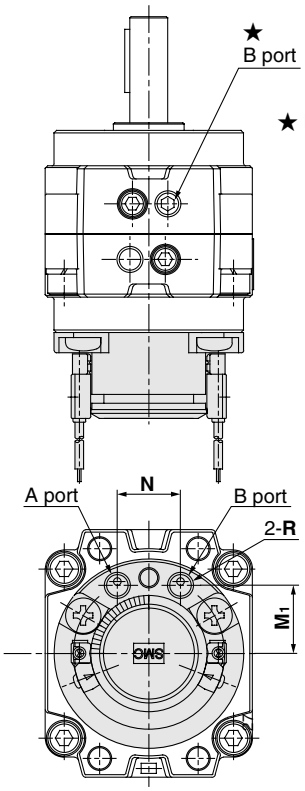
Single vane type/Double vane type
CDRB1BW□-□S/D
<Port location: Side ported>

(mm)



Keyway dimension			
Model	b (h9)	h (h9)	ℓ
CDRB1BW50-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20
CDRB1BW63-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	25
CDRB1BW80-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	36
CDRB1BW100-□□□	$7^{0}_{-0.036}$	$7^{0}_{-0.036}$	40

CDRB1BW□-□SE, CDRB1BW□-□DE <Port location: Axial ported>



★ If B port of Body (B) is machined, the port is plugged with Rc 1/8.

∗ For single vane: Above illustrations show actuators for 180° when B port is pressurized.

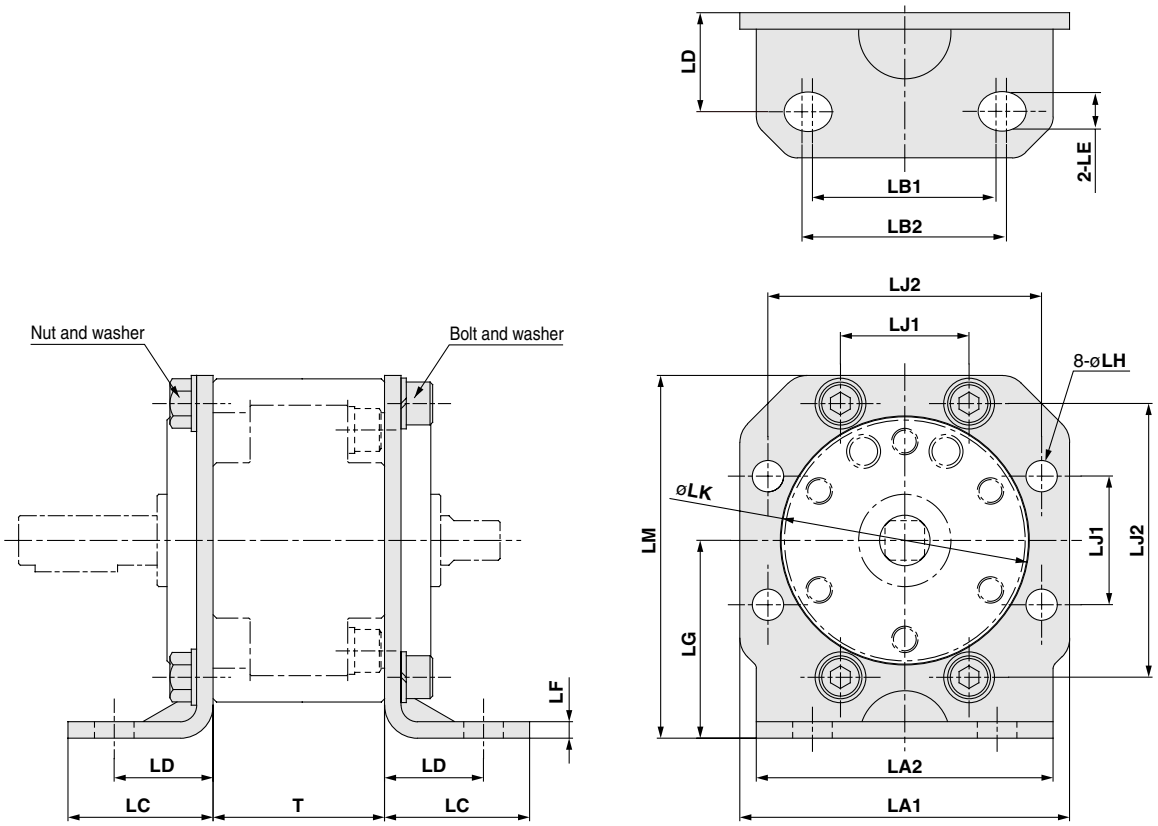
(mm)

Model	A1	A2	B	C	D	E (g6)	F (h9)	G1	G2	H (R)	J	K	L	M1	M2	N	P	Q	R (Rc)	S	T	U	V	W	X	Y	Z
CDRB1BW50-□□	67	78	70	32	39.5	$12^{-0.006}_{-0.017}$	$25^{0}_{-0.052}$	3	6.5	R22.5	32.5	5	13.5	26	18	14	50	M6 x 1 depth 9	1/8	60	R6	11	34	66	46	5.5	6.5
CDRB1BW50-□□E														21	—	18											
CDRB1BW63-□□	82	98	80	34	45	$15^{-0.006}_{-0.017}$	$28^{0}_{-0.052}$	3	8	R30	21	5	17	29	22	15	60	M8 x 1.25 depth 10	1/8	75	R7.5	14	39	83	52	8	9
CDRB1BW63-□□E														27		25											
CDRB1BW80-□□	95	110	90	34	53.5	$17^{-0.006}_{-0.017}$	$30^{0}_{-0.052}$	3	8	R30	21	5	19	30	30	20	70	M8 x 1.25 depth 12	1/4	88	R8	15	48	94	63	7.5	9
CDRB1BW80-□□E														29	—	30											
CDRB1BW100-□□	125	140	103	39	65	$25^{-0.007}_{-0.020}$	$45^{0}_{-0.062}$	4	13	R30	21	5	28	35.5	32	24	80	M10 x 1.5 depth 13	1/4	108	R11	11.5	60	120	78	7.5	11
CDRB1BW100-□□E														38	—	38											

∗ For single vane: Above illustrations show actuators for 180° when B port is pressurized.

Dimensions

Option: Foot bracket



(mm)

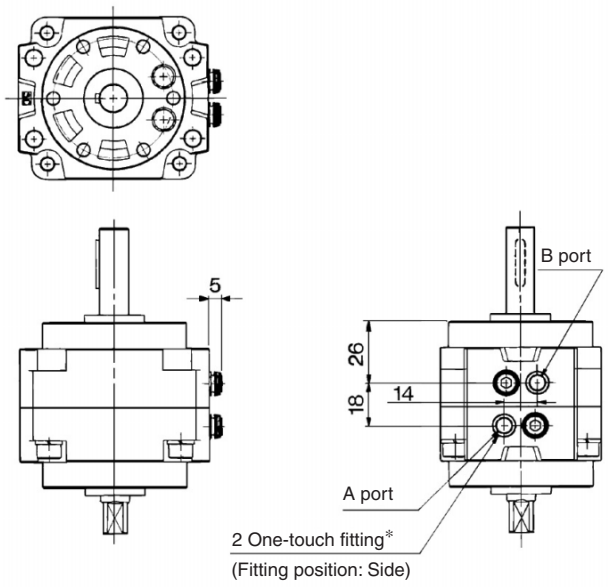
Applicable size	Foot bracket assembly no.	LA1	LA2	LB1	LB2	LC	LD	LE	LF	LG	LH	LJ1	LJ2	LK	LM	T
50	P411020-5	78	70	45	50	36	25.5	10	4.5	45	7.5	34	66	60.5	84	48
63	P411030-5	100	90	56		44	30	ø12	5	60	9.5	39	83	75.5	110	52
80	P411040-5	111	100	63		46	32	ø12	6	65	9.5	48	94	88.5	120.5	60
100	P411050-5	141	126	80		55	39.5	ø14	6	80	11.5	60	120	108.5	150.5	80

Note 1) The foot bracket (with bolt, nut, and washer) is not mounted on the actuator at the time of shipment.
Note 2) The foot bracket can be mounted on the rotary actuator bracket 90° intervals.
Note 3) Refer to the foot bracket assembly part no. in the table at right when foot bracket assembly is required separately.

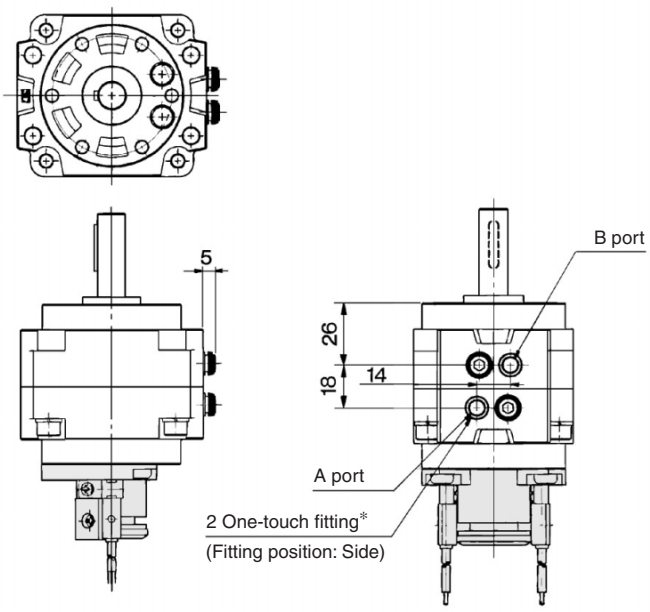
Model		Foot bracket assembly no.
Standard	With auto switch	
CRB1LW50	**CDRB1LW50**	P411020-5
CRB1LW63	**CDRB1LW63**	P411030-5
CRB1LW80	**CDRB1LW80**	P411040-5
CRB1LW100	**CDRB1LW100**	P411050-5

With One-touch Fittings: 50

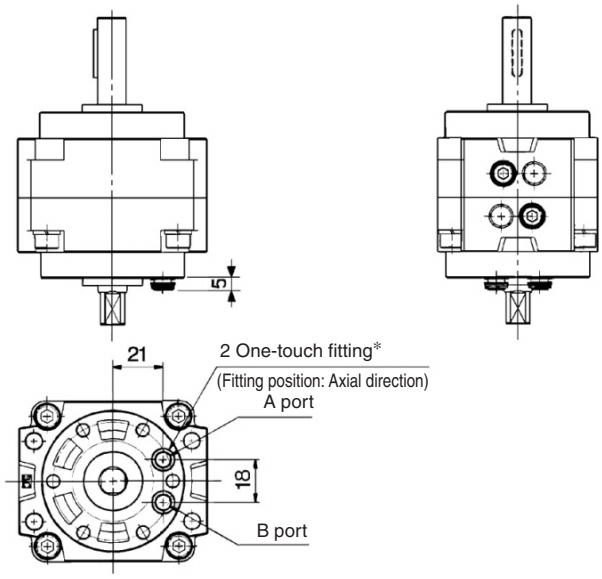
Standard
CRB1□W50F-□□
<Port location: Side ported>



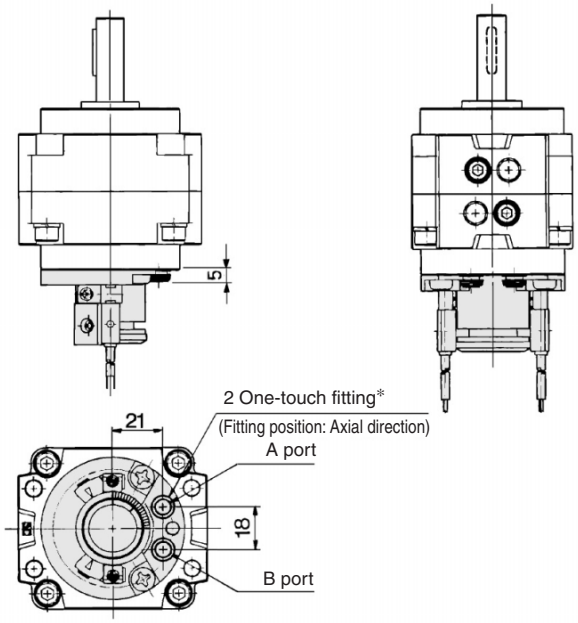
With auto switch
CDRB1□W50F-□□-□
<Port location: Side ported>



CRB1□W50F-□□E
<Port location: Axial ported>



CDRB1□W50F-□□E-□
<Port location: Axial ported>



Applicable Tubing and O.D/I.D

Applicable tubing O.D/I.D (mm)	ø6/ø4
Applicable tubing material	Nylon, Soft nylon, Polyurethane

∗ Dimensions not indicated in the above illustrations are the same as size 50 actuator. Refer to pages 11-4-9 to 11-4-10.

∗ Keys in the illustrations above show the intermediate rotation position for single vane type.

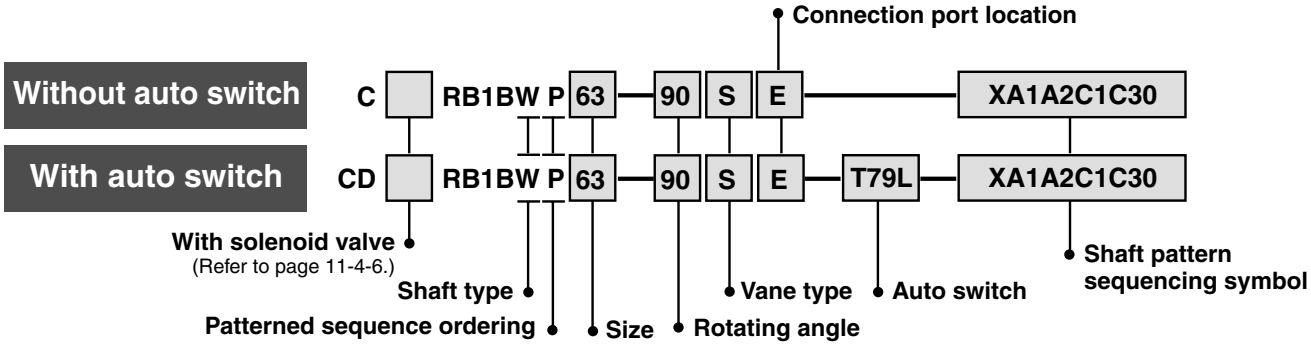
Series ***CRB1*** (Size: 50, 63, 80, 100)

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
XA1	Shaft-end female thread	50, 63, 80, 100
XA14 *	Shaft through-hole + Shaft-end female thread	
XA24	Double key	

● Axial: Bottom (Short shaft side)

Symbol	Description	Applicable size
XA2 *	Shaft-end female thread	50, 63, 80, 100
XA15 *	Shaft through-hole + Shaft-end female thread	

● Double Shaft

Symbol	Description	Applicable size
XA13 *	Shaft through-hole	50, 63, 80, 100
XA16 *	Shaft through-hole + Double shaft-end female threads	

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

Combination

XA□ Combination

Symbol	Combination	
XA1	XA1	XA24
XA2	●	●
XA13	●	●
XA14	—	●
XA15	—	●
XA16	—	●
XA24	—	—

A combination of up to two XA□s are available.
Example: -XA1A2

XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.
Refer to pages 11-4-18 to 11-4-19 for details of made-to-order specifications.

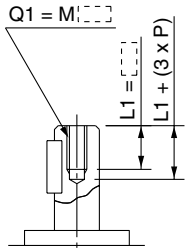
Symbol	Description	Applicable size	XA1, XA2 XA13 to 16, 24
XC1	Add connection port	50, 63 80,100	●
XC4	Change of rotation range and direction		●
XC5	Change of rotation range and direction		●
XC6	Change of rotation range and direction		●
XC7	Reversed shaft		—
XC26	Change of rotation range and direction		●
XC27	Change of rotation range and direction		●
XC30	Fluorine grease		●

A total of four XA□and XC□ combinations is available.
Example: -XA1A2C1C30

Axial: Top (Long shaft side)

Symbol: A1
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 type: W



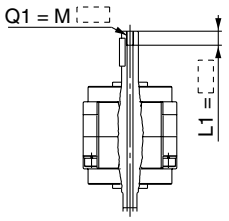
(mm)

Size	Q1
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

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-holes, whose diameter is equivalent to the diameter of the pilot holes.

- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 = 10 mm
- Applicable shaft type: W



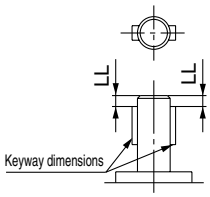
(mm)

Thread \ Size	50	63	80	100
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Symbol: A24
Double key

Keys and keyways are machined at 180° of standard position.

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



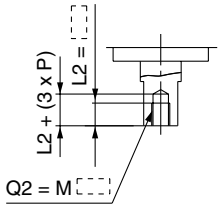
(mm)

Size	Keyway dimension	LL
50	4 x 4 x 20	5
63	5 x 5 x 25	
80	5 x 5 x 36	
100	7 x 7 x 40	

Axial: Bottom (Short shaft side)

Symbol: A2
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
- Applicable shaft type: W



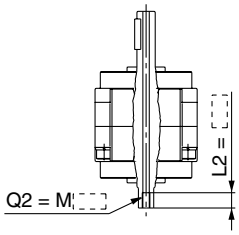
(mm)

Size	Q2
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

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.

- The maximum dimension L2 is, as a rule, twice the thread size.
  (Example) For M4: L2 = 8 mm
- Applicable shaft type: W



(mm)

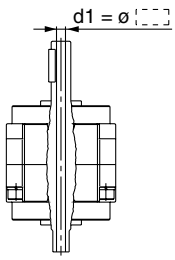
Thread \ Size	50	63	80	100
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Double Shaft

Symbol: A13
Applicable to single vane type only

Shaft with through-hole

- Minimum machining diametor for d1 is 0.1 mm.
- Applicable shaft type: W



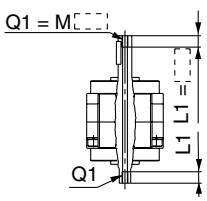
(mm)

Size	d1
50	ø4 to ø5
63	ø4 to ø6
80	ø4 to ø6.5
100	ø5 to ø8

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.

- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 = 10 mm
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



(mm)

Thread \ Size	50	63	80	100
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

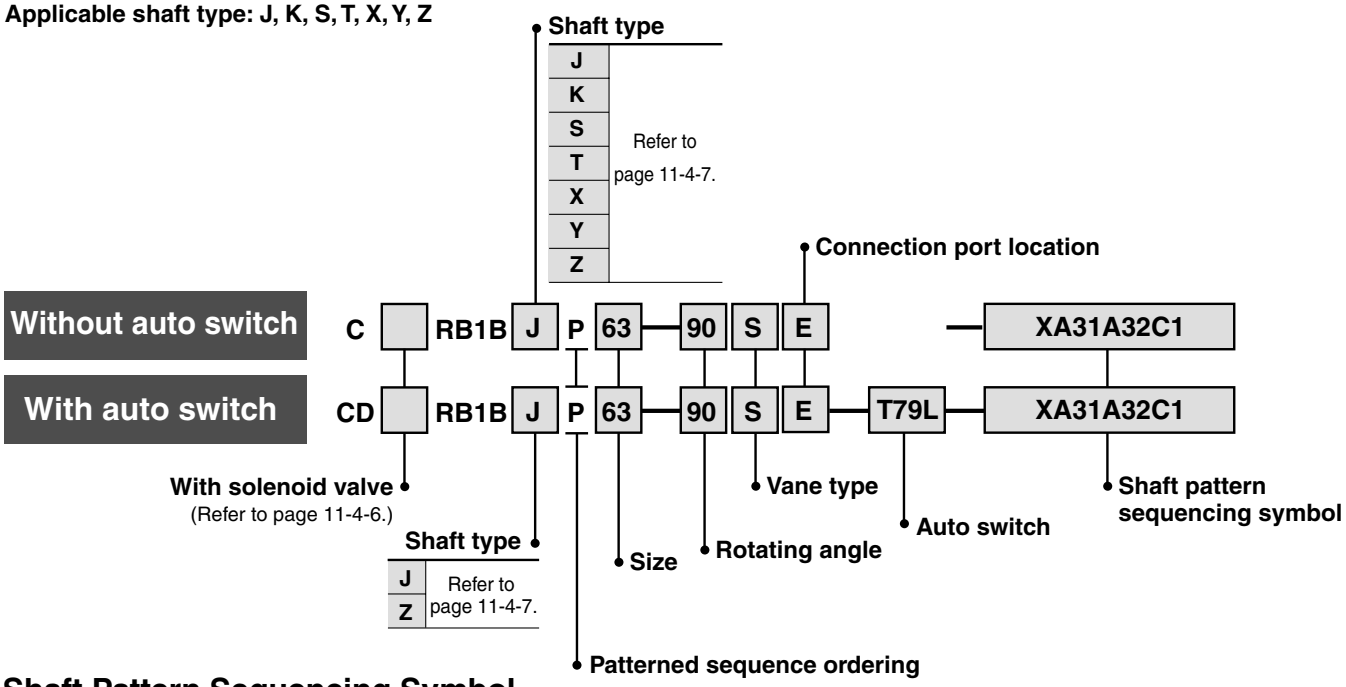
Series CRB1 (Size: 50, 63, 80, 100)

Simple Specials: -XA31 to -XA46: Shaft Pattern Sequecing 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 XA46

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



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

Symbol	Description	Shaft type	Applicable size
XA31	Shaft-end female thread	S, Y	50, 63, 80, 100
XA33	Shaft-end female thread	J, K, T	
XA35	Shaft-end female thread	X, Z	
XA37	Stepped round shaft	J, K, T	
XA45	Middle-cut chamfer	J, K, T	

● Axial: Bottom (Short shaft side)

Symbol	Description	Shaft type	Applicable size
XA32 *	Shaft-end female thread	S, Y	50, 63, 80, 100
XA34 *	Shaft-end female thread	K, T	
XA36 *	Shaft-end female thread	J, X, Z	
XA38 *	Stepped round shaft	K	
XA46 *	Middle-cut chamfer	K	

● Double Shaft

Symbol	Description	Shaft type	Applicable size
XA39 *	Shaft through-hole	S, Y	50
XA40 *	Shaft through-hole	K, T	63
XA41 *	Shaft through-hole	J, X, Z	80
XA42 *	Shaft through-hole + Shaft-end female thread	S, Y	100
XA43 *	Shaft through-hole + Shaft-end female thread	K, T	
XA44 *	Shaft through-hole + Shaft-end female thread	J, X, Z	

* This specification is not available for rotary actuators with auto switch.

Combination

XA□ Combination

Symbol	Combination						
XA31	**XA31**	* These are shaft types that can be combined.					
XA32	●						
XA33	—	**XA33**					
XA34	—	●	**XA34**				
XA35	—	—	—	**XA35**			
XA36	—	J *	K, T *	X, Z *	**XA36**		
XA37	—	—	—	—	J *	**XA37**	
XA38	—	K *	K, T *	—	—	●	
XA45	—	—	—	—	J *	—	**XA45**
XA46	—	●	—	—	—	●	●

Combinations of XA39 to XA44 with others are not available.
A combination of up to two XA□s are available.
Example: -XA1A24

XA□, XC□ Combinations

Combination other than -XA□, such as made-to order (-XC□), is also available.
Refer to pages 11-4-18 to 11-4-19 for details of made-to-order specifications.

Symbol	Description	Shaft type	XA31 to XA46
		J, K, S, T, X, Y, Z	
XC1	Add connection port	●	●
XC4	Change of rotation range and direction	●	●
XC5	Change of rotation range and direction	●	●
XC6	Change of rotation range and direction	●	●
XC7	Reversed shaft	J, S, T, X	—
XC26	Change of rotation range and direction	●	●
XC27	Change of rotation range and direction	●	●
XC30	Fluorine grease	●	●

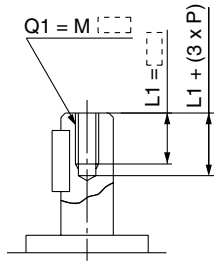
* These specifications are not available for rotary actuators with auto switch unit.
A total of four XA□and XC□ combinations is available.
Example: -XA1A2C1C30
-XA2C1C4C30

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



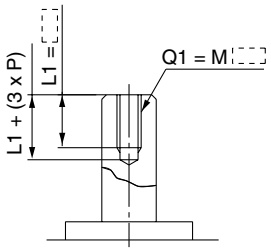
(mm)

Size \ Shaft type	Q1	
	S	Y
50	M3, M4, M5	
63	M4, M5, M6	
80	M4, M5, M6	
100	M5, M6, M8	

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



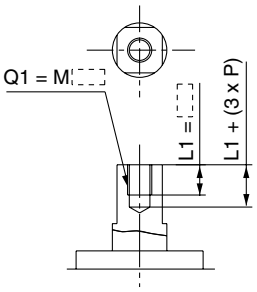
(mm)

Size \ Shaft type	Q1		
	J	K	T
50	M3, M4, M5, M6		
63	M4, M5, M6		
80	M4, M5, M6, M8		
100	M5, M6, M8, M10		

Symbol: A35

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: X, Z



(mm)

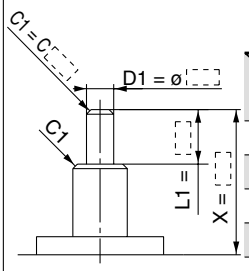
Size \ Shaft type	Q1	
	X	Z
50	M3, M4, M5	
63	M4, M5, M6	
80	M4, M5, M6	
100	M5, M6, M8	

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.)
(If not specifying dimension C1, indicate "∗" instead.)

- Equal dimensions are indicated by the same marker.
- Applicable shaft types: J, K, T



(mm)

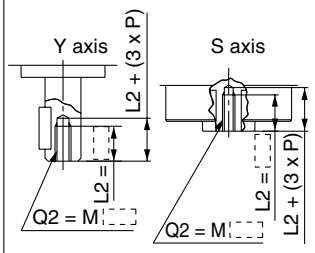
Size \ Shaft type	X			L1 max			D1		
	J	K	T	J	K	T	J	K	T
50	4 to 39.5			X – 3			3 to 11.9		
63	4 to 45			X – 3			3 to 14.9		
80	4 to 53.5			X – 3			3 to 16.9		
100	5 to 65			X – 4			3 to 24.9		

Axial: Bottom (Short shaft side)

Symbol: A32

Machine female threads into the short shaft.

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



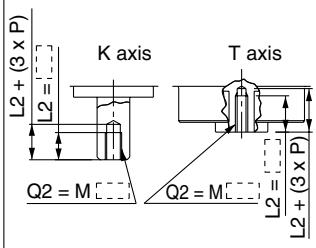
(mm)

Size \ Shaft type	Q2	
	S	Y
50	M3, M4, M5, M6	M3, M4, M5
63	M4, M5, M6	M4, M5, M6
80	M4, M5, M6, M8	M4, M5, M6
100	M5, M6, M8, M10	M5, M6, M8

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
- Applicable shaft types: K, T



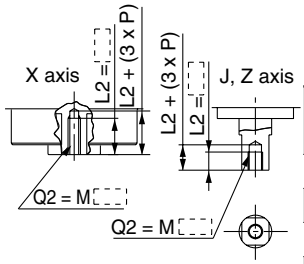
(mm)

Size \ Shaft type	Q2	
	K	T
50	M3, M4, M5, M6	
63	M4, M5, M6	
80	M4, M5, M6, M8	
100	M5, M6, M8, M10	

Symbol: A36

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
- Applicable shaft types: J, X, Z



(mm)

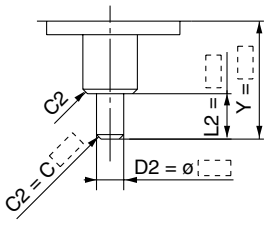
Size \ Shaft type	Q2		
	X	J	Z
50	M3, M4, M5, M6	M3, M4, M5	
63	M4, M5, M6	M4, M5, M6	
80	M4, M5, M6, M8	M4, M5, M6	
100	M5, M6, M8, M10	M5, M6, M8	

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.)
(If not specifying dimension C2, indicate "∗" instead.)

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



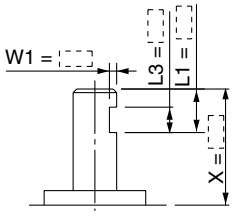
(mm)

Size	Y	L2 max	D2
50	4 to 39.5	Y – 3	3 to 11.9
63	4 to 45	Y – 3	3 to 14.9
80	4 to 53.5	Y – 3	3 to 16.9
100	5 to 65	Y – 4	3 to 24.9

Axial: Top (Long shaft side)

Symbol: A45 The long shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)

(If shortening the shaft is not required, indicate "∗" for dimension X.)
• Minimum machining dimension is 0.1 mm. • Applicable shaft types: J, K, T



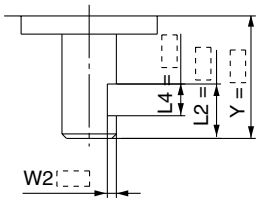
(mm)

Size \ Shaft type	X			W1			L1 max			L3 max		
	J	K	T	J	K	T	J	K	T	J	K	T
50	11.5 to 39.5			1 to 6			X – 3			L1 – 2		
63	12.5 to 45			1 to 7.5			X – 3			L1 – 2		
80	13.5 to 53.5			1 to 8.5			X – 3			L1 – 2		
100	18.5 to 65			1 to 12.5			X – 4			L1 – 2		

Axial: Bottom (Short shaft side)

Symbol: A46 The short shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)

(If shortening the shaft is not required, indicate "∗" for dimension X.)
• Minimum machining dimension is 0.1 mm.
• Applicable shaft type: K



(mm)

Size	Y	W2	L2 max	L4 max
50	11.5 to 39.5	1 to 6	Y – 3	L2 – 2
63	12.5 to 45	1 to 7.5	Y – 3	L2 – 2
80	13.5 to 53.5	1 to 8.5	Y – 3	L2 – 2
100	18.5 to 65	1 to 12.5	Y – 4	L2 – 2

⚠ Caution

For the shaft patterns A45 and A46, a middle-cut chamfer may interfere with the center hole if the W1/W2 dimensions and (L1 – L3), (L2 – L4) dimensions are less than what are shown in the tables at right.

(mm)

Size	W1, W2	L1 – L3, L2 – L4
50	4.5 to 6	2 to 5.5
63	6 to 7.5	2 to 3

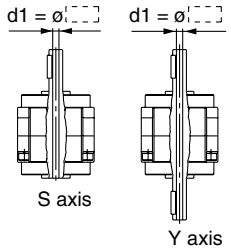
(mm)

Size	W1, W2	L1 – L3, L2 – L4
80	6.5 to 8.5	2 to 6.5
100	10.5 to 12.5	2 to 6.5

Double Shaft

Symbol: A39 Applicable to single vane type only

Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: S, Y

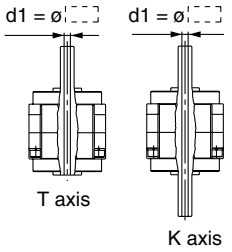


(mm)

Size \ Shaft type	d1	
	S	Y
50	ø4 to ø5	
63	ø4 to ø6	
80	ø4 to ø6.5	
100	ø5 to ø8	

Symbol: A40 Applicable to single vane type only

Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: K, T

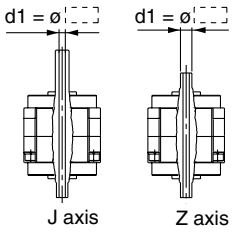


(mm)

Size \ Shaft type	d1	
	K	T
50	ø4 to ø5.5	
63	ø4 to ø6	
80	ø4 to ø7.5	
100	ø5 to ø10	

Symbol: A41 Applicable to single vane type only

Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: J, X, Z

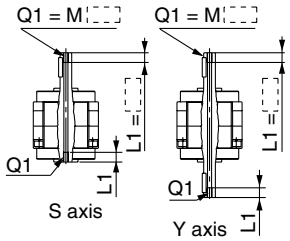


(mm)

Size \ Shaft type	d1		
	J	X	Z
50	ø4 to ø5		
63	ø4 to ø6		
80	ø4 to ø6.5		
100	ø5 to ø8		

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.
• The maximum dimension L1 is, as a rule, twice the thread size.
• Applicable shaft types: S, Y • Equal dimensions are indicated by the same marker.

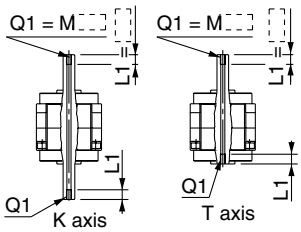


(mm)

Size	50		63		80		100	
Shaft type / Thread	S	Y	S	Y	S	Y	S	Y
M5 x 0.8	ø4.2		ø4.2		ø4.2		ø4.2	
M6 x 1	—		ø5		ø5		ø5	
M8 x 1.25	—		—		—		ø6.8	

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.
• The maximum dimension L1 is, as a rule, twice the thread size.
• Applicable shaft types: K, T • Equal dimensions are indicated by the same marker.

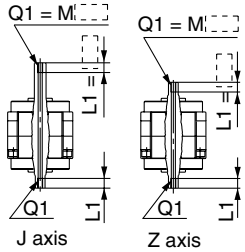


(mm)

Size	50		63		80		100	
Shaft type / Thread	K	T	K	T	K	T	K	T
M5 x 0.8	ø4.2		ø4.2		ø4.2		ø4.2	
M6 x 1	ø5		ø5		ø5		ø5	
M8 x 1.25	—		—		ø6.8		ø6.8	
M10 x 1.5	—		—		—		ø8.6	

Symbol: A44 Applicable to single vane type only

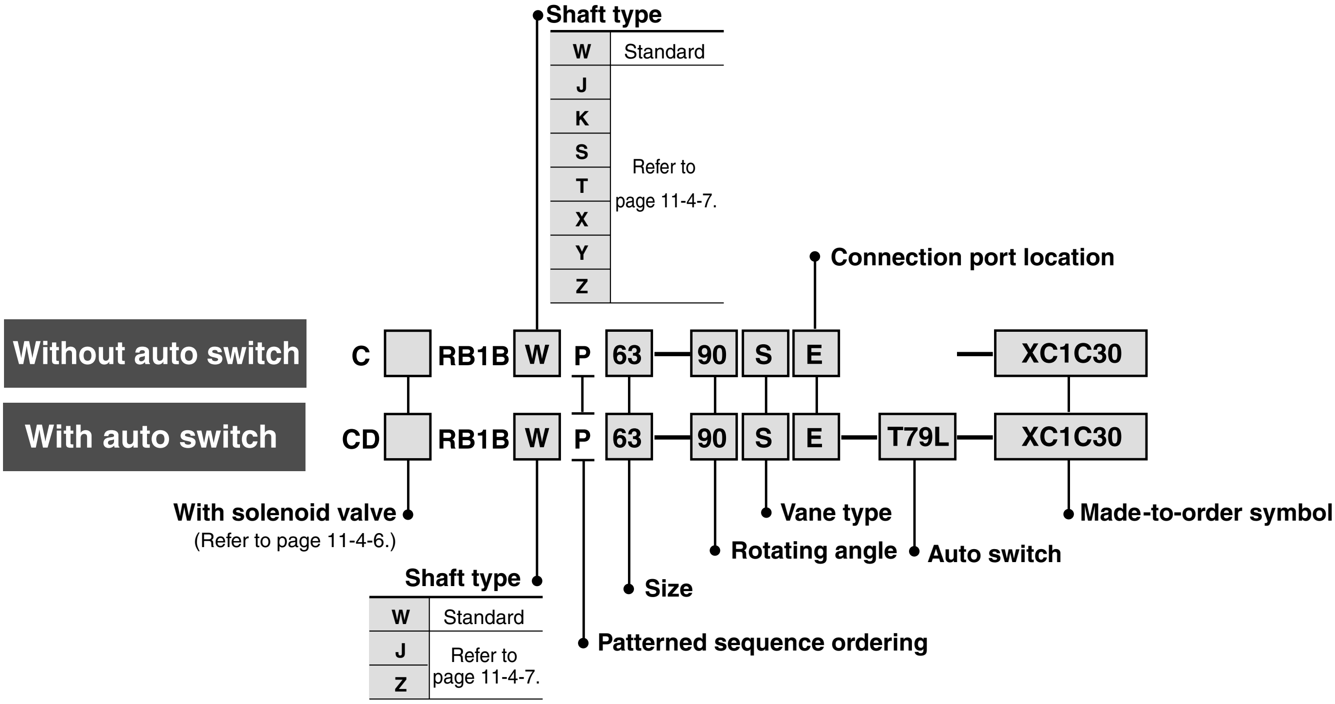
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes
• The maximum dimension L1 is, as a rule, twice the thread size.
• Applicable shaft types: J, X, Z • Equal dimensions are indicated by the same marker.



(mm)

Size	50			63			80			100		
Shaft type / Thread	J	X	Z	J	X	Z	J	X	Z	J	X	Z
M5 x 0.8	ø4.2			ø4.2			ø4.2			ø4.2		
M6 x 1	—			ø5			ø5			ø5		
M8 x 1.25	—			—			—			ø6.8		

Series CRB1 (Size: 50, 63, 80, 100)
Made to Order Specifications: -XC1, 4, 5, 6, 7, 26, 27, 30



Made-to-Order Symbol

Symbol	Description	Applicable shaft type W, J, K, S, T, X, Y, Z	Applicable size
XC1	Add connection port	●	50, 63, 80, 100
XC4	Change of rotation range and direction	●	
XC5	Change of rotation range and direction	●	
XC6	Change of rotation range and direction	●	
XC7*	Reversed shaft	●	
XC26	Change of rotation range and direction	●	
XC27	Change of rotation range and direction	●	
XC30	Fluoro grease	●	

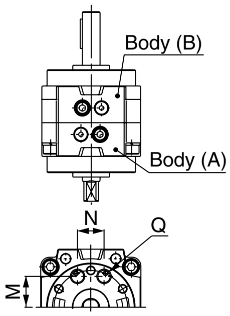
* This specification is not available for rotary actuators with auto switch unit.

Combination

Symbol	Combination XC1	Combination XC30
XC1	—	●
XC4	●	●
XC5	●	●
XC6	●	●
XC7	●	●
XC26	●	●
XC27	●	●
XC30	●	—

Symbol: C1

Add connection ports on Body (A).
(An additionally machined port will have an aluminum surface since it will be left unfinished.)

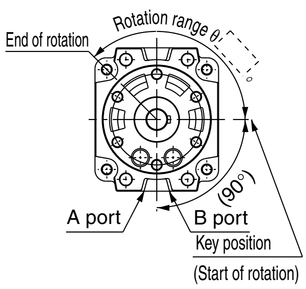


(mm)

Size	Q	M	N
50	Rc 1/8	21	18
63	Rc 1/8	27	25
80	Rc 1/4	29	30
100	Rc 1/4	38	38

Symbol: C4

Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (90° down from the top to the right side).

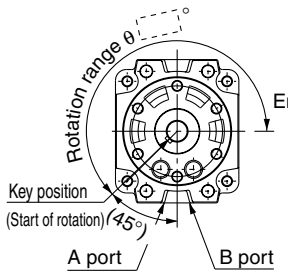


(mm)

Size	Rotation range θ
50	$45^{\circ}{}^{+8^{\circ}}_{0}$, $90^{\circ}{}^{+8^{\circ}}_{0}$, $135^{\circ}{}^{+6^{\circ}}_{0}$
63	
80	
100	

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

Symbol: C5 Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line
(45° down from the top to the left side).

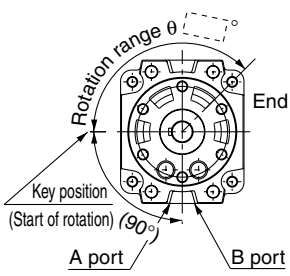


(mm)

Size	Rotation range (θ)
50	
63	$45^{\circ}{}^{+8^{\circ}}_{0}$, $90^{\circ}{}^{+6^{\circ}}_{0}$, $135^{\circ}{}^{+6^{\circ}}_{0}$
80	$180^{\circ}{}^{+4^{\circ}}_{0}$, $225^{\circ}{}^{+4^{\circ}}_{0}$
100	

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

Symbol: C6 Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line
(90° down from the top to the left side).

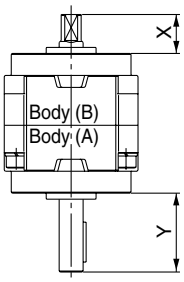


(mm)

Size	Rotation range (θ)
50	
63	$45^{\circ}{}^{+8^{\circ}}_{0}$, $90^{\circ}{}^{+8^{\circ}}_{0}$, $135^{\circ}{}^{+6^{\circ}}_{0}$
80	
100	

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

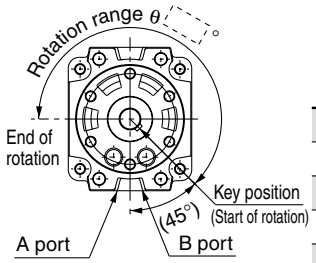
Symbol: C7 The shafts are reversed.



(mm)

Size	Y	X
50	39.5	19.5
63	45	21
80	53.5	23.5
100	56	30

Symbol: C26 Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (45° down from the top to the right side).

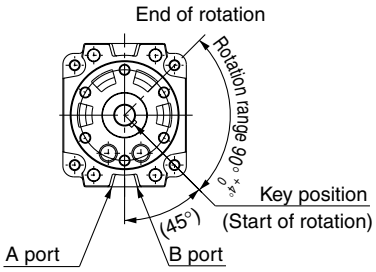


(mm)

Size	Rotation range (θ)
50	
63	$45^{\circ}{}^{+8^{\circ}}_{0}$, $90^{\circ}{}^{+6^{\circ}}_{0}$, $135^{\circ}{}^{+6^{\circ}}_{0}$
80	$180^{\circ}{}^{+4^{\circ}}_{0}$, $225^{\circ}{}^{+4^{\circ}}_{0}$
100	

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

Symbol: C27 Change of rotation. (Applicable to double vane type only)
Rotation: 90° Rotation starts from the horizontal line
(45° down from the top to the right side).



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

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

1 Auto Switch Unit Part No.

Each unit can be retrofitted to the rotary actuator.

Series	Model	Vane type	Unit part no.
Series ***CRB2***	**CDRB2BW10**	Single/Double type	P611070-1
	CDRB2BW15		P611090-1
	CDRB2BW20		P611060-1
	CDRB2BW30		P611080-1
	CDRB2BW40	Single type	P612010-1
		Double type	P611010-1
Free mount type *Series* ***CRBU2***	**CDRBU2W10**	Single/Double type	P611070-1
	CDRBU2W15		P611090-1
	CDRBU2W20		P611060-1
	CDRBU2W30		P611080-1
	CDRBU2W40		P612010-1
Series ***CRB1***	**CDRB1BW50**	Single/Double type	P411020-1
	CDRB1BW63		P411030-1
	CDRB1BW80		P411040-1
	CDRB1BW100		P411050-1

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

2 Switch Block Unit Part No.

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

Series	Model	Unit part no.	
Series ***CRB2***	**CDRB2BW10, 15**	Right-handed	P611070-8
		Left-handed	P611070-9
	CDRB2BW20, 30	Right-handed	P611060-8
		Left-handed	
	CDRB2BW40	Right-handed	P611010-8
		Left-handed	P611010-9
Free mount type *Series* ***CRBU2***	**CDRBU2W10, 15**	Right-handed	P611070-8
		Left-handed	P611070-9
	CDRBU2W20, 30	Right-handed	P611060-8
		Left-handed	
	CDRBU2W40	Right-handed	P611010-8
		Left-handed	P611010-9
Series ***CRB1***	**CDRB1BW50**	Right-handed	P411020-8
		Left-handed	P411020-9
	CDRB1BW63, 80, 100	Right-handed	P411040-8
		Left-handed	P411040-9

∗ Solid state switch for size 10 and 15 requires no switch block, therefore the unit part no. will be P611070-13.

3 Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

Series	Model	Vane type	Unit part no.
Series ***CRB2***	**CRB2BWU10**	Single/Double type	P611070-3
	CRB2BWU15		P611090-3
	CRB2BWU20		P611060-3
	CRB2BWU30		P611080-3
	CRB2BWU40	Single type	P612010-3
		Double type	P611010-3
Free mount type *Series* ***CRBU2***	**CRBU2WU10**	Single/Double type	P611070-3
	CRBU2WU15		P611090-3
	CRBU2WU20		P611060-3
	CRBU2WU30		P611080-3
	CRBU2WU40		P612010-3

4 Auto Switch Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

Series	Model	Vane type	Unit part no.
Series ***CRB2***	**CDRB2BWU10**	Single/Double type	P611070-4
	CDRB2BWU15		P611090-4
	CDRB2BWU20		P611060-4
	CDRB2BWU30		P611080-4
	CDRB2BWU40	Single type	P612010-4
		Double type	P611010-4
Free-mount type *Series* ***CRBU2***	**CDRBU2WU10**	Single/Double type	P611070-4
	CDRBU2WU15		P611090-4
	CDRBU2WU20		P611060-4
	CDRBU2WU30		P611080-4
	CDRBU2WU40		P612010-4

5 Joint Unit Part No.

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

Series	Model	Vane type	Unit part no.
Series ***CRB2***	**CDRB2BWU10**	Single/Double type	P211070-10
	CDRB2BWU15		P211090-10
	CDRB2BWU20		P211060-10
	CDRB2BWU30		P211080-10
	CDRB2BWU40		P211010-10
Free mount type *Series* ***CRBU2***	**CDRBU2WU10**	Single/Double type	P211070-10
	CDRBU2WU15		P211090-10
	CDRBU2WU20		P211060-10
	CDRBU2WU30		P211080-10
	CDRBU2WU40		P211010-10

With Auto Switch

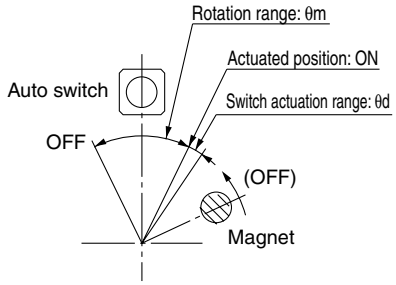
Applicable Auto Switch

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

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

Operating Range and Hysteresis

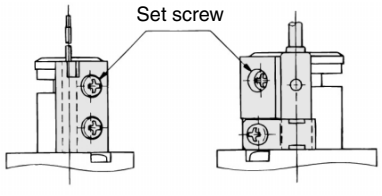
* Operating range: θm
  The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the switch turns OFF as the magnet travels the same direction.
* Hysteresis range: θd
  The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the switch turns OFF as the magnet travels the opposite direction.



Model	Operating range: θm	Switch actuation range: θd
CDRB2BW10/15	110°	10°
CDRBU2W10/15		
CDRB2BW20/30	90°	
CDRBU2W20/30		
CDRB2BW40	52°	8°
CDRBU2W40		
CDRB1BW50		
CDRB1BW63 to 100	38°	7°

How to Change the Detecting Position of Auto Switch

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



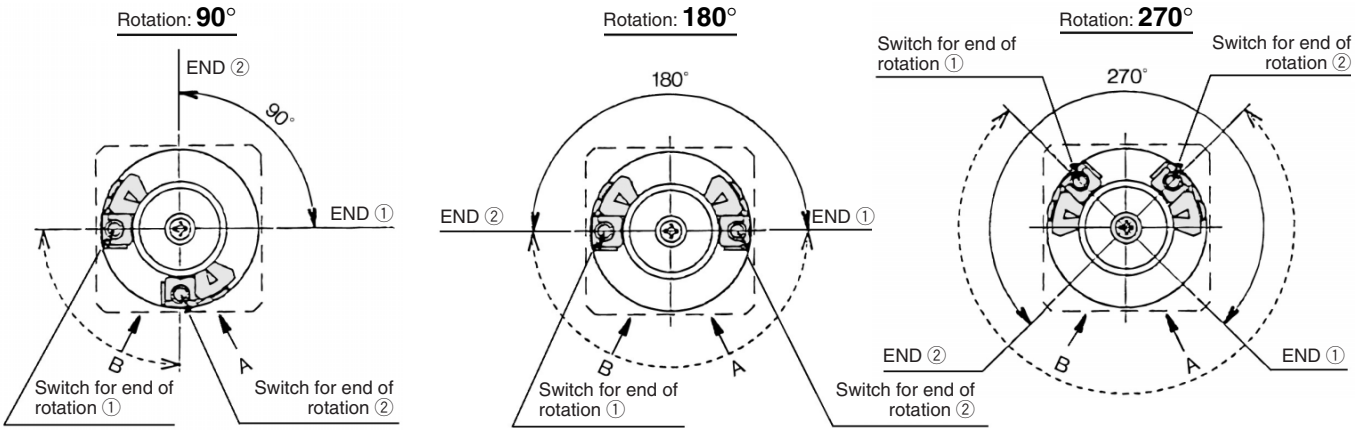
CDRB2BW10/15
CDRBU2W10/15

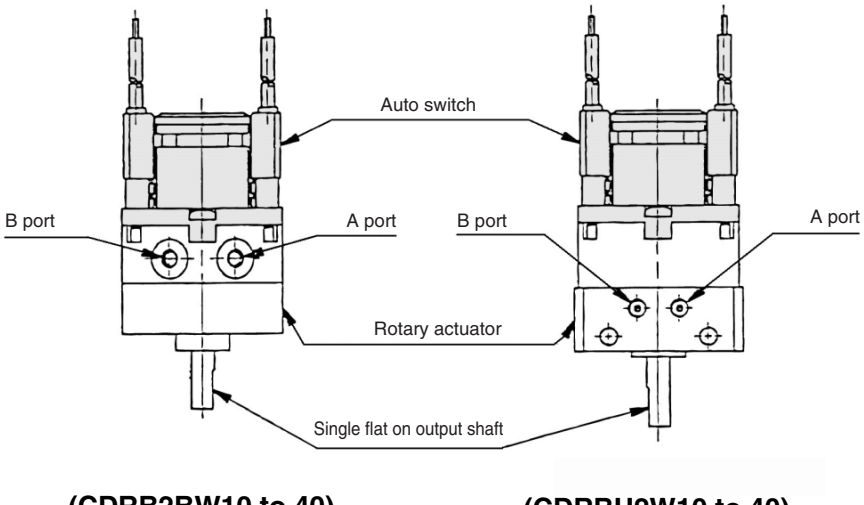
CDRB2BW20 to 40
CDRBU2W20 to 30
CDRB1BW50 to 100

Adjustment of Auto Switch

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

<Single vane>





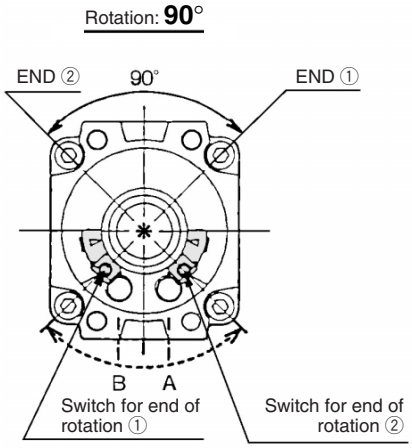
(CDRB2BW10 to 40) **(CDRBU2W10 to 40)**

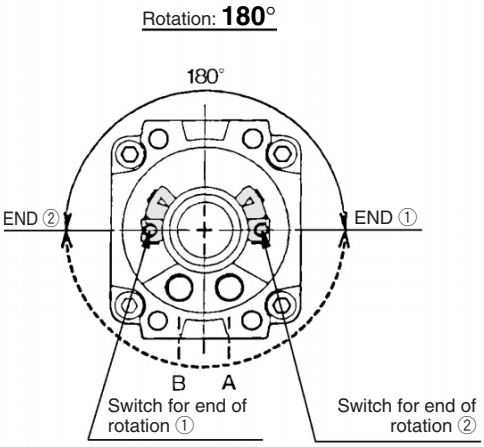
∗ Solid-lined curves indicate the rotation range of the output shaft with single flat (key). When the single flat (key) is pointing to end of rotation ①, the switch for end of rotation ① will operate, and when the single flat (key) is pointing to end of rotation ②, the switch for end of rotation ② will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

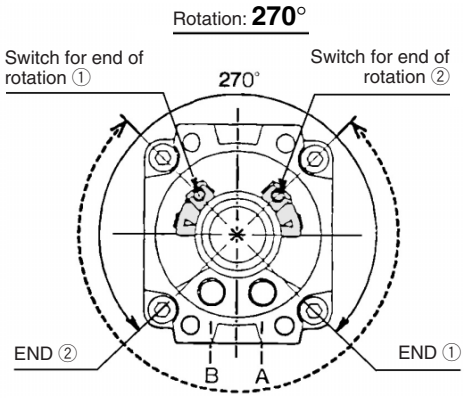
Adjustment of Auto Switch

Rotation range of the output key (keyway) and auto switch mounting position
Size: 50, 63, 80, 100

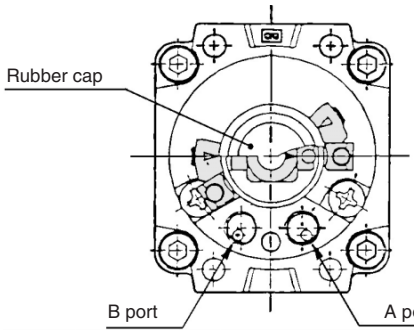
<Single vane>

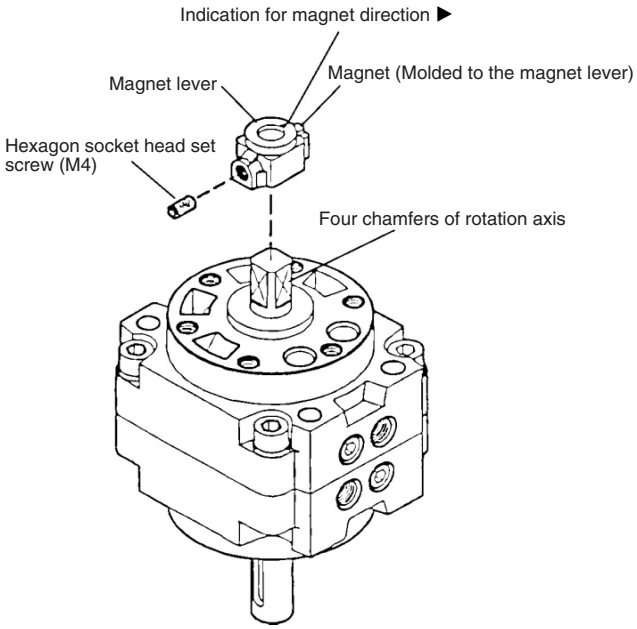


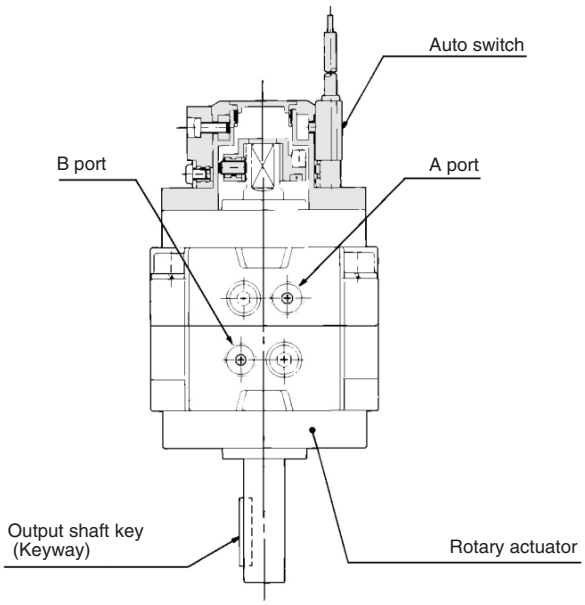




* Solid-lined curves indicate the rotation range of the output key (keyway). When the key is pointing to end of rotation ①, the switch for end of rotation ① will operate, and when the key is pointing to end of rotation ②, the switch for end of rotation ② will operate.
* Broken-lined curves indicate the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







Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ **Caution :** Operator error could result in injury or equipment damage.

⚠ **Warning :** Operator error could result in serious injury or loss of life.

⚠ **Danger :** In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Common Precautions

Be sure to read before handling.
For detailed precautions on every series, refer to main text.

Selection

⚠ Warning

1. Confirm the specifications.

Products represented in this catalog are designed for use in compressed air appllications only (including vacuum), unless otherwise indicated.
Do not use the product outside their design parameters.
Please contact SMC when using the products in applications other than compressed air (including vacuum).

Mounting

⚠ Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Securing the space for maintenance

When installing the products, please allow access for maintenance.

3. Tightening torque

When installing the products, please follow the listed torque specifications.

Piping

⚠ Caution

1. Before piping

Make sure that all debris, cutting oil, dust, etc, are removed from the piping.

2. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

⚠ Warning

1. Operating fluid

Please consult with SMC when using the product in applications other than compressed air (including vacuum).
Regarding products for general fluid, please ask SMC about applicable fluids.

2. Install an air dryer, aftercooler, etc.

Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
Installation of an air dryer, after cooler etc. is recommended.

3. Drain flushing

If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
For compressed air quality, refer to “Air Preparation Equipment” catalog.

4. Use clean air

If the compressed air supply is contaminated with chemicals, cynthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

⚠ Warning

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.

2. Do not expose the product to direct sunlight for an extended period of time.

3. Do not use in a place subject to heavy vibrations and/or shocks.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠ Warning

1. Maintenance procedures are outlined in the operation manual.

Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

2. Maintenance work

If handled improperly, compressed air can be dangerous.
Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

3. Drain flushing

Remove drainage from air filters regularly. (Refer to the specifications.)

4. Shut-down before maintenance

Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.

5. Start-up after maintenance and inspection

Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.

6. Do not make any modifications to be product.

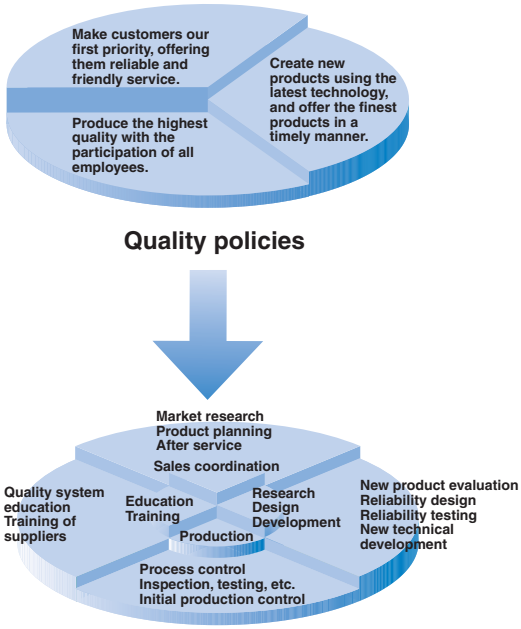
Do not take the product apart.

Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

SMC’s quality control system



Quality management system

ISO 9001

This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.



Environmental management system

ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.



SMC Product Conforming to Inter

SMC products complying with EN/ISO, CSA/UL standards are supporting

CE Mark

The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied.
It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU.
Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

■ CE Mark

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

■ As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

■ EC Directives and Pneumatic Components

• Machinery Directive

The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

• Electromagnetic Compatibility (EMC) Directive

The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

• Low Voltage Directive

This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

• Simple Pressure Vessels Directive

This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.

national Standards

you to comply with EC directives and CSA/UL standards.

■ CSA Standards & UL Standards

UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question.
Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

■ TSSA (MCCR) Registration Products

TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

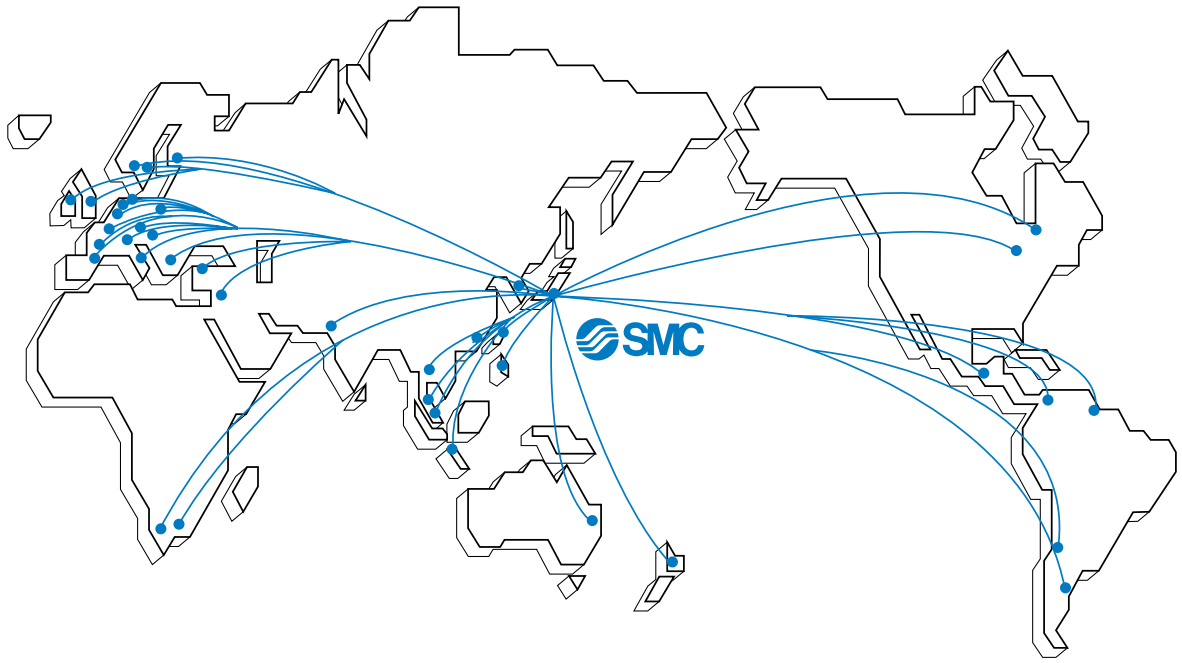
Products conforming to CE Standard

With CE symbol for simple visual recognition

In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

http://www.smcworld.com

SMC's Global Service Network



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

Series Variations

Fluid			Air																
Size			10				15				20, 30				40				
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 / Long shaft without keyway & Short shaft with single flat J													●	●	●	●	
		Same length double long shaft with single flat on both shafts / Double shaft key Y													●	●	●	●	
		Double round shaft K													●	●	●	●	
	Single shaft type	Single flat / Single shaft key S													●	●	●	●	
		Single round shaft T													●	●	●	●	
	Pattern	Shaft pattern	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		Rotation pattern	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

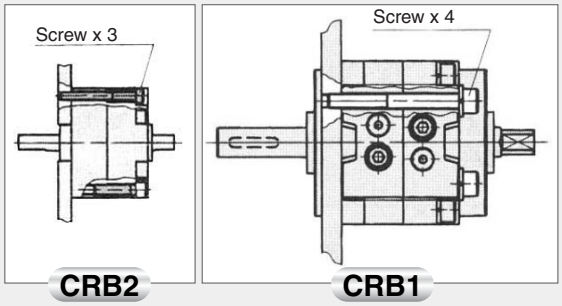
Rotating angle: 90°, 180°, 270° All series can rotate up to 270°.

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

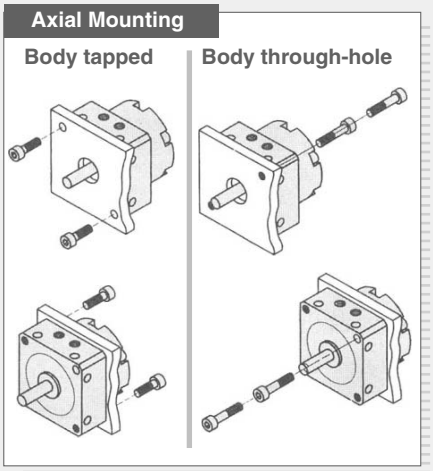
Size 15 to 100: 0.15 MPa

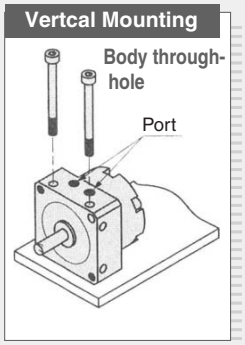
Unrestricted auto switch mounting position

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.

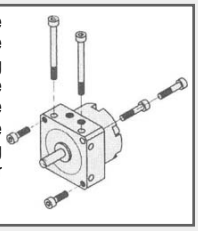
Direct mounting from 3 different directions is possible (CRBU2).

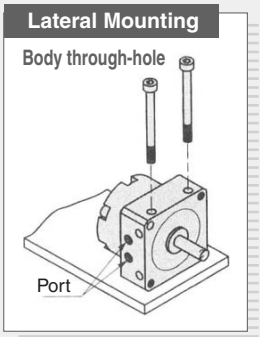
Series CRBU2 can be mounted in 3 directions: axial, vertical, and lateral. In the axial direction, there are 3 mounting variations.





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

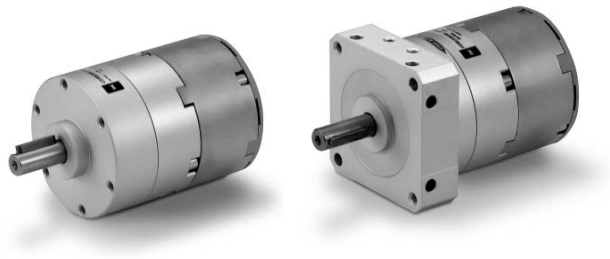
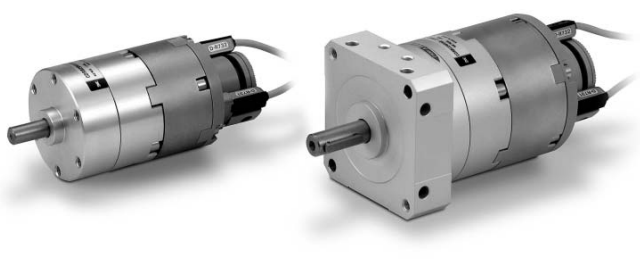
CRBU2/Size:
10, 15, 20, 30, 40

CRB1/Size:
50, 63, 80, 100

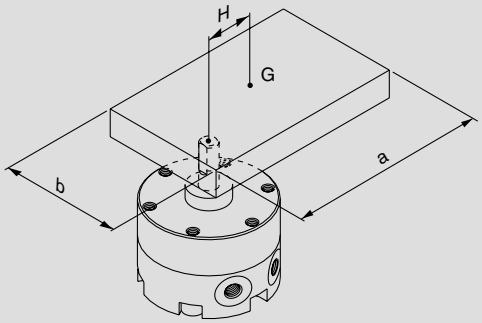
Double vane construction is now a standard feature for 90° and 100° rotation type actuators.

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·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**	$1 / 2 \times (0.0002) \times (2 \times (\pi / 2) / 0.3)^2 =$ 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

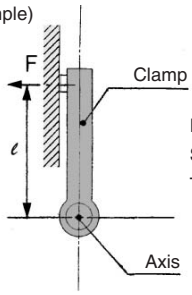
During examination if it is decided to consider the mass of the lever itself in the drawing below, it should be regarded as an inertial load.

● 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

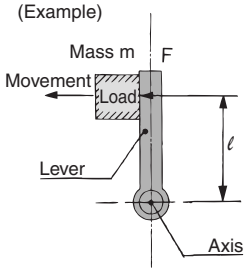
A load that is affected by external forces such as friction or gravity

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

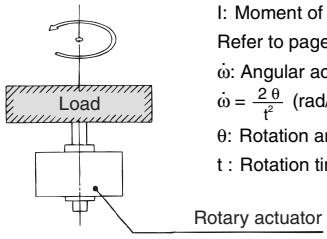
The load which must be rotated by the actuator

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)

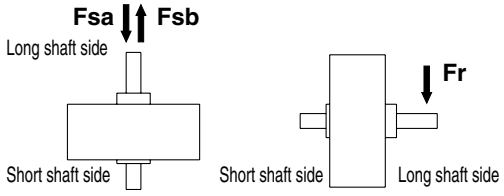
t : Rotation time (S)

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)

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)

Size (Without auto switch)

10
15
20
30
40

Size (With auto switch, Size: 10, 15)

10
15

Size (With auto switch, Size: 20, 30, 40)

20
30
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 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	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

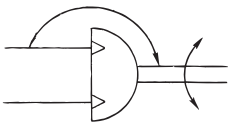
Model (Size)		CRB2BW10-□S		CRB2BW15-□S		CRB2BW20-□S	CRB2BW30-□S	CRB2BW40-□S
Vane type		Single vane						
Rotating angle		90°,180°	270°	90°,180°	270°	90°,180°, 270°		
Fluid		Air (Non-lube)						
Proof pressure (MPa)		1.05					1.5	
Ambient and fluid temperature		5 to 60°C						
Max. operating pressure (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).

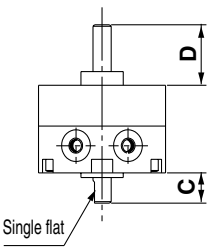
Without auto switch

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

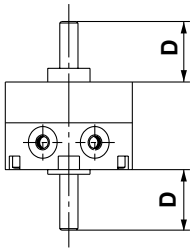
Shaft type

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

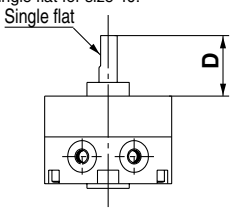


K

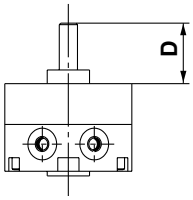


S

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

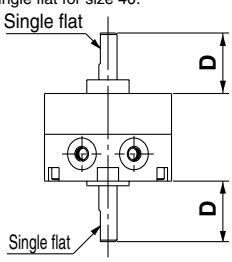


T



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

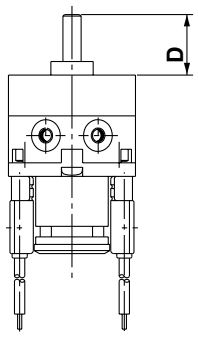
Shaft type

With auto switch

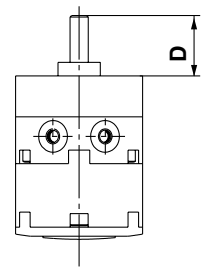
Symbol	Shaft type	Shaft-end shape	Size				
			10	15	20	30	40
J	Double shaft	Long shaft without single flat & with single flat	●	●	●	●	
		Long shaft without keyway & single flat					●

J

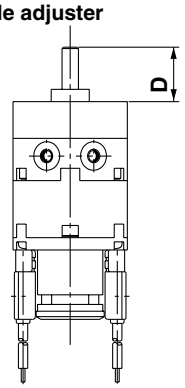
With auto switch



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.

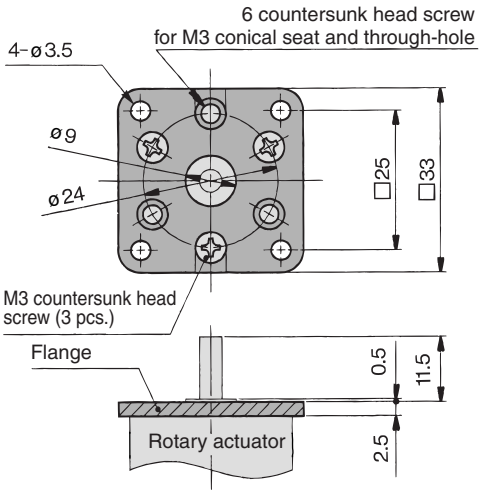
3. The allowable kinetic energy is the same as the specifications of the rotary actuator by itself (i.e., without angle adjuster).

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

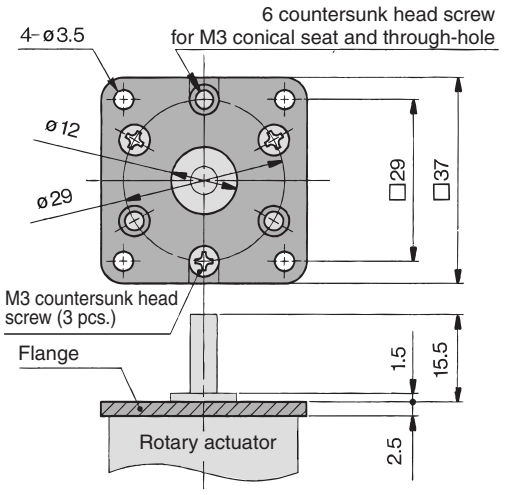
Type				Flange assembly part no.
Basic type	With auto switch	With angle adjuster	With angle adjuster and auto switch	
CRB2FW10	CDRB2FW10	CRB2FWU10	CDRB2FWU10	P211070-2
CRB2FW15	CDRB2FW15	CRB2FWU15	CDRB2FWU15	P211090-2
CRB2FW20	CDRB2FW20	CRB2FWU20	CDRB2FWU20	P211060-2
CRB2FW30	CDRB2FW30	CRB2FWU30	CDRB2FWU30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

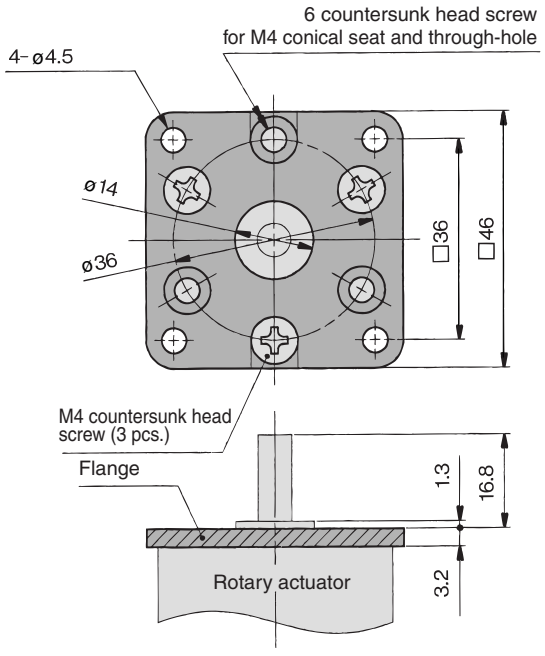
Assembly Part No.: P211070-2 (for C□RB2FW□10)



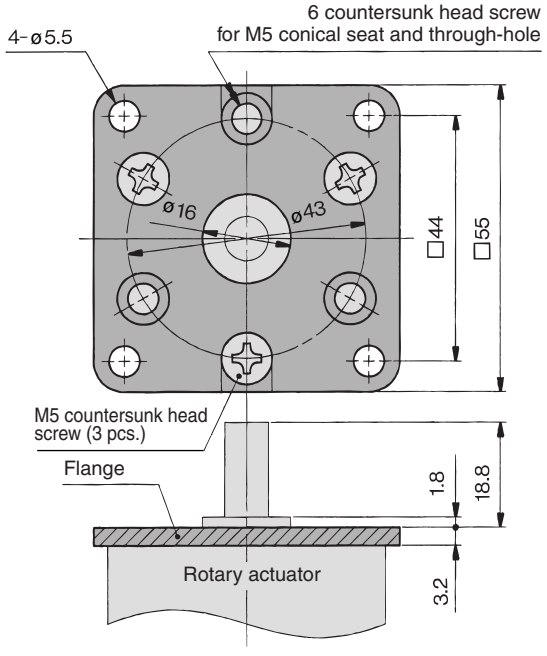
Assembly Part No.: P211090-2 (for C□RB2FW□15)



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

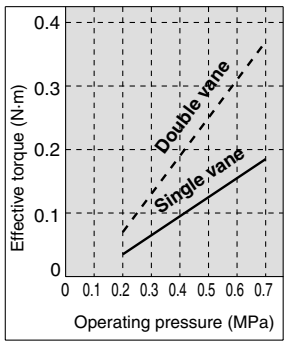


Assembly Part No.: P211080-2 (for C□RB2FW□30)

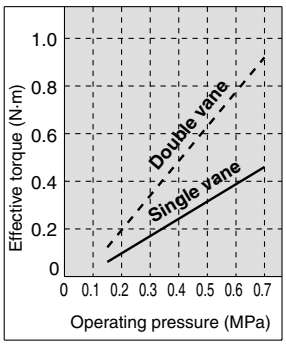


Effective Output

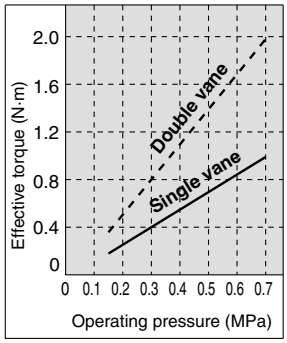
CRB2BW10



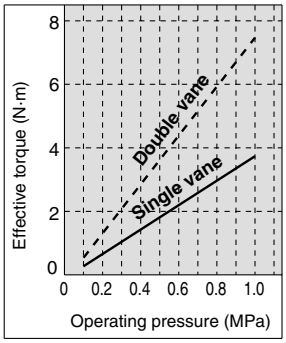
CRB2BW15



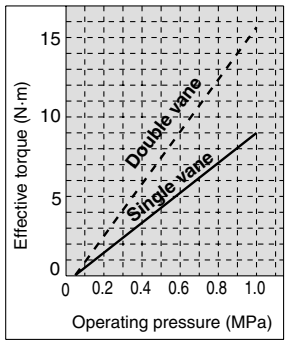
CRB2BW20



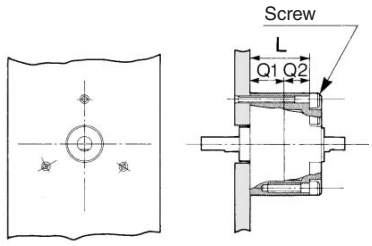
CRB2BW30



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

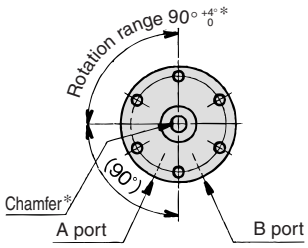
* Only the size 10 actuators have different L dimensions for single and double vane.
* Refer to pages 11-2-14 to 11-2-15 for Q1 and Q2 dimensions.

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

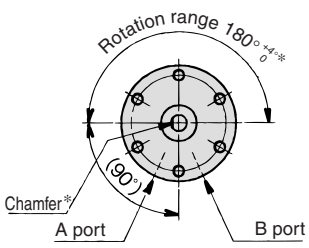
Chamfered positions shown below illustrate the conditions of actuators when B port is pressurized.

Single vane type

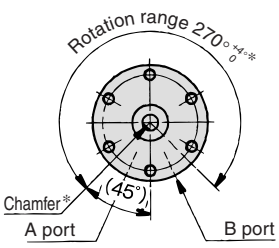
90˚



180˚

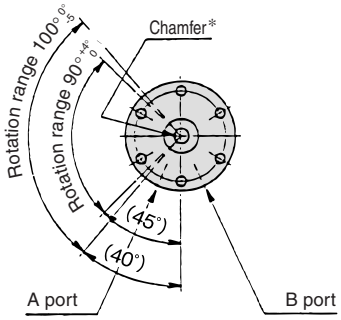


270˚



Double vane type

90˚, 100˚



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

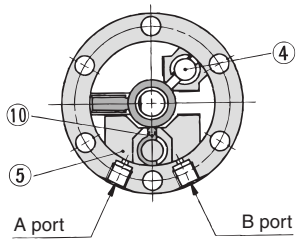
Note) For single vane type, rotation tolerance of 90°, 180°, and 270° actuators will be $^{+5°}_{0}$ for size 10 actuators only.
For double vane style, the tolerance of rotation angle of 90° will be $^{+5°}_{0}$ for size 10 only.

Construction: 10, 15, 20, 30, 40

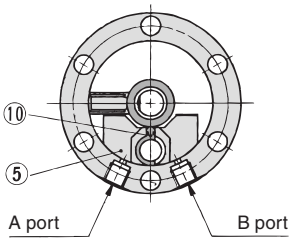
Single vane type

- 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.

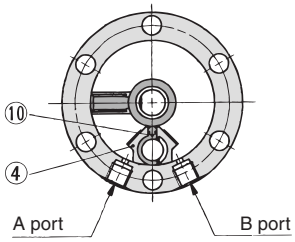
For 90°
(Top view from long shaft side)



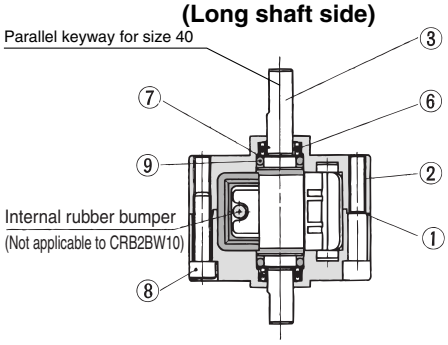
For 180°
(Top view from long shaft side)



For 270°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

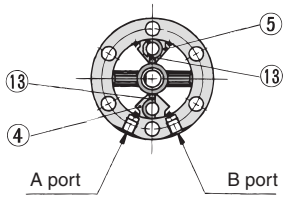
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	White
②	Body (B)	Aluminum alloy	White
③	Vane shaft	Stainless steel *	
④	Stopper	Resin	For 270°
⑤	Stopper	Resin	For 180°
⑥	Bearing	High carbon chrome bearing steel	
⑦	Back-up ring	Stainless steel	
⑧	Hexagon socket head cap screw	Stainless steel	Special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

* Carbon steel for CRB2BW30 and CRB2BW40.

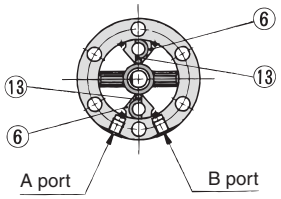
Double vane type

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

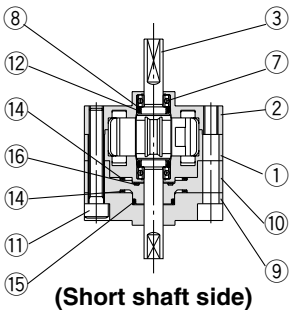
For 90°
(Top view from long shaft side)



For 100°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

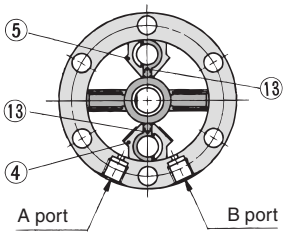
Component Parts

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

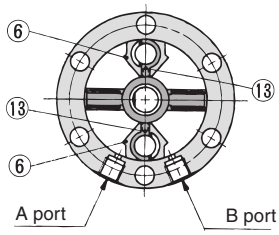
* For size 40, material for no. ④⑥ is die-cast aluminum.

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

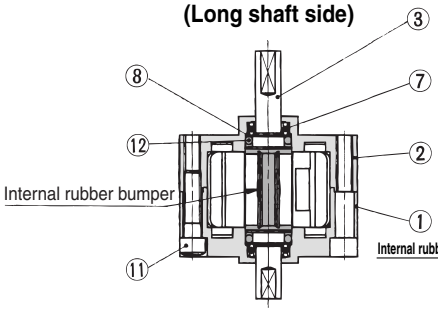
For 90°
(Top view from long shaft side)



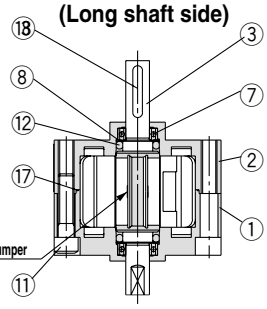
For 100°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)



(Short shaft side)
For size 40

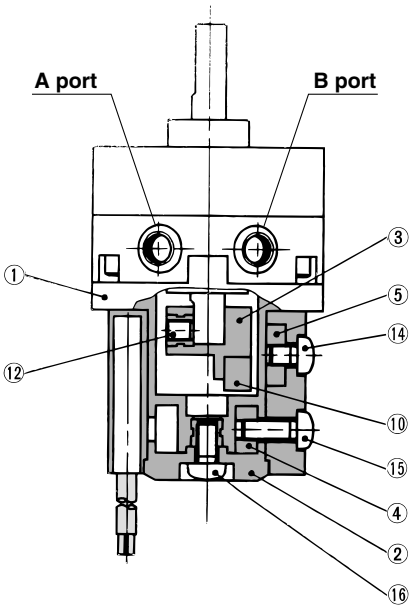
No.	Description	Material	Note
⑩	Plate	Resin	White
⑪	Hexagon socket head cap screw	Stainless steel	Special screw
⑫	O-ring	NBR	
⑬	Stopper seal	NBR	Special seal
⑭	Gasket	NBR	Special seal
⑮	O-ring	NBR	
⑯	O-ring	NBR	
⑰	O-ring	NBR	Double vane only
⑱	Parallel keyway	Carbon steel	Size 40 only

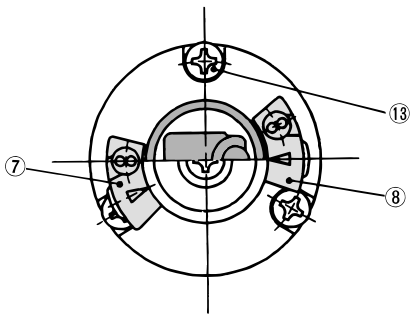
Construction (With auto switch unit)

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.)

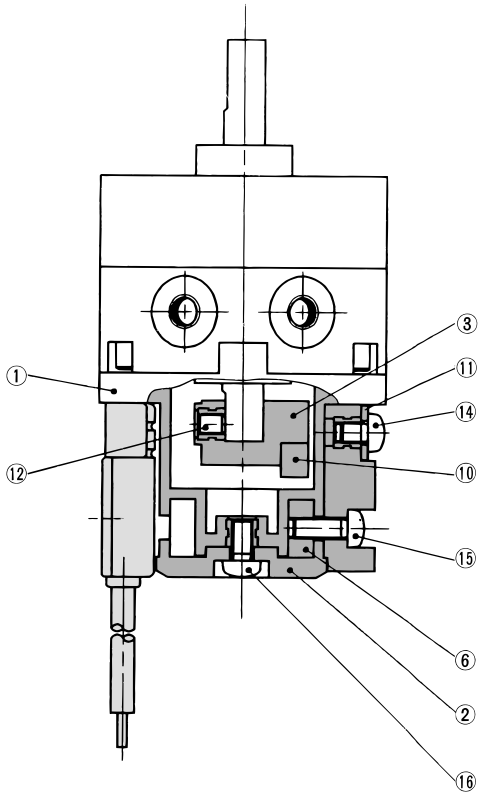
Double vane type • Following illustrations show the intermediate rotation position when A or B port is pressurized.

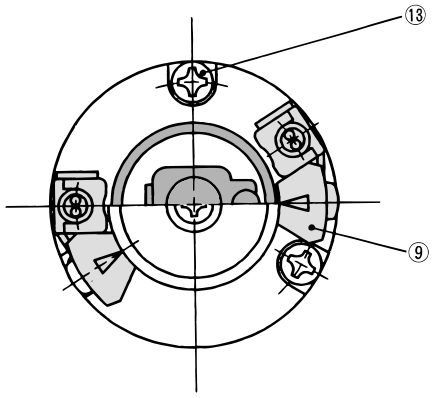
CDRB2BW10/15-□ S D



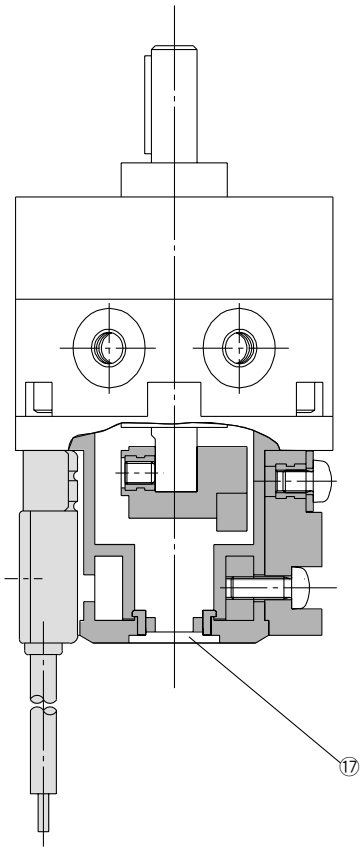


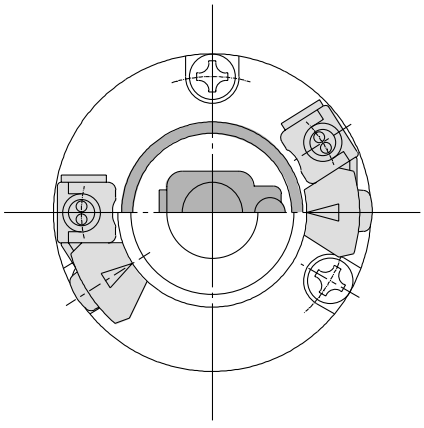
CDRB2BW20/30-□ S D





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

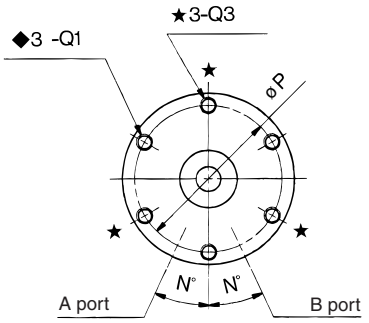
No.	Description	Material
⑪	Arm	Stainless steel
⑫	Hexagon socket head set screw	Stainless steel
⑬	Round head Phillips screw	Stainless steel
⑭	Round head Phillips screw	Stainless steel
⑮	Round head Phillips screw	Stainless steel
⑯	Round head Phillips screw	Stainless steel
⑰	Rubber cap	NBR

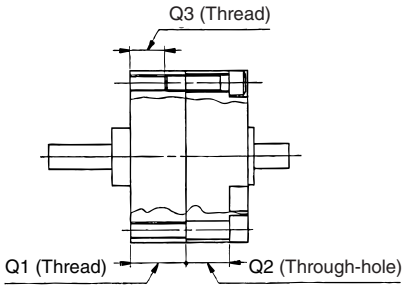
∗ For CDRB2BW10, 2 round head Phillips screws, ⑬, are required.

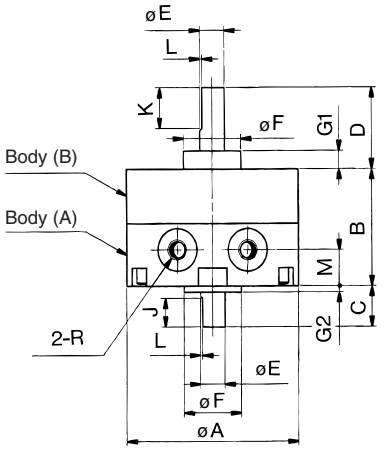
Dimensions: 10, 15, 20, 30

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

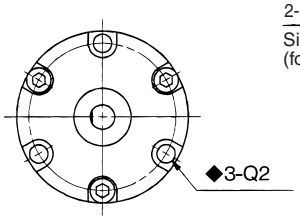
CRB2BW□-□S
<Port location: Side ported>

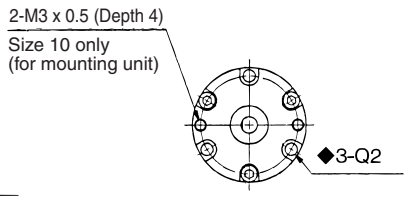




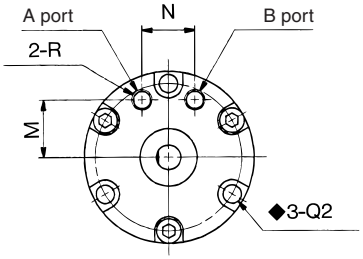


CRB2BW10-□S
<Port location: Side ported>





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).

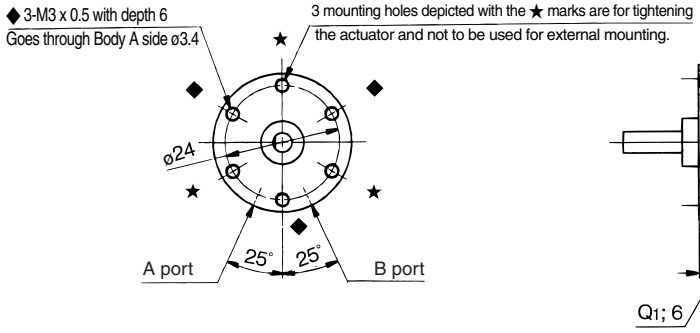
Note) The pre-drilled mounting threads for CRB2BW15, 20, and 30, 3 mounting holes depicted with the ★ marks are for tightening the actuator and not to be used for external mounting.

(mm)

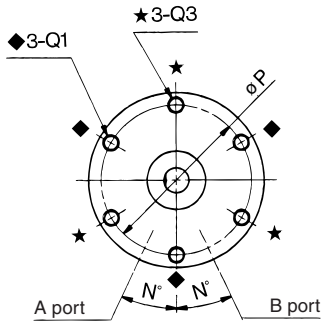
Model	A	B	C	D	E (g6)	F (h9)	G1	G2	J	K	L	M	N	P	◆Q1	◆Q2	★Q3	R 90°	R 180°	R 270°
CRB2BW10-□S	29	15	8	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	3	1	5	9	0.5	5	25	24	M3 (6)	3.4 (5.5)	—	M5		M3
CRB2BW10-□SE												8.5	9.5					M3		
CRB2BW15-□S	34	20	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	4	1.5	6	10	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							

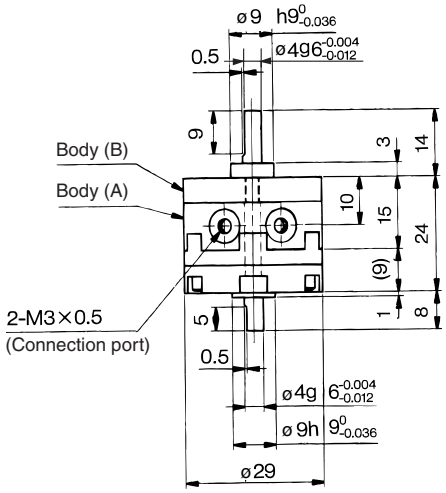
Double vane type ● Following illustrations show the intermediate rotation position when A or B port is pressurized.

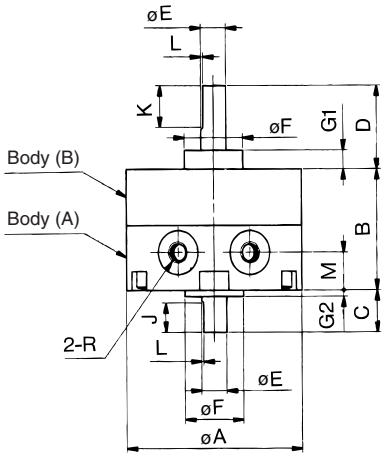
CRB2BW10-□D
<Port location: Side ported>



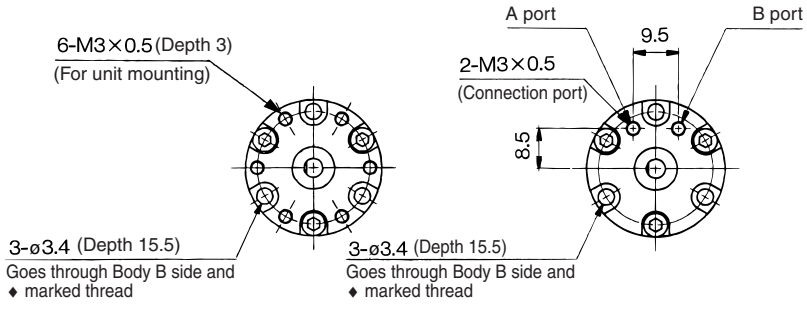
CRB2BW15/20/30-□D
<Port location: Side ported>



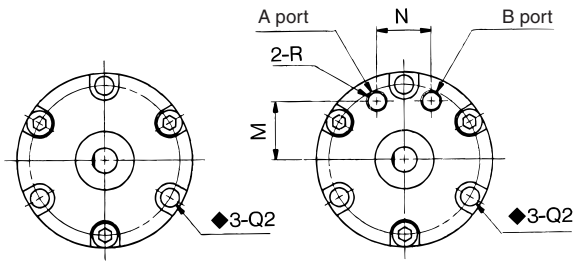




CRB2BW10-□DE
<Port location: Axial ported>



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

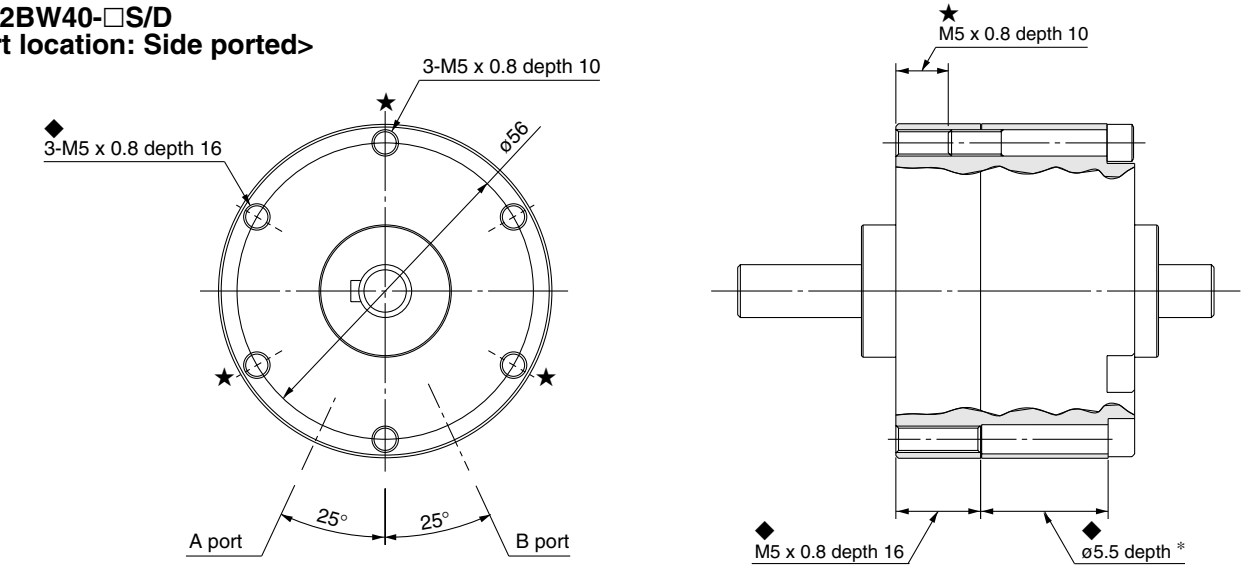


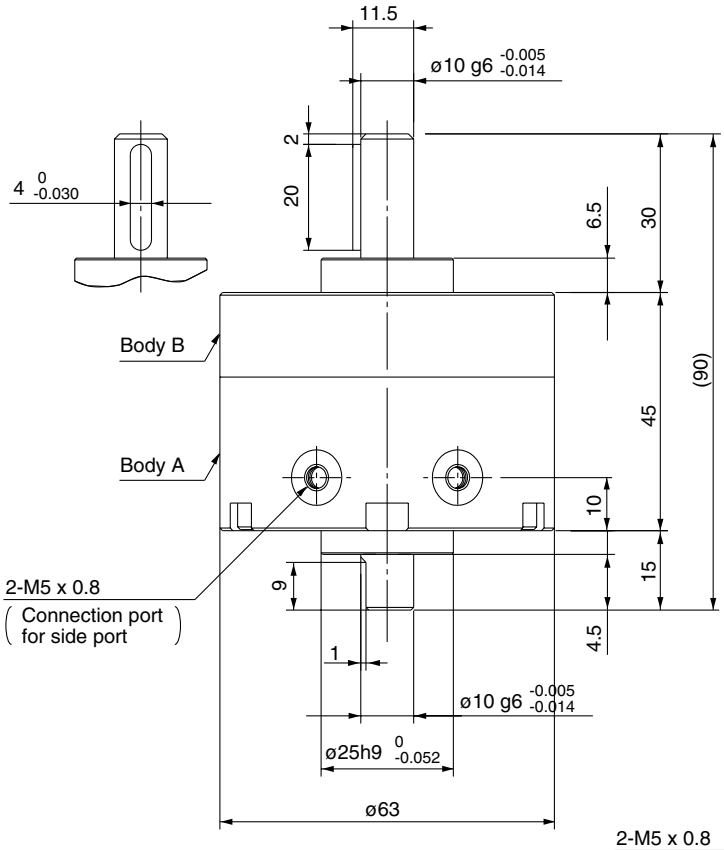
(mm)

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>



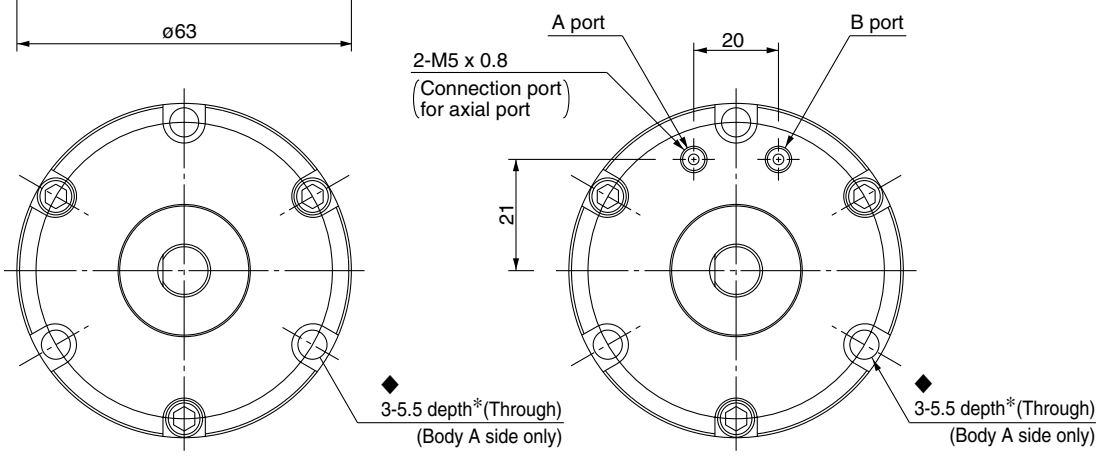


(mm)

Keyway dimensions	ℓ	h	b

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

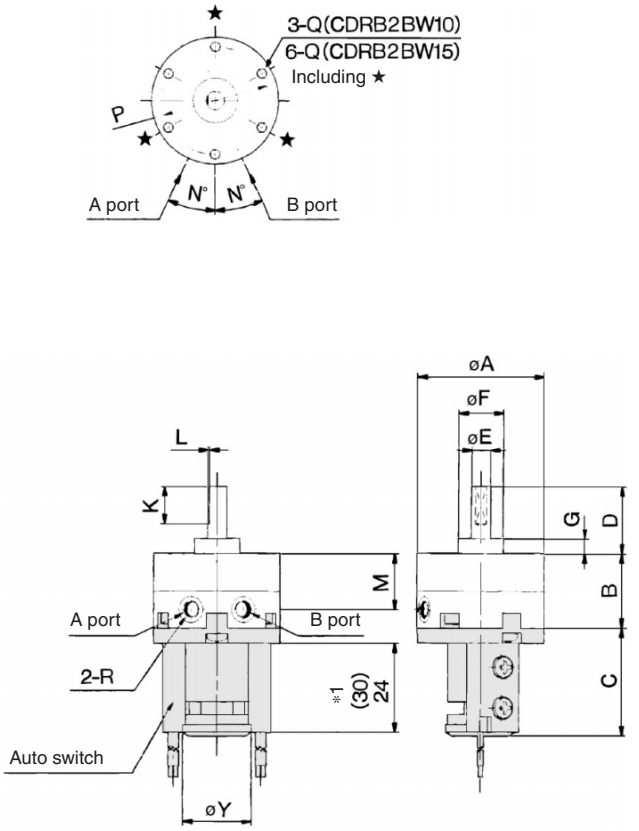
CRB2BW40-□SE/DE
<Port location: Axial ported>

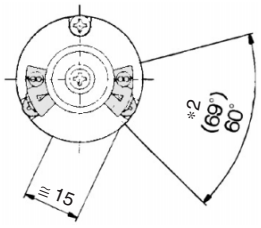


Dimensions: 10, 15, 20, 30 (With auto switch unit)

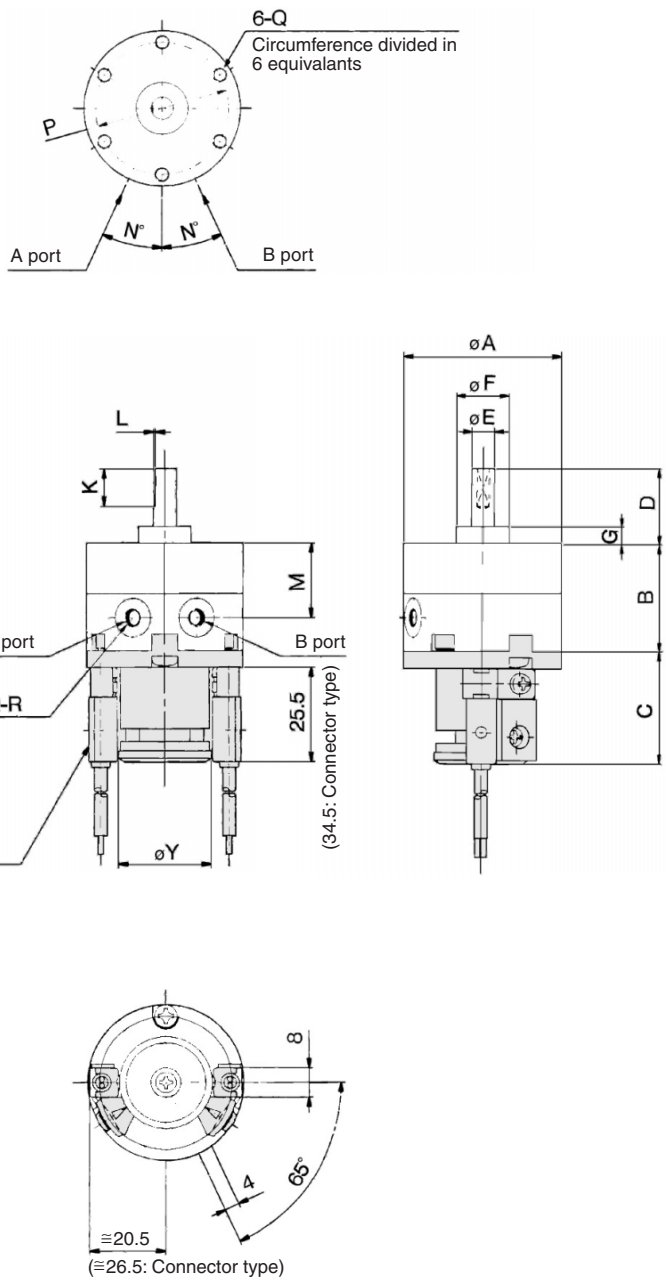
Single vane type ● Following illustrations show actuators for 90° and 180° when B port is pressurized.

CDRB2BW10/15-□S





CDRB2BW20/30-□S



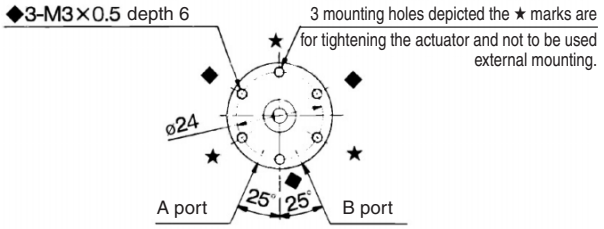
∗ 1 The length is 24 when any of the following auto switches are used: D-90, D-90A, D-S99(V), D-T99(V), and D-S9P(V)
The length is 30 when any of the following auto switches are used: D-97 and D-93A
∗ 2 The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A.
The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

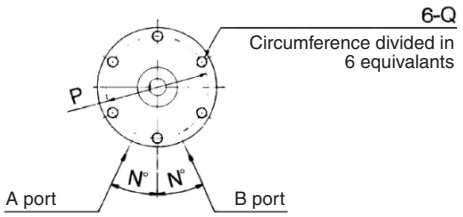
Double vane type ● Illustrations below show the intermediate rotation position when A or B port is pressurized.

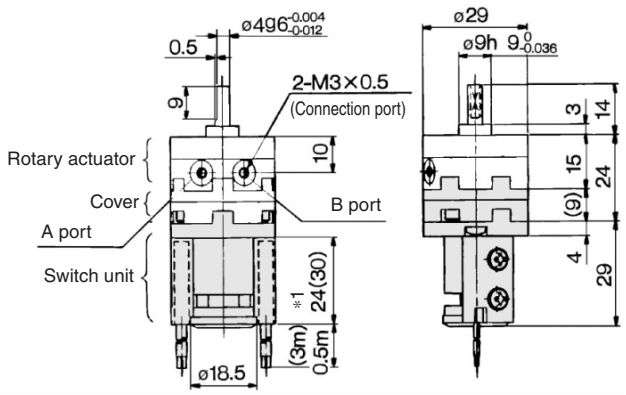
CDRB2BW10-□D

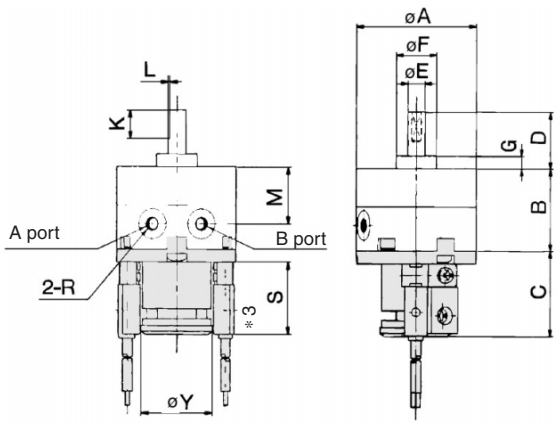


CDRB2BW15/20/30-□D

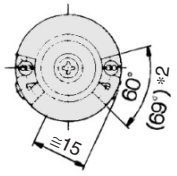
(Dimensions are the same as the single vane type.)

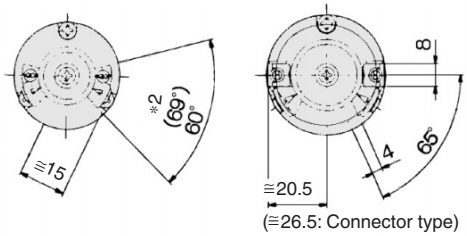






CDRB2BW15-□D CDRB2BW20/30-□D





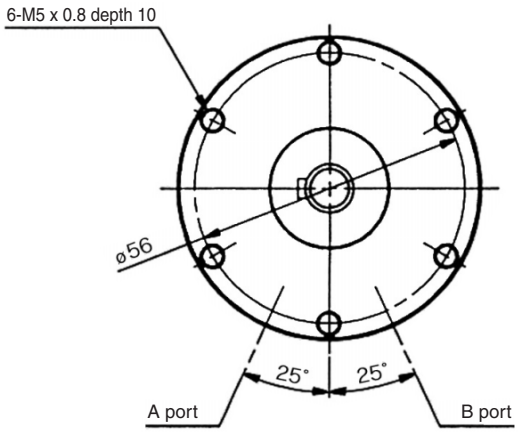
∗ 1 The length is 24 when any of the following auto switches are used: D-90, D-90A, D-S99(V), D-T99(V), and D-S9P(V)
The length is 30 when any of the following auto switches are used: D-97 and D-93A
∗ 2 The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A
The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

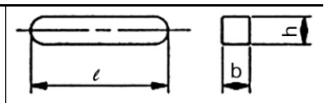
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M	N	P	Q	R		S		Y
														90°	100°			
CDRB2BW15-□D	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 x 0.5 depth 5	M3 x 0.5		24*1	30*1	18.5
CDRB2BW20-□D	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 x 0.7 depth 7	M5 x 0.8		25.5*3	34.5*3	25
CDRB2BW30-□D	50	40	31	22	8	16	5	12	1	30	25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

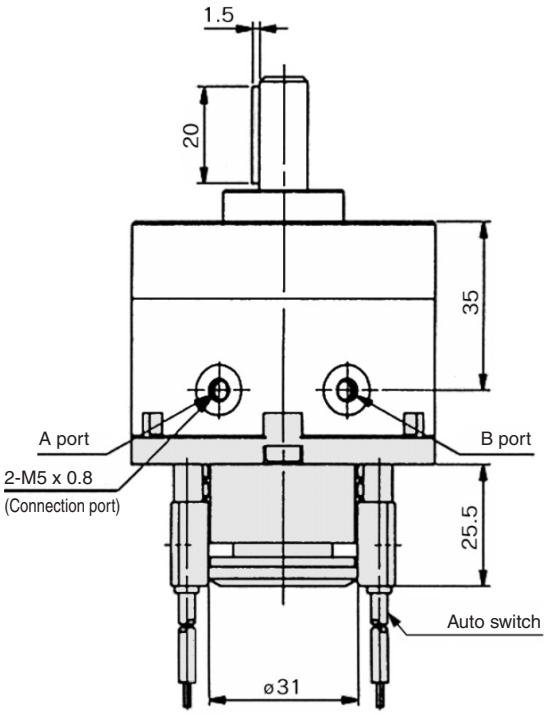
Dimensions: 40 (With auto switch unit)

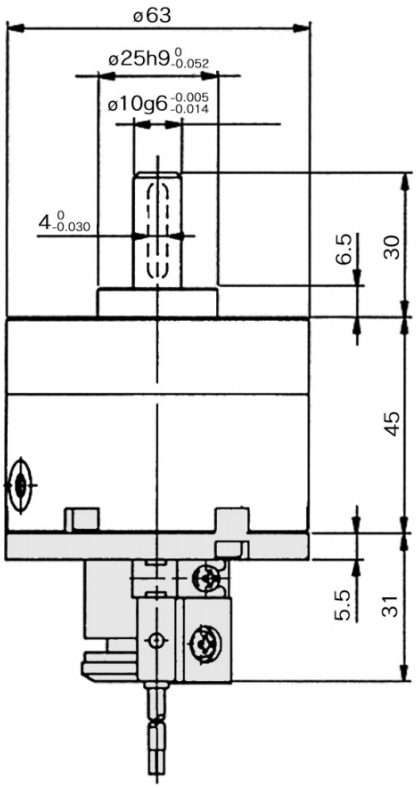
Single vane type/Double vane type
CDRB2BW40-□S/D

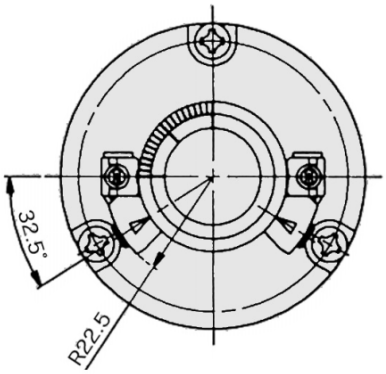


(mm)

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

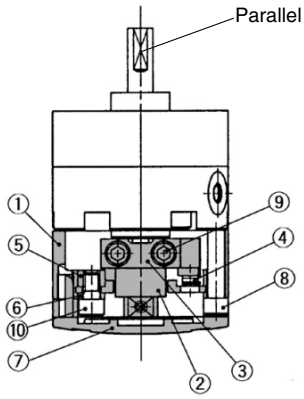
Applicabie Auto Switch/Refer to page 11-1-1 for further information on auto switches.

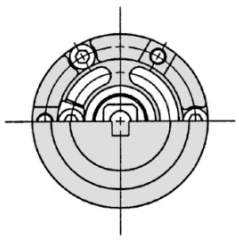
Applicable size	Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model	Lead wire type	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
For 10 and 15	Reed switch	Grommet	No	2-wire	24 V	5 V, 12 V	24 V or less	90	Parallel cord	●	●	●	—	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

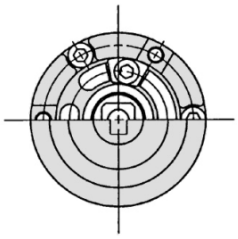
Construction (Same switch units are used for both single and double vane type.)

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



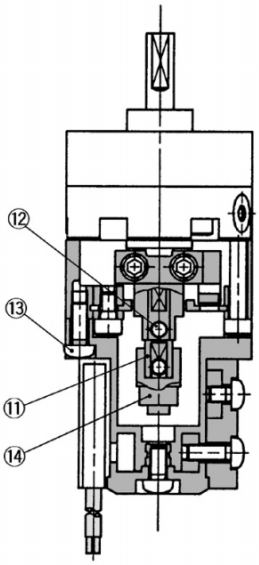


Single vane

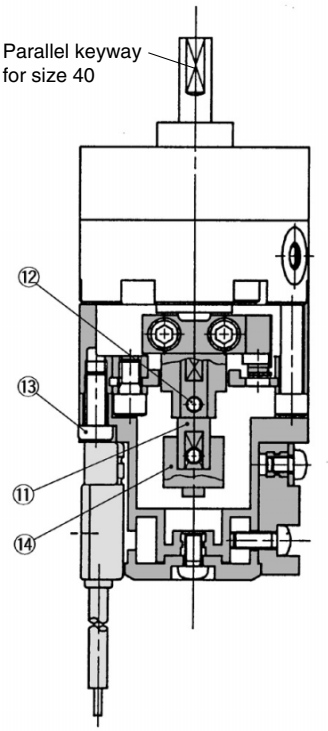


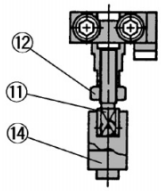
Double vane

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.

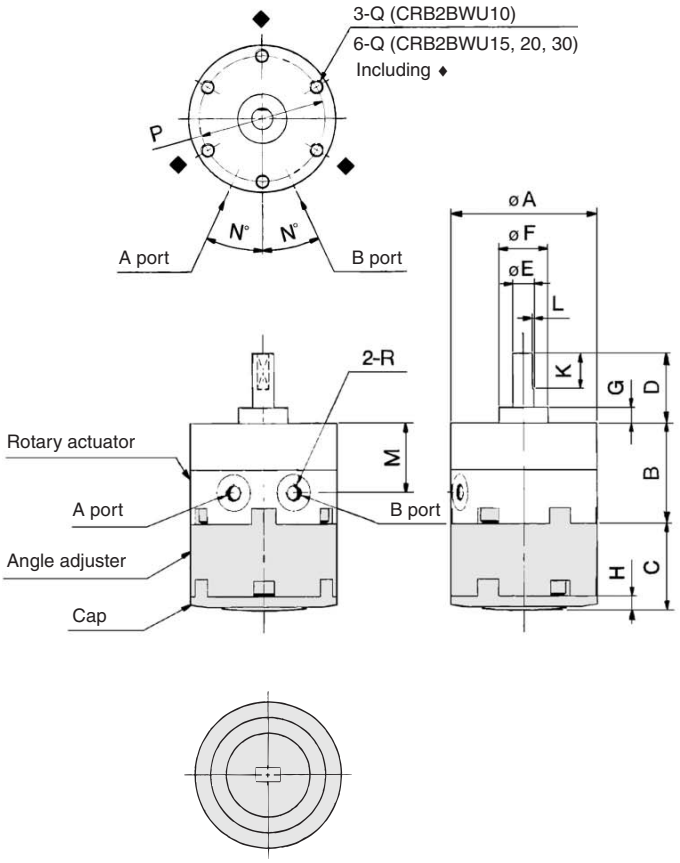
Dimensions: 10, 15, 20, 30 (With angle adjuster)

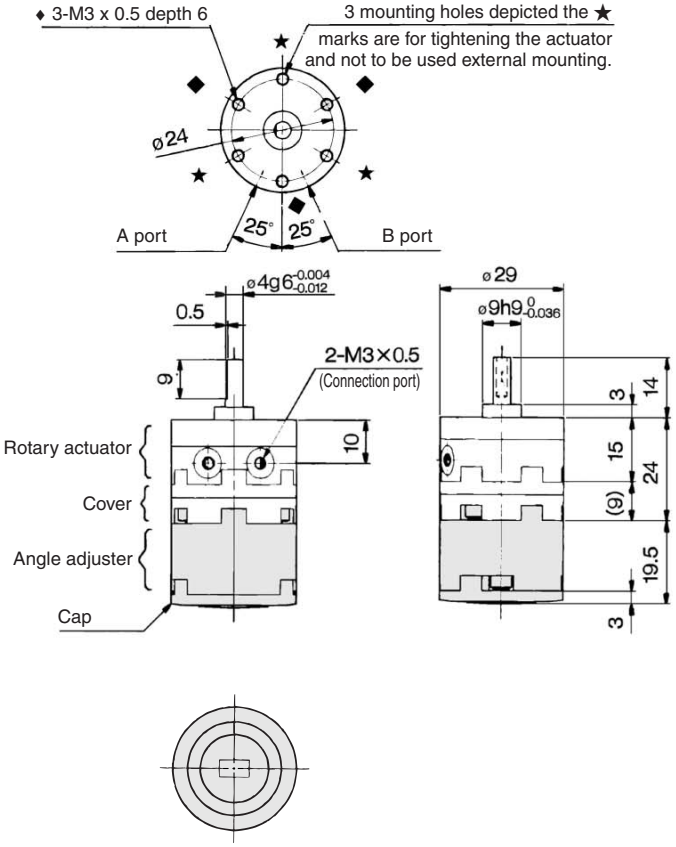
Single vane type
CRB2BWU10/15/20/30-□S

• 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.

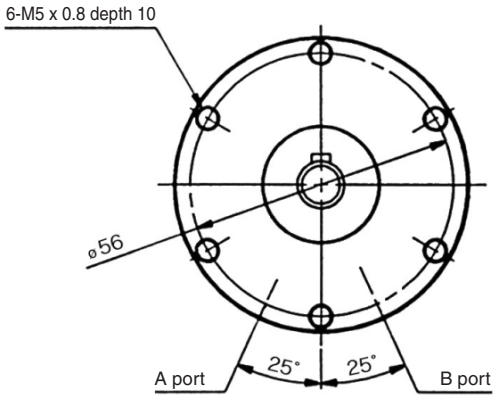
(mm)

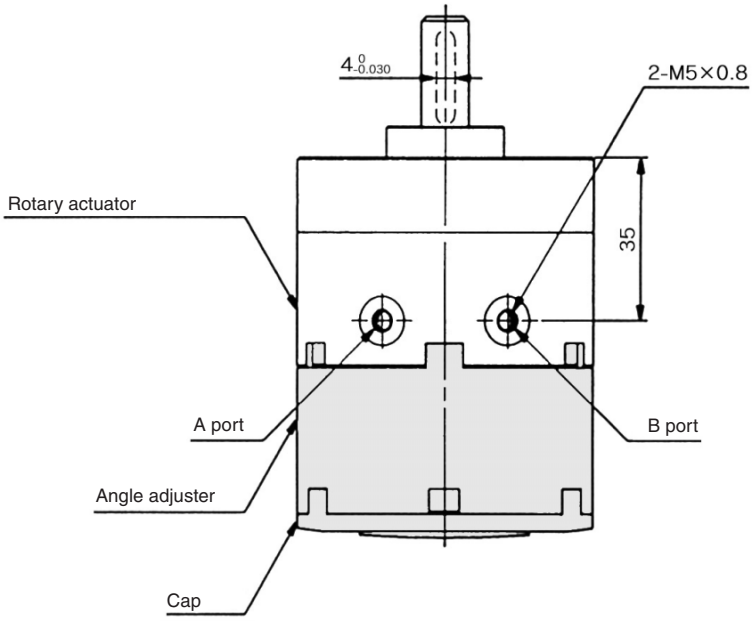
Model	A	B	C	D	E (g6)	F (h9)	G	H	K	L	M	N	P	Q
CRB2BWU10-□S	29	15	19.5	14	4	9	3	3	9	0.5	10	25	24	M3 x 0.5 depth 5
CRB2BWU15-□S	34	20	21.2	18	5	12	4	3.2	10	0.5	15	25	29	M3 x 0.5 depth 5
CRB2BWU15-□D														
CRB2BWU20-□S	42	29	25	20	6	14	4.5	4	10	0.5	20	25	36	M4 x 0.7 depth 7
CRB2BWU20-□D										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

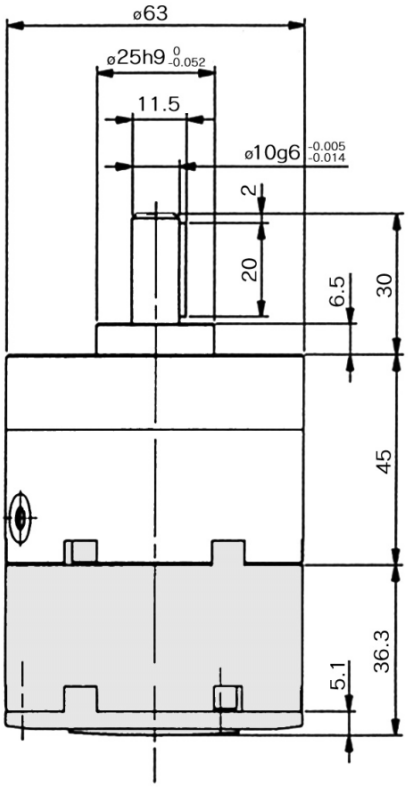
Model	R			
	90°	100°	180°	270°
CRB2BWU10-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU10-□D	∗Refer to the drawing.		—	
CRB2BWU15-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU15-□D	M3 x 0.5		—	
CRB2BWU20-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU20-□D	M5 x 0.8		—	
CRB2BWU30-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU30-□D	M5 x 0.8		—	

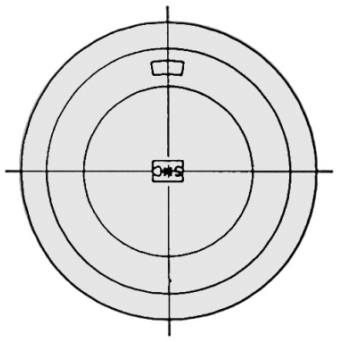
Dimensions: 40 (With angle adjuster)

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









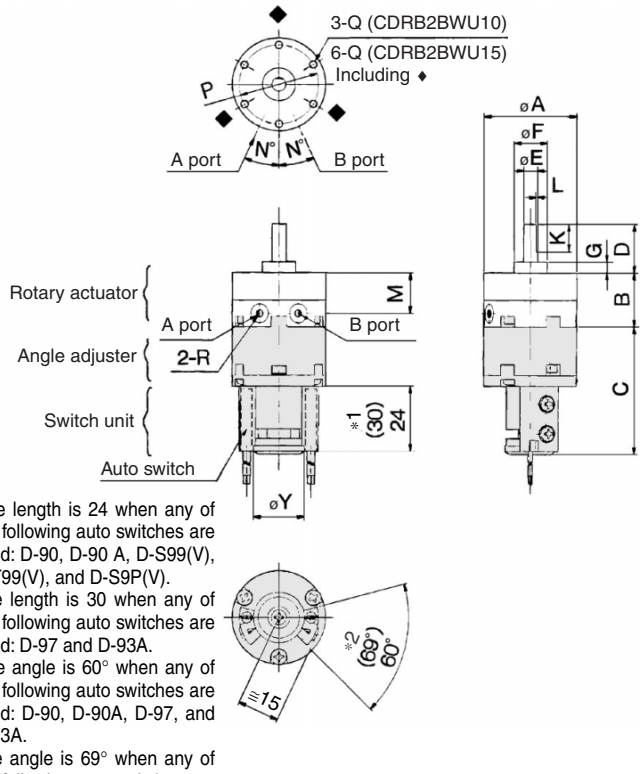
(mm)

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.

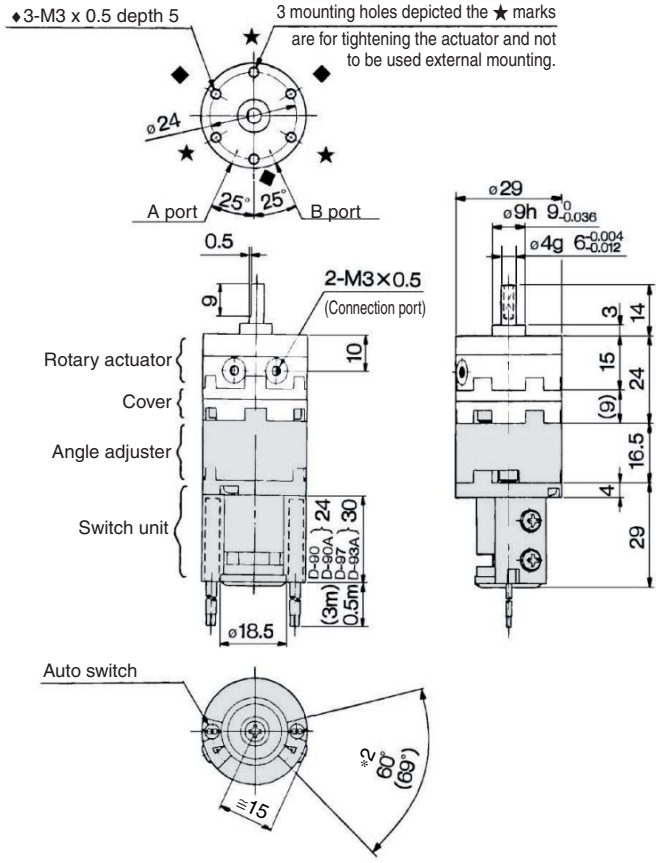


∗ 1. The length is 24 when any of the following auto switches are used: D-90, D-90 A, D-S99(V), D-T99(V), and D-S9P(V).
The length is 30 when any of the following auto switches are used: D-97 and D-93A.

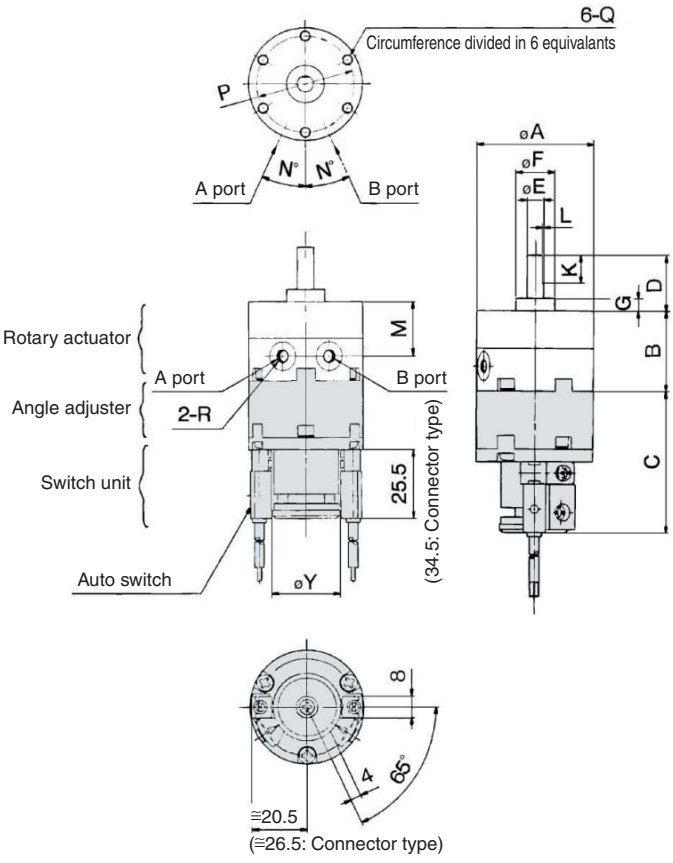
∗ 2. The angle is 60° when any of the following auto switches are used: D-90, D-90A, D-97, and D-93A.
The angle is 69° when any of the following auto switches are used: D-S99(V), D-T99(V), and D-S9P(V).

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)

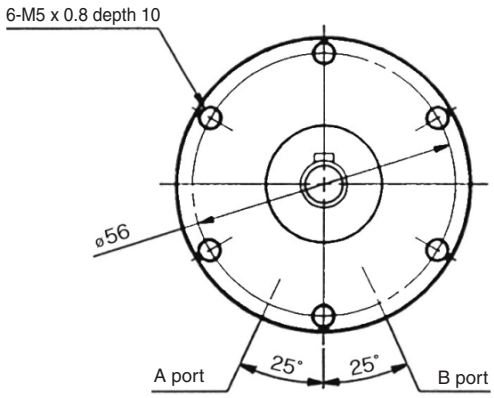
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M
CDRB2BWU10-□S	29	15	45.5	14	4	9	3	9	0.5	10
CDRB2BWU15-□S	34	20	47	18	5	12	4	10	0.5	15
CDRB2BWU15-□D										
CDRB2BWU20-□S	42	29	51	20	6	14	4.5	10	0.5	20
CDRB2BWU20-□D										
CDRB2BWU30-□S	50	40	55.5	22	8	16	5	12	1	30
CDRB2BWU30-□D										

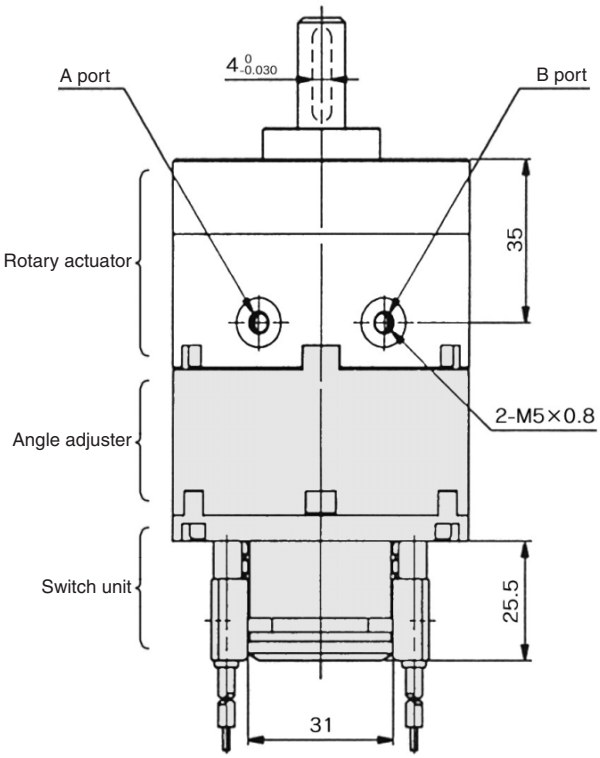
Model	N	P	Y	Q	R			
					90°	100°	180°	270°
CDRB2BWU10-□S	25	24	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
CDRB2BWU10-□D					∗ Refer to the drawing.		—	
CDRB2BWU15-□S	25	29	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
CDRB2BWU15-□D					M3 x 0.5		—	
CDRB2BWU20-□S	25	36	25	M4 x 0.7 depth 7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

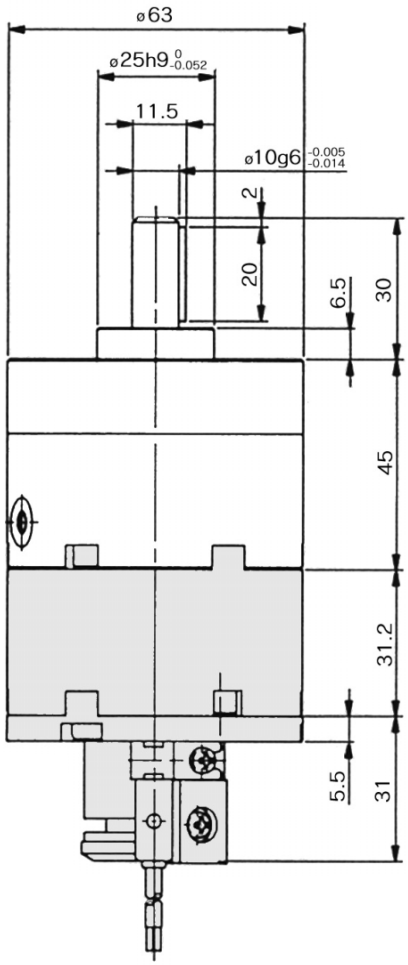
Note) • For rotary actuators with angle adjuster and auto switch unit, connection ports are side ports only.
• The above exterior view drawings illustrate the rotary actuator equipped with one right-hand and one left-hand switch.

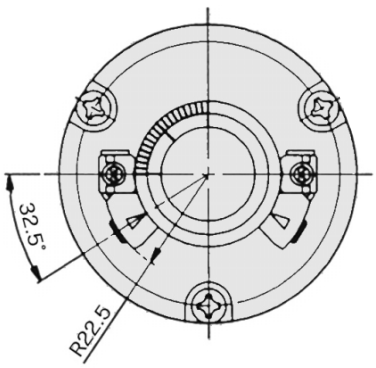
Dimensions: 40 (With angle adjuster and auto switch unit)

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

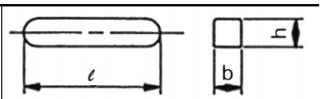








(mm)

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

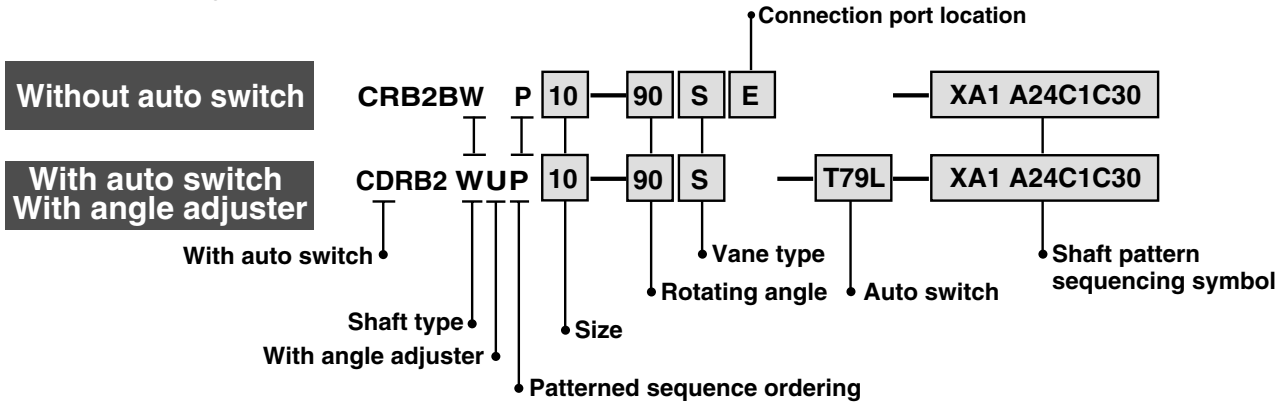
Series CRB2 (Size: 10, 15, 20, 30, 40)

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		●

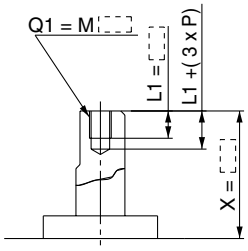
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.
A total of four XA□ and XC□ combinations is available.
Example: -XA1A24C1C30
-XA2C1C4C30

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



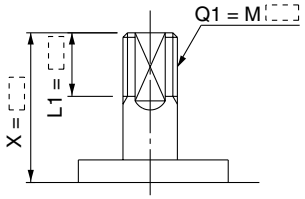
(mm)

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



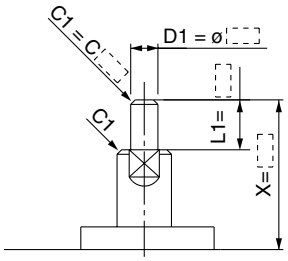
(mm)

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.)



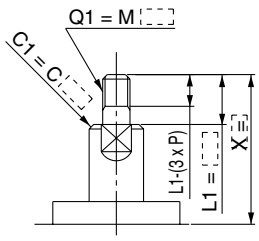
(mm)

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)

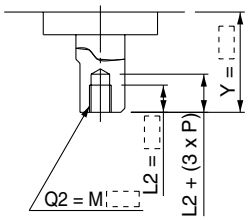
Size	X	L1 max	Q1
10	7.5 to 14	X – 3	M3
15	10 to 18	X – 4	M3, M4
20	12 to 20	X – 4.5	M3, M4, M5
30	14 to 22	X – 5	M3, M4, M5, M6

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



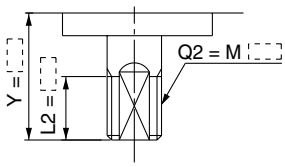
(mm)

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



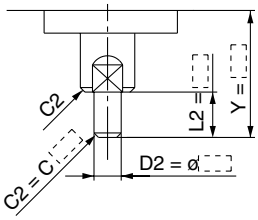
(mm)

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.)



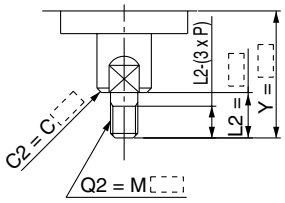
(mm)

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.)



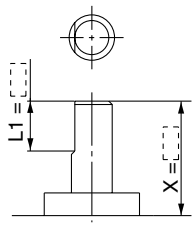
(mm)

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

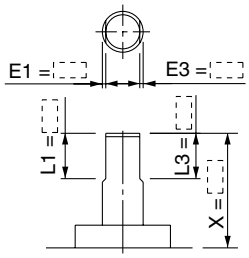


(mm)

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

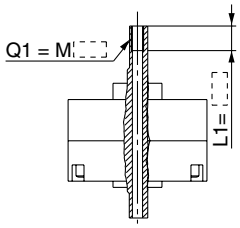


(mm)

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

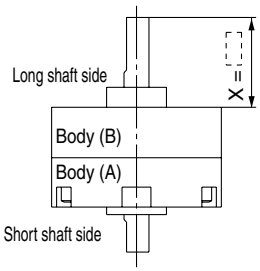
A special end is machined onto the long shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For 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



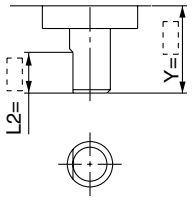
(mm)

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.)

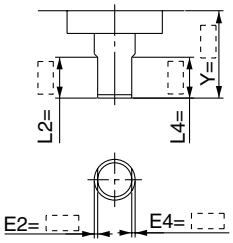


(mm)

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

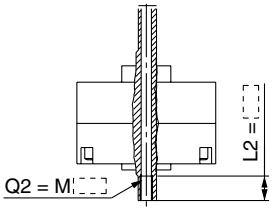


(mm)

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

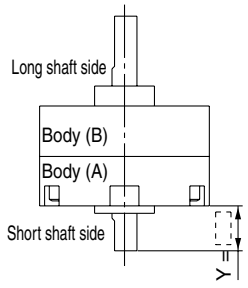
A special end is machined onto the short shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.
- A parallel keyway is used on the long shaft for size 40.
- Not available for size 10.
- The maximum dimension 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



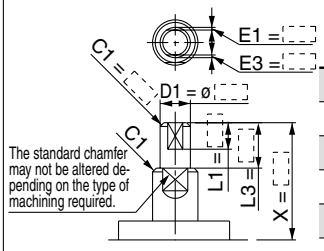
(mm)

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.)



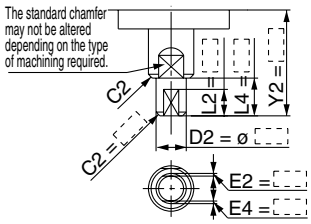
(mm)

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.)



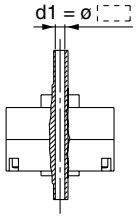
(mm)

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

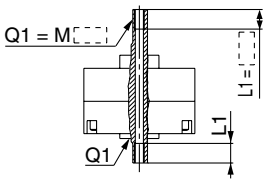


(mm)

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

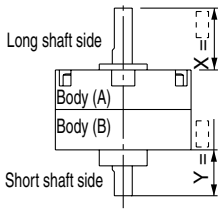
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice 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

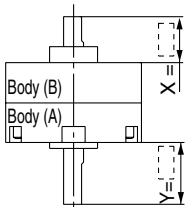


(mm)

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

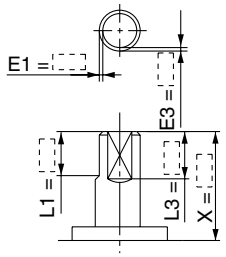


(mm)

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

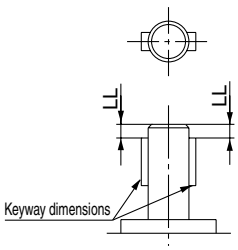


(mm)

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

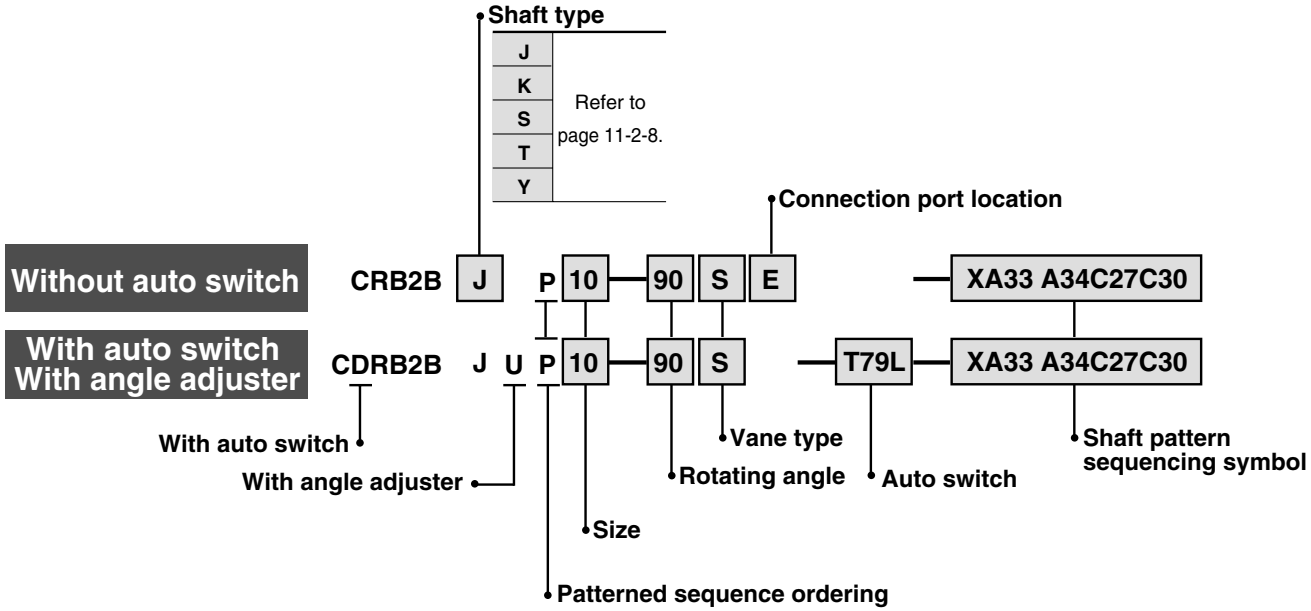
Series CRB2 (Size: 10, 15, 20, 30, 40)

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		●

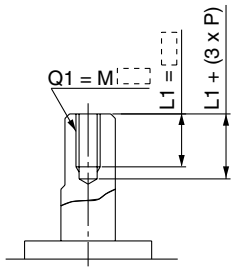
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.
A total of four XA□ and XC□ combinations is available.
Example: -XA33A34C27C3C

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



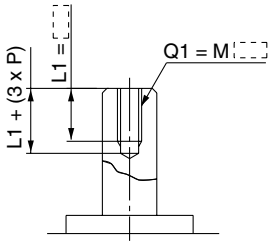
(mm)

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)

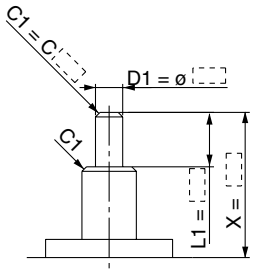
Size \ Shaft type	Q1		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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)

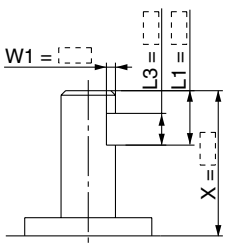
Size	X	L1 max	D1
10	4 to 14	X – 3	ø3 to ø3.9
15	5 to 18	X – 4	ø3 to ø3.9
20	6 to 20	X – 4.5	ø3 to ø5.9
30	6 to 22	X – 5	ø3 to ø7.9
40	8 to 30	X – 6.5	ø3 to ø9.9

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)

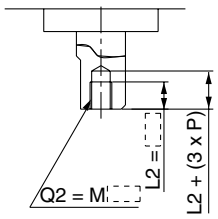
Size \ Shaft type	X			W1			L1 max			L3 max		
	J	K	T	J	K	T	J	K	T	J	K	T
10	6.5 to 14			0.5 to 2			X – 3			L1-1		
15	8 to 18			0.5 to 2.5			X – 4			L1-1		
20	9 to 20			0.5 to 3			X – 4.5			L1-1		
30	11.5 to 22			0.5 to 4			X – 5			L1-2		
40	15.5 to 30			0.5 to 5			X – 5.5			L1-2		

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



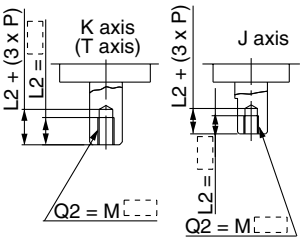
(mm)

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)

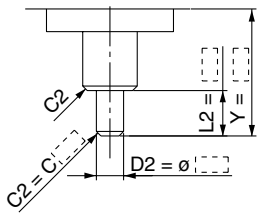
Size \ Shaft type	Q2		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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)

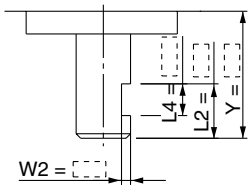
Size	Y	L2 max	Q2
10	2 to 14	Y – 1	ø3 to ø3.9
15	3 to 18	Y – 1.5	ø3 to ø4.9
20	3 to 20	Y – 1.5	ø3 to ø5.9
30	3 to 22	Y – 2	ø3 to ø7.9
40	6 to 30	Y – 4.5	ø5 to ø9.9

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



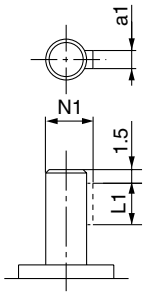
(mm)

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)

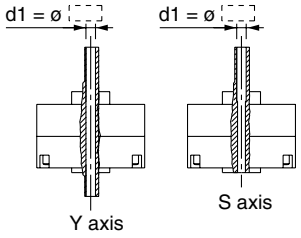
Size	a1	L1	N1
20	$2h9\,{}^{0}_{-0.025}$	10	6.8
30	$3h9\,{}^{0}_{-0.025}$	14	9.2

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.



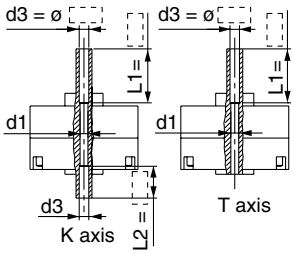
(mm)

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.



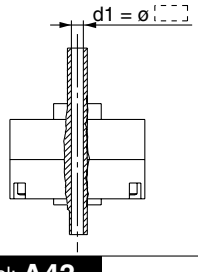
(mm)

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.



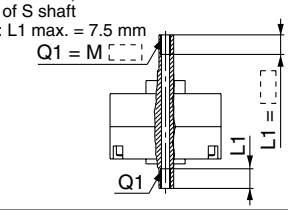
(mm)

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.



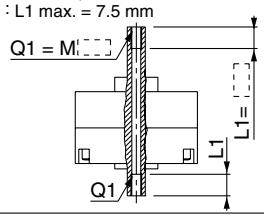
(mm)

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.



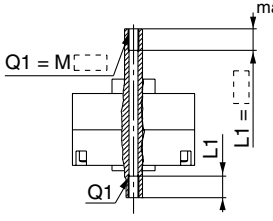
(mm)

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.

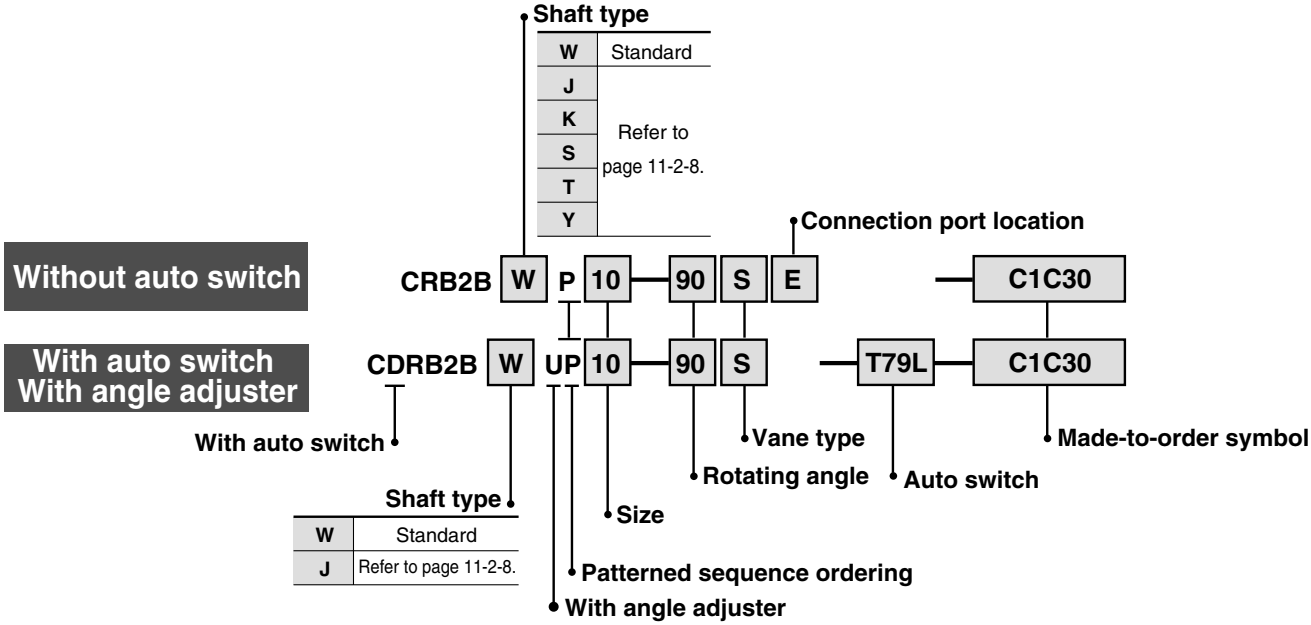
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



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.

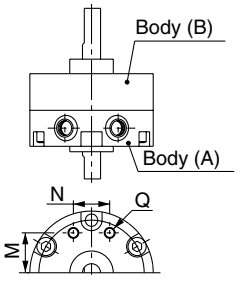
Combination

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.



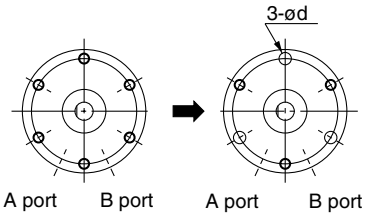
(mm)

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.

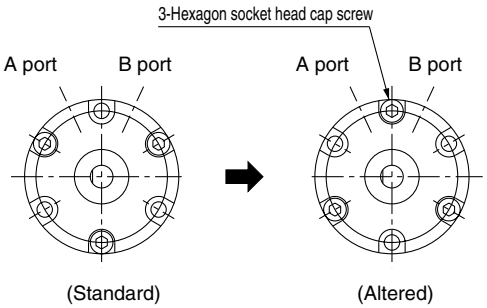


(mm)

Size	d
15	3.4
20	4.5
30	5.5
40	5.5

(Top view from long shaft side)

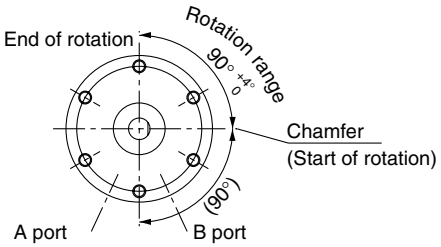
Symbol: C3 Change the position of the screws for tightening the actuator body.



(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 $^{+5°}_{0}$.
- A parallel keyway is used instead of chamfer for size 40.

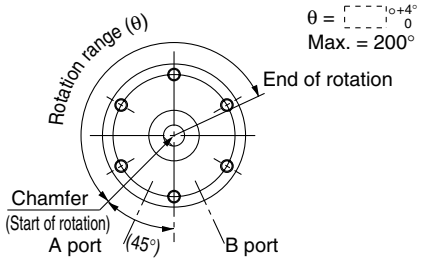


Start of rotation is the position of the chamfer (keyway) when A port is pressurized.

(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 $^{+5°}_{0}$.
- Port size for CRB2BW10, 15 is M3.
- A parallel keyway is used instead of chamfer for size 40.

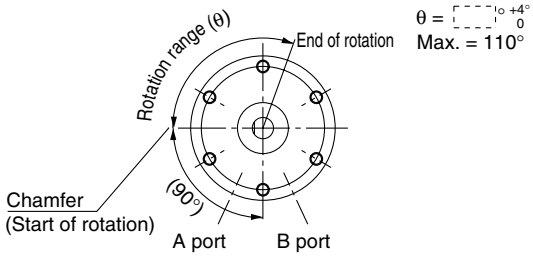


Start of rotation is the position of the chamfer (keyway) when B port is pressurized.

(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 $^{+5°}_{0}$.
- A parallel keyway is used instead of chamfer for size 40.

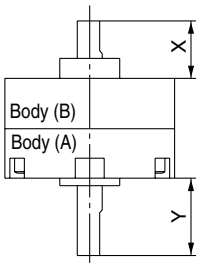


Start of rotation is the position of the chamfer (keyway) when B port is pressurized.

(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.)

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ **Caution :** Operator error could result in injury or equipment damage.

⚠ **Warning :** Operator error could result in serious injury or loss of life.

⚠ **Danger :** In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Common Precautions

Be sure to read before handling.
For detailed precautions on every series, refer to main text.

Selection

⚠ Warning

1. Confirm the specifications.

Products represented in this catalog are designed for use in compressed air appllications only (including vacuum), unless otherwise indicated.
Do not use the product outside their design parameters.
Please contact SMC when using the products in applications other than compressed air (including vacuum).

Mounting

⚠ Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Securing the space for maintenance

When installing the products, please allow access for maintenance.

3. Tightening torque

When installing the products, please follow the listed torque specifications.

Piping

⚠ Caution

1. Before piping

Make sure that all debris, cutting oil, dust, etc, are removed from the piping.

2. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

⚠ Warning

1. Operating fluid

Please consult with SMC when using the product in applications other than compressed air (including vacuum).
Regarding products for general fluid, please ask SMC about applicable fluids.

2. Install an air dryer, aftercooler, etc.

Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
Installation of an air dryer, after cooler etc. is recommended.

3. Drain flushing

If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
For compressed air quality, refer to “Air Preparation Equipment” catalog.

4. Use clean air

If the compressed air supply is contaminated with chemicals, cynthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

⚠ Warning

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.

2. Do not expose the product to direct sunlight for an extended period of time.

3. Do not use in a place subject to heavy vibrations and/or shocks.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠ Warning

1. Maintenance procedures are outlined in the operation manual.

Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

2. Maintenance work

If handled improperly, compressed air can be dangerous.
Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

3. Drain flushing

Remove drainage from air filters regularly. (Refer to the specifications.)

4. Shut-down before maintenance

Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.

5. Start-up after maintenance and inspection

Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.

6. Do not make any modifications to be product.

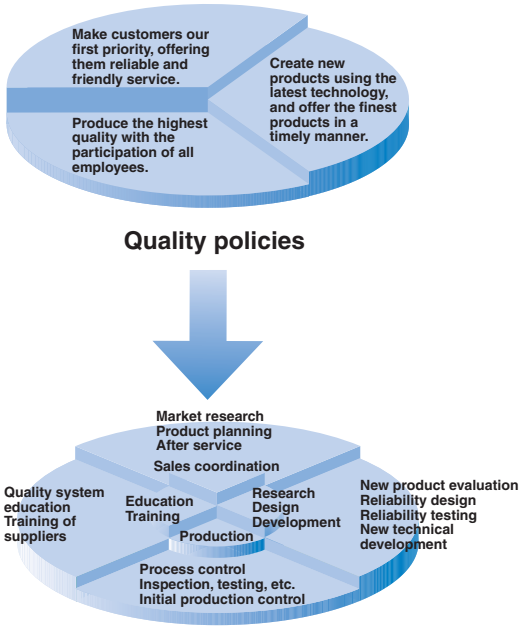
Do not take the product apart.

Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

SMC’s quality control system



Quality management system

ISO 9001

This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.



Environmental management system

ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.



SMC Product Conforming to Inter

SMC products complying with EN/ISO, CSA/UL standards are supporting

CE Mark

The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied.
It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU.
Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

■ CE Mark

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

■ As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

■ EC Directives and Pneumatic Components

• Machinery Directive

The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

• Electromagnetic Compatibility (EMC) Directive

The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

• Low Voltage Directive

This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

• Simple Pressure Vessels Directive

This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.

national Standards

you to comply with EC directives and CSA/UL standards.

■ CSA Standards & UL Standards

UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question.
Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

■ TSSA (MCCR) Registration Products

TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

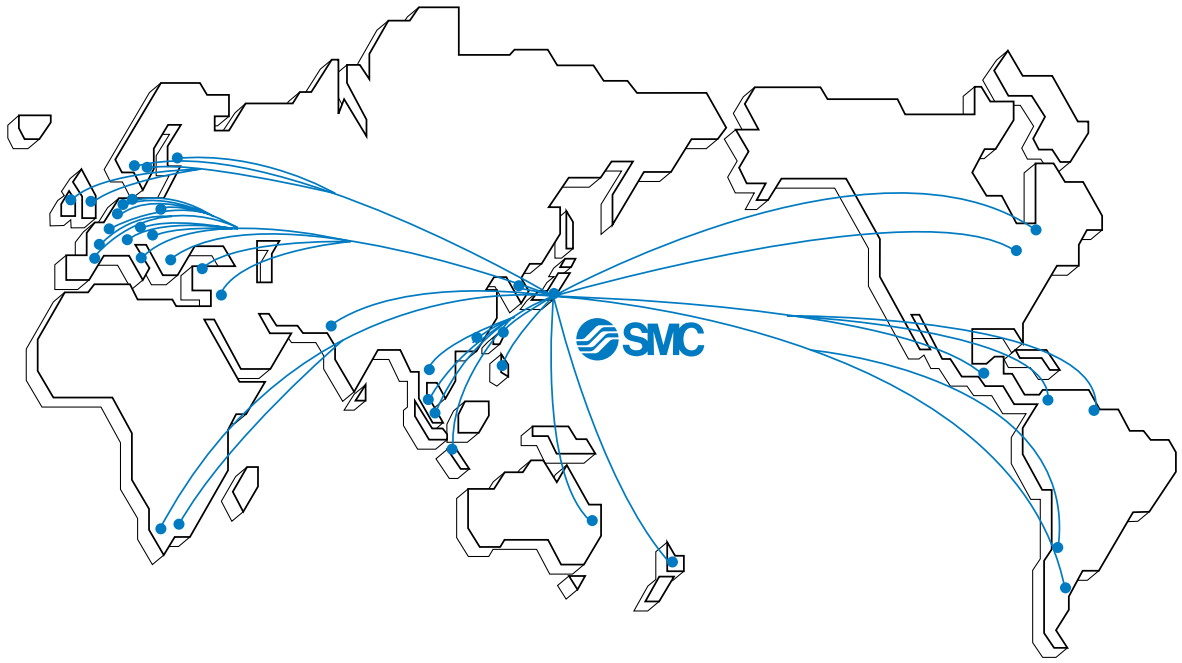
Products conforming to CE Standard

With CE symbol for simple visual recognition

In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

http://www.smcworld.com

SMC's Global Service Network



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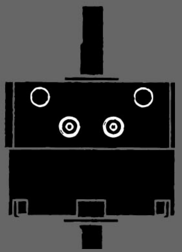


Rotary Actuator
Free Mount Style
Series CRBU (Size: 10/15/20/30)

Direct mounting in three directions (Axial, Vertical, & Side) is possible.

Variations

				10				15				20, 30				Pages
Fluid				Air												
Size				10				15				20, 30				
Vane Style		S: Single vane D: Double vane		Single vane (S)		Double vane (D)		Single vane (S)		Double vane (D)		Single vane (S)		Double vane (D)		
Port Location		Body side (–) Body axial direction (E)		Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	Body side	Axial direction	
Standard	Rotation angle	90°		●	●	●	●	●	●	●	●	●	●	●	●	1.2-4 to 1.2-18
Standard	Rotation angle	100°				●	●			●	●			●	●	
Standard	Rotation angle	180°		●	●			●	●			●	●			
Standard	Rotation angle	270°		●	●			●	●			●	●			
Standard	Shaft style	Double shaft	W	●	●	●	●	●	●	●	●	●	●	●	●	
Standard	Cushion	Rubber bumper						●	●	●	●	●	●	●	●	
Standard	Variations	Basic style		●	●	●	●	●	●	●	●	●	●	●	●	
Standard	Variations	With auto switch		●		●		●		●		●		●		
Standard	Variations	With angle adjuster		●		●		●		●		●		●		
Standard	Variations	With auto switch and angle adjuster		●		●		●		●		●		●		
Standard	Variations	Built-in One-touch fittings										●				
Standard	Variations	Copper free	20-	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Shaft style / Double shaft	Long shaft without one chamfer and short shaft with one chamfer	J	●	●	●	●	●	●	●	●	●	●	●	●	1.2-19 to 1.2-27
Made to order	Shaft style / Double shaft	Double long shaft, same size, one chamfer to both ends	Y	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Shaft style / Double shaft	Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Shaft style / Single shaft	One chamfer	S	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Shaft style / Single shaft	One round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Patterns	Shaft patterns		●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Patterns	Rotation angle patterns		●	●			●	●			●	●			

Rotary Actuator Vane Style/Free Mount Style

Series CRBU/Size: 10, 15, 20, 30

Rotation angles: 90°, 80°, 270° Up to 270° is possible in the entire series

Through the adoption of specially designed seals and stoppers, a rotation angle of 270° has been achieved for the first time in a compact vane style actuator.
(Single vane style)

Stainless steel shafts and bolts

(Carbon steel for size 30 and the double vane style)

High reliability and long life

To support thrust and radial loads, bearings are used throughout the series. In addition, rubber bumpers are used internally (except size 10) to further improve reliability.

Low pressure operation made possible

The special sealing construction that has been adopted in the body supports a wide operating pressure range and enable the entire series to be used at low pressures.
Min. operating pressure

- Size 10 ·····0.2 MPa
  Size 15, 20, 30 ·····0.15MPa

Double vane style standard: 90°, 100°

The outside diameter is identical to the single vane construction (except size 10); however, due to the double vane construction, twice the torque of the single vane style can be obtained.

Unrestricted auto switch mounting positions

Because the switch can be moved anywhere along the circumstance, it can be mounted in a position that is most appropriate for the specifications.

Port positions: body side and axial direction

The positions can be selected for ease of use. (Those that are equipped with various styles of units can only be connected to the body side.)

(On the body side)

(Fittings are sold separately.)

(In the axial direction)

(Fittings are sold separately.)

Mountable without a flange even when equipped with a unit.

Block-built (units) adopted

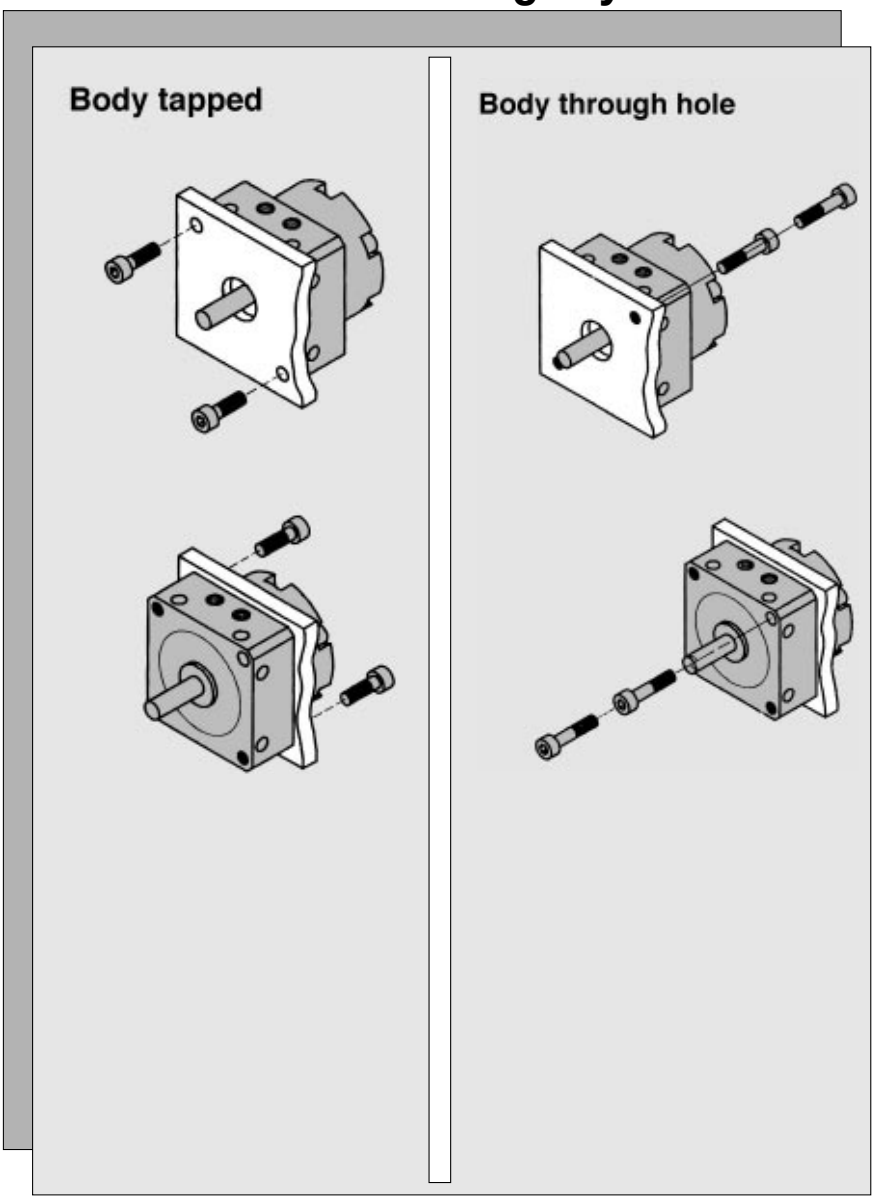
Various styles of units that can be housed within the body's outside diameter can easily be retrofitted to the rotary actuator units of the entire series.

Basic style + Switch unit	Basic style + Angle adjusting unit	Basic style + Angle adjusting unit + Switch unit
		

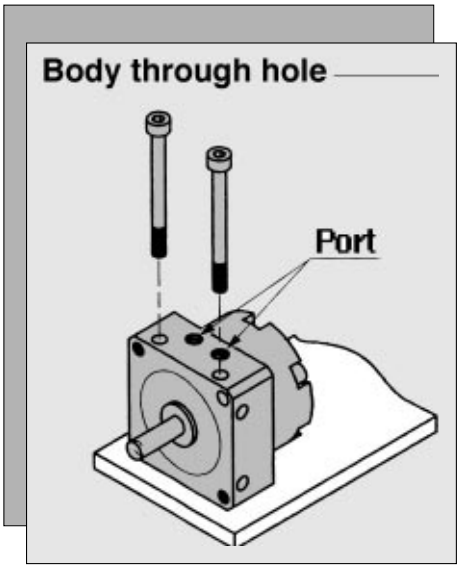
Direct Mounting In Three Directions Possible

Mounting in three directions, axial, vertical and side, is possible.
Three mounting variations are available in mounting in axial direction.

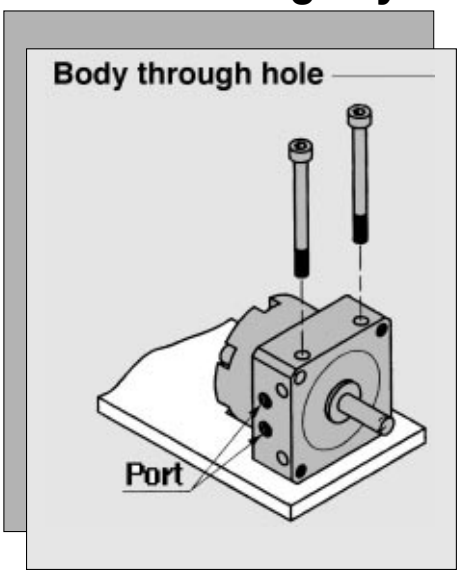
Axial Direction Mounting Style



Vertical Mounting Style

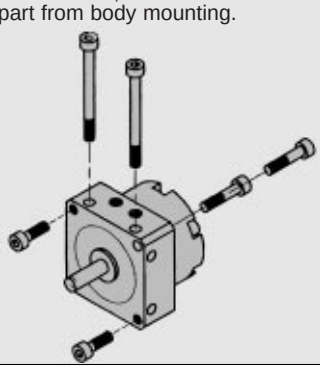


Side Mounting Style



Round Indication Board Adopted

Simultaneous mounting in three directions is possible. Therefore, it can be utilized in other ways apart from body mounting.



Indication board mounted axially sets the rotation range about the axis (one chamfering processed part) clear, and the indication of connecting port (A/B port) locations prevents wrong wiring.

*The above is an indication board of a single vane style.

Rotary Actuator
Free Mount Style

Series CRBU (Size: 10/15/20/30)

How to Order

Standard CRBU W 10 — 180 S E

Free mount

Size

10
15
20
30

Connecting port location

—	Body side
E	Axis direction

Vane type

S	Single vane
D	Double vane

Angle of rotation

Application	Symbol	Angle of rotation
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

Connecting port locations

Body side (Fittings should be ordered seperately.)

Axis direction

With Auto Switch Size 10/15

CDRB UW 10 — 180 S — 90 L

With Auto Switch Size 20/30

CDRB UW 20 — 180 S — R73 L

With auto switch (With switching unit)

Free mount

Size

10
15

Size

20
30

Angle of rotation

Application	Symbol	Angle of rotation
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

Vane Style

S	Single vane
D	Double vane

Auto switch

—	Without auto switch

∗ Refer to the table below for selection of applicable auto switch.

No. of auto switches

S	1∗
—	2

∗ The one auto switch attached with order symbol "S" is right hand operating type.

Electrical entry and length

—	Grommet, Lead wire: 0.5m
L	Grommet, Lead wire: 3m
C	Connector, Lead wire: 0.5m
CL	Connector, Lead wire: 3m
CN	Connector, Without wires

∗ Connector type is applicable only to "R73", "R80" and "T79".

∗ ∗ Part nos. of lead wire with connector
D-LC05: Lead wire 0.5m
D-LC30: Lead wire 3m
D-LC50: Lead wire 5m

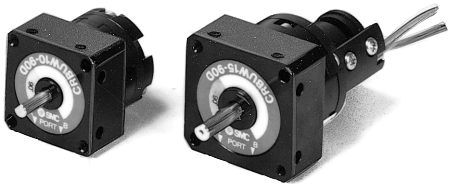
Auto switch specifications/ Refer to p.2.11-1 for further information on auto switch single unit.

Applicable size	Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch part no.	Lead wire	Lead wire length∗ (m) 0.5 (—)	3 (L)	5 (Z)	— (N)	Applicable loading	
For 10/15	Reed switch	Grommet	No	2 wire	5V, 12V	5V, 12V,24V	90	Parallel cord	●	●	●	—	IC	Relay PLC
					5V, 12V, 100V	5V, 12V,24V, 100V	90A	Cab tire	●	●	●	—		
			Yes		—	—	97	Parallel cord	●	●	●	—	—	
						100V	93A	Cab tire	●	●	●	—		
	Solid state switch				12V	—	T99		●	●	—	—		
							T99V		●	●	—	—		
				3 wire (NPN)	5V, 12V		S99		●	●	—	—	IC	
							S99V		●	●	—	—		
				3 wire (PNP)			S9P		●	●	—	—		
							S9PV		●	●	—	—		
For 20/30	Reed switch	Grommet	Yes	2 wire	—	100V	R73	Cab tire	●	●	—	—	—	Relay PLC
		Connector					R73C		●	●	●	●		
		Grommet	No		48V, 100V	24V, 48V, 100V	R80		●	●	—	—	IC	
		Connector					R80C		●	●	●	●		
	Solid state switch	Grommet	Yes		12V	—	T79		●	●	—	—	—	
		Connector					T79C		●	●	●	●		
		Grommet		3 wire (NPN)	5V, 12V		S79		●	●	—	—	IC	
				3 wire (PNP)			S7P		●	●	—	—		

∗ Symbols for lead wire length 0.5m: — Ex.) R73C
3m: L Ex.) R73CL
5m: Z Ex.) R73CZ
—: N Ex.) R73CN

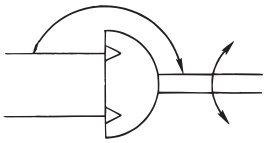
- Operating time — 1.2ms
- Operating temperature range — -10° to 60°C
- Shock resistance — 300m/s^2 {30, 6G} (Reed switch), 1000m/s^2 {102G} (Solid state switch)

Single vane type



Double vane type

JIS symbol



Order Made P.1.2-19 to P1.2-23

⚠Caution

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instructions and common precautions on the products mentioned in this catalog, and refer to p.1.0-2 to 1.0-4 for precautions for every series.

Single vane style specifications

Model		CRBUW10-□S	CRBUW15-□S	CRBUW20-□S	CRBUW30-□S
Rotation angle		90°, 180°, 270°			
Fluid		Air (Non-lube)			
Proof pressure (MPa)		1.05			1.5
Ambient and fluid temperature		5 to 60°C			
Max. operating pressure (MPa)		0.7			1.0
Min. operating pressure (MPa)		0.2	0.15		
Speed adjustable range (1) (sec/90°)		0.03 to 0.3			0.04 to 0.3
Allowable kinetic energy (2) (J)		0.00015	0.001	0.003	0.02
			0.00025	0.0004	0.015
Shaft load	Allowable radial load (N)	15		25	30
	Allowable thrust load (N)	10		20	25
Bearing		Ball bearing			
Port position		On the body side or in the axial direction			
Shaft style		Double shaft (With one flat chamfer to each shaft)			
Angle adjustable range of the unit		0 to 230°	0 to 240°		

Note 1) Make sure to operate within the adjustable speed range.
Exceeding the upper limit (0.3 sec/90°) of speed control could cause the unit to stick or not operate at all.
Note 2) In the chart, the upper section indicates the energy factor when the rubber bumper is used (at the end of the rotation); the lower section indicates the energy value when the rubber bumper is not used.

Double vane style

Model		CRBUW10-□D	CRBUW15-□D	CRBUW20-□D	CRBUW30-□D
Rotation 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 (1) (sec/90°)		0.03 to 0.3			0.04 to 0.3
Allowable kinetic energy (J)		0.0003	0.0012	0.0033	0.02
Shaft load	Allowable radial load (N)	15		25	30
	Allowable thrust load (N)	10		20	25
Bearing		Bearing			
Port position		On the body side or in the axial direction			
Shaft style		Double shafts (With one flat chamfer to each shaft)			
Angle adjustable range of the unit		0 to 90°			

Note 1) Make sure to operate within the adjustable speed range.
Exceeding the upper limit (0.3 sec/90°) of speed control could cause the unit to stick or not operate at all.

Inner volume and Connecting port

Vane style	Model		CRBUW10			CRBUW15			CRBUW20			CRBUW30		
Single vane	Rotation angle		90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
	Inner volume (cm^3)		1 (0.6)	1.2	1.5	1.5 (1.0)	2.9	3.7	4.8 (3.5)	6.1	7.9	11.3 (8.5)	15	20.2
	Connecting port bore size	Body side	M5 X 0.8											
		Axial direction	M3 X 0.5						M5 X 0.8					
Double vane	Rotation angle		90°		100°		90°		100°		90°		100°	
	Inner volume cm^3 *		1		1.1		2.6		2.7		5.6		5.7	14.4	14.5
	Connecting port bore size	Body side	M5 X 0.8						M5 X 0.8					
		Axial direction	M3 X 0.5											

* Values in ( ) represent inner volume in the SUP side when A port is pressurized. (Rubber cushion is not available for size 10.)

Weight

(g)

Vane style	Model	CRBUW10			CRBUW15			CRBUW20			CRBUW30		
Single vane	Rotation angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
	Body of the rotary actuator	47.5	47.1	47	73	72	72	143	142	140	263	258	255
	Auto switch unit + 2 auto switches	30			30			50			60		
	Angle adjusting unit	30			47			90			150		
Double vane	Rotation angle	—	90°	100°	—	90°	100°	—	90°	100°	—	90°	100°
	Body of the rotary actuator	—	62.2	63.2	—	77	81	—	151	158	—	289	308
	Auto switch unit + 2 auto switches	30			30			50			60		
	Angle adjusting unit	30			47			90			150		

Built-in One-touch Fittings

CRBUW [Size] **F** — [Rotation angle] **S**

F → **Built-in One-touch fittings**

A free mount rotary actuator with built-in one-touch fittings. It dramatically reduces the piping process and saves space.

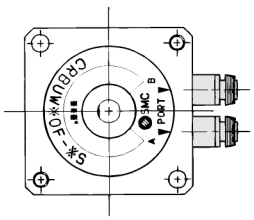
Specifications

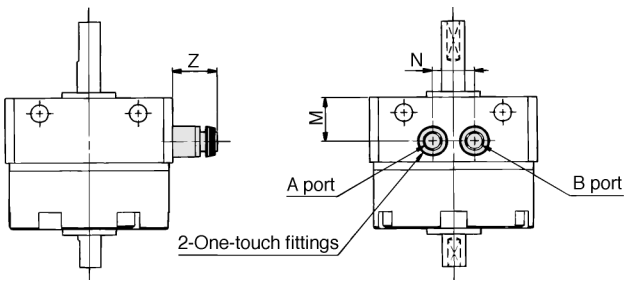
Vane style	Single vane	
Size	**20**	**30**
Operating pressure MPa	0.15 to 0.7	0.15 to 1.0
Speed adjustable range	0.03 to 0.3s/90°	0.04 to 0.3s/90°
Port position	Only on the body side	
Piping	One-touch fittings installed type	
Mounting	Basic style only	
Variations	Basic style, With switches, With an angle adjuster, With switches and an angle adjuster	

O.D./I.D. of the applicable tube

O.D./I.D. of the applicable tube (mm)	ø4/ø2.5
Material of the applicable tube	Nylon, Soft Nylon, Polyurethane

Dimensions





Note1) The exterior of the rotary actuator body has a standard configuration.
Note2) The dimensions are the same for the one-touch fitting of the rotary actuator with auto switch, with angle adjuster, or with auto switch and angle adjuster.

(mm)

Model	M	N	Z
CRBUW20F	11.5	12	11.5
CRBUW30F	12	13	10.5

Copper Free

20 – **CRBUW** [Size] — [Rotation angle] [Vane type] [Port position]

20 → **Copper free**

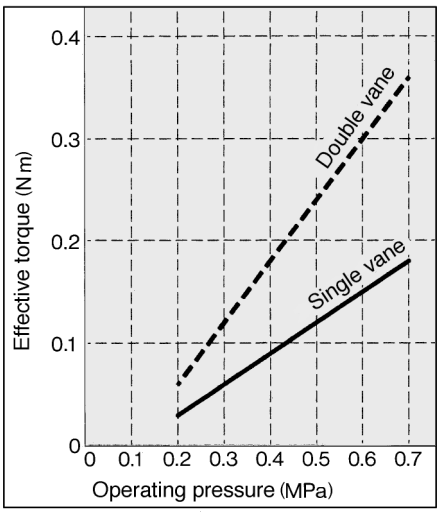
The entire standard series of vane type rotary actuators does not affect color CRTs due to copper ions or fluororesins.

Specifications

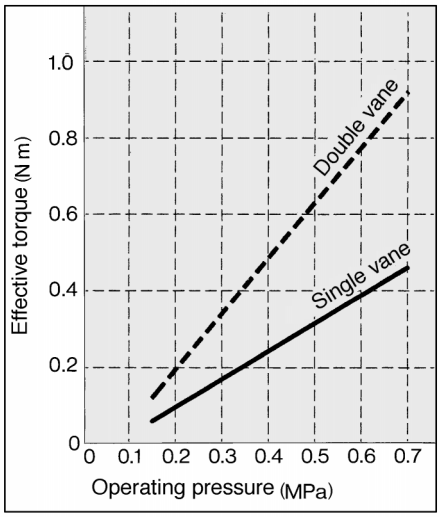
Vane style	Single vane, Double vane			
Size	**10**	**15**	**20**	**30**
Operating pressure MPa	0.2 to 0.7	0.15 to 0.7		0.15 to 1.0
Speed adjustable range	0.03 to 0.3s/90°			0.04 to 0.3s/90°
Port position	On the body side or in the axial direction			
Shaft style	Double shafts (with one flat chamfer to both ends)			
Auto switch	Mountable			

Output

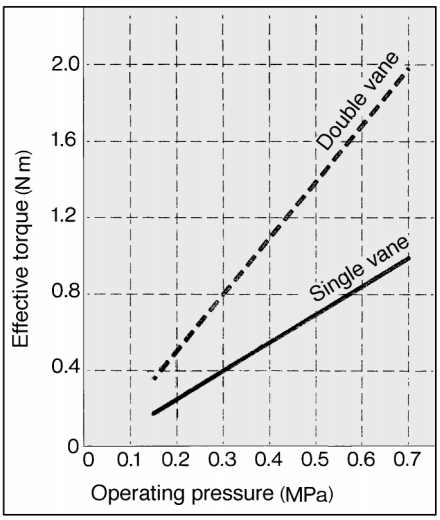
CRBUW10



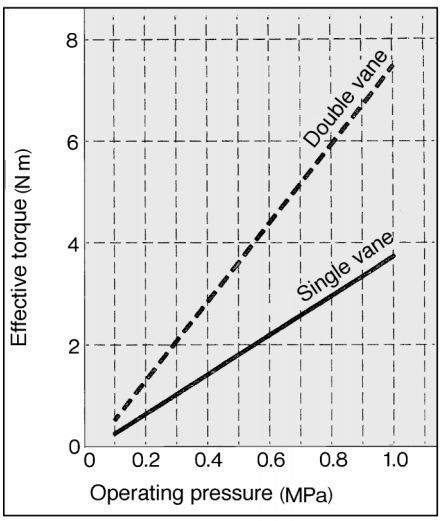
CRBUW15



CRBUW20



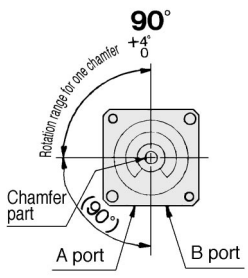
CRBUW30

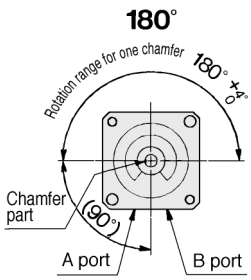


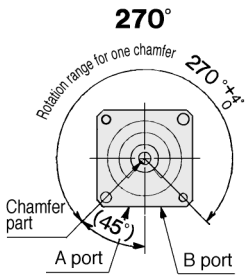
Chamfer positions and rotation range (Viewed from the long shaft side)

The chamfer positions below show the pressurization to the B port.

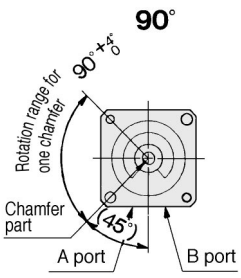
Single vane style

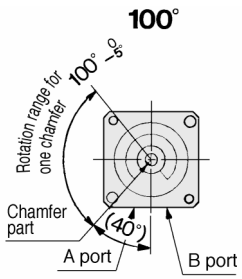






Double vane type

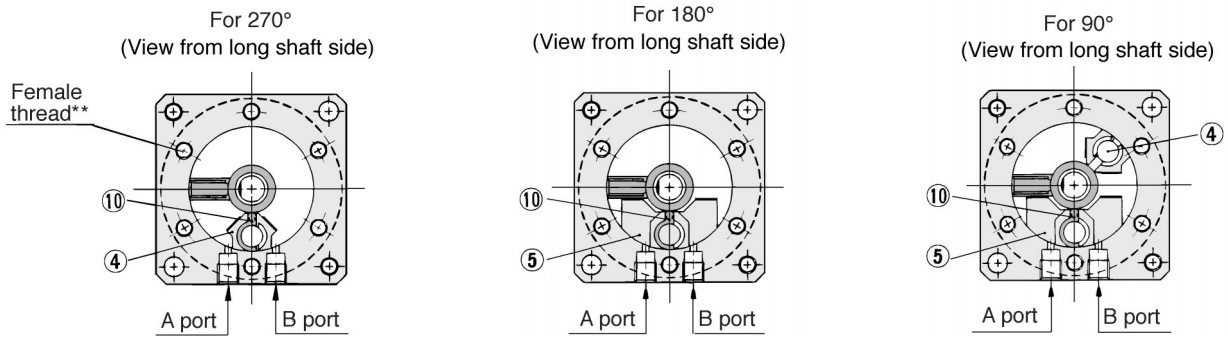


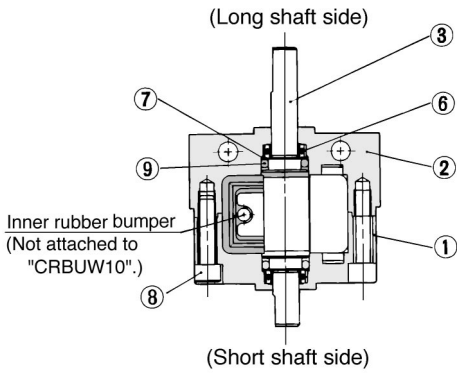


Note) For size 10 of the single vane style, the rotation angle of 90°, 180° and 270° is $^{+5^\circ}_{0}$.
For size 10 of the double vane style, the rotation angle of 90° is $^{+5^\circ}_{0}$.

Construction/Single Vane Style

Standard: CRBUW 10, 15, 20, 30-□S (Size 10: Without three positions for three equally divided length of circumference of female thread**)





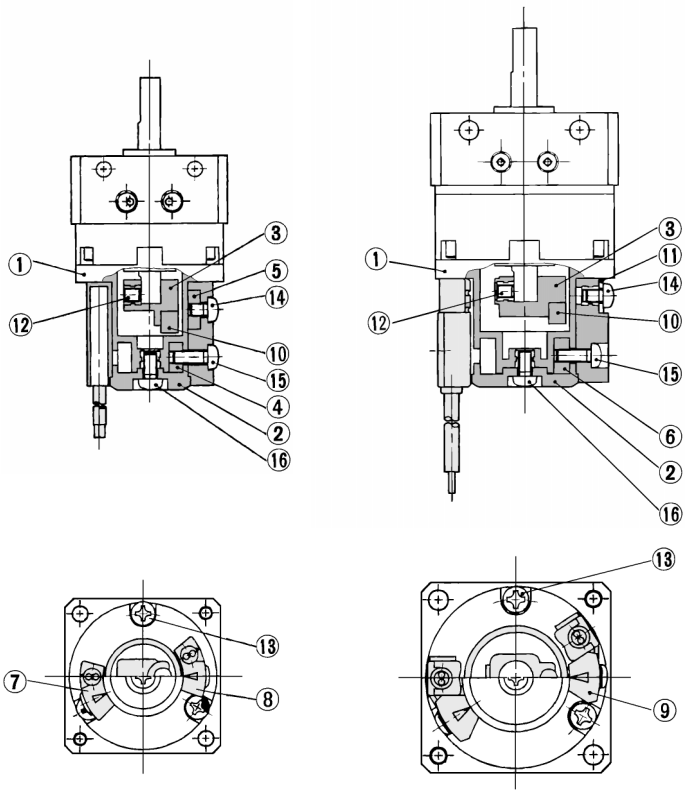
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
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 bolt
⑨	O ring	NBR	
⑩	Stopper packing	NBR	Special packing

* CRBUW30:Carbon steel

With Auto Switch (Units are common for single vane and double vane.)

CDRBUW10/15-□$^{S}_{D}$ **CDRBUW20/30-□$^{S}_{D}$**



Auto Switch Attached Style/Component Parts

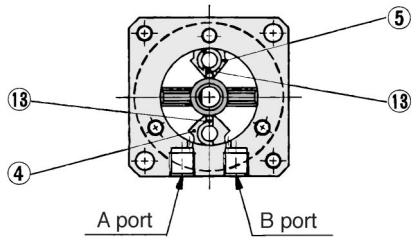
No.	Description	Material
①	Cover (A)	Resin
②	Cover (B)	Resin
③	Magnet lever	Resin
④	Fixation block (A)	Aluminum alloy
⑤	Fixation block (B)	Aluminum alloy
⑥	Fixation block	Aluminum alloy
⑦	Switch block (A)	Resin
⑧	Switch block (B)	Resin
⑨	Switch block	Resin
⑩	Magnet	
⑪	Arm	Steel
⑫	Hexagon socket head cap screw	Steel
⑬	Cross-recessed head cap screw	Steel
⑭	Cross-recessed head cap screw	Steel
⑮	Cross-recessed head cap screw	Steel
⑯	Cross-recessed head cap screw	Steel

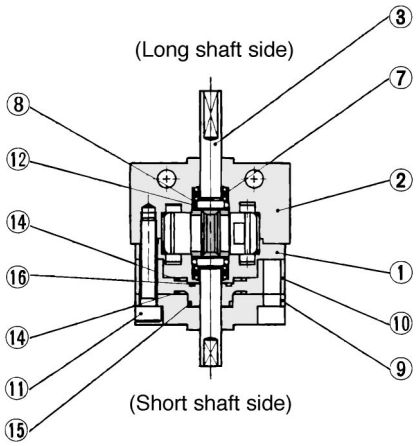
* Two cross-recessed head cap screws ⑬ are attached to "CDRBUW10".

Double Vane Style

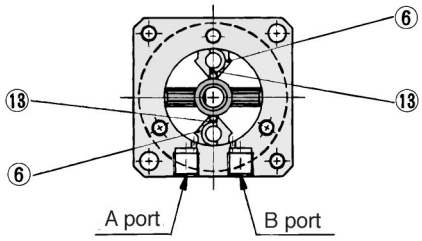
Standard: **CRBUW10-□D**

For 90°
(View from long shaft side)





For 100°
(View from long shaft side)

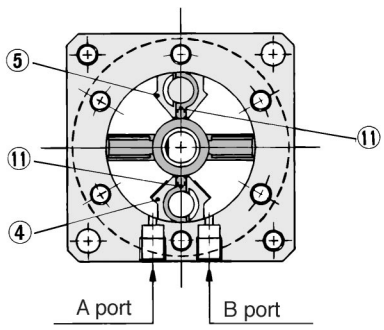


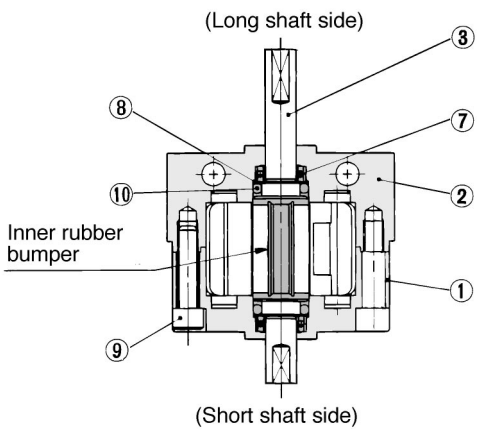
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
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	
⑩	Plate	Resin	
⑪	Hexagon socket head cap screw	Stainless steel	Special bolt
⑫	O ring	NBR	
⑬	Stopper packing	NBR	
⑭	Gasket	NBR	
⑮	O ring	NBR	
⑯	O ring	NBR	

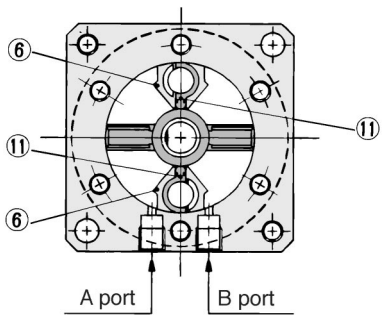
Standard: **CRBUW15/20/30-□D**

For 90°
(View from long shaft side)





For 100°
(View from long axis side)



Component Parts

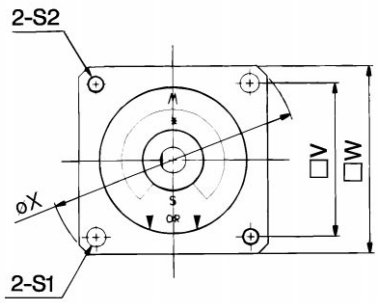
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
③	Vane shaft	Carbon steel	
④	Stopper	Stainless steel	
⑤	Stopper	Resin	
⑥	Stopper	Stainless steel	
⑦	Bearing	High carbon chrome bearing steel	
⑧	Back-up ring	Stainless steel	
⑨	Hexagon socket head cap screw	Stainless steel	Special bolt
⑩	O ring	NBR	
⑪	Stopper packing	NBR	

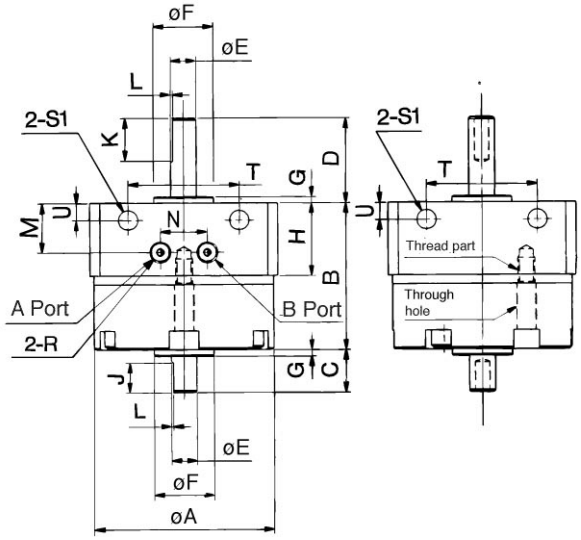
Standard Style Dimensions/Single Vane Style

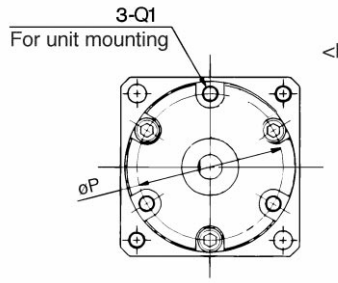
Standard Style

(The dimensions below show pressurization to B port of the actuators for 90° and 180°. Refer to p.1.2-7 for further information.)

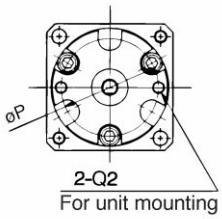
Port locations: Body side
CRBUW□-□S



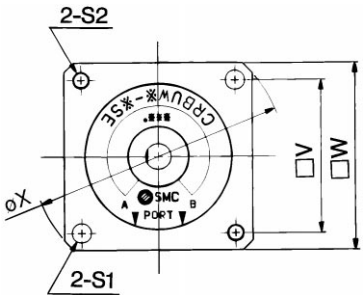


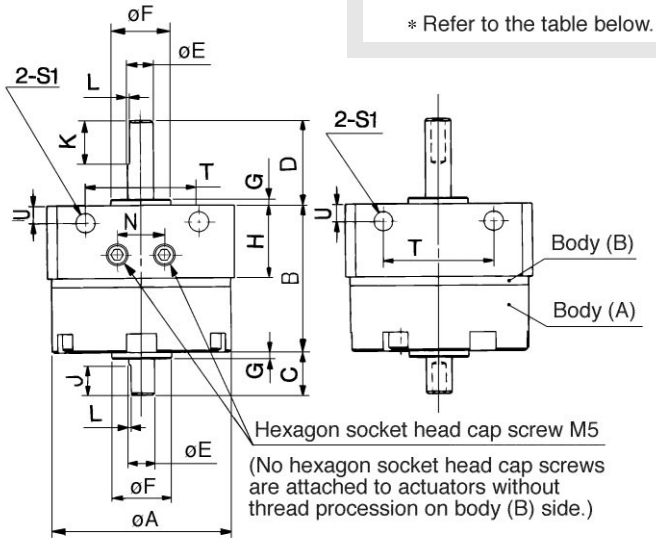


CRBUW10-□S
<Port locations: Body side>

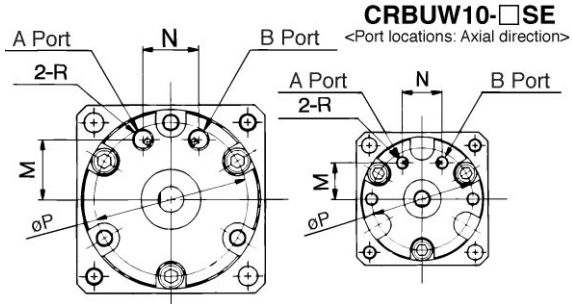


Port locations: Axial direction
CRBUW□-□SE

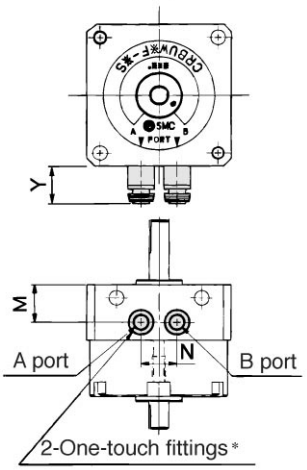




CRBUW10-□SE
<Port locations: Axial direction>



One-touch fittings: Size 20/30



* Refer to the table below.

(mm)

Model	A	B	C	D	E(g6)	F(h9)	G	H	J	K	L	M	N	P	Q1	(Depth) Q2	R	S1	S2	T	U	V	W	X
CRBUW10-□S	29	22	8	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.043}$	1	15.5	5	9	0.5	10.5	10.5	24	—	M3 (4)	M5 X 0.8	3.5	M3 X 0.5	17	3	25	31	41
CRBUW10-□SE												8.5	9.5				M3 X 0.5							
CRBUW15-□S	34	25	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	6	10	0.5	10.5	10.5	29	M3 X 0.5	—	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48
CRBUW15-□SE												11	10				M3 X 0.5							
CRBUW20-□S	42	34.5	10	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	7	10	0.5	11.5	11	36	M4 X 0.7	—	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59
CRBUW20-□SE												14	13											
CRBUW30-□S	50	47.5	13	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	8	12	1	12	13	43	M5 X 0.8	—	M5 X 0.8	5.5	M5 X 0.8	29	5	42	52	69
CRBUW30-□SE												15.5	14											

With One-touch Fittings

(mm)

Model	Applicable tube O.D.	M	N	Y
CRBUW20F-□S	ø 4	11.2	12	11.5
CRBUW30F-□S	ø 4	12	13	10.5

CAD

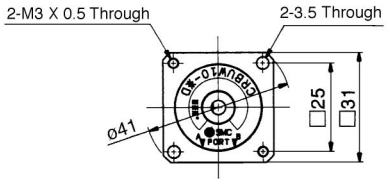
Port location (Body side)
CRBUW Size -S·····SCRB Size , #2
Port location (Axial direction)
CRBUW Size -SE·····SCRB Size , #4

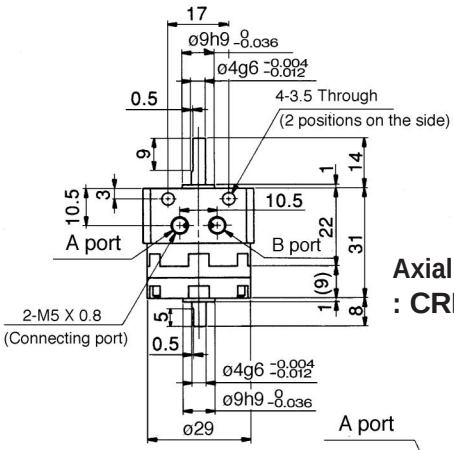
* Applicable tube material: Nylon, Soft nylon, Polyurethane
* Sizes apart from the ones shown above are the same as standard style.

Standard Style Dimensions/ Double Vane Style

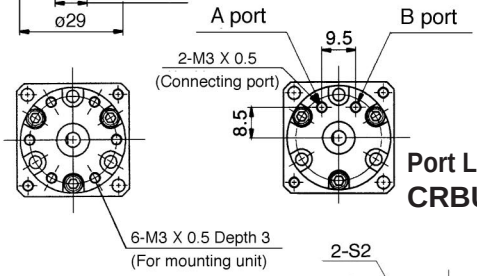
∗ The dimensions below show rotation at middle point during pressurization to A/B port.

Port locations: Body side
CRBUW10-□D



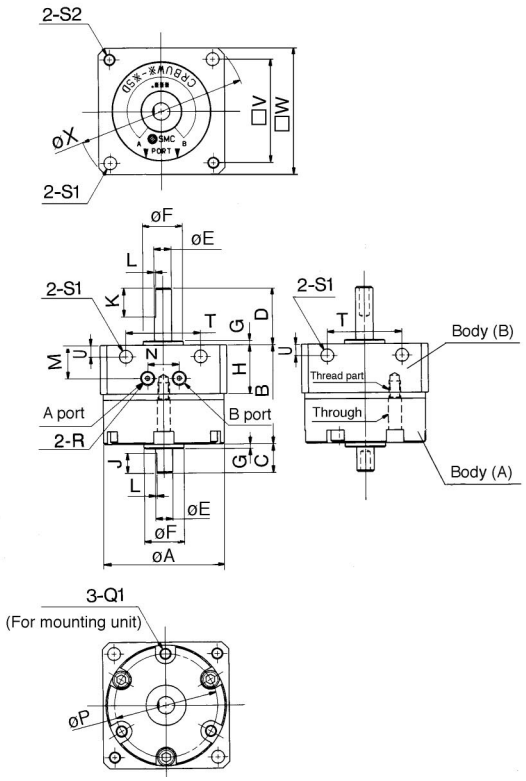


Axial Direction (Port Locations)
: CRBUW10-□DE

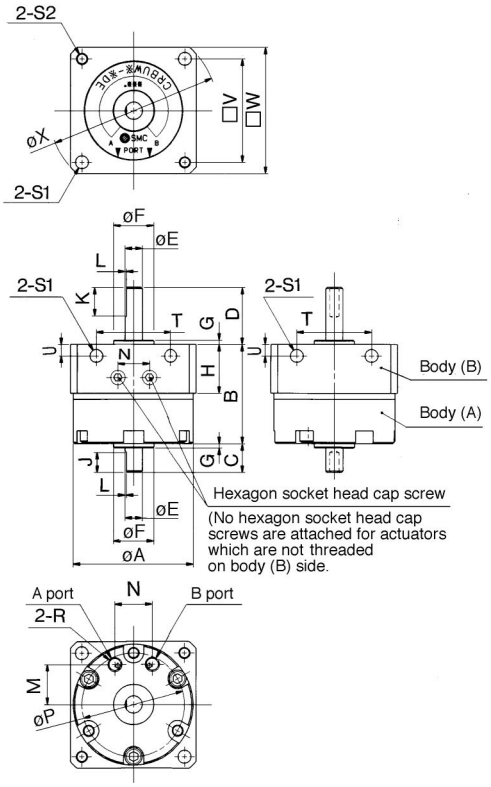


Port locations: Body side
CRBUW15/20/30-□D

(The dimensions below are based on size 30.)



Port Locations: Body Axial Direction
CRBUW15/20/30-□DE



Model	A	B	C	D	E(g6)	F(h9)	G	H	J	K	L	M	N	P	Q1	R	S1	S2	T	U	V	W	X
CRBUW15-□D	34	25	9	18	5 -0.004 -0.012	12 0 -0.043	1.5	15.5	6	10	0.5	10.5	10.5	29	M3 X 0.5	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48
CRBUW15-□DE												11	10			M3 X 0.5							
CRBUW20-□D	42	34.5	10	20	6 -0.004 -0.012	14 0 -0.043	1.5	17	7	10	0.5	11.5	11	36	M4 X 0.7	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59
CRBUW20-□DE												14	13										
CRBUW30-□D	50	47.5	13	22	8 -0.005 -0.014	16 -0.00 -0.043	2	17.5	8	12	1	12	13	43	M5 X 0.8	M5 X 0.8	5.5	M5 X 0.8	29	4.5	42	52	69
CRBUW30-□DE												15.5	14										

Series CDRBU
Auto Switch Specifications

Refer to p.2.11-1 for further information on auto switch single body.

Applicable Auto Switch

Applicable series	Auto switch part No.		Electrical entry	Page
CDRBUW10 CDRBUW15	Reed switch	D-90/90A	Grommet	2.11-12, 2.11-14
		D-97/93A		
	Solid state switch	D-S99/S99V*	Grommet/3 wire style (NPN)	2.11-23
		D-S9P/S9PV	Grommet/3 wire style (PNP)	
		D-T99/T99V	Grommet/2 wire style	
CDRBUW20 CDRBUW30	Reed switch	D-R 7	Grommet	2.11-15
		D-R 8		
	Solid state switch	D-R 7*	Grommet/3 wire style (NPN)	2.11-24
		D-S7P	Grommet/3 wire style (PNP)	
		D-T 7	Grommet/2 wire type, Connector/2 wiretype	

* No connector type is available for solid state switch 3 wire style.

⚠ Caution

Be sure to read before handling. Refer to p.2.11-2 to 2.11-4 before handling auto switches.

Units

Every kind of unit is mountable to series CDRBU. Refer to p.1.0-23 and 1.0-24 for further information.

• Combinable units:

① Auto switch unit
② Switch block unit
③Angle adjusting unit
④ Angle adjusting unit with auto switch
⑤ Joint unit

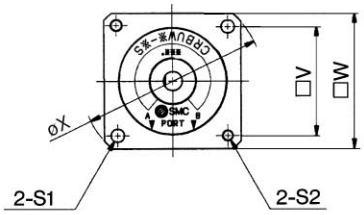
CAD Auto switch single unit
D-97/93·····SCRB10,#16
D-97/93·····SCRB15,#16

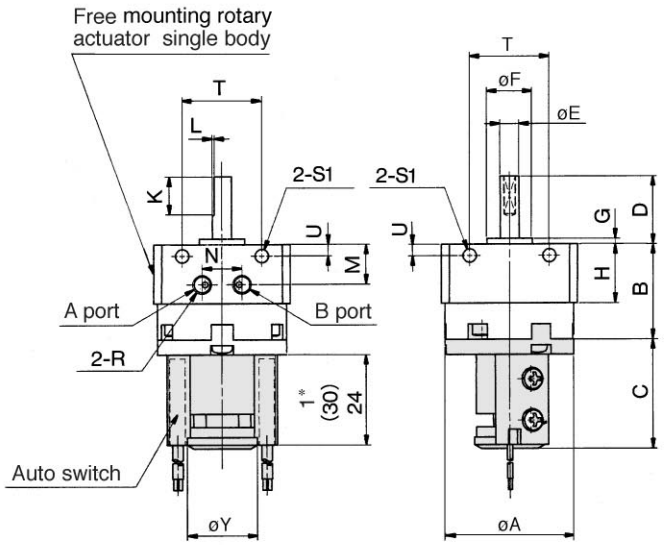
With Auto Switch Dimensions/Single Vane Style

∗The dimensions below show pressurization to B port of actuators for 90° and for 180°.

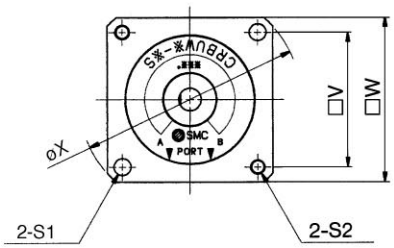
Refer to p.1.2-5 for further information.

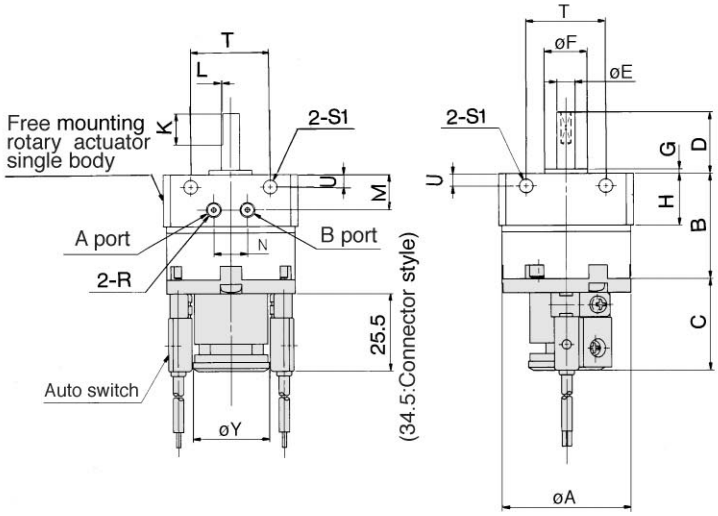
CDRBUW10, 15-□S

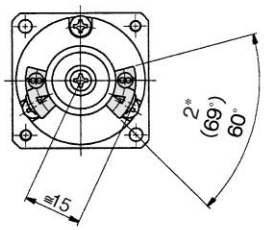


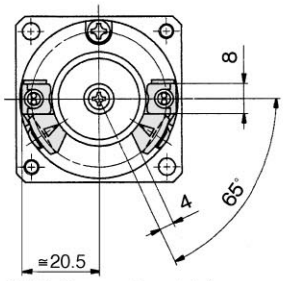


CDRBUW20, 30-□S









(Approx. 26.5: Connector style)

∗ 1) 24: When auto switches "D-90, 90A, S99(V), T99, S9P(V)" types are used.
30: When auto switches "D-97, 93A" types are used.

∗ 2) 60: When auto switches "D-90, 90A, 97, 93A" types are used.
69: When auto switches "D-S99(V),T 99, S9P(V)" types are used.

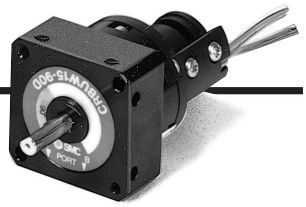
Note) All connecting port locations are on the body side for auto switch attached style.

Note) The dimensions above are of one right hand side operating style attached and one left hand side operating style attached.

Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CDRBUW10-□S	29	22	29	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	1	15.5	9	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	17	3	25	31	41	18.5
CDRBUW15-□S	34	25	29	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48	18.5
CDRBUW20-□S	42	34.5	30	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59	25
CDRBUW30-□S	50	47.5	31	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 X 0.8	5.5	M5 X 0.8	29	4.5	42	52	69	25

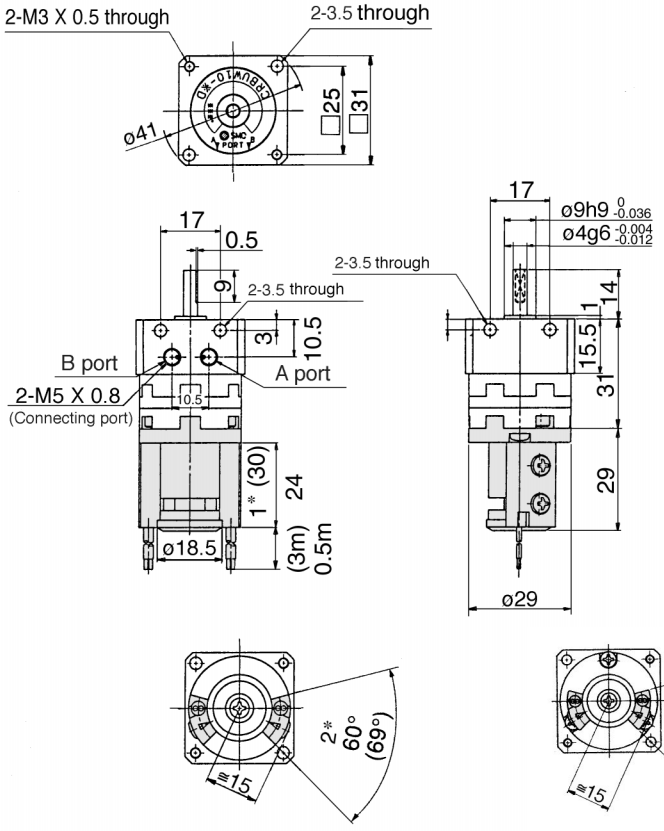
CAD CDRBUW Size-S·····SCRB Size, #8

With Auto Switch Dimensions/Double Vane Style



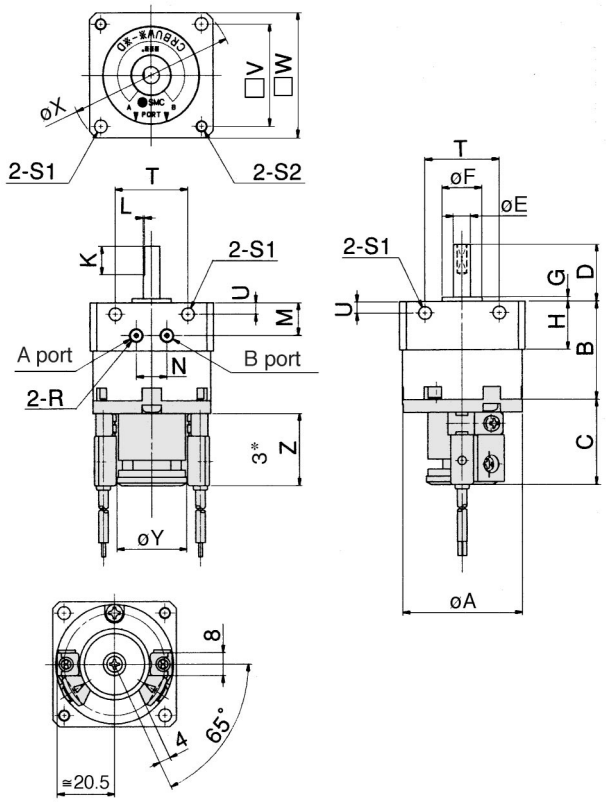
∗ The dimensions below show fluctuation at intermediate positions during pressurization to A port or B port.

CDRBUW10-□D



CDRBUW15/20/30-□D

(The dimensions below are based on size 20.)



(Approx. 26.5: Connector style)

CDRBUW15-□D **CDRBUW20, 30-□D**

∗ 1) 24: When auto switches "D-90, 90A, S99(V), T99(V), S9P(V)" types are used.
30: When auto switches "D-97, 93A" types are used.

∗ 2) 60°: When auto switches "D-90, 90A, 97, 93A" types are used.
69°: When auto switches "D-S99(V),T99(V), S9P(V)" types are used.

∗ 3) 25.5: When auto switches grommet type "D-R73, R80, S79,S7P, T79" types are used.
34.5: When auto switches connector type "D-R73, R80, T79" types are used.

Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y	Z	
CDRBUW15-□D	34	25	29	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48	18.5	24∗1	30∗1
CDRBUW20-□D	42	34.5	30	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59	25	25.5∗3	34.5∗3
CDRBUW30-□D	50	47.5	31	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 X 0.8	5.5	M5 X 0.8	29	4.5	42	52	69	25		

Rotary Actuator
Free Mount Style with Angle Adjuster

Series CRBUWU (Size: 10/15/20/30)

How to Order

Standard CRBU W U **10** — **180** **S**

- Free mount
- Angle adjusting unit
- Size: 10, 15, 20, 30
- Vane style: S Single vane; D Double vane
- Rotation angle

With Auto Switch Size 10/15 CDRBU W U **10** — **180** **S** — **90** **L** ☐

With Auto Switch Size 20/30 CDRBU W U **20** — **180** **S** — **R73** **L** ☐

- With auto switch (With switch unit)
- Free mounting
- Angle adjusting unit
- Size: 20, 30
- Rotation angle
- Vane style: S Single vane; D Double vane
- Auto switch: — Without auto switch
- No. of auto switchs: S 1*; — 2

* Refer to the table below for applicable auto switch part number.

* The one auto switch attached with order symbol "S" is right hand operating type.

Application	Symbol	Rotation angle
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

Application	Symbol	Rotation angle
Double vane	90	90°
	100	100°

Size	Rotation angle
10	90°, 180°, 270°
15	90°, 180°, 270°
20	90°, 180°, 270°
30	90°, 180°, 270°

Vane style	
S	Single vane
D	Double vane

Auto switch	
—	Without auto switch

No. of auto switchs	
S	1*
—	2

* The one auto switch attached with order symbol "S" is right hand operating type.

Electrical entry and length

—	Grommet, Lead wire: 0.5m
L	Grommet, Lead wire: 3m
C	Connector, Lead wire: 0.5m
CL	Connector, Lead wire: 0.3m
CN	Connector, Without lead wire

* Connector type is applicable only to R73, R80 and T79.
** Part number for lead wire with connector:
D-LC05: Lead wire 0.5m
D-LC30: Lead wire 3m
D-LC50: Lead wire 5m

Auto Switch Specifications/ Refer to p.2.11-1 for further information on auto switch single body.

Applicable size	Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch part no.	Lead wire	Lead wire length* (m) 0.5 (—)	3 (L)	5 (Z)	— (N)	Applicable loading	
For 10/15	Reed switch	Grommet	No	2 wire	24V	5V,12V	5V,12V,24V	90	Parallel cord	●	●	●	●	IC	Relay PLC
						5V,12V, 100V	5V,12V, 24V,100V	90A	Cab tire	●	●	●	●		
	Solid state switch		Yes			—	—	97	Parallel cord	●	●	●	●	—	
							100V	93A	Cab tire	●	●	●	●		
						12V	—	T99		●	●	—	—		
								T99V		●	●	—	—		
				3 wire (NPN)		5V,12V	—	S99		●	●	—	—	IC	
								S99V		●	●	—	—		
				3 wire (PNP)				S9P		●	●	—	—		
								S9PV		●	●	—	—		
For 20/30	Reed switch	Grommet	Yes	2 wire	24V	—	100V	R73	Cab tire	●	●	—	—	—	Relay PLC
		Connector						R73C		●	●	●	●		
		Grommet	No			48V, 100V	24V,48V, 100V	R80		●	●	—	—	IC	
		Connector						R80C		●	●	●	●		
	Solid state switch	Grommet	Yes			12V	—	T79		●	●	—	—	—	
		Connector						T79C		●	●	●	●		
		Grommet		3 wire (NPN)		5V,12V		S79		●	●	—	—	IC	
				3 wire (PNP)				S7P		●	●	—	—		

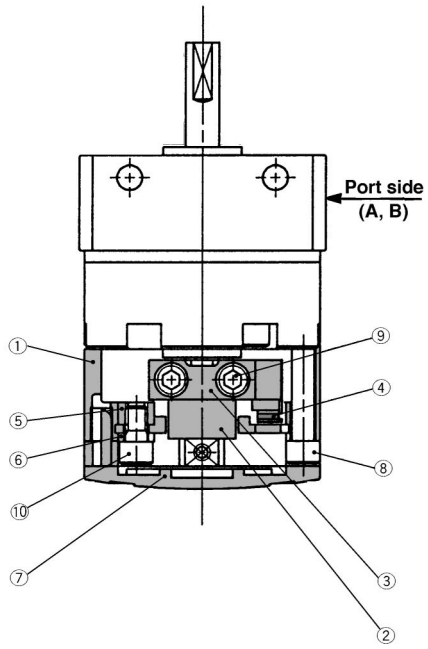
* Symbols for each wire length
0.5m: — Ex.) R73C
3m: L Ex.) R73CL
5m: Z Ex.) R73CZ
—: N Ex.) R73CN

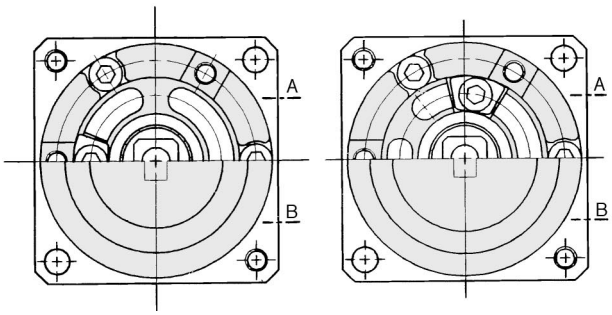
- Operating time —— 1.2ms
- Shock resistance —— 300m/s² {30.6G} (Reed switch), 1000m/s² {102G} (Solid state switch)
- Operating temperature range ——–10° to 60°

Construction/Single Vane, Double Vane

With angle adjuster

CRBUW10/15/20/30 - □S D

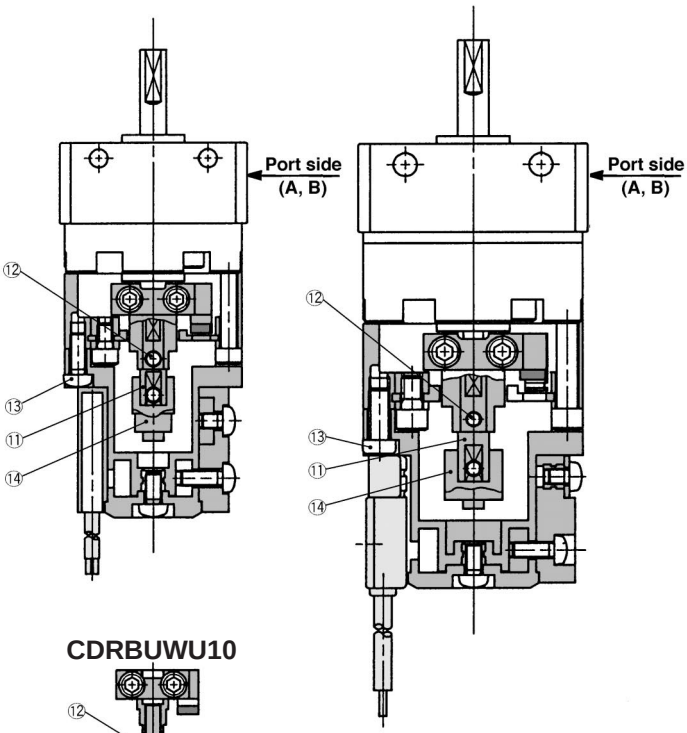




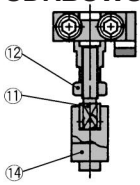
Single vane　　Double vane

With angle adjuster and auto switch

CDRBUW10/15 - □S D　　**CDRBUWU20/30 - □S D**



CDRBUWU10



● **Single vane**
This diagram shows the pressurized state of port B in the rotary actuator used for a 90° or 180° application.

● **Double vane**
This diagram shows the intermediate rotation position of the rotary actuator with port A or port B pressurized.

Component Parts

No.	Description	Material	Note
①	Stopper ring	Aluminum die cast	
②	Stopper lever	Carbon steel	
③	Lever retainer	Carbon steel	Zinc chromated
④	Rubber damper	NBR	
⑤	Stopper block	Carbon steel	Zinc chromated
⑥	Block retainer	Carbon steel	Zinc chromated
⑦	Cap	Resin	
⑧	Hexagon socket head cap bolt	Stainless steel	Special bolt
⑨	Hexagon socket head cap bolt	Stainless steel	Special bolt
⑩	Hexagon socket head cap bolt	Stainless steel	Special bolt
⑪	Joint	Aluminum alloy	Note)
⑫	Hexagon socket head cap screw	Stainless steel	For CDRBUW10, a hexagon nut is used to the part indicated with no. ⑫.
	Hexagon nut	Stainless steel	
⑬	Round head Phillips screw	Stainless steel	Note)
⑭	Magnet lever	—	Note)

Note) It is consisted of an auto switch unit and an angle adjusting unit. Refer to p.1.0-23 and 1.0-24 for further specifications.

⚠ Precautions

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instructions and common precautions for the products mentioned in this catalog, and refer to p.1.0-2 to 1.0-4 for common precautions for every series.

Unit with An Angle Adjuster

⚠ Caution

① If the rotary actuator body is used for a 90° or 180° application, the maximum angle of the rotation angle adjustment range will be limited by the rotation angle of the rotary actuator body. Make sure to take this into consideration when ordering equipment.
(Refer to the table below)

Rotation angle of the rotary actuator body	Adjustable range of rotating angle
$270°^{+4}_{0}$	0° to 230° (size 10)*1
	0° to 240° (Size 15, 20, 30)
$180°^{+4}_{0}$	0° to 175°
$90°^{+4}_{0}$	0° to 85°

*1: The maximum adjustable angle of the angle adjustment unit for size 10 is 230°.

② All connecting port positions are on the body side.

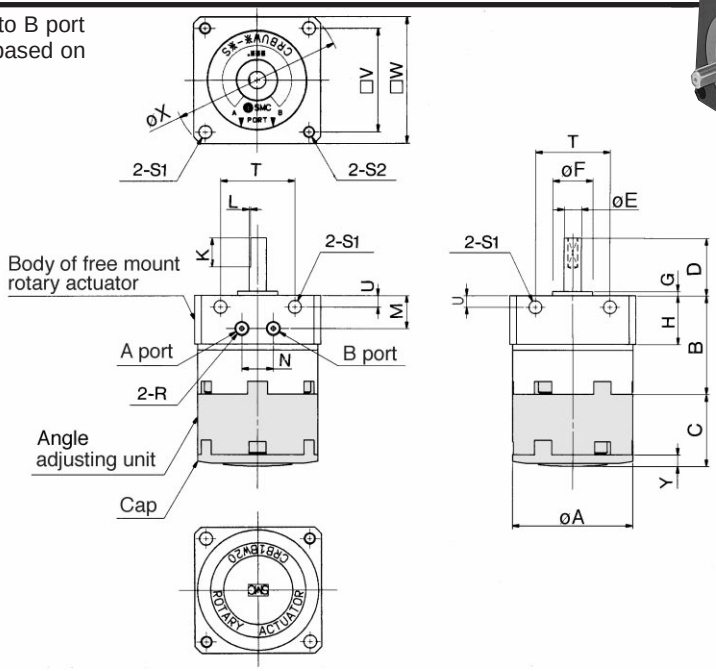
③ The allowable kinetic energy is the same as the specifications of the rotary actuator unit itself.

④ To make a 90° adjustment on the double vane type, use a rotary actuator for a 100° application.

With Angle Adjuster Dimensions/Single Vane Style

∗The dimensions below show pressurization to B port of actuators for 90° and for 180°. They are based on size 20.

CRBUWU10/15/20/30-□S



CRB1
CRBU
CRA1
CRQ
MRQ
MSQ
MSUB

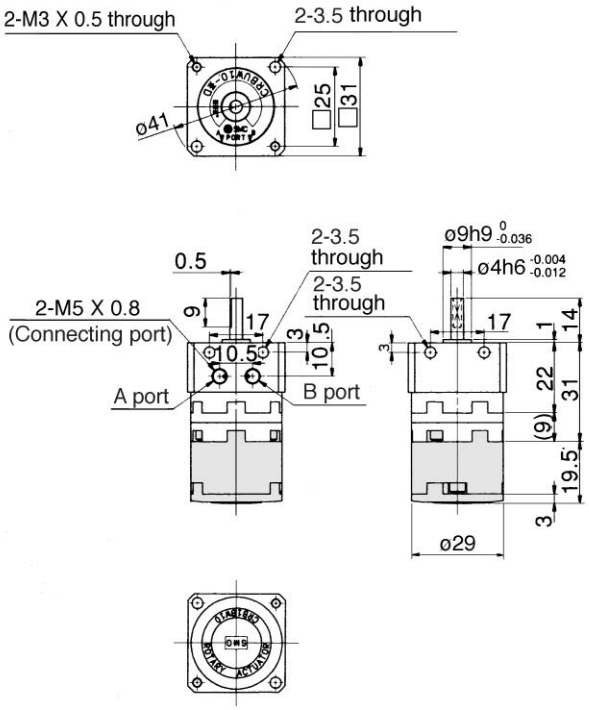
CAD Basic style
CRBUWU Size -S·····SCRB Size , #(

Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CRBUWU10-□S	29	22	19.5	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	1	15.5	9	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	17	3	25	31	41	3
CRBUWU15-□S	34	25	21.2	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48	3.2
CRBUWU20-□S	42	34.5	25	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59	4
CRBUWU30-□S	50	47.5	29	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 X 0.8	5.5	M5 X 0.8	29	4.5	42	52	69	4.5

With Angle Adjuster Dimensions/Double Vane Style

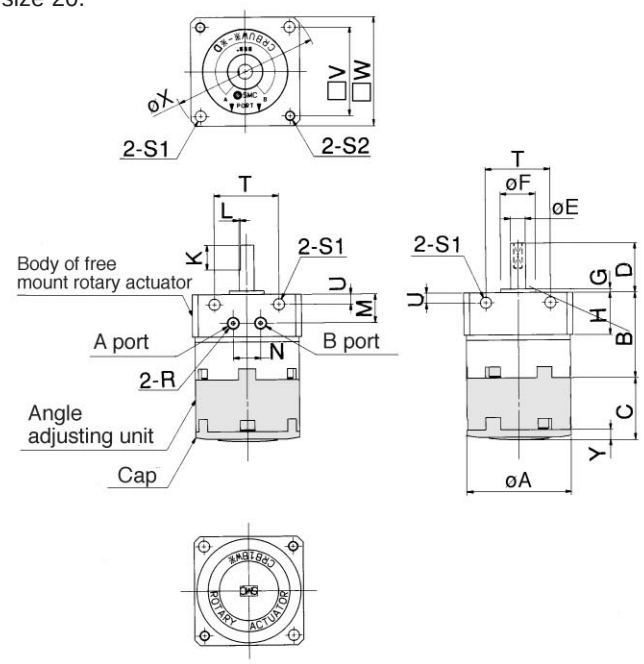
∗The dimensions below show rotation middle points during pressurization to A port or B port.

CRBUWU10-□D



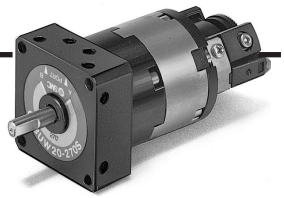
CRBUWU15/20/30-□D

The dimensions below are based on size 20.



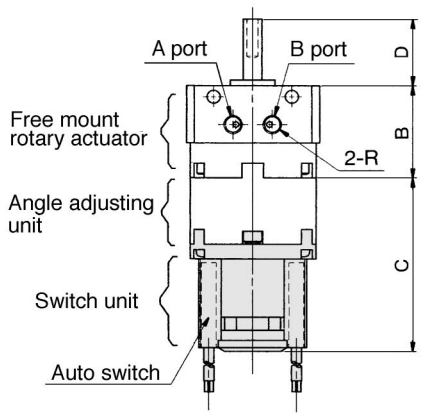
Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CRBUWU15-□D	34	25	21.2	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 X 0.8	3.5	M3 X 0.5	21	3	29	36	48	3.2
CRBUWU20-□D	42	34.5	25	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59	4
CRBUWU30-□D	50	47.5	29	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 X 0.8	5.5	M5 X 0.8	29	4.5	42	52	69	4.5

With Angle Adjuster and Auto Switch Dimensions/Single Vane Style

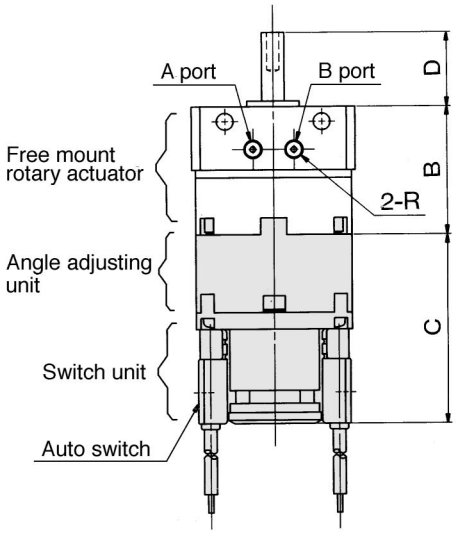


∗ The dimensions below show pressurization to A port of actuators for 90° and for 180°.

CDRBUWU10/15-□S



CDRBUWU20/30-□S



Model	B	C	D	R
CDRBUWU10-□S	22	45.5	14	M5 X 0.8
CDRBUWU15-□S	25	47	18	M5 X 0.8
CDRBUWU20-□S	34.5	51	20	M5 X 0.8
CDRBUWU30-□S	47.5	55.5	22	M5 X 0.8

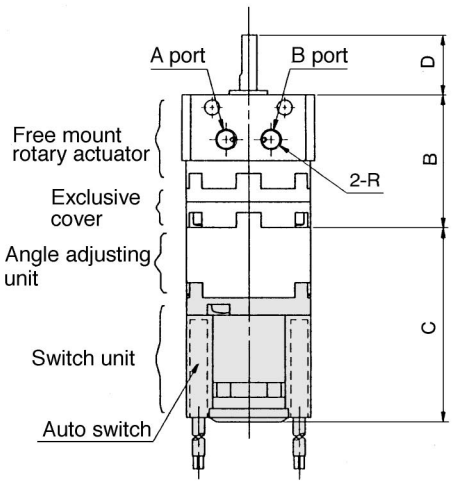
Note) All the port locations are on the body side for angle adjuster attached style and auto switch attached style.
Note) The dimension of switch attached style shows one right side handling switch attached style and one left side handling switch attached style.

CAD With auto switch
CDRBUWU-Size S·····SCRB Size , #10

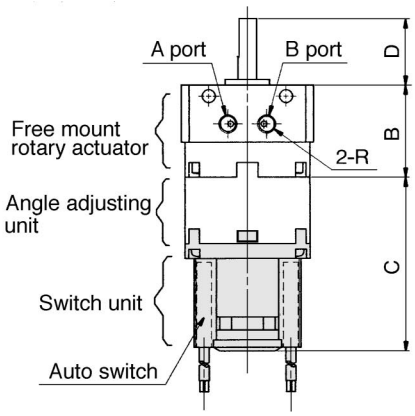
With Angle Adjuster and Auto Switch Dimensions/Double Vane Style

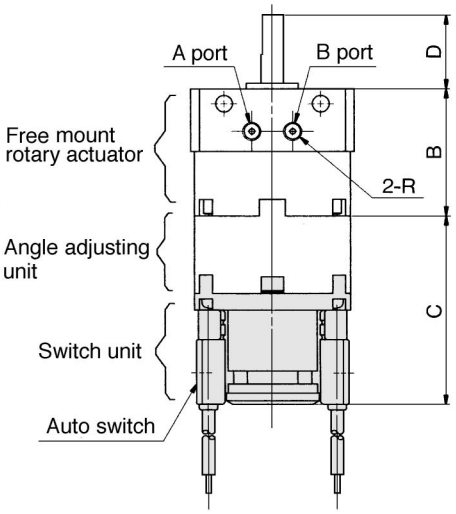
∗ The dimensions below show rotation middle point during pressurization to A port or B port.

CDRBUWU10/15-□D



CDRBUWU20/30-□D





Model	B	C	D	R
CDRBUWU10-□D	31	45.5	14	M5 X 0.8
CDRBUWU15-□D	25	47	18	M5 X 0.8
CDRBUWU20-□D	34.5	51	20	M5 X 0.8
CDRBUWU30-□D	47.5	55.5	22	M5 X 0.8

Note) All the port locations are on the body side for angle adjuster attached style and auto switch attached style.
Note) The dimensions of auto switch attached style shows one right side handling switch attached style and one left side handling switch attached style.

Series CRBU
Made to Order Specifications
Change of Shaft End Shape/-XA1 to XA47

Consult SMC for further information on specifications, dimensions and delivery.

Symbol

1 Change of shaft end shape — -XA1 to XA47

A wide selection of models is now available, as non-standard shaft configurations for the CRB1 Series (Sizes: 50, 80, 100) are provided in 46 types of patterns.

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- The thread pitch is based on coarse metric threads.
  P = thread pitch M3 X 0.5, M4 X 0.7, M5 X 0.8
- Enter the desired figures in the [ ] portion of the diagram.
- If the shaft is required to be shortened, refer to the list of the dimensions for patterns A17 to A19.
- If equipped with an auto switch, the manufacturable patterns are those for shafts J and W only.
- Consult SMC for made to order specifications other than those mentioned in "How to Order".
- Individual drawings for specific made to order models may not be available.
  Consult SMC separately if drawings are needed.

How to Order

Without auto switch — For 2 patterns (A1, C6)

CRB U W P 30 [ ] S E X A1 C6

- **Series (Vane style)**
- **Mounting**

U	Free mount

- **Shaft**

W	Double shaft (Standard)
J	Double shaft (Long shaft without one chamfer & one chamfer)
Y	Double shaft with one chamfer
K	Double round shaft
S	Single shaft with one chamfer
T	Single round shaft

- **Pattern**
  Refer to the right table for further information on patterns -XA1 to -XC30.
- **Size**

10
15
20
30

- **Rotation angle**
- **Vane style**

S	Single vane
D	Double vane

- **Connecting port positions**

—	Body side
E	Axial direction

- **Symbols for made to order specification**
- **Symbols**

A31 to A23
A31 to A47
C31 to C37
C30

With auto switch — For pattern A1

C D RBU W P 30 [ ] S T79L X A1

- **With auto switch unit**
- **Pattern**
- **Auto switch**

Refer to p.1.2-4 for further information.

Applicable patterns

Size	10, 15, 20, 30
Pattern	XA 1 to XA23, XA31 to XA34, XA37 to XA47, XC 1 to XC 7, XC30

Applicable shaft/Pattern combination table (Size: 10, 15, 20, 30)

Shaft shape/Double shaft (W): Standard

Symbol	Specification	Shaft direction: Upward	Shaft direction: Downward	Applicable size
-XA 1	Rod end female thread	●	–	15, 20, 30
-XA 2	Rod end female thread	–	●	
-XA 3	Rod end male thread	●	–	
-XA 4	Rod end male thread	–	●	
-XA 5	Round shaft with steps	●	–	10
-XA 6	Round shaft with steps	–	●	15
-XA 7	Round shaft with steps and male thread	●	–	
-XA 8	Round shaft with steps and male thread	–	●	20
-XA 9	Change in length of the standard product's chamfer part	●	–	30
-XA10	Change in length of the standard product's chamfer part	–	●	
-XA11	2 flat chamfers	●	–	
-XA12	2 flat chamfers	–	●	
-XA13	Shaft through hole	●	●	15
-XA14	Shaft through hole and female thread	●	–	20
-XA15	Shaft through hole and female thread	–	●	
-XA16	Shaft through hole and female thread	●	●	30
-XA17	Shaft is shortened	●	–	
-XA18	Shaft is shortened	–	●	10
-XA19	Shaft is shortened	●	●	15
-XA20	Reverse mounting of the shaft	●	●	
-XA21	Round shaft with steps and two flat chamfers	●	–	20
-XA22	Round shaft with steps and two flat chamfers	–	●	30
-XA23	Right angled chamfer	●	–	

Shaft shape/J, K, S, T, Y: Made to order

Symbol	Specification	Shaft direction		Applicable shaft type: J	K	S	T	Y	Applicable size
-XA31	Rod end female thread	●	–	–	–	●	–	●	15
-XA32	Rod end female thread	–	●	–	–	●	–	●	20
-XA33	Rod end female thread	●	–	●	●	–	●	–	
-XA34	Rod end female thread	–	●	●	●	–	●	–	30
-XA37	Round shaft with steps	●	–	●	●	–	●	–	10, 15,
-XA38	Round shaft with steps	–	●	–	●	–	–	–	20, 30
-XA39	Shaft through hole	●	●	–	–	●	–	●	
-XA40	Shaft through hole	●	●	–	●	–	●	–	15
-XA41	Shaft through hole	●	●	●	–	–	–	–	
-XA42	Shaft through hole and female thread	●	●	–	–	●	–	●	20
-XA43	Shaft through hole and female thread	●	●	–	●	–	●	–	30
-XA44	Shaft through hole and female thread	●	●	●	–	–	–	–	
-XA45	Intermediate chamfer	●	–	●	●	–	●	–	10, 15,
-XA46	Intermediate chamfer	–	●	–	●	–	–	–	20, 30
-XA47	Key groove	●	–	●	●	–	●	–	20, 30
-XC 1	A connecting port is added to the side end of the body (A)	–	–	●	●	●	●	●	
-XC 2	2 thread parts of the body (B) are used as through holes	–	–	●	●	●	●	●	10
-XC 3	Position of the tightening bolts are changed	–	–	●	●	●	●	●	
-XC 4	Rotating range is changed. (90° to the right from the starting point)	–	–	●	●	●	●	●	15
-XC 5	Rotation angle is changed. (45° to the left from the starting point)	–	–	●	●	●	●	●	20
-XC 6	Rotation angle is changed. (90° to the left from the starting point)	–	–	●	●	●	●	●	
-XC 7	Reverse mounting of the shaft	–	–	●	–	–	–	–	30
-XC30	Fluorine grease	–	–	●	●	●	●	●	

Note) Standard style (double shafts: W) is also available for "-XC1" to "XC30".

Series CRBU
Made to Order Specifications
Change of Shaft End Shape/-XA1 to -XA17
Consult SMC for further information on specifications, dimensions and delivery.

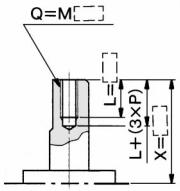
1 Change of shaft end shape

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A1

The shaft can be further shortened by machining female threads on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



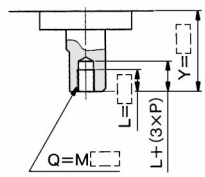
- Size 10mm is not manufaturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.

(mm)

Size	X	Q
15	1.5 to 18	M3
20	1.5 to 20	M3, M4
30	2 to 22	M3, M4, M5

Symbol: A2

The shaft can be further shortened by machining female threads on the long end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)



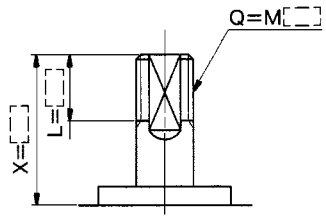
- Size 10mm is not manufaturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule. Ex.) M3: L = 6mm

(mm)

Size	Y	Q
15	1.5 to 9	M3
20	1.5 to 10	M3, M4
30	2 to 13	M3, M4, M5

Symbol: A3

The shaft can be further shortened by machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

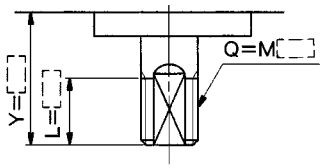


(mm)

Size	X	Lmax	Q
10	7 to 14	X-3	M4
15	8.5 to 18	X-3.5	M5
20	10 to 20	X-4	M6
30	13 to 22	X-5	M8

Symbol: A4

The shaft can be further shortened by machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

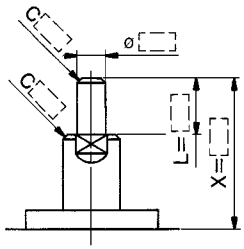


(mm)

Size	Y	Lmax	Q
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

Symbol: A5

The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

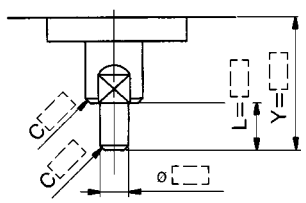


(mm)

Size	X	Lmax
10	2 to 14	X-1
15	3 to 18	X-1.5
20	3 to 20	X-1.5
30	3 to 22	X-2

Symbol: A6

The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

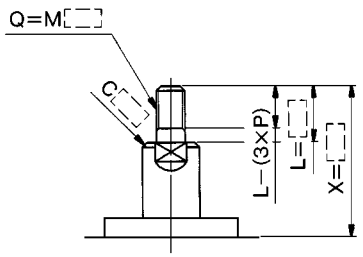


(mm)

Size	Y	Lmax
10	2 to 8	Y-1
15	3 to 9	Y-1.5
20	3 to 10	Y-1.5
30	3 to 13	Y-2

Symbol: A7

The shaft can be further shortened by machining a round shoulder and machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

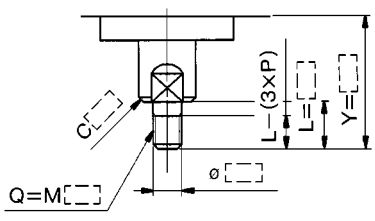


(mm)

Size	X	Lmax	Q
10	5.5 to 14	X-1	M3
15	7.5 to 18	X-1.5	M3, M4
20	9 to 20	X-1.5	M3, M4, M5
30	11 to 22	X-2	M3, M4, M5, M6

Symbol: A8

The shaft can be further shortened by machining a round shoulder and machining male threads on the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)



(mm)

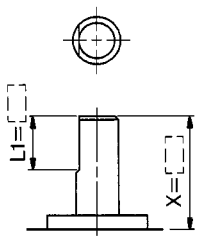
Size	Y	Lmax	Q
10	5.5 to 8	Y-1	M3
15	7.5 to 9	Y-1.5	M3, M4
20	9.5 to 10	Y-1.5	M3, M4, M5
30	11 to 13	Y-2	M3, M4, M5, M6

Symbol

-XA1 to XA17

Symbol: A9

The shaft can be further shortened by changing the length of the standard flat of the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

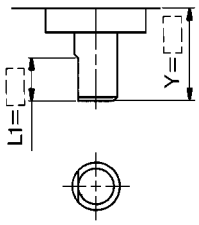


(mm)

Size	X	L1
10	3 to 14	9 – (14 – X) to (X –1)
15	5.5 to 18	10 – (18 – X) to (X – 1.5)
20	7 to 20	10 – (20 – X) to (X – 1.5)
30	7 to 22	12 – (22 – X) to (X – 2)

Symbol: A10

The shaft can be further shortened by changing the length of the standard flat of the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

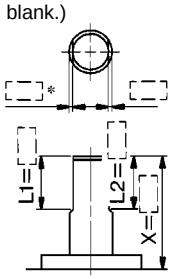


(mm)

Size	Y	L1
10	3 to 8	5 – (8 – Y) to (Y to 1)
15	3 to 9	6 – (9 – Y) to (Y to 1.5)
20	3 to 10	7 – (10 – Y) to (Y to 1.5)
30	5 to 13	8 – (13 –Y) to (Y to 2)

Symbol: A11

The shaft can be further shortened by machining double flats on the long end of the shaft. (If no changes are to be made to the standard flat, and the shaft is not to be shortened, leave the L1 and X dimensions blank.)



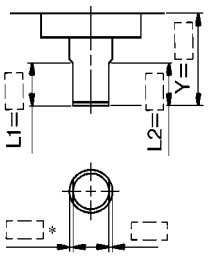
(mm)

Size	X	L1	L2max
10	3 to 14	9 – (14 – X) to (X –1)	X – 1
15	3 to 18	10 – (18 –X) to (X – 1.5)	X – 1.5
20	3 to 20	10 – (20 – X) to (X – 1.5)	X – 1.5
30	5 to 22	12 – (22 – X) to (X – 2)	X – 2

The "*" symbol indicates 0.5mm minimum, L_1 is the standard flat.

Symbol: A12

The shaft can be further shortened by milling double flats on the short end of the shaft. (If no changes are to be made to the standard flat, and the shaft is not to be shortened, leave the L_1 and Y dimensions blank.)



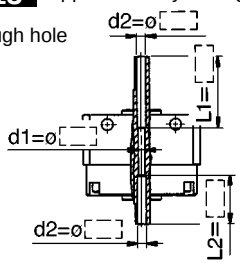
(mm)

Size	Y	L1	L2max
10	3 to 8	5 – (8 – Y) to (Y – 1)	Y – 1
15	3 to 9	6 – (9 – Y) to (Y – 1.5)	Y – 1.5
20	3 to 10	7 – (10 – Y) to (Y – 1.5)	Y – 1.5
30	5 to 13	8 – (13 – Y) – (Y – 2)	Y – 2

*1.5mm or more, L_1: Standard chamfering part

Symbol: A13 Applicable only to single vane.

Shaft through hole



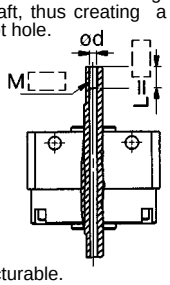
- For size 15mm, d_1 = ø2.5, L_1 = max. 18.
- For size 15mm only, inscribe the L_1, L_2, and d_1 dimensions when = d_2 is 2.6 or more
- Sizes 20mm and 30mm, d_1 = d_2
- The minimum range of the machinable dimension for the d_2 area is 0.1mm.

(mm)

Size	d1	d2
15	ø2.5	ø2.5 to 3
20	—	ø2.5 to 4
30	—	ø2.5 to 4.5

Symbol: A14 Applicable only to single vane.

Machine a special end (at the long end of the shaft), and machine female threads in the through hole at the long end of the shaft, thus creating a through hole to serve as the pilot hole.



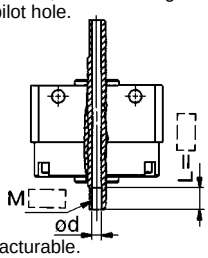
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. Example: For M3 bolt: L max. = 6mm

(mm)

Size	15	20	30
M3 X 0.5	ø2.5	ø2.5	ø2.5
M4 X 0.7	—	ø3.3	ø3.3
M5 X 0.8	—	—	ø4.2

Symbol: A15 Applicable only to single vane.

Machine a special end (at the short end of the shaft), and machine female threads in the through hole at the short end of the shaft, thus creating a through hole to serve as the pilot hole.



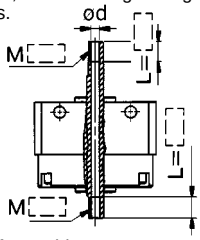
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. Example: For M4 bolt: L max. = 8mm

(mm)

Size	15	20	30
M3 X 0.5	ø2.5	ø2.5	ø2.5
M4 X 0.7	—	ø3.3	ø3.3
M5 X 0.8	—	—	ø4.2

Symbol: A16 Applicable only to single vane.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as pilot holes.



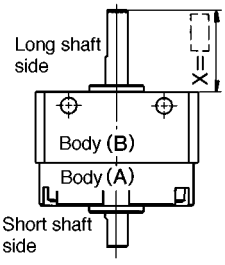
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. Example: For M5 bolt: L max. = 10mm

(mm)

Size	15	20	30
M3 X 0.5	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 end of the shaft.



(mm)

Size	X
10	1 to 14
15	1.5 to 8
20	1.5 to 20
30	2 to 22

Series CRBU
Made to Order Specifications
Change of Shaft End Shape/-XA18 to -XA23
Consult SMC for further information on specifications, dimensions and delivery.

Symbol

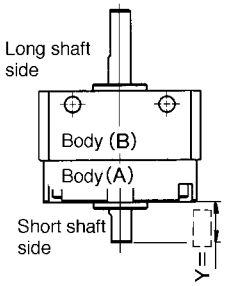
1 Change of shaft end shape — -XA18 to XA23

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A18

Shorten the short end of the shaft.

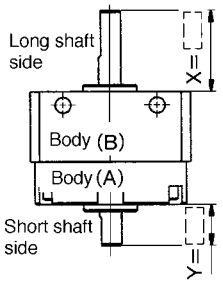


(mm)

Size	Y
10	1 to 8
15	1.5 to 9
20	1.5 to 10
30	2 to13

Symbol: A19

Shorten both the long end and the short end of the shaft.

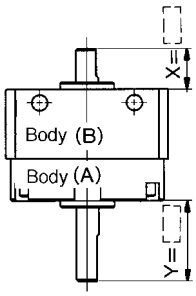


(mm)

Size	X	Y
10	1 to 14	1 to 8
15	1.5 to 18	1.5 to 9
20	1.5 to 20	1.5 to10
30	2 to 22	2 to 13

Symbol: A20

Reverse the assembly of the shaft (thus shortening the long end and the short end of the shaft).

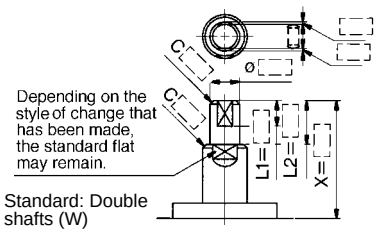


(mm)

Size	X	Y
10	1 to 3	1 to 19
15	1.5 to 6.5	1.5 to 15.5
20	1.5 to 7.5	1.5 to 22.5
30	2 to 8.5	2 to 26.5

Symbol: A21

The shaft can be further shortened by machining a round shoulder and double flats on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

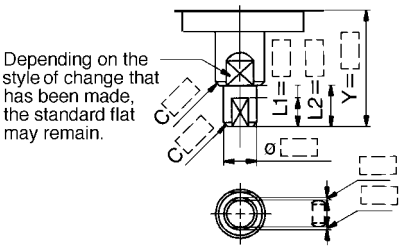


(mm)

Size	X	L1max	L2
10	4 to 14	X-2.5	L1 + 1.5
15	4.5 to 18	X-3	L1 + 1.5
20	5 to 20	X-3.5	L1 + 2
30	7 to 22	X-5	L1 + 3

Symbol: A22

The shaft can be further shortened by machining a round shoulder and double flats on the short end of the shaft. (If the shaft is not to be shortened, leave Y dimension blank.)



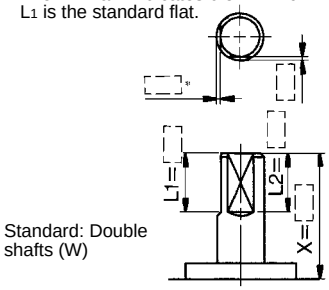
(mm)

Size	Y	L1max	L2
10	4 to 8	Y-2.5	L1 + 1.5
15	4.5 to 9	Y-3	L1 + 1.5
20	5 to 10	Y-3.5	L1 + 2
30	7 to 13	Y-5	L1 + 3

Symbol: A23

The shaft can be further shortened by milling perpendicular double flats on the long end of the shaft. (If no changes are to be made to the standard flat and the shaft is not to be shortened, leave the L1 and X dimensions blank.)

The "∗" mark indicates 0.5 minimum.
L_1 is the standard flat.



(mm)

Size	X	L1	L2max
10	3 to 14	9 – (14 – X) to (X – 1)	X – 1
15	3 to 18	10 – (18 – X) to (X – 1.5)	X – 1.5
20	3 to 20	10 – (20 – X) to (X – 1.5)	X – 1.5
30	5 to 22	12 – (22 – X) to (X – 2)	X – 2

Made to Order Specifications

Change of Shaft End Shape/-XA31 to XA40

Consult SMC for further information on specifications, dimensions and delivery.

Symbol

2 Change of shaft end shape/Applicable shaft style: J, K, S, T, Y — -XA31 to XA40

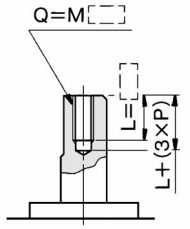
Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the [ ] portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17-A19 for reference.

Symbol: A31

Machine female threads into the long end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M3 bolt: L max. = 6mm)
- Applicable shaft configurations — shafts S, Y



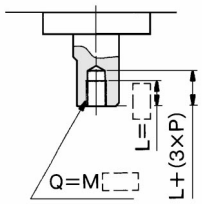
(mm)

Size \ Shaft form	Q	
	S	Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A32

Machine female threads into the short end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M4 bolt: L max. = 8mm)
- Applicable shaft configurations — shafts S,Y



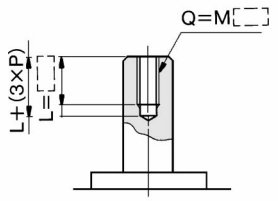
(mm)

Size \ Shaft form	Q	
	S	Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A33

Machine female threads into the long end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M3 bolt: L max. = 6mm)
- Applicable shaft configurations — shafts J, K, T



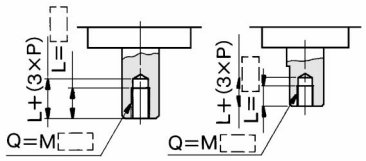
(mm)

Size \ Shaft form	Q		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		

Symbol: A34

Machine female threads into the short end of the shaft.

- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M3 bolt: L max. = 6mm)
  However, in the case of the M5 bolt for shaft S, it is 1.5 times the size of the bolt.
- Applicable shaft configurations — shafts J, K, T



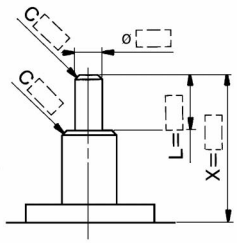
(mm)

Size \ Shaft form	Q		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		

Symbol: A37

The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)

- Applicable shaft configurations — shafts J, K, T



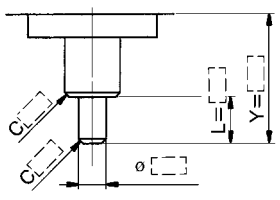
(mm)

Size \ Shaft form	J	K	T	J	K	T
	X			Lmax		
10	2 to 14			X – 1		
15	3 to 18			X – 1.5		
20	3 to 20			X – 1.5		
30	3 to 22			X – 2		

Symbol: A38

The shaft can be further shortened by machining a round shoulder on the short end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)

- Applicable shaft configurations — shaft K

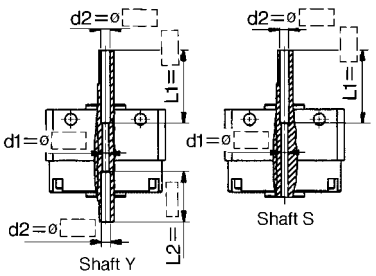


(mm)

Size	Y	Lmax
10	2 to14	Y – 1
15	3 to 18	Y – 1.5
20	3 to 20	Y – 1.5
30	3 to 22	Y – 2

Symbol: A39 Applicable only to single vane style.

Shaft through hole (Shafts S and Y are machined additionally)



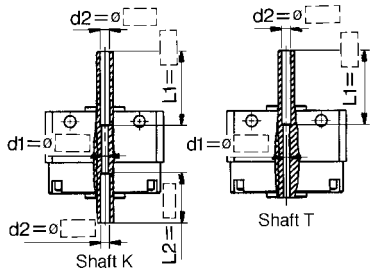
- Size 10 is not manufacturable.
- For size 15 is d1 = ø2.5, L1 = max. X 18
  The minimum range of the machinable dimension for the d2 area is 0.1mm.
- For sizes 20 and 30 are d1 = d2.
- With size 15, enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- Applicable shaft configurations — shafts S, Y

(mm)

Size \ Shaft form	S	Y	S	Y
	d1		d2	
15	2.5		2.5 to 3	
20	—		2.5 to 4	
30	—		2.5 to 4.5	

Symbol: A40 Applicable only to single vane style.

Shaft through hole (Shafts K and T are machined additionally)



- Size 10 is not manufacturable.
- For size 15 is d1 = ø2.5, L1 = max. X 18
  The minimum range of the machinable dimension for the d2 area is 0.1mm.
- For sizes 20 and 30 are d1 = d2.
- With size 15, enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- Applicable shaft configurations — shafts K, T

(mm)

Size \ Shaft form	K	T	K	T
	d1		d2	
15	2.5		2.5 to 3	
20	—		2.5 to 4	
30	—		2.5 to 4.5	

Series CRBU

Made to Order Specifications

Change of Shaft End Shape/-XA41 to XA47

Consult SMC for further information on specifications, dimensions and delivery.

Symbol

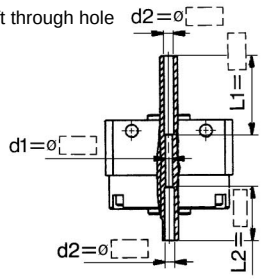
2 **Change of shaft end shape/Applicable shaft style: J, K, S, T, Y** **-XA41 to XA47**

Additional reminders

- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- Unless specified otherwise, the thread pitch is based on coarse metric threads.
  P = thread pitch
  M3 X 0.5; M4 X 0.7; M5 X 0.8
- Enter the desired figures in the ☐ portion of the diagram.
- To shorten the shaft, use the dimensional tables for patterns A17 to A19 for reference.

Symbol: A41 Applicable only to single vane style.

Shaft through hole



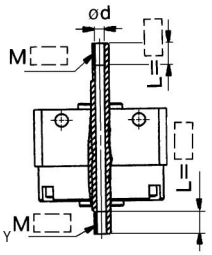
- Size 10 is not manufacturable.
- For size 15 is d1 = 2.5, L1 = max. 18
  The minimum range of the machinable dimension for the d2 area is 0.1mm.
  Enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- For sizes 20 and 30 are d1 = d2.
- Applicable shaft configuration — shaft J

(mm)

Size	d1	d2
15	2.5	2.5 to 3
20	—	2.5 to 4
30	—	2.5 to 4.5

Symbol: A42 Applicable only to single vane style.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



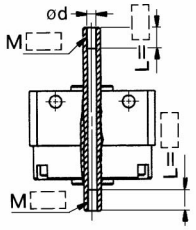
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M5 bolt: L max. 0 = 10mm.)
  However, for the short end of shaft S: For M5 bolt: L max. = 7.5 mm.
- Applicable shaft configurations — shafts S, Y

(mm)

Thread \ Size / Shaft form	15 S	15 Y	20 S	20 Y	30 S	30 Y
M3 X 0.5	2.5		2.5		2.5	
M4 X 0.7	—		3.3		3.3	
M5 X 0.8	—		—		4.2	

Symbol: A43 Applicable only to single vane style.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



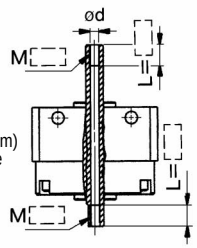
- Size 10 is not manufactured.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M5 bolt: L max. = 10mm.)
  However, for the short end of shaft T: For M5 bolt: L max. = 7.5mm.
- Applicable shaft configurations — shafts K, T

(mm)

Thread \ Size / Shaft form	15 K	15 T	20 K	20 T	30 K	30 T
M3 X 0.5	2.5		2.5		2.5	
M4 X 0.7	—		3.3		3.3	
M5 X 0.8	—		—		4.2	

Symbol: A44 Applicable only to single vane style.

Machine special ends (at both ends of the shaft), and machine female threads in the through holes at both ends of the shaft, thus creating through holes to serve as the pilot holes.



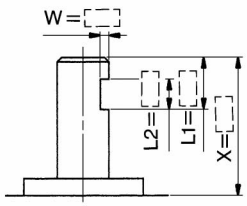
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  (Example: For M5 bolt: L max. = 10mm.)
- Applicable shaft configuration — shaft J

(mm)

Thread \ Size	15	20	30
M3 X 0.5	2.5	2.5	2.5
M4 X 0.7	—	3.3	3.3
M5 X 0.8	—	—	4.2

Symbol: A45

The shaft can be further shortened by machining an intermediate flat on the long end of the shaft (the position is that of the standard flat.)



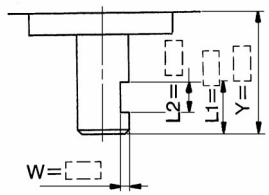
- Applicable shaft configurations — Shaft J, K, T

(mm)

Size \ Shaft form	X J	X K	X T	W J	W K	W T	L1max J	L1max K	L1max T	L2max J	L2max K	L2max 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		

Symbol: A46

The shaft can be further shortened by machining an intermediate flat on the short end of the shaft (the position is that of the standard flat.)



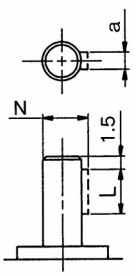
- Applicable shaft configurations — Shaft K

(mm)

Size	Y	W	L1max	L2max
10	4.5 to 14	0.5 to 2	Y–1	L1–1
15	5.5 to 18	0.5 to 2.5	Y–1.5	L1–1
20	6 to 20	0.5 to 3	Y–1.5	L1–1
30	8.5 to 22	0.5 to 4	Y–2	L1–2

Symbol: A47

Machining a key groove in the long end of the shaft (the position is that of the standard flat). A key must be ordered separately.



- Applicable shaft configurations — Shaft J, K, T

(mm)

Size	a	L	N
20	$2h^{0}_{-0.025}$	10	6.8
30	$3h^{0}_{-0.025}$	14	9.2

⚠ Caution

Symbols A45, A46, and dimensions W and (L1–L2)

The intermediate flat may interfere with the center hole if dimensions W and (L1–L2) are at the measurements given below.

Size	W	L1–L2
ø10	1 to 2	1 to 3
ø15	1.5 to 2.5	1 to 3
ø20	2 to 3	1 to 3
ø30	3 to 4	2 to 3

Series CRBU
Made to Order Specifications
-XC1 to XC4

Consult SMC for further information on specifications, dimensions and delivery.

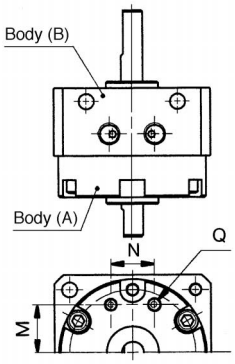
3 Connecting ports are added to the end side of the body(A) — Symbol -XC1

CRBUWP Refer to "How to Order" on p.1.2-19. — **XC1**

Symbol
Connecting ports are added to the end side of the body (A).

∗SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are indicated.

A connecting port is added to the end side of the body (A). (Aluminum is used, for when the additional machined part is untreated.)



Size	Q	M	N
10	M3	8.5	9.5
15	M3	11	10
20	M5	14	13
30	M5	15.5	14

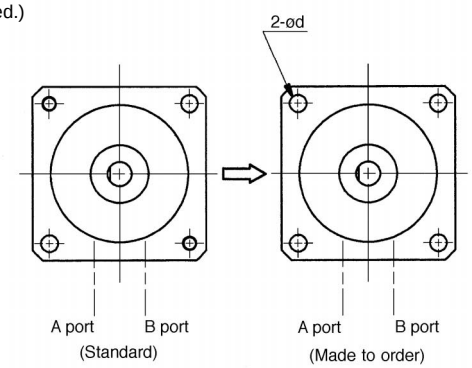
4 2 thread parts of the body (B) are machined to be through holes — Symbol -XC2

CRBUWP Refer to "How to Order" on p.1.2-19. — **XC2**

Symbol
2 thread parts of the body (B) are machined to be through holes.

∗SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are indicated.

2 thread parts of the body (B) are used as through holes. (Aluminum is used, for when the additional machined part is untreated.)



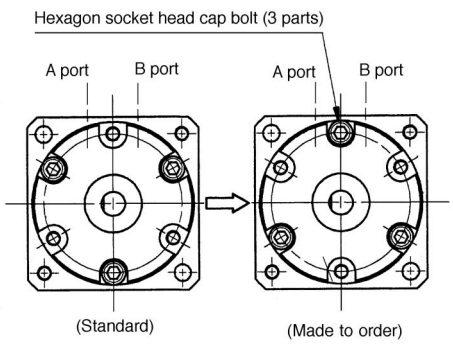
Size	d
10	3.4
15	3.4
20	4.5
30	5.5

5 Positions of the body tightening bolts are changed. — Symbol -XC3

CRBUWP Refer to "How to Order" on p.1.2-19. — **XC3**

Symbol
Positions of the body tightening bolts are changed.

Positions of the body tightening bolts are changed. Size 10 is not available.



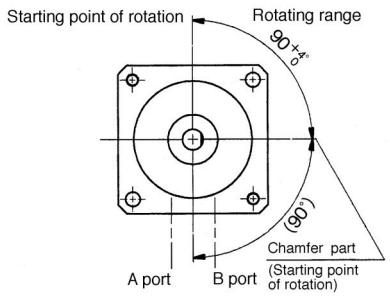
6 Rotating range is changed.(90° to the right from the starting point) — Symbol -XC4

CRBUWP Refer to "How to Order" on p.1.2-19. — **XC4**

∗SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are indicated.
∗There are no standard chamfering parts on shafts S and T.

Symbol
Rotating range is changed. (90° to the right from the starting point)

Rotating range is changed. (Rotating angle is 90°.)
Starting point of rotation is 90° to the right on the horizontal line.
Angle error for CRBUW10 is $^{+5}_{0}$°.
Applicable only to the single vane style.



The start of the contact point is at the position of the single flat when air pressure is applied through port A.

Series CRBU Made to Order Specifications
Change in Angle of Rotation/-XC5 to XC6
Reverse Mounting of Rotary Shaft/-XC7, Fluorine Grease/-XC30

Consult SMC for further information on specifications, size and delivery.

7 Change in Angle of Rotation -XC5 to XC6

(-XC5: At 45° to the left from the starting point.
-XC6: At 90° to the left from the starting point.)

Symbol

CRBUWP Refer to "How to Order" on p.1.2-19. — XC5 / XC6

Symbol

-XC5	At 45° from the starting point.
-XC6	At 90° from the starting point.

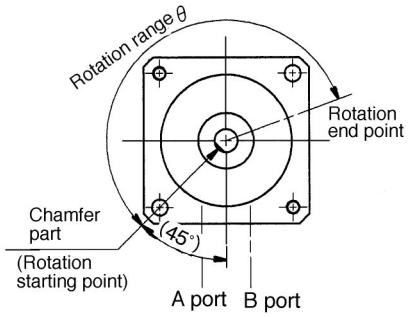
∗ Write required value in □ in the diagram below.
∗ No basic chamfer position on S and Y shaft.

Symbol: C5 Applicable only to single vane style.

Change in angle of rotation.
Rotation starting point at the angle of 45°.
Error in the angle at from 0° to +5° for "CRBUW10".

$\theta = \square^{\circ}\ {}^{+4^{\circ}}_{0}$

max.200°



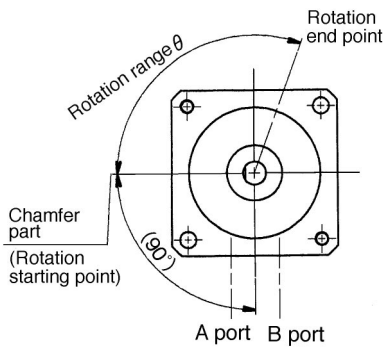
Rotation starting point is on the one chamfering position when pressurized to B port.

Symbol: C6 Applicable only to single vane style.

Change in angle of rotation
Rotation starting point at the angle of 90°.
Error in the angle at from 0° to +5° for "CRBUW10".

$\theta = \square^{\circ}\ {}^{+4^{\circ}}_{0}$

max.110°



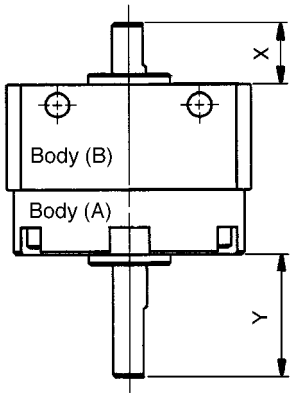
Rotation starting point is on the one chamfering position when pressurized to B port.

8 Reverse Mounting of Rotary Shaft -XC7

Symbol

CRBUWP Refer to "How to Order" on p.1.2-19. — XC7

Dimensions



(mm)

Size	Y	X
10	19	3
15	20.5	6.5
20	22.5	7.5
30	26.5	8.5

9 Fluorine Grease -XC30

Symbol

CRBUWP Refer to "How to Order" on p.1.2-19. — XC30

Fluorine Grease

Lubricant oil on the seal part of packing and inner wall of the cylinder is changed to fluorine grease.

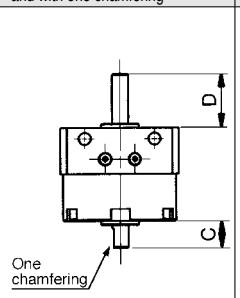
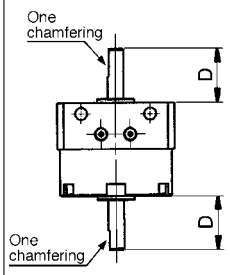
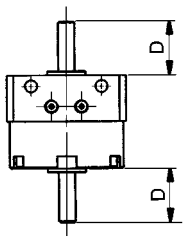
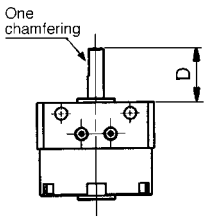
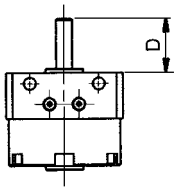
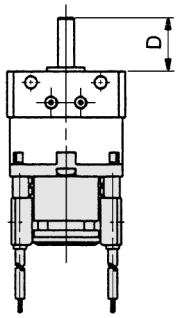
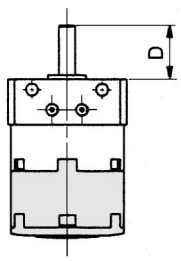
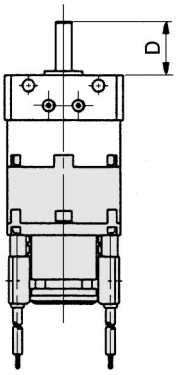
Made to Order Specifications
Shaft Variations/Shaft Style: J, Y, K, S, T

Consult SMC for further information on specifications, size and delivery.

10 Shaft Variations

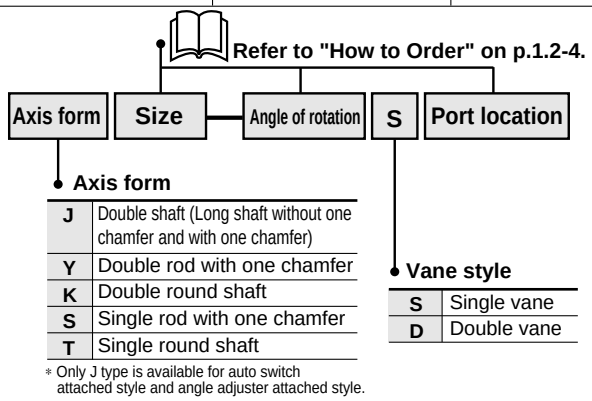
Symbol
Shaft Style: J, Y, K, S, T

Shaft styles except for standard shaft style (W) of series CRBU.

Shaft Style	J	Y	K	S	T
Classification	Double Rod			Sringle Rod	
Shaft Style	Long axis without one chamfering and with one chamfering	One chamfer	Round shaft	One chamfer	Round shaft
Basic style					
With auto switch					
With angle adjuster					
With auto switch and angle adjuster					

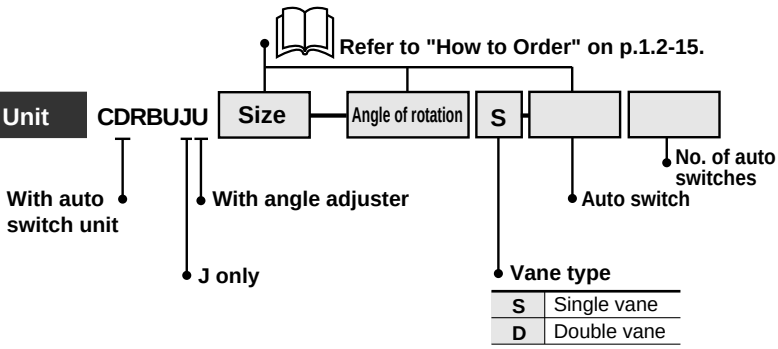
How to Order

Basic Style CRBU



∗ Only J type is available for auto switch attached style and angle adjuster attached style.

With Unit CDRBUJU



(mm)

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

Note 1) Port positions are only on the body side for unit attached style.
Note 2) Sizes of shaft and one chamfer are the same as sizes and allowance of the standard style. Refer to p.1.2-10.

Rotary Actuator: Free Mount Type
Vane Style
Series CRBU2
Size: 10, 15, 20, 30, 40

Series Variations

Standard

Fluid			Air																
Size			10				15				20, 30				40				
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	
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-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

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														●	●	●	●
		Same length double long shaft with single flat on both shafts	Y	●	●	●	●	●	●	●	●	●	●	●	●				
		Double shaft key														●	●	●	●
		Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Single shaft type	Single flat	S	●	●	●	●	●	●	●	●	●	●	●	●				
		Single shaft key														●	●	●	●
		Single round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pattern	Shaft pattern			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Rotation pattern			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Rotary Actuator: Free Mount Type
Vane Style
Series CRBU2
Size: 10, 15, 20, 30, 40

How to Order

Without auto switch — CRBU2 W □ 180 S E

With auto switch Size: 10, 15 — CDRBU2 W □ 180 S 90 L □

With auto switch Size: 20, 30, 40 — CDRBU2 W □ 180 S R73 L □

With auto switch (With switch unit)

Free mount type

Shaft type

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

Size

Size
10
15

Size

Size
20
30
40

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.

Connection 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

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 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	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	●	●	●	—		
	Solid state switch		Yes		—	—	**97**	Parallel cord	●	●	●	—	—	
						100 V	**93A**	Heavy-duty cord	●	●	●	—		
					—	—	**T99**		●	●	—	—		
							T99V		●	●	—	—		
				3-wire (NPN)	5 V,12 V	—	**S99**		●	●	—	—	IC circuit	
							S99V		●	●	—	—		
				3-wire (PNP)			**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			—	—	**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

Single Vane Specifications

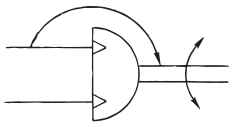
Model (Size)		CRBU2W10-□S	CRBU2W15-□S	CRBU2W20-□S	CRBU2W30-□S	CRBU2W40-□S
Rotating angle		90°, 180°, 270°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Speed regulation range (sec/90°) (1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (2) (J)		0.00015	0.001	0.003	0.02	0.04
			0.00025	0.0004	0.015	0.033
Shaft load	Allowable radial load (N)	15		25	30	60
	Allowable thrust load (N)	10		20	25	40
Bearing type		Bearing				
Port location		Side ported or Axial ported				
Shaft type		Double shaft (Double shaft with single flat on both shafts)				Double shaft (Long shaft key & Single flat)
Angle adjustable (3)		0 to 230°	0 to 240°			0 to 230°

Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 11-3-5.

Double Vane Specifications

Model (Size)		CRBU2W10-□D	CRBU2W15-□D	CRBU2W20-□D	CRBU2W30-□D	CRBU2W40-□D
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 regulation range (sec/90°) (1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (J)		0.0003	0.0012	0.0033	0.02	0.04
Shaft load	Allowable radial load (N)	15		25	30	60
	Allowable thrust load (N)	10		20	25	40
Bearing type		Bearing				
Port location		Side ported or Axial ported				
Shaft type		Double shaft (Double shaft with single flat on both shafts)				Double shaft (Long shaft key & Single flat)
Angle adjustable (3)		0 to 90°				0 to 230°

JIS Symbol



Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speeds 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 11-3-5.

Inner Volume and Connection Port

Vane type	Model (size)		CRBU2W10			CRBU2W15			CRBU2W20			CRBU2W30			CRBU2W40		
Single vane	Rotating angle		90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
	Volume (cm^3)		1 (0.6)	1.2	1.5	1.5 (1.0)	2.9	3.7	4.8 (3.5)	6.1	7.9	11.3 (8.5)	15	20.2	25	31.5	41
	Port size	Side ported	M5 x 0.8														
		Axial ported	M3 x 0.5						M5 x 0.8								
Double vane	Rotating angle		90°	100°		90°	100°		90°	100°		90°	100°		90°	100°	
	Volume (cm^3) *		1	1.1		2.6	2.7		5.6	5.7		14.4	14.5		33	34	
	Port size	Side ported	M5 x 0.8						M5 x 0.8								
		Axial ported	M3 x 0.5														

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

Weight

(g)

Vane type	Model (size)	CRBU2W10			CRBU2W15			CRBU2W20			CRBU2W30			CRBU2W40		
Single vane	Rotating angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
	Body of rotary actuator	47.5	47.1	47	73	72	72	143	142	140	263	258	255	491	480	469
	Auto switch unit + 2 switches	30			30			50			60			46.5		
	Angle adjuster	30			47			90			150			203		
Double vane	Rotating angle	—	90°	100°	—	90°	100°	—	90°	100°	—	90°	100°	—	90°	100°
	Body of rotary actuator	—	62.2	63.2	—	77	81	—	151	158	—	289	308	—	504	550
	Auto switch unit + 2 switches	30			30			50			60			46.5		
	Angle adjuster	30			47			90			150			203		

⚠ Caution

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.

Rotary Actuator: Replaceable Shaft

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

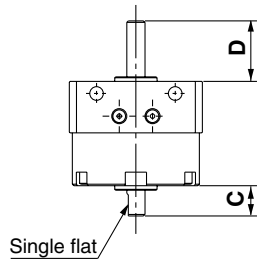
Without auto switch

CRBU2 **J** | **Size** | **Rotating angle** | **Vane type** | **Port location**

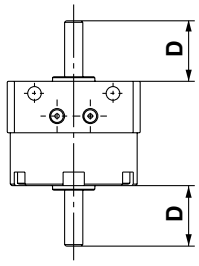
Shaft type

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					●

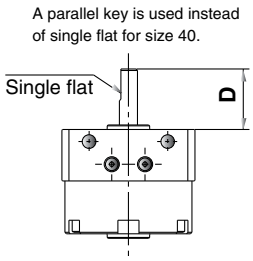
J



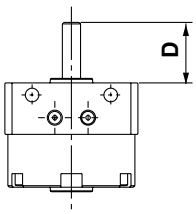
K



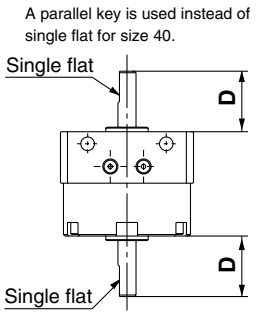
S



T



Y



(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 adjuster

CDRBU2 **J** **U** | **Size** | **Rotating angle** | **Vane type** | **Auto switch**

With angle adjuster

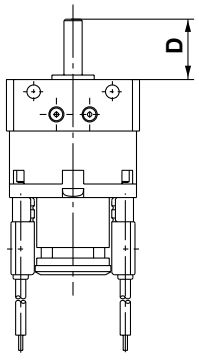
Shaft type

With auto switch

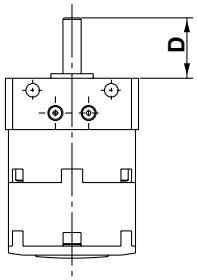
Symbol	Shaft type	Shaft-end shape	Size				
			10	15	20	30	40
J	Double shaft	Long shaft without single flat & with single flat	●	●	●	●	
		Long shaft without keyway & single flat					●

J

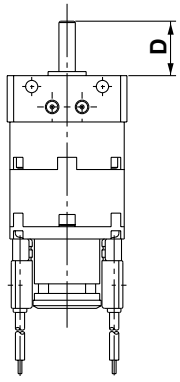
With auto switch



With angle adjuster



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 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 – CRBU2W | **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 s/90°			0.04 to 0.3 s/90°	0.07 to 0.5 s/90°
Port location	Side ported or Axial ported				
Shaft type	Double shaft (Shaft with single flat on both shafts)				Long shaft key & Single flat
Auto switch	Mountable				

⚠ 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°.

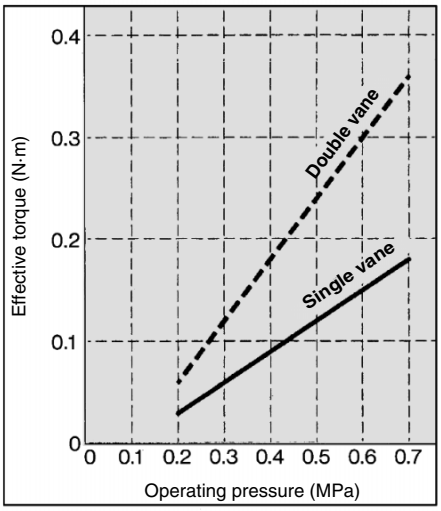
2. Connection ports are side ports only.

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

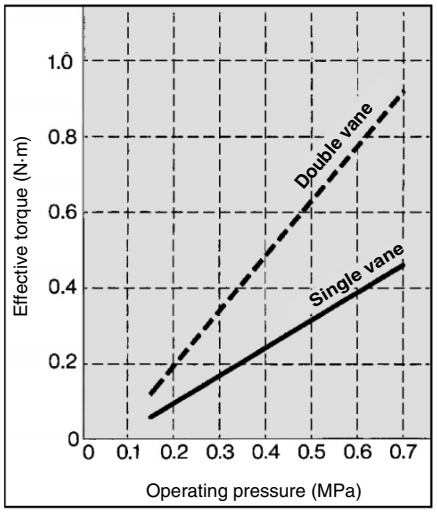
4. Use a 100° rotary actuator if you desire to adjust the angle to 90° using a double vane type.

Effective Output

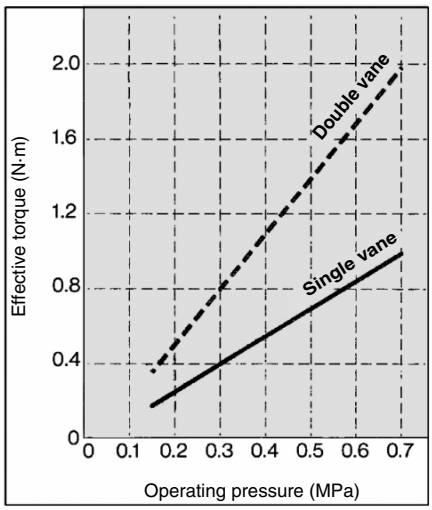
CRBU2W10



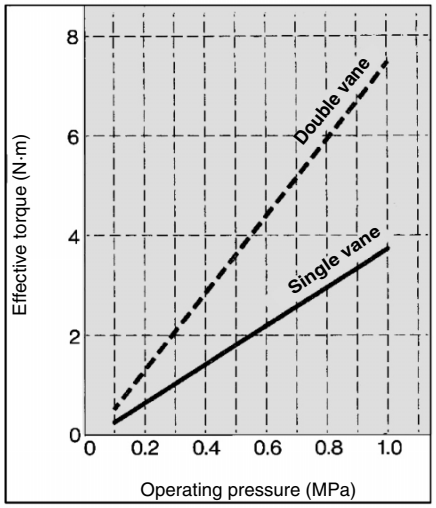
CRBU2W15



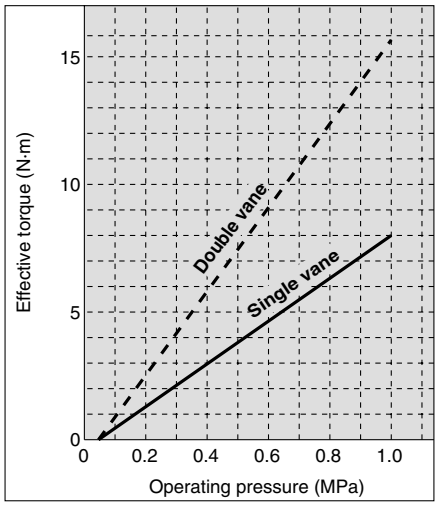
CRBU2W20



CRBU2W30

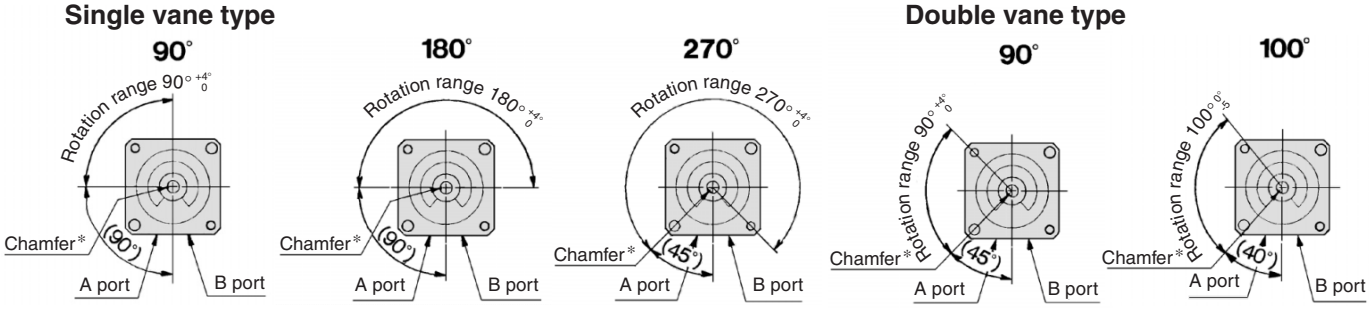


CRBU2W40



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

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



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

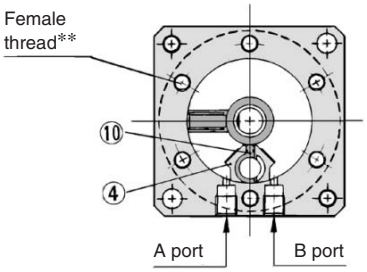
Note) For single vane style, rotation tolerance of 90°, 180°, and 270° actuators $^{+5^\circ}_{0}$ will be for size 10 actuators only.
For double vane style, rotation tolerance of 90° actuators $^{+5^\circ}_{0}$ will be for size 10 actuators only.

Construction: 10, 15, 20, 30, 40

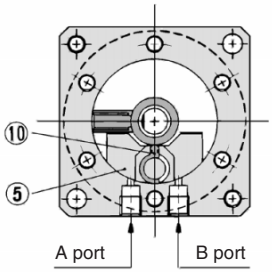
Single vane type

Standard: CRBU2W10/15/20/30/40-□S (3 female threads (one of them is indicated with "**") spaced equally apart in 120° are not available for size 10.)

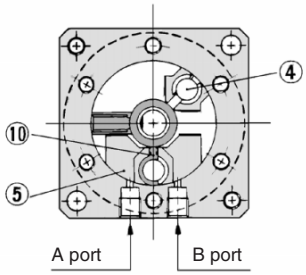
For 270°
(Top view from long shaft side)



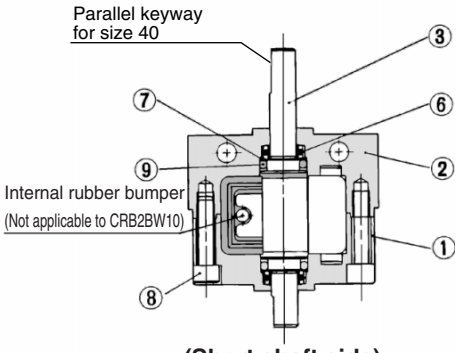
For 180°
(Top view from long shaft side)



For 90°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)

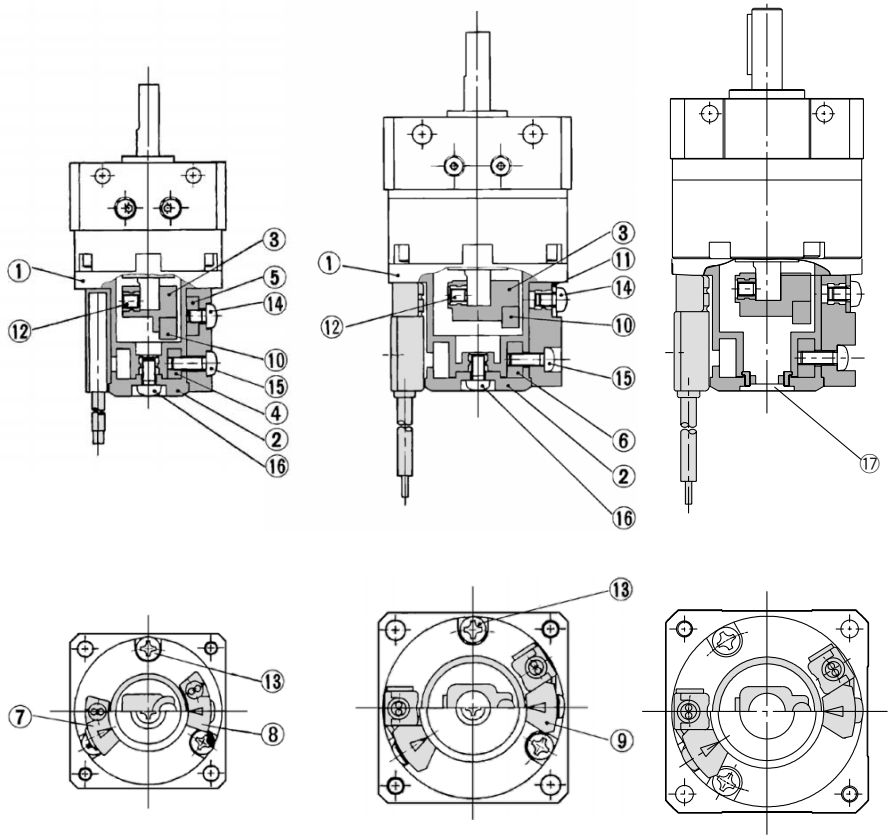
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
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 CRBU2W30 and CRBU2W40.

With auto switch unit

CDRBU2W10/15-□$^{S}_{D}$ CDRBU2W20/30/40-□$^{S}_{D}$ CDRBU2W40-S/D



Component Parts

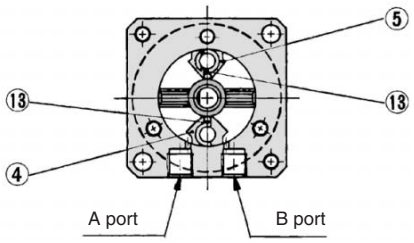
No.	Description	Material
①	Cover (A)	Resin
②	Cover (B)	Resin
③	Magnet lever	Resin
④	Holding block (A)	Aluminum alloy
⑤	Holding block (B)	Aluminum alloy
⑥	Holding block	Aluminum alloy
⑦	Switch block (A)	Resin
⑧	Switch block (B)	Resin
⑨	Switch block	Resin
⑩	Magnet	Magnetic body
⑪	Arm	Stainless steel
⑫	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 (size 40 only)

* For CDRBU2W10, two round head Phillips screws ⑬, are required.

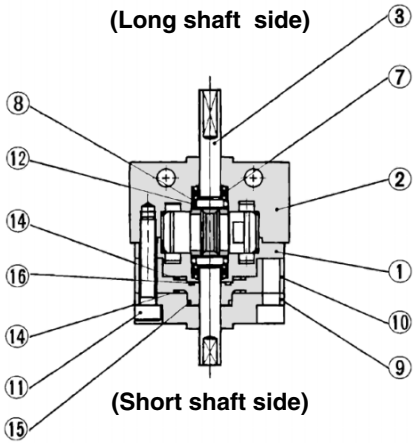
Construction: 10, 15, 20, 30, 40

Double vane type
Standard: CRBU2W10-□D

For 90°
(Top view from long shaft side)

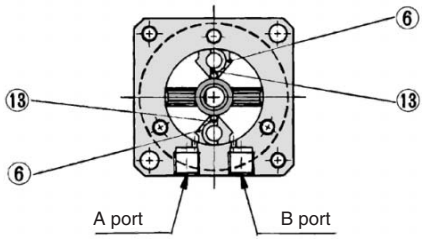


(Long shaft side)



(Short shaft side)

For 100°
(Top view from long shaft side)

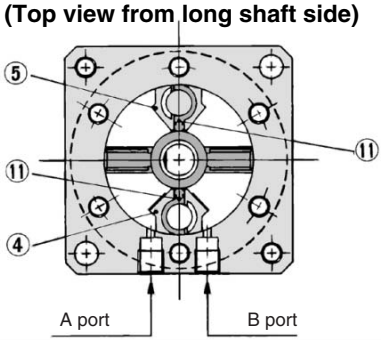


Component Parts

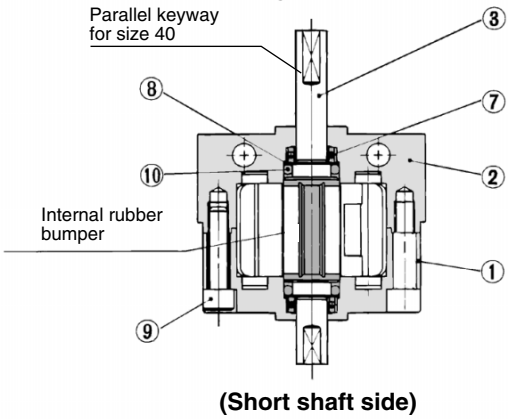
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
③	Vane shaft	Carbon steel	
④	Stopper	Stainless steel	
⑤	Stopper	Resin	
⑥	Stopper	Stainless steel	
⑦	Bearing	High carbon chrome bearing steel	
⑧	Back-up ring	Stainless steel	
⑨	Cover	Aluminum alloy	
⑩	Plate	Resin	
⑪	Hexagon socket head cap screw	Stainless steel	Special screw
⑫	O-ring	NBR	
⑬	Stopper seal	NBR	
⑭	Gasket	NBR	
⑮	O-ring	NBR	
⑯	O-ring	NBR	

Standard: CRBU2W15/20/30/40-□D

For 90°
(Top view from long shaft side)

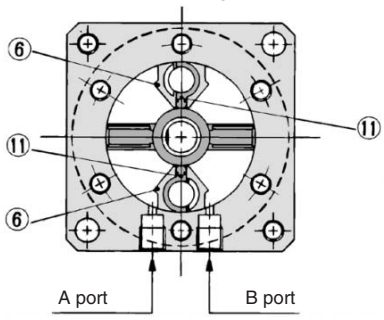


(Long shaft side)



(Short shaft side)

For 100°
(Top view from long shaft side)



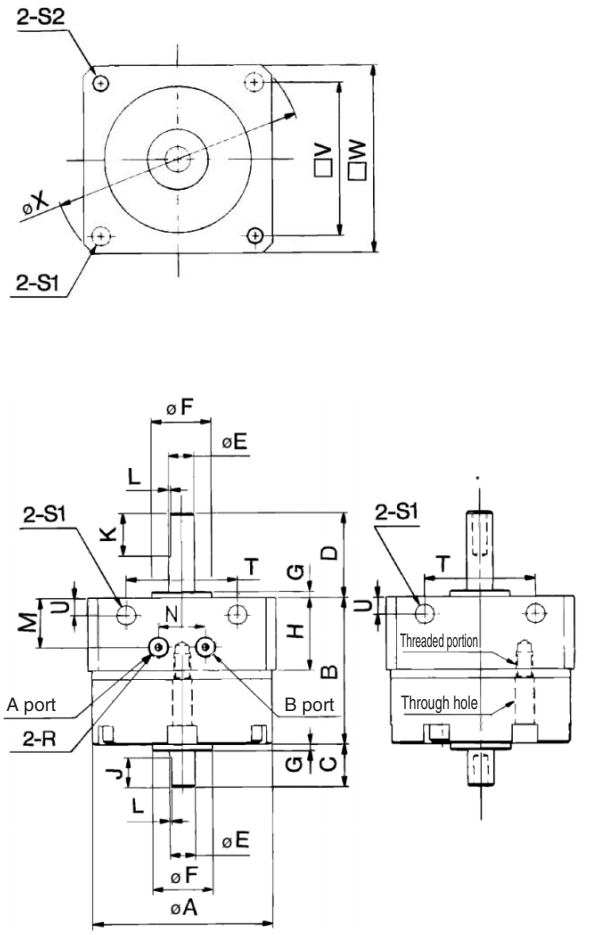
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	
②	Body (B)	Aluminum alloy	
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	Hexagon socket head cap screw	Stainless steel	Special screw
⑩	O-ring	NBR	
⑪	Stopper seal	NBR	

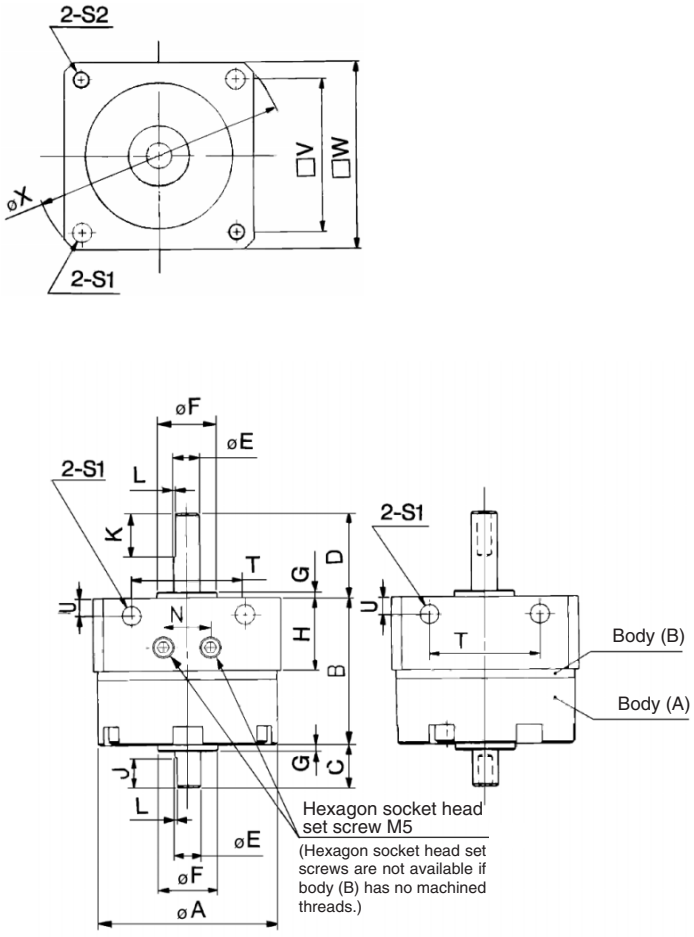
Dimensions: 10, 15, 20, 30

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

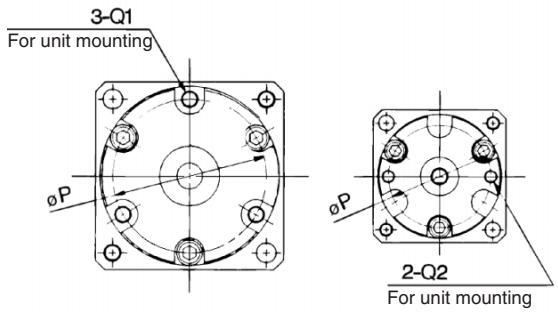
CRBU2W□-□S
<Port location: Side ported>



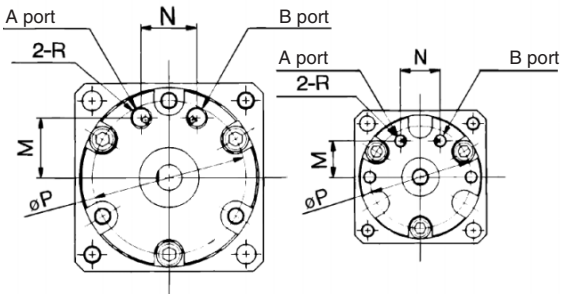
CRBU2W□-□SE
<Port location: Axial ported>



CRBU2W10□-□S
<Port location: Side ported>



CRBU2W10□-□SE
<Port location: Axial ported>



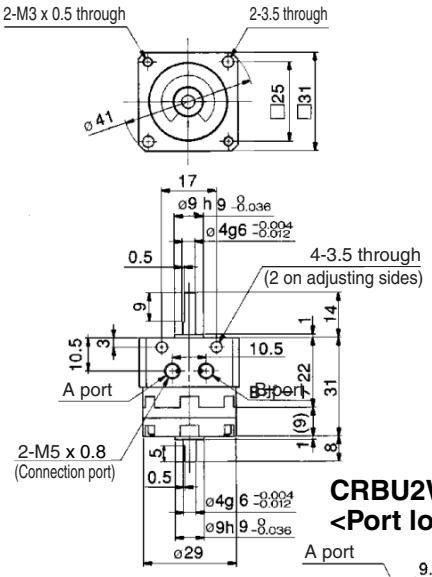
(mm)

Model	A	B	C	D	E (g6)	F (h9)	G	H	J	K	L	M	N	P	Q1	(Depth) Q2	R	S1	S2	T	U	V	W	X
CRBU2W10-□S	29	22	8	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	1	15.5	5	9	0.5	10.5	10.5	24	—	M3 (4)	M5 x 0.8	3.5	M3 x 0.5	17	3	25	31	41
CRBU2W10-□SE												8.5	9.5				M3 x 0.5							
CRBU2W15-□S	34	25	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	6	10	0.5	10.5	10.5	29	M3 x 0.5	—	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48
CRBU2W15-□SE												11	10				M3 x 0.5							
CRBU2W20-□S	42	34.5	10	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	7	10	0.5	11.5	11	36	M4 x 0.7	—	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59
CRBU2W20-□SE												14	13											
CRBU2W30-□S	50	47.5	13	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	8	12	1	12	13	43	M5 x 0.8	—	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69
CRBU2W30-□SE												15.5	14											

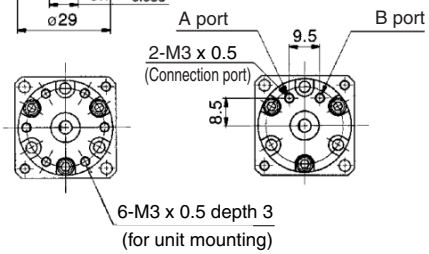
Dimensions: 10, 15, 20, 30

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

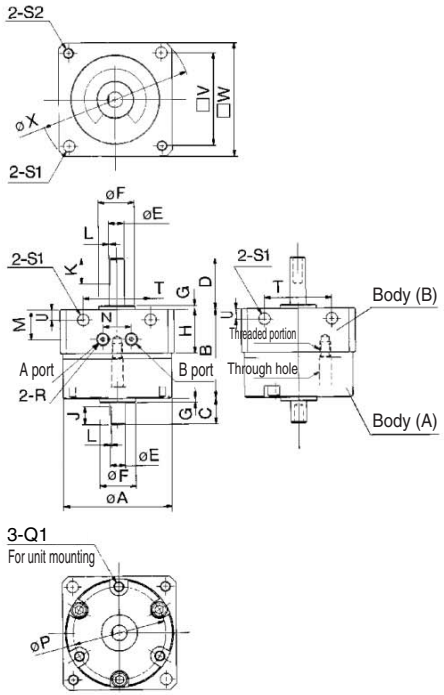
CRBU2W10-□D
<Port location: Side ported>



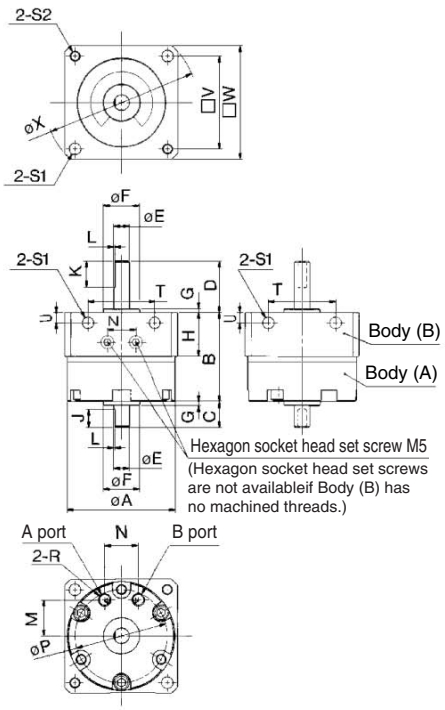
CRBU2W10-□DE
<Port location: Axial ported>



CRBU2W15/20/30-□D
<Port location: Side ported>(Illustrations below show size 30 actuators.)



CRBU2W15/20/30-□DE
<Port location: Axial ported>



(mm)

Model	A	B	C	D	E(g6)	F(h9)	G	H	J	K	L	M	N	P	Q1	R	S1	S2	T	U	V	W	X
CRBU2W15-□D	34	25	9	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	6	10	0.5	10.5	10.5	29	M3 x 0.5	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48
CRBU2W15-□DE												11	10			M3 x 0.5							
CRBU2W20-□D	42	34.5	10	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	7	10	0.5	11.5	11	36	M4 x 0.7	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59
CRBU2W20-□DE												14	13										
CRBU2W30-□D	50	47.5	13	22	$8^{-0.005}_{-0.014}$	$16^{-0.00}_{-0.043}$	2	17.5	8	12	1	12	13	43	M5 x 0.8	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69
CRBU2W30-□DE												15.5	14										

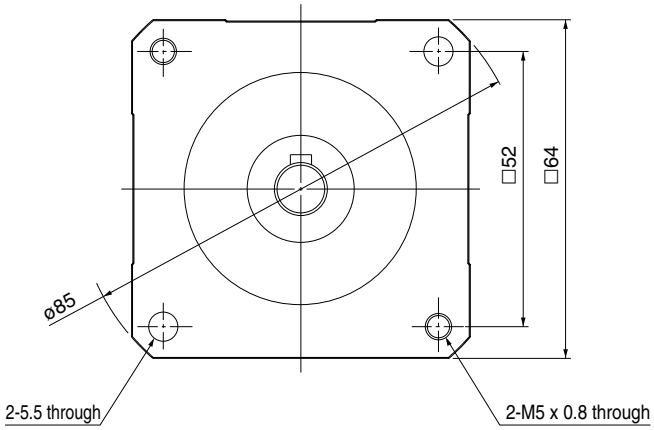
Dimensions: 40

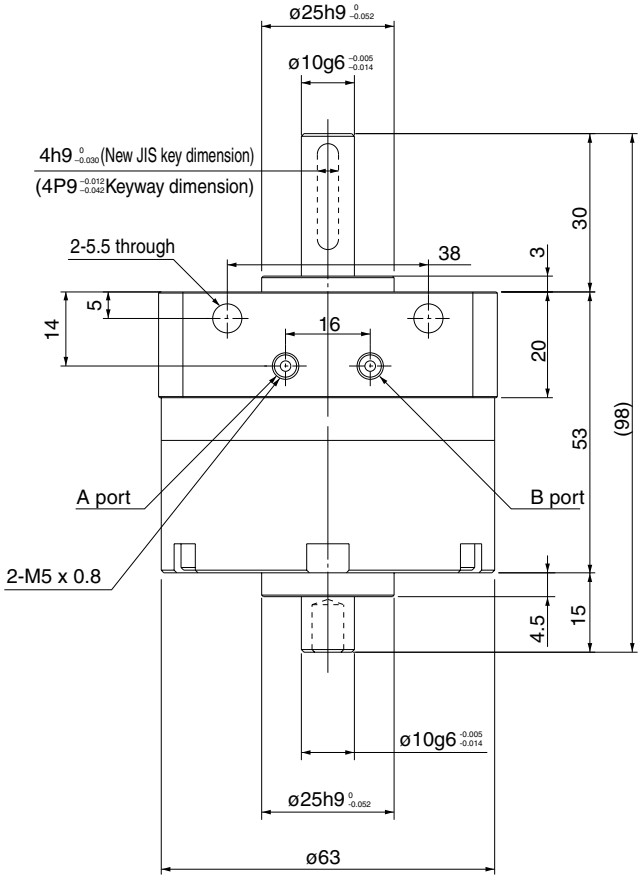
Single vane type/Double vane type
CRBU2W40-□S/D
<Port location: Side ported>

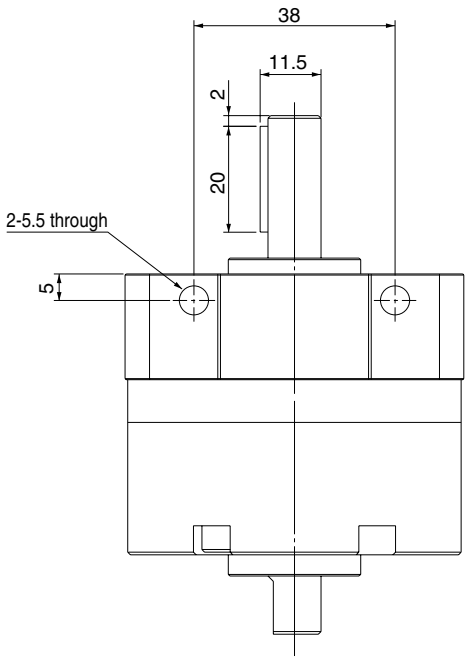
(mm)

Keyway dimensions	ℓ	b	h

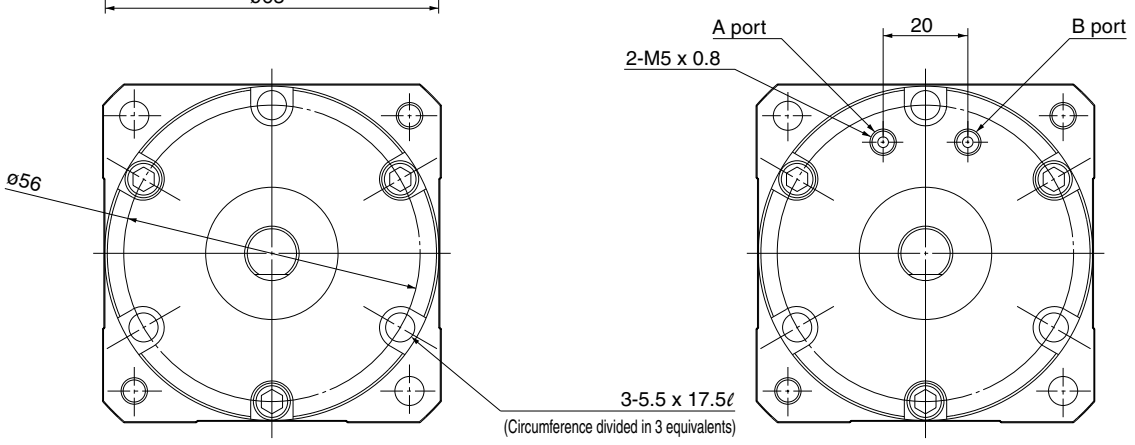
Model	b (h9)	h (h9)	ℓ
CRBU2W40-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20







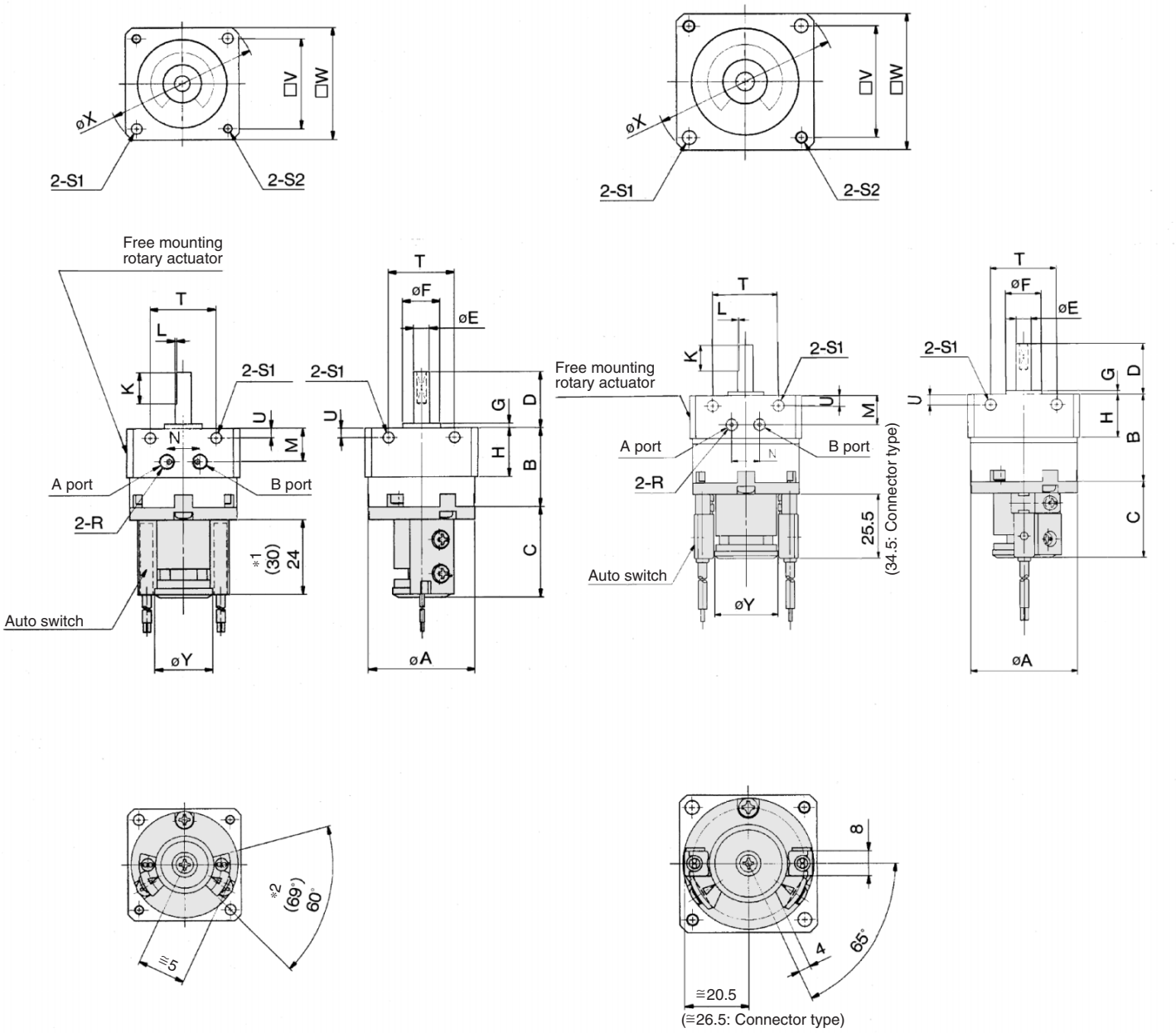
CRBU2W40-□SE/DE
<Port location: Axial ported>



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.

CDRBU2W10/15-□S **CDRBU2W20/30-□S**



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

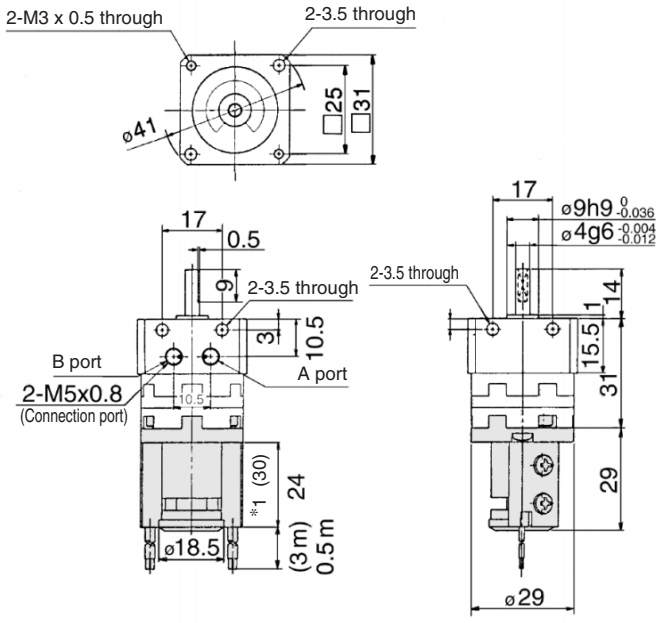
Note)
- For rotary actuators with auto switch unit connection ports are side ports only.
- The above exterior view drawings illustrate rotary actuators with one right-hand and one left-hand

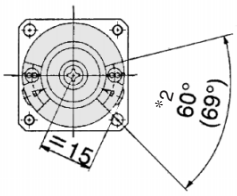
(mm)

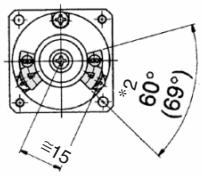
Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CDRBU2W10-□S	29	22	29	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	1	15.5	9	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	17	3	25	31	41	18.5
CDRBU2W15-□S	34	25	29	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48	18.5
CDRBU2W20-□S	42	34.5	30	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59	25
CDRBU2W30-□S	50	47.5	31	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69	25

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

CDRBU2W10-□D



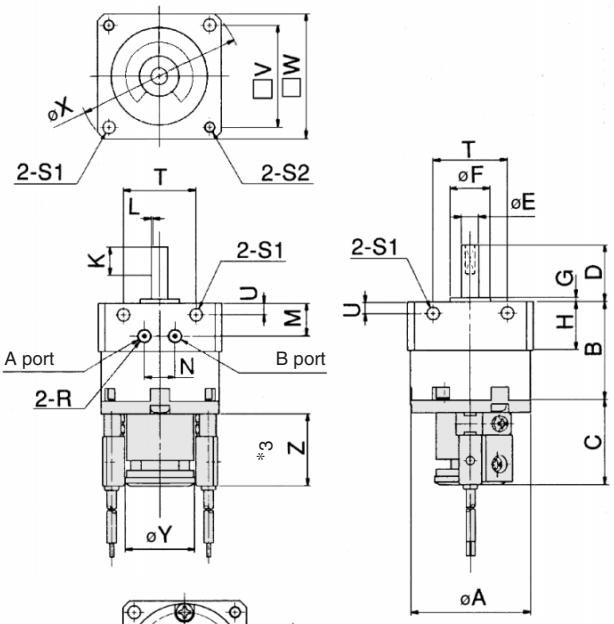


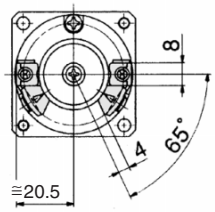


CDRBU2W15-□D

CDRBU2W15/20/30-□D

(Illustrations below show size 20 actuators.)





(Approx. 26.5 for connector type)
CDRBU2W20/30-□D

∗ 1. The length is 24 when any of the following auto switches are used: D-90, D-90A, D-S99(V), D-T99 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	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y	Z	
CDRBU2W15-□D	34	25	29	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48	18.5	24 *1	30 *1
CDRBU2W20-□D	42	34.5	30	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59	25	25.5 *3	34.5 *3
CDRBU2W30-□D	50	47.5	31	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69	25		

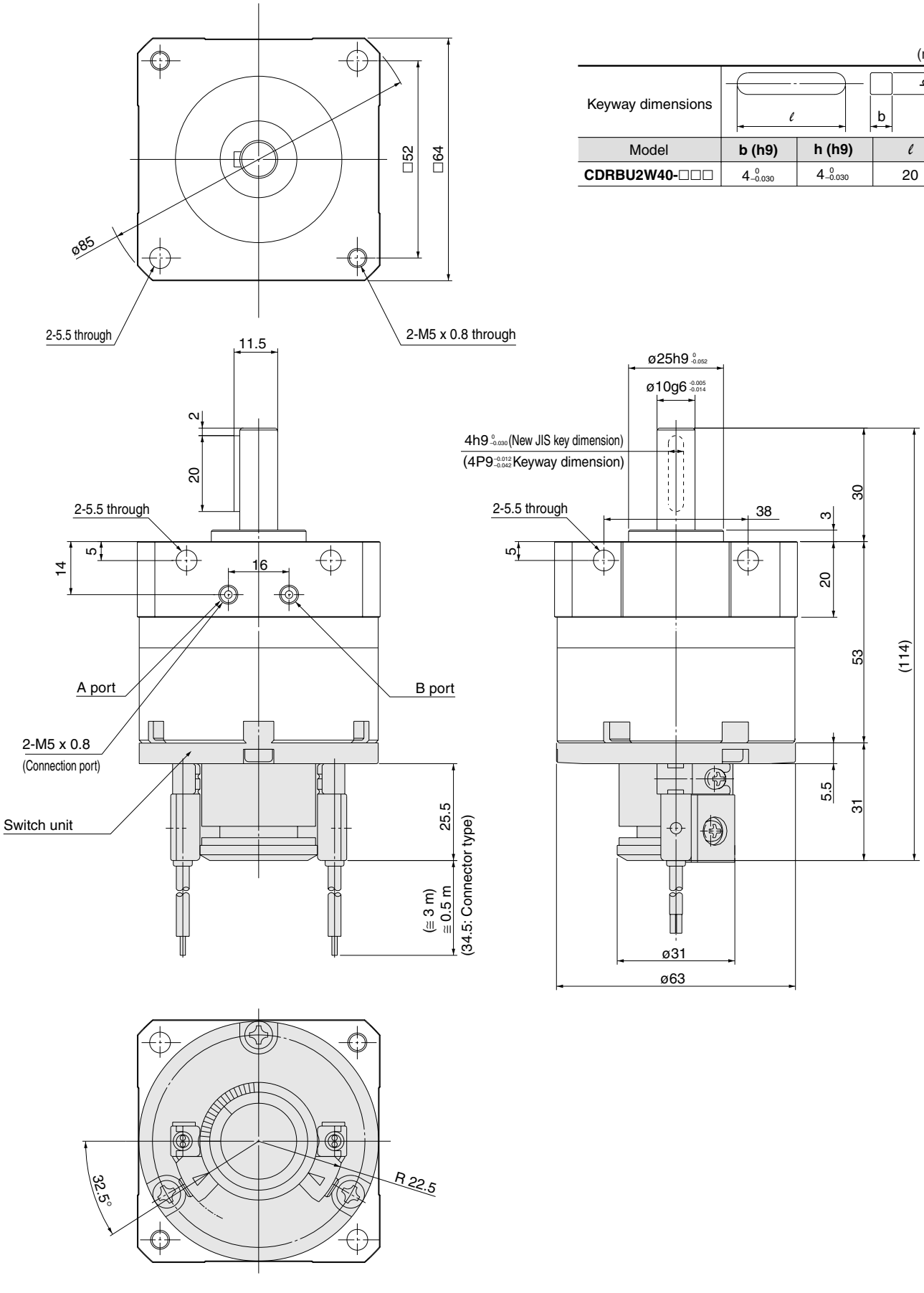
Dimensions: 40 (With auto switch unit)

Single vane type/Double vane type
CDRBU2W40-□S/D

(mm)

Keyway dimensions

Model	b (h9)	h (h9)	ℓ
CDRBU2W40-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20



Rotary Actuator with Angle Adjuster
Free Mount Type, Vane Style
Series CRBU2WU
Size: 10, 15, 20, 30, 40

How to Order

Without auto switch

CRBU2 W U 10 — 180 S

Size

10
15
20
30
40

With auto switch Size: 10, 15

CDRBU2 W U 10 — 180 S — 90 ☐ ☐

With auto switch Size: 20, 30, 40

CDRBU2 W U 20 — 180 S — R73 ☐ ☐

With auto switch
(With switch unit)

Free mount type

With angle adjuster

Size

10
15

20
30
40

Rotating angle

Application	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	Grommet/Lead wire: 0.3 m
CN	Connector/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

Applicable Auto Switch/Refer to page 11-11-1 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	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, 1 00 V	**90A**	Heavy-duty cord	●	●	●	—		
			Yes		—	—	**97**	Parallel cord	●	●	●	—	—	
						100 V	**93A**	Heavy-duty cord	●	●	●	—		
	Solid state switch				—	—	**T99**		●	●	—	—		
							T99V		●	●	—	—		
				3-wire (NPN)		—	**S99**		●	●	—	—	IC circuit	
							S99V		●	●	—	—		
				3-wire (PNP)	5 V, 12 V		**S9P**		●	●	—	—		
							S9PV		●	●	—	—		
For 20, 30, and 40	Reed switch	Grommet	Yes	2-wire	—	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		—	—	**T79**		●	●	—	—	—	
		Connector					**T79C**		●	●	●	●		
		Grommet		3-wire (NPN)	5 V, 12 V		**S79**		●	●	—	—	IC circuit	
				3-wire (PNP)			**S7P**		●	●	—	—		

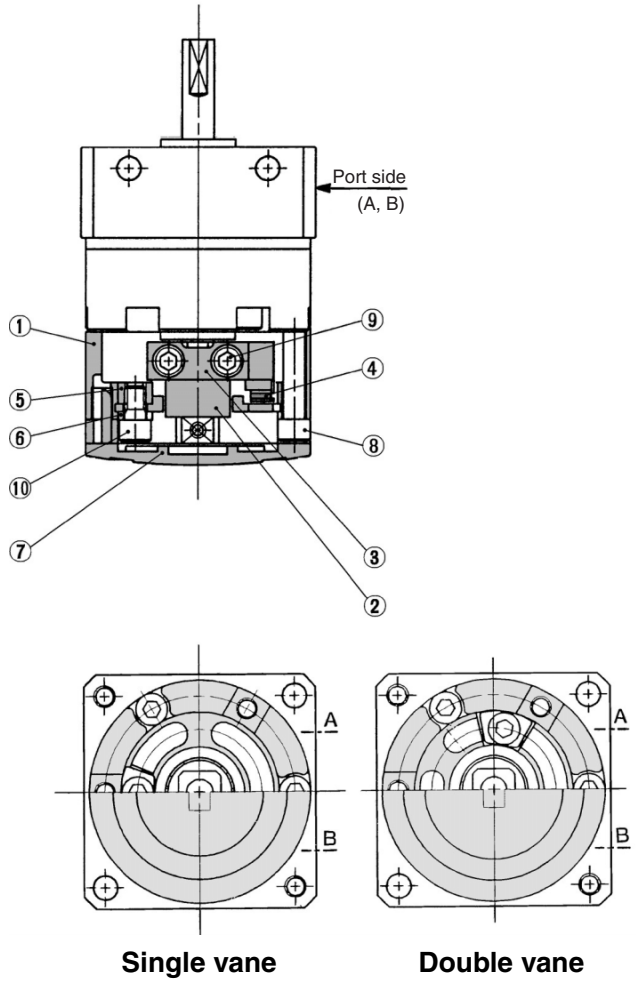
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) R73C
3 m ····· L (Example) R73CL
5 m ····· Z (Example) R73CZ
None ···· N (Example) R73CN

Construction: 10, 15, 20, 30, 40

Single vane type/Double vane style

With angle adjuster

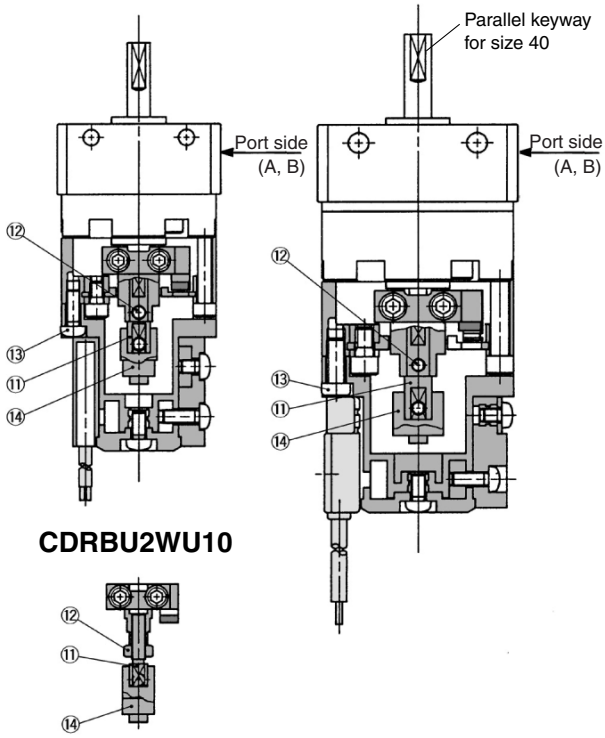
CRBU2W10/15/20/30/40-□$^{S}_{D}$



Single vane **Double vane**

With angle adjuster + Auto switch unit

CDRBU2WU10/15-□$^{S}_{D}$ **CDRBU2WU20/30/40-□$^{S}_{D}$**



CDRBU2WU10

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

Component Parts

No.	Description	Material	Note
①	Stopper ring	Aluminum die-casted	
②	Stopper lever	Carbon steel	Zinc chromated
③	Lever retainer	Carbon steel	Zinc chromated
④	Rubber bumper	NBR	Zinc chromated
⑤	Stopper block	Carbon steel	
⑥	Block retainer	Carbon steel	Special screw
⑦	Cap	Resin	Special screw
⑧	Hexagon socket head cap screw	Stainless steel	Special screw
⑨	Hexagon socket head cap screw	Stainless steel	
⑩	Hexagon socket head cap screw	Stainless steel	
⑪	Joint	Aluminum alloy	Note)
⑫	Hexagon socket head set screw	Stainless steel	Hexagon nut will be used for CDRBU2W10 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 page 11-4-20 to 11-4-27 for detailed specifications. Stainless steel is used for size 10 only.

⚠ 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.

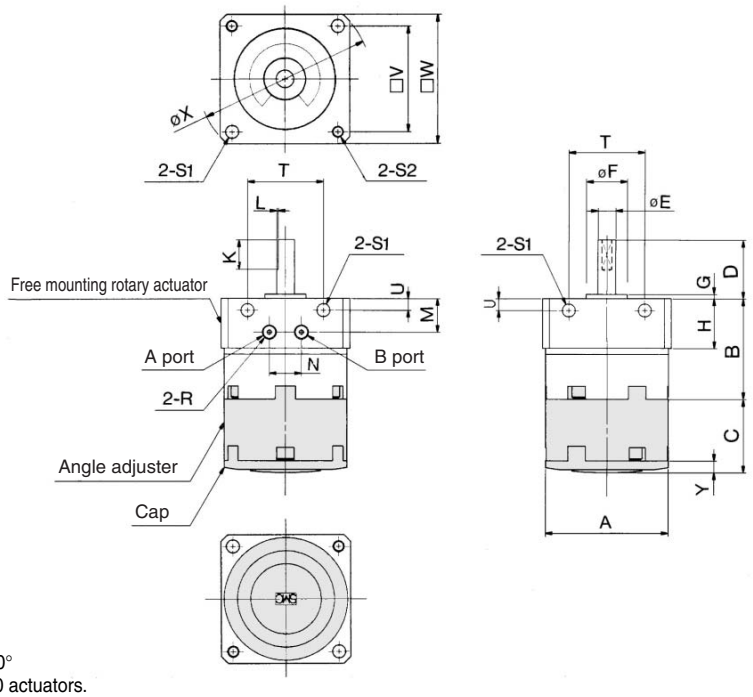
Rotating angle of the rotary actuator	Rotating angle adjustment range
$270^{\circ}{}^{+4}_{0}$	0 to 230° (Size: 10, 40) *
	0 to 240° (Size: 15, 20, 30)
$180^{\circ}{}^{+4}_{0}$	0 to 175°
$90^{\circ}{}^{+4}_{0}$	0 to 85°

* 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.
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
CRBU2WU10/15/20/30-□S

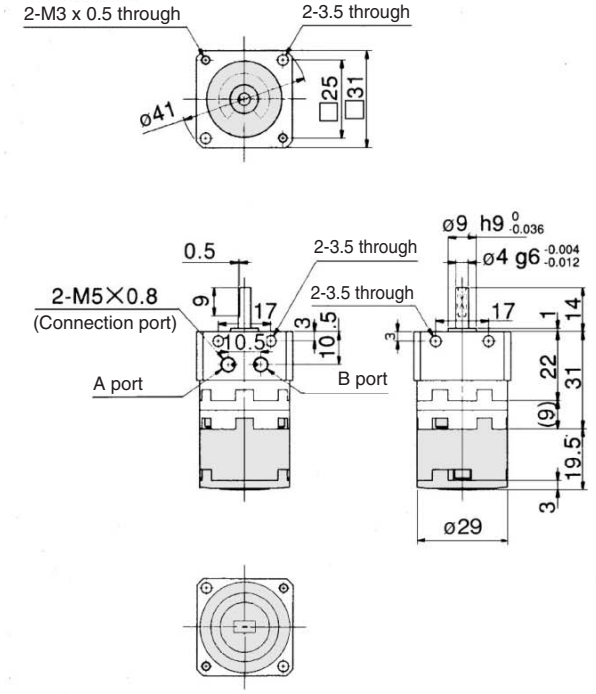


∗ Illustrations above show actuators for 90° and 180° when B port is pressurized,and they show size 20 actuators.

(mm)

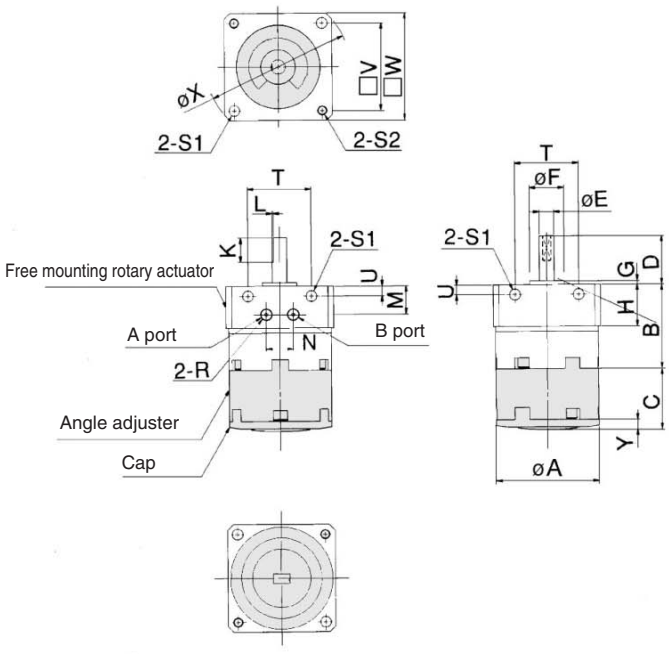
Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CRBU2WU10-□S	29	22	19.5	14	$4^{-0.004}_{-0.012}$	$9^{0}_{-0.036}$	1	15.5	9	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	17	3	25	31	41	3
CRBU2WU15-□S	34	25	21.2	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48	3.2
CRBU2WU20-□S	42	34.5	25	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59	4
CRBU2WU30-□S	50	47.5	29	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69	4.5

Double vane type
CRBU2WU10-□D



CRBU2WU15/20/30-□D

Illustrations below show size 20 actuators.



∗ Illustrations above show the intermediate rotation position when A or B port is pressurized.

(mm)

Model	A	B	C	D	E(g6)	F(h9)	G	H	K	L	M	N	R	S1	S2	T	U	V	W	X	Y
CRBU2WU15-□D	34	25	21.2	18	$5^{-0.004}_{-0.012}$	$12^{0}_{-0.043}$	1.5	15.5	10	0.5	10.5	10.5	M5 x 0.8	3.5	M3 x 0.5	21	3	29	36	48	3.2
CRBU2WU20-□D	42	34.5	25	20	$6^{-0.004}_{-0.012}$	$14^{0}_{-0.043}$	1.5	17	10	0.5	11.5	11	M5 x 0.8	4.5	M4 x 0.7	26	4	36	44	59	4
CRBU2WU30-□D	50	47.5	29	22	$8^{-0.005}_{-0.014}$	$16^{0}_{-0.043}$	2	17.5	12	1	12	13	M5 x 0.8	5.5	M5 x 0.8	29	4.5	42	52	69	4.5

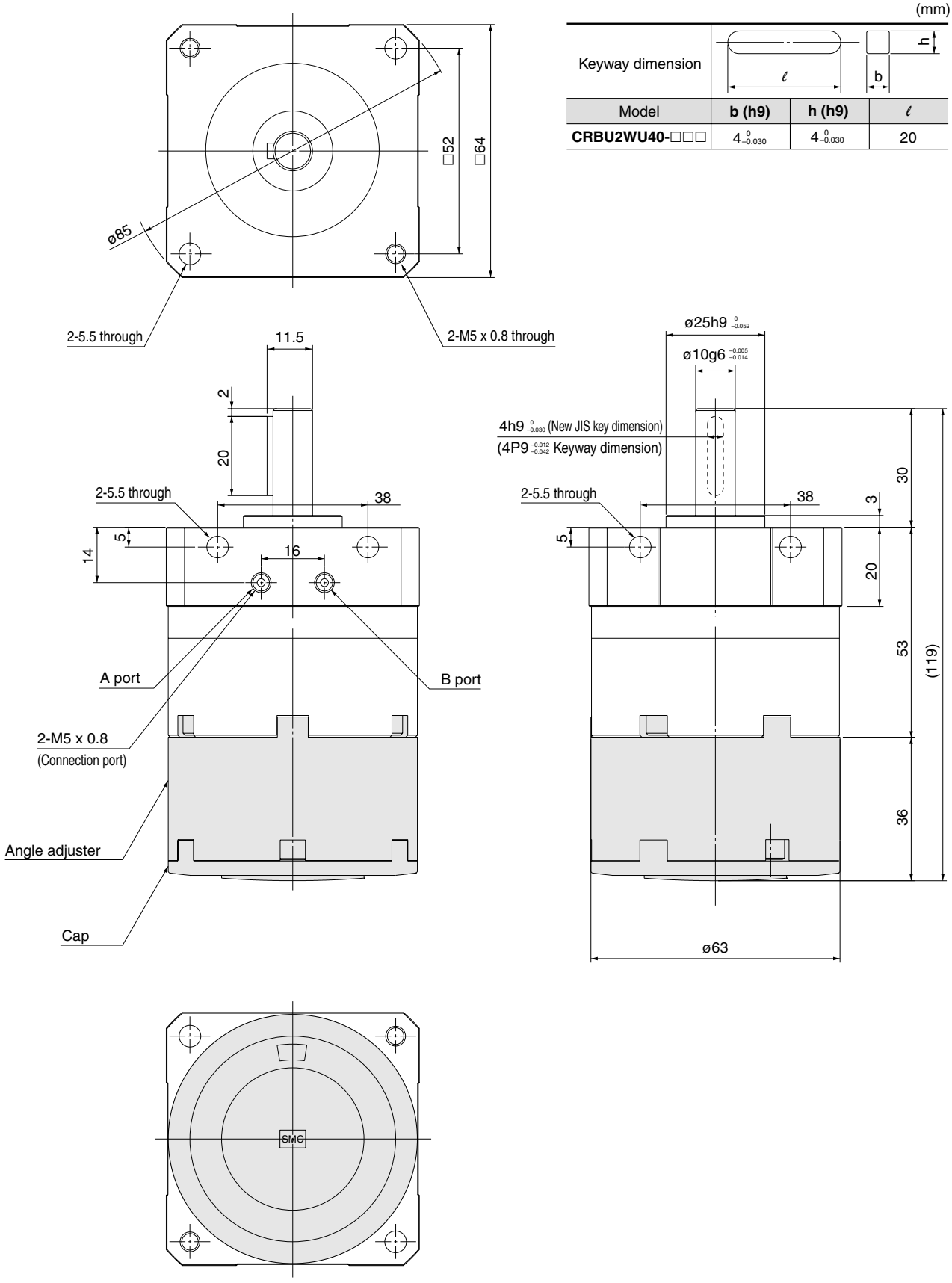
Dimensions: 40 (With angle adjuster)

Single vane type/Double vane type
CRBU2WU40-□S/D

(mm)

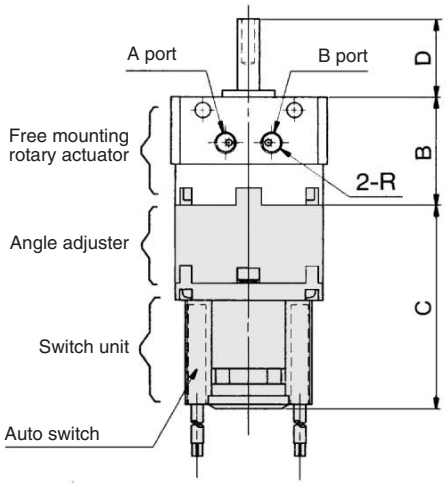
Keyway dimension	ℓ	b	h

Model	b (h9)	h (h9)	ℓ
CRBU2WU40-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20

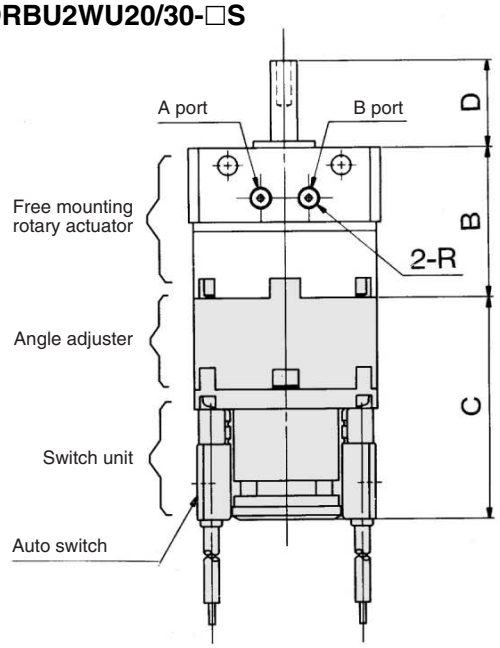


Dimensions: 10, 15, 20, 30 (With angle adjuster and auto switch unit)

Single vane type
CDRBU2WU10/15-□S



CDRBU2WU20/30-□S

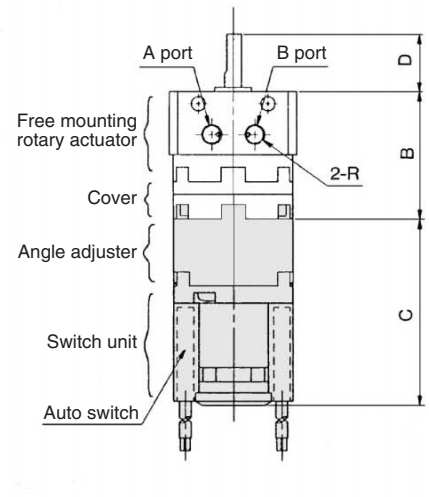


(mm)

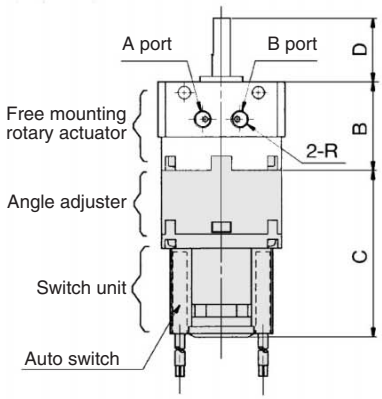
Model	B	C	D	R
CDRBU2WU10-□S	22	45.5	14	M5 x 0.8
CDRBU2WU15-□S	25	47	18	M5 x 0.8
CDRBU2WU20-□S	34.5	51	20	M5 x 0.8
CDRBU2WU30-□S	47.5	55.5	22	M5 x 0.8

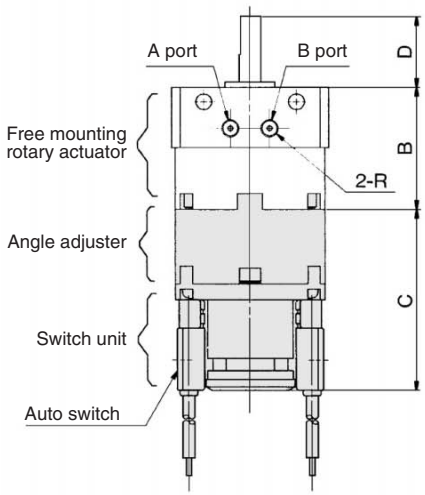
∗ Following illustrations show actuators for 90° and 180° when A port is pressrized.
Note) • For rotary actuators with angle adjuster and auto switch unit, connection ports are side ports only.
• The above exterior view drawings illustrate the rotary actuator equipped with one right-hand and one left-hand switches.

Double vane type
CDRBU2WU10/15-□D



CDRBU2WU20/30-□D





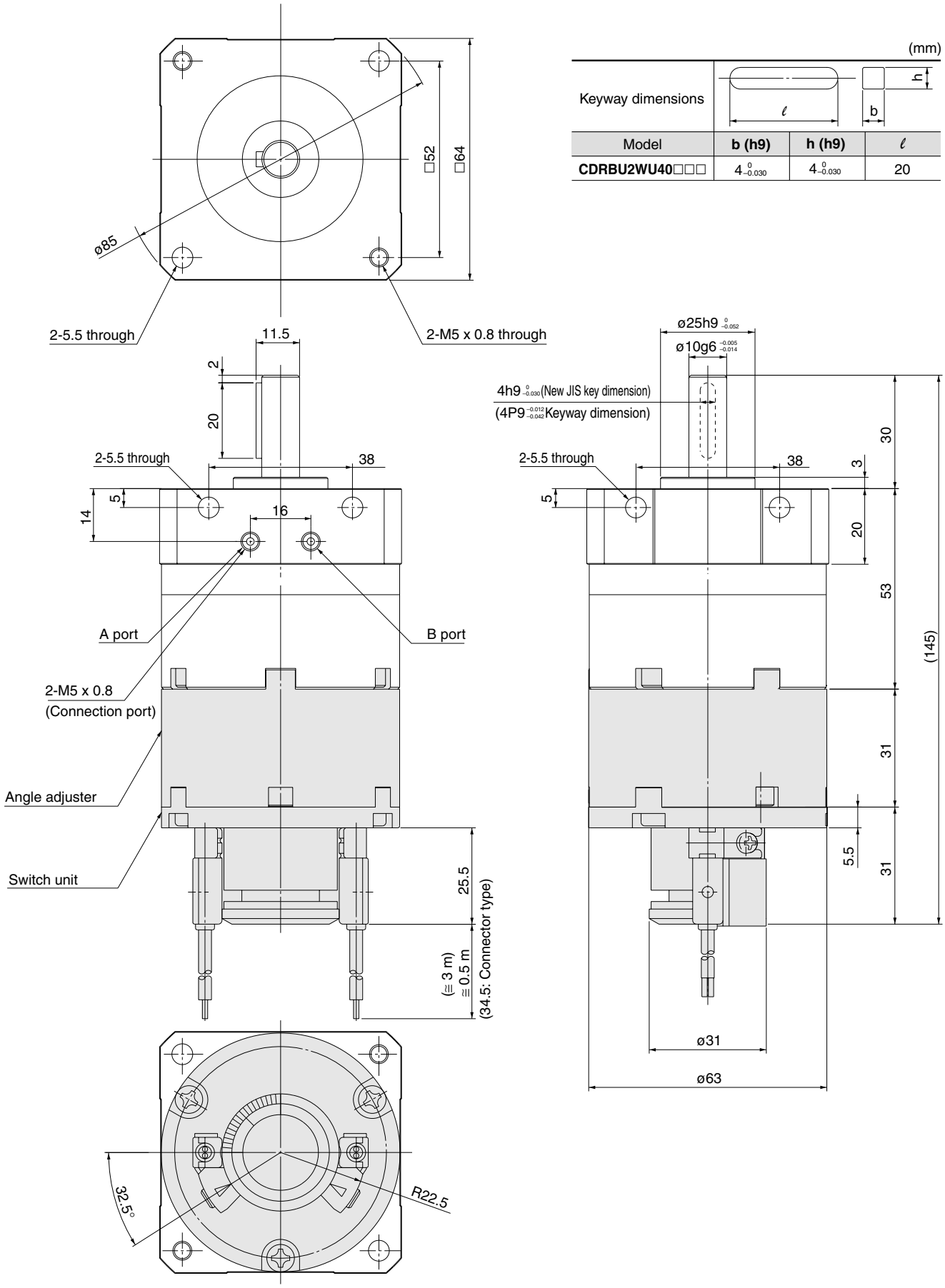
(mm)

Model	B	C	D	R
CDRBU2WU10-□D	31	45.5	14	M5 x 0.8
CDRBU2WU15-□D	25	47	18	M5 x 0.8
CDRBU2WU20-□D	34.5	51	20	M5 x 0.8
CDRBU2WU30-□D	47.5	55.5	22	M5 x 0.8

∗ Illustrations above show the intermediate rotation position when A or B port is pressurized.
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 switches.

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

Single vane type/Double vane type
CDRBU2WU40-□S/D



(mm)

Keyway dimensions	ℓ	b	h

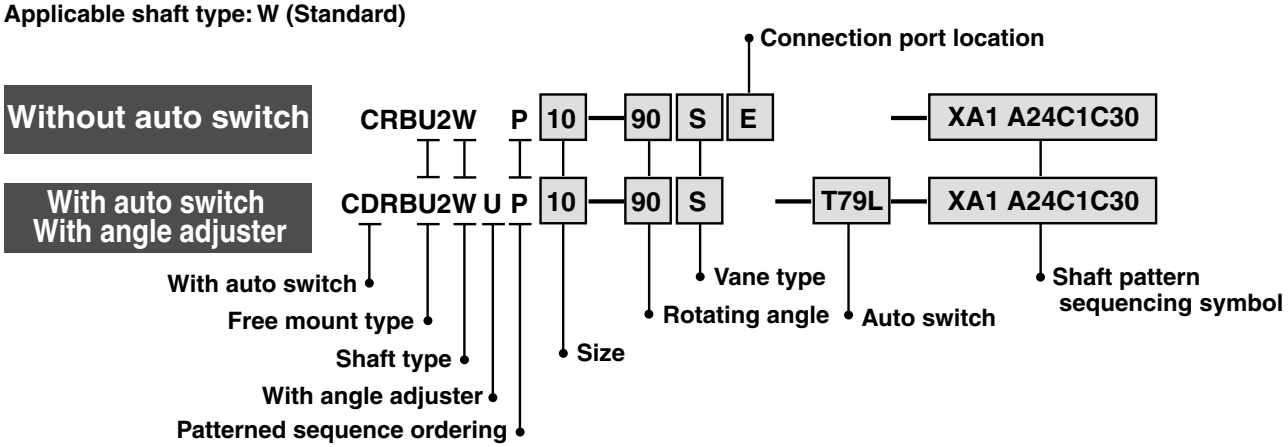
Model	b (h9)	h (h9)	ℓ
CDRBU2WU40□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20

Series ***CRBU2*** (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 11-3-31 to 11-3-32 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 holes to through-holes	15, 20, 30, 40	●
XC3 *	Change the screw position	Size: 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		●

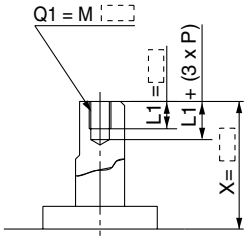
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.
A total of four XA□ and XC□ combinations is available.
Example: -XA1A24C1C30
-XA2C1C4C30

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



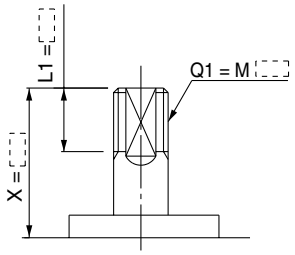
(mm)

Size	X	Q1
15	1.5 to 18	M3
20	1.5 to 20	M3, M4
30	2 to 22	M3, M4, M5

Symbol: A3

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

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



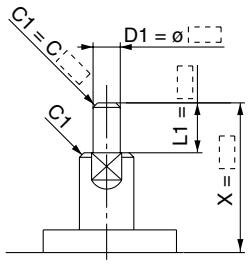
(mm)

Size	X	L1 max	Q1
10	7 to 14	X – 3	M4
15	8.5 to 18	X – 3.5	M5
20	10 to 20	X – 4	M6
30	13 to 22	X – 5	M8

Symbol: A5

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

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



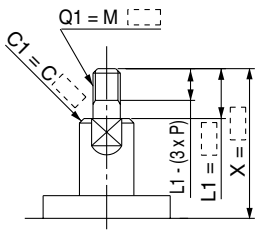
(mm)

Size	X	L1 max
10	2 to 14	X – 1
15	3 to 18	X – 1.5
20	3 to 20	X – 1.5
30	3 to 22	X – 2

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)

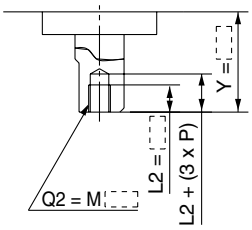
Size	X	L1 max	Q1
10	5.5 to 14	X – 1	M3
15	7.5 to 18	X – 1.5	M3, M4
20	9 to 20	X – 1.5	M3, M4, M5
30	11 to 22	X – 2	M3, M4, M5, M6

Axial: Bottom (Short shaft side)

Symbol: A2

The long 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



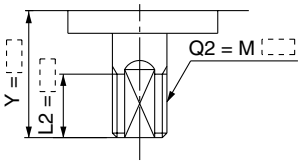
(mm)

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



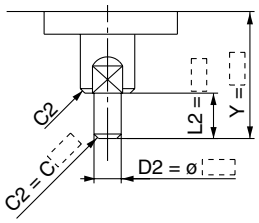
(mm)

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.)



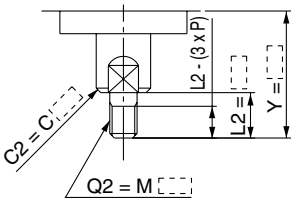
(mm)

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

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.)



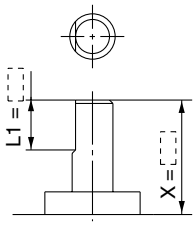
(mm)

Size	Y	L2 max	Q2
10	5.5 to 8	Y – 1	M3
15	7.5 to 9	Y – 1.5	M3, M4
20	9.5 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

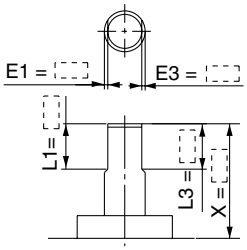


(mm)

Size	X	L1
10	3 to 14	9 – (14 – X) to (X – 1)
15	5.5 to 18	10 – (18 – X) to (X – 1.5)
20	7 to 20	10 – (20 – X) to (X – 1.5)
30	7 to 22	10 – (22 – X) to (X – 1.5)

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.
• Applicable shaft type: W

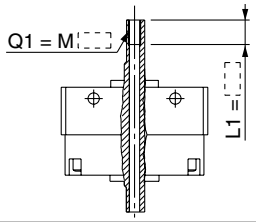


(mm)

Size	X	L1	L3 max
10	3 to 14	9 – (14 – X) to (X – 1)	X – 1
15	3 to 18	10 – (18 – X) to (X – 1.5)	X – 1.5
20	3 to 20	10 – (20 – X) to (X – 1.5)	X – 1.5
30	5 to 22	12 – (22 – X) to (X – 2)	X – 2

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

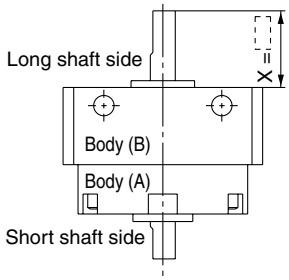


(mm)

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



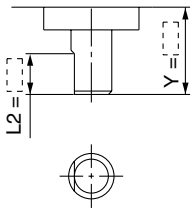
(mm)

Size	X
10	1 to14
15	1.5 to18
20	1.5 to 20
30	2 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.)
• Applicable shaft type: W

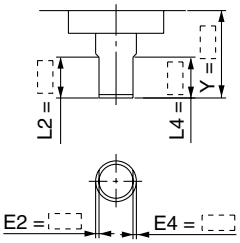


(mm)

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 – 4.5)

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

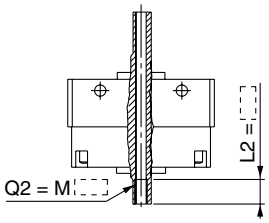


(mm)

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

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

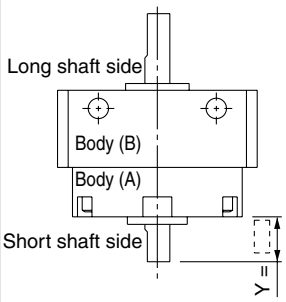


(mm)

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: A18 Shorten the short shaft.

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



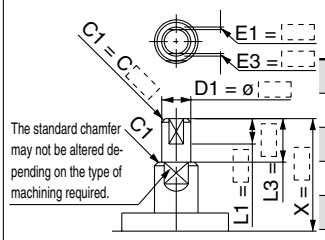
(mm)

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

Axial: Top (Long shaft side)

Symbol: A21 The long shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer.

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



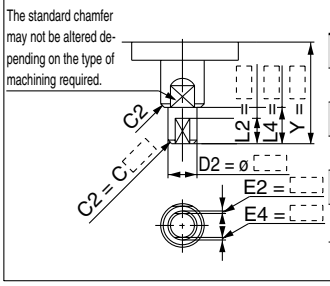
(mm)

Size	X	L1 max	L3	D1
10	4 to 14	X – 2.5	L1+1.5	ø3
15	4.5 to 18	X – 3	L1+1.5	ø3 to ø4
20	5 to 20	X – 3.5	L1+2	ø3 to ø5
30	7 to 22	X – 5	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.)



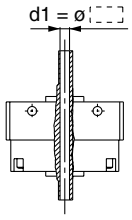
(mm)

Size	X	L2 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+3	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
- Equal dimensions are indicated by the same marker.

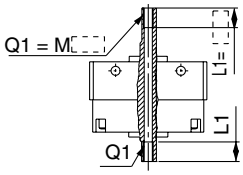


(mm)

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

Symbol: A16 Applicable to single vane type only

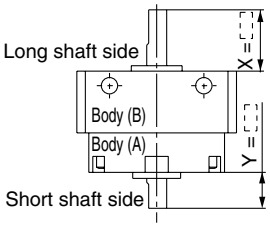
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.
- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice 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

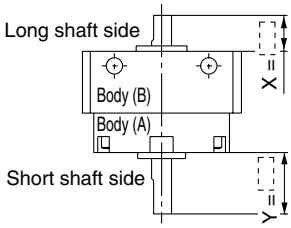


(mm)

Size	X	Y
10	1 to 14	1 to 8
15	1.5 to 18	1.5 to 9
20	1.5 to 20	1.5 to 10
30	2 to 22	2 to 13

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

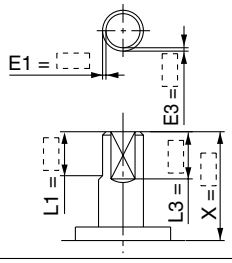


(mm)

Size	X	Y
10	1 to 3	1 to 12
15	1.5 to 6.5	1.5 to 15.5
20	1.5 to 7.5	1.5 to 17
30	2 to 8.5	2 to 19
40	3 to 9	—

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

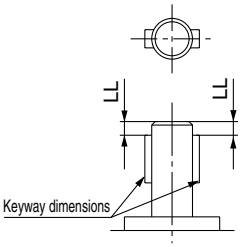


(mm)

Size	X	L1	L3 max
10	3 to 14	9 – (14 – X) to (X – 1)	X – 1
15	3 to 18	10 – (18 – X) to (X – 1.5)	X – 1.5
20	3 to 20	10 – (20 – X) to (X – 1.5)	X – 1.5
30	5 to 22	10 – (22 – X) to (X – 2)	X – 2

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

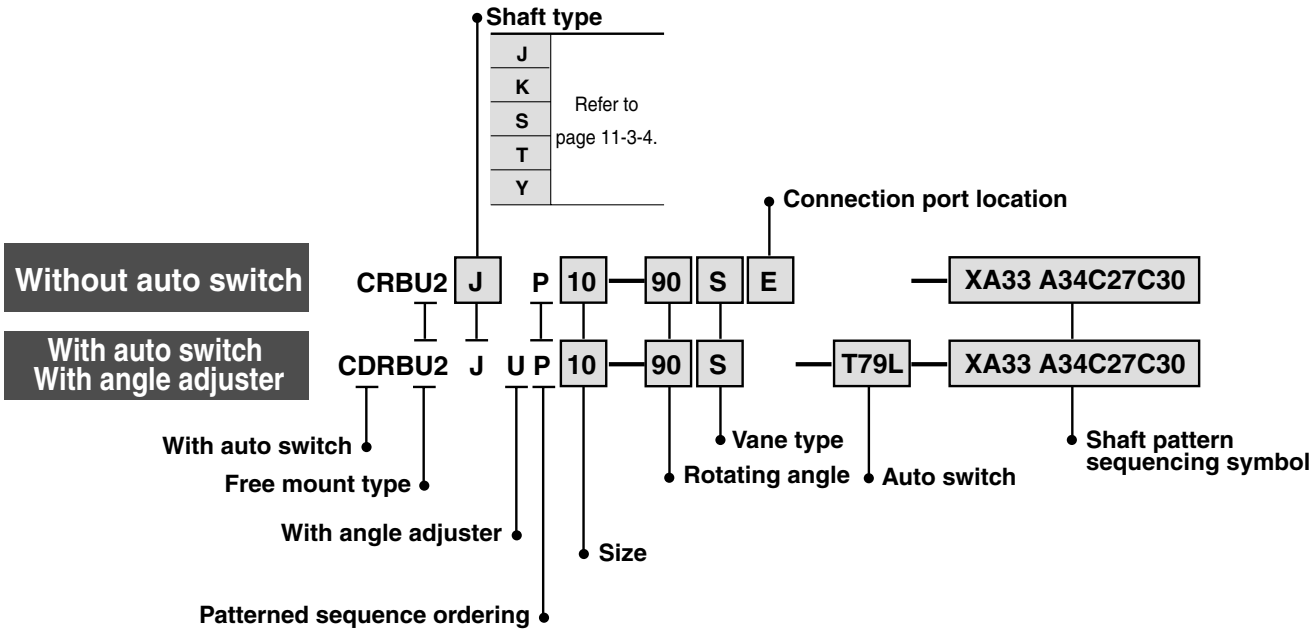
Series CRBU2 (Size: 10, 15, 20, 30, 40)

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: -XA31 A32

XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.
Refer to pages 11-3-31 to 11-3-32 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		●

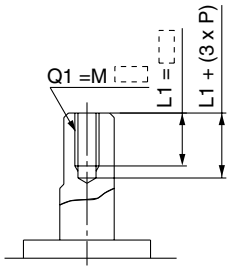
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster. A total of four XA□ and XC□ combinations is available. Example: -XA33 A34C27C3C

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



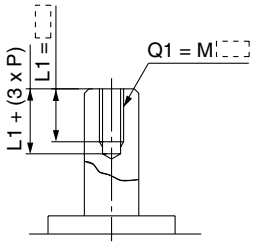
(mm)

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)

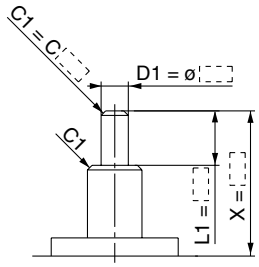
Size \ Shaft type	Q1		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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)

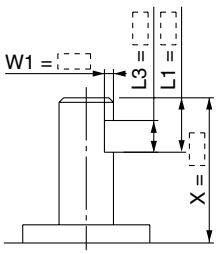
Size	X	L1 max	D1
10	2 to 14	X – 1	ø3 to ø3.9
15	3 to 18	X – 1.5	ø3 to ø4.9
20	3 to 20	X – 1.5	ø3 to ø5.9
30	3 to 22	X – 2	ø3 to ø7.9
40	4 to 30	X – 3	ø3 to ø9.9

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)

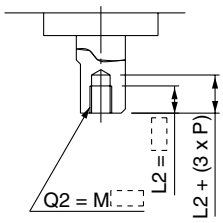
Size \ Shaft type	X			W1			L1 max			L3 max		
	J	K	T	J	K	T	J	K	T	J	K	T
10	6.5 to 14			0.5 to 2			X – 3			L1 – 1		
15	8 to 18			0.5 to 2.5			X – 4			L1 – 1		
20	9 to 20			0.5 to 3			X – 4.5			L1 – 1		
30	11.5 to 22			0.5 to 4			X – 5			L1 – 2		
40	15.5 to 30			0.5 to 5			X – 5.5			L1 – 2		

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



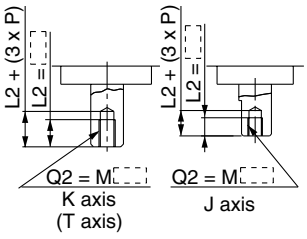
(mm)

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)

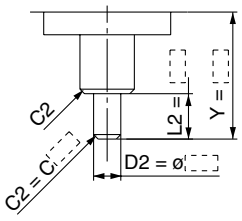
Size \ Shaft type	Q2		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

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)

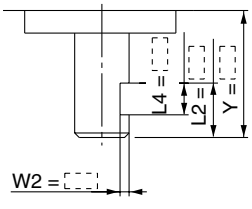
Size	Y	L2 max	D2
10	2 to 14	Y – 1	ø3 to ø3.9
15	3 to 18	Y – 1.5	ø3 to ø4.9
20	3 to 20	Y – 1.5	ø3 to ø5.9
30	6 to 22	Y – 2	ø3 to ø7.9
40	6 to 30	Y – 4.5	ø5 to ø9.9

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



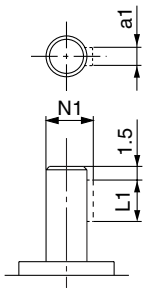
(mm)

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



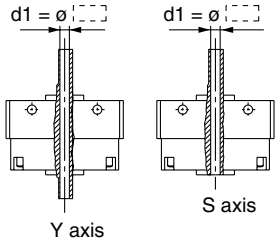
(mm)

Size	a1	L1	N
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.

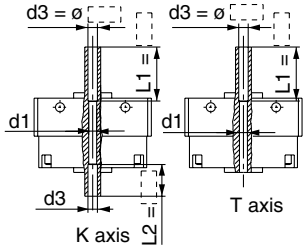


(mm)

Size \ Shaft type	S	Y
	d1	
15	ø2.5	
20	ø2.5 to ø3.5	
30	ø2.5 to ø4	
40	ø2.5 to ø5	

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.

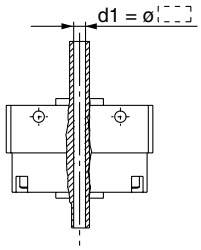


(mm)

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.

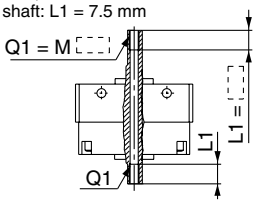


(mm)

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 = 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.

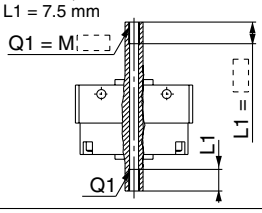


(mm)

Size	15		20		30		40	
Shaft type / Thread	S	Y	S	Y	S	Y	S	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 L1 dimension is, in principle, twice the thread size. (Example) For M5: L1 max. = 10 mm However, for M5 on the short shaft of T shaft: L1 = 7.5 mm
- Applicable shaft types: K, T
- Equal dimensions are indicated by the same marker.

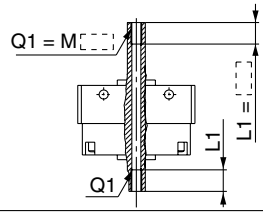


(mm)

Size	15		20		30		40	
Shaft type / Thread	K	T	K	T	K	T	K	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.

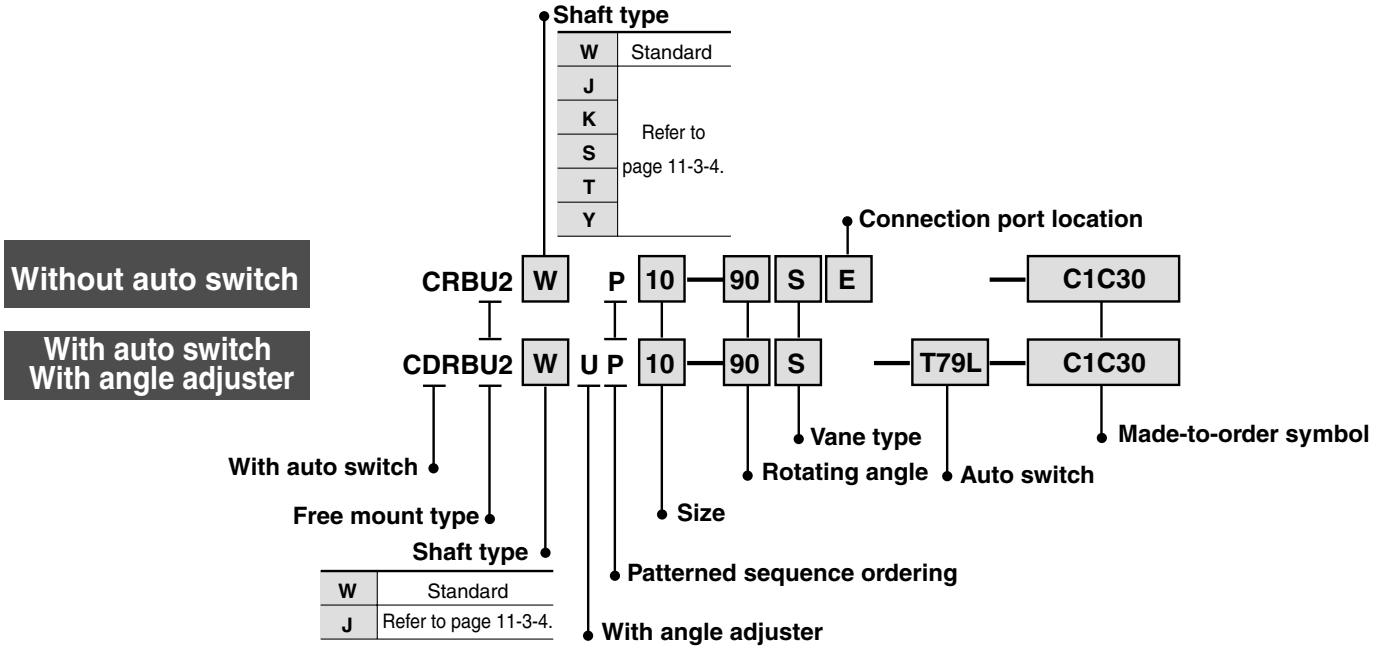


Size / Thread	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	ø3.3
M5 x 0.8	—	—	ø4.2	ø4.2

Series ***CRBU2*** **(Size: 10, 15, 20, 30, 40)**
Made to Order Specifications: -XC1, 2, 3, 4, 5, 6, 7, 30

Without auto switch

With auto switch With angle adjuster



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 hole 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	Fluorine grease	●	

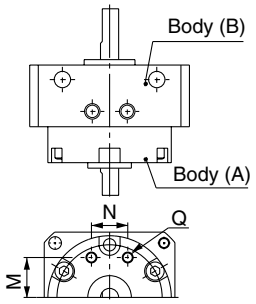
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.

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.)

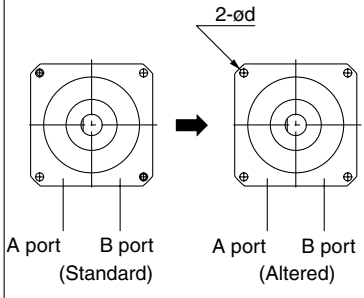
- Parallel keyway is used on the long shaft for size 40.
- This specification is not available for the rotary actuator with auto switch unit.



(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 2 threaded holes on Body (B) into through holes
(An additionally machined port will have an aluminum surface since it will be left unfinished.)

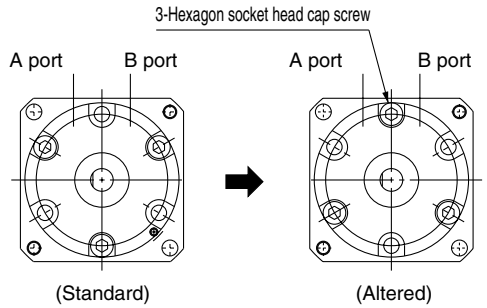


(mm)

Size	d
10	3.4
15	3.4
20	4.5
30	5.5
40	5.5

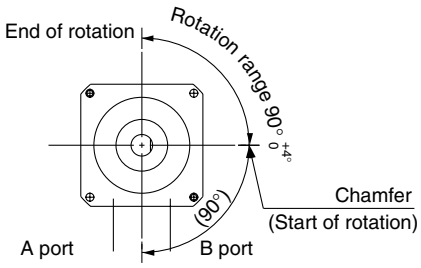
Symbol: C3 Change the position of the screws for tightening the actuator body.

• Not available for size 10.



Symbol: C4 Applicable to single vane style only

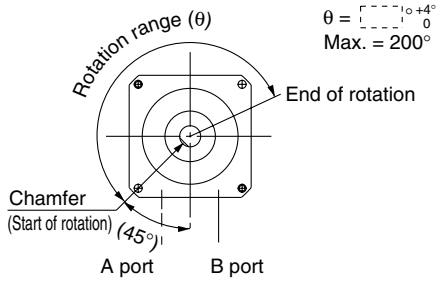
Rotation starts from the horizontal line (90° down from the top to the right side)
• Rotation tolerance for CRBU2W10 is $^{+5°}_{0}$.
• A parallel keyway is used instead $^{+5°}_{0}$ of chamfer for size 40.



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

Symbol: C5 Applicable to single vane style only

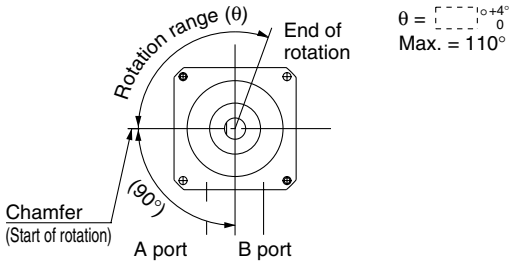
Start of rotation is 45° up from the bottom of the vertical line to the left side.
• Rotation tolerance for CRBU2W10 is $^{+5°}_{0}$.
• A parallel keyway is used instead of chamfer for size 40.



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

Symbol: C6 Applicable to single vane style only

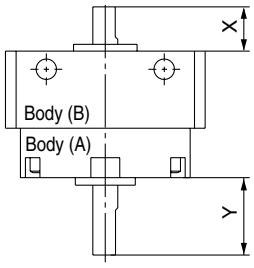
Start of rotation is 45° up from the bottom of the vertical line to the left side.
• Rotation tolerance for CRBU2W10 is $^{+5°}_{0}$.
• A parallel keyway is used instead of chamfer for size 40.



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

Symbol: C7 The shafts are reversed.

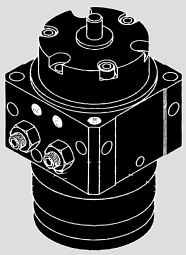
• A parallel keyway is used instead of chamfer for size 40.



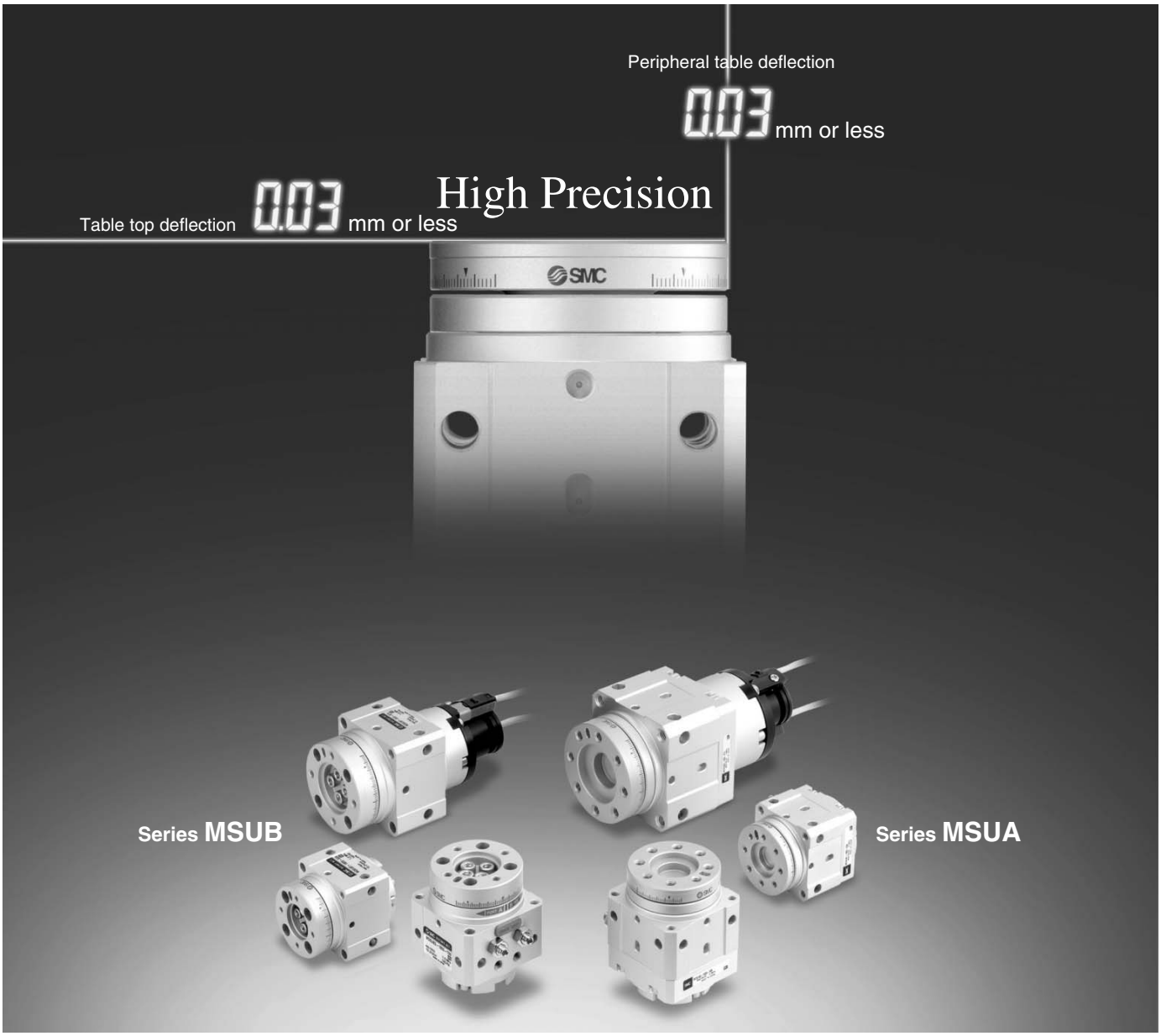
(mm)

Size	Y	X
10	19	3
15	20.5	6.5
20	22.5	7.5
30	26.5	8.5
40	36	9

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



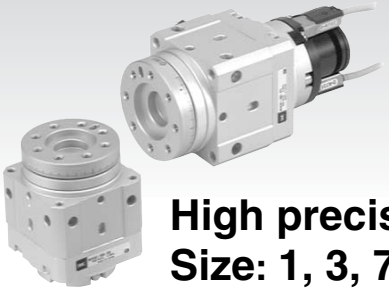
Rotary Table
Vane Style
Series MSU
Size: 1, 3, 7, 20



Series

Vane Style/

Rotary actuator with lightweight,

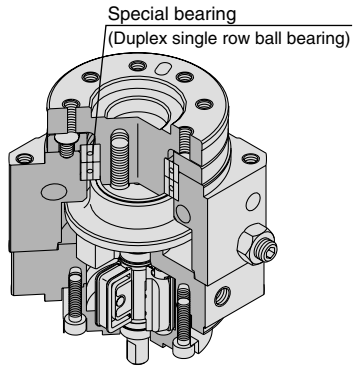


High precision type
Size: 1, 3, 7, 20

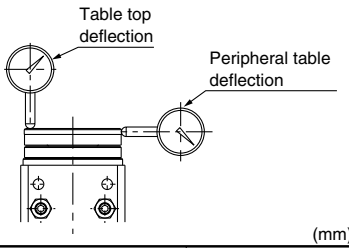
Series MSUA

Improved table deflection accuracy:
0.03 mm or less

High precision/High rigidity



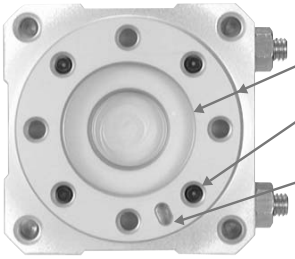
Deflection accuracy: Displacement for 180° rotation



(mm)

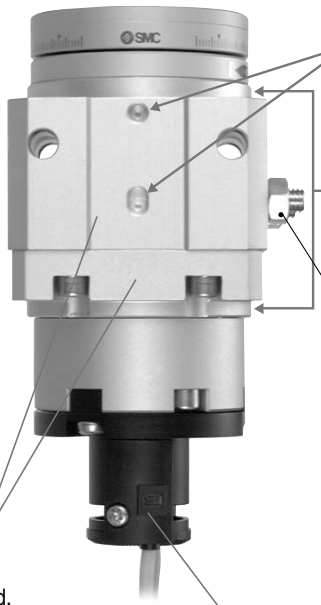
Model	MSUA
Table top deflection	0.03 (0.1 to 0.2)
Peripheral table deflection	0.03 (0.1 to 0.2)

Values inside ( ) are for Series MSUB



Easy alignment when mounting the load

- **Table inside/outside diameter tolerance H9/h9**
- **Female threads for load mounting provided in eight places.** (increases freedom in mounting the load)
- **Mounting reference pin holes**

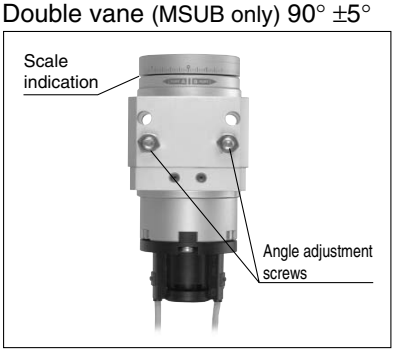


Easy alignment when mounting the body

- **Mounting reference pin holes** (Alignment with center of body) Provided on three sides, excluding port side
- **Reference diameter h9** (Alignment with center of table rotation)

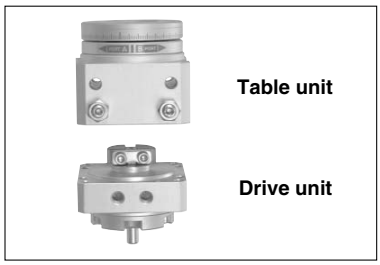
Angle adjustable

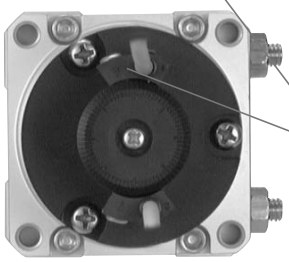
90° ±10°, 180° ±10°
Double vane (MSUB only) 90° ±5°



Disengageable

Maintenance work is simplified.
The drive unit can be replaced with the load mounted.



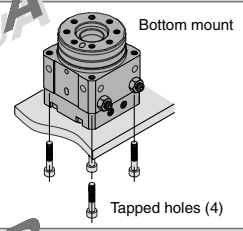
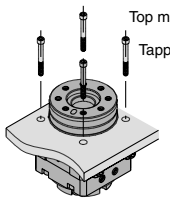
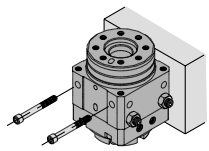
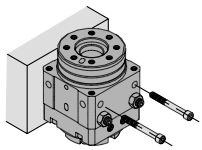
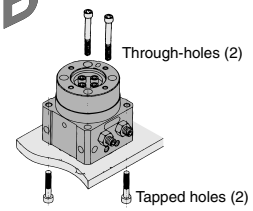
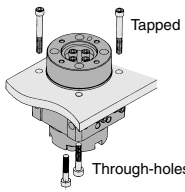
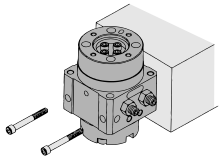
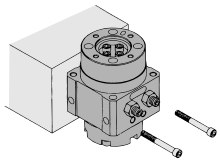


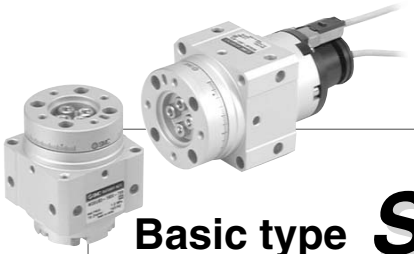
Auto switch capable

Since switches can be moved anywhere on the circumference, they can be mounted at positions which accommodate the specifications.

Table
MSU
Size: 1, 3, 7, 20
compact table for robotic hands

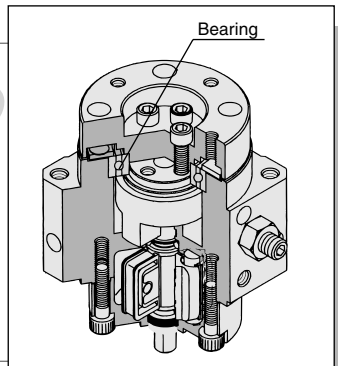
Free mount type
Can be mounted from three directions: axial, lateral, vertical

	Axial mounting		Lateral mounting	Vertical mounting
MSUA				
MSUB				



Basic type Series MSUB
Size: 1, 3, 7, 20

- **Single vane and double vane standardized**
- **Double vane has the same dimensions as single vane**
  (Except size 1)



Single vane

Series Variations

Series	Size	Rotating angle	Vane type	Applicable auto switch
High precision type **MSUA**	1	90°	Single vane	D-9, D-T99 D-9□A, D-S99, S9P
	3			
	7	180°		D-R73, D-T79 D-R80, D-S79, S7P
	20			
Basic type **MSUB**	1	90°	Single vane	D-9, D-T99 D-9□A, D-S99, S9P
	3			
	7	180°	Double vane *	D-R73, D-T79 D-R80, D-S79, S7P
	20			

* Double vane is available with 90° rotation setting only.

⚠ 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.

Selection

⚠ Warning

1. Ensure the load energy within the product's allowable energy value.

Operation with a load kinetic energy exceeding the allowable value can cause human injury and/or damage to equipment or machinery. (Refer to model section procedures in this catalog.)

⚠ Caution

1. When there are load fluctuations, allow a sufficient margin in the actuator torque.

In case of horizontal mounting (operation with product facing sideways), malfunction may occur due to load fluctuations.

Mounting

⚠ Caution

1. Adjust the rotation angle within the prescribed ranges. (90°±10°, 180°±10°) (±5° at end of rotation)

Adjustment outside the prescribed ranges may cause malfunction of the product or failure of switches to operate.

2. Adjust the rotation time within the prescribed values using a speed controller, etc. (0.07 to 0.3 s/90°)

The product is provided with a fixed throttle and is designed not to operate faster than 0.07 s/90°. However, in cases such as a large load inertia, it can exceed the allowable energy causing damage to equipment. (Refer to the model selection procedures in this catalog.)

Furthermore, adjustment to a speed slower than 0.3 s/90° can cause sticking and slipping or stopping of operation.

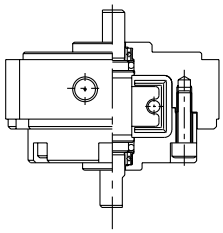
Maintenance

⚠ Caution

<High precision type/MSUA>

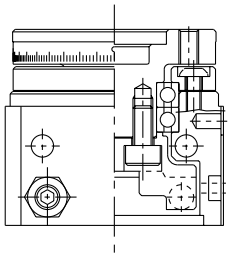
In case a rotary unit and table unit are required for maintenance, order with the unit part numbers shown below.

Rotary unit



Model	Unit part no.
MSUA1-□S	P402070-2A
MSUA1-□SE	P402070-2B
MSUA3-□S	P402090-2A
MSUA3-□SE	P402090-2B
MSUA7-□S	P402060-2A
MSUA7-□SE	P402060-2B
MSUA20-□S	P402080-2A
MSUA20-□SE	P402080-2B

Table unit



Model	Unit part no.
MSUA1- 90□	P402070-3A
MSUA1-180□	P402070-3B
MSUA3- 90□	P402090-3A
MSUA3-180□	P402090-3B
MSUA7- 90□	P402060-3A
MSUA7-180□	P402060-3B
MSUA20- 90□	P402080-3A
MSUA20-180□	P402080-3B

Note 1) Note that the rotation angle should not be changed even though the rotary unit has been changed. For maintenance, order units with a part number suitable for the model being used.

Note 2) Due to the integral construction of the MSUB series, the rotary and table units cannot be ordered separately.

Rotary Table: High Precision Type Vane Style

Series MSUA

Size: 1, 3, 7, 20

How to Order

Without auto switch

MSUA 20 — 90 S [ ]

With auto switch

M D SUA 20 — 90 S — T79 L [ ]

Bearing type

A	High precision type

Free mount type

Connection port location

Nil	Side ported
E	Axial ported

Available with side ported only, when equipped with switch unit.

With auto switch unit

Nominal size (Torque)

1	MSUA1
3	MSUA3
7	MSUA7
20	MSUA20

Rotating angle

Applicable	Symbol	Rotating angle
Single vane	90	90°
	180	180°

Rotation adjustment range
Single vane: Both ends 5° each

Vane type

S	Single vane

Number of auto switches

S	1 pc. *
Nil	2 pcs.

∗ For 1 piece, a right hand auto switch is installed.

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

∗ Available only with R73, R80 and T79 type connectors.
∗∗ 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.
∗ Auto switches are shipped together (but not assembled).

Applicable Auto Switch/Refer to page 11-11-1 for further information on auto swiches.

Applicable model	Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire type	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
MDSUA1 MDSUA3	Reed switch	—	Grommet	Yes	2-wire	24 V	—	—	—	97	Parallel cord	●	●	●	—	—	—	Relay, PLC
								100 V	—	93A		●	●	●	—			
	Solid state switch	—			3-wire (NPN)		5 V, 12 V	—	S99V	S99	Heavy-duty cord	●	●	—	—	○	IC circuit	
					3-wire (PNP)				S9PV	S9P		●	●	—	—	○		
					2-wire		12 V		T99V	T99		●	●	—	—	○	—	
MDSUA7 MDSUA20	Reed switch	—	Grommet	Yes	2-wire	24 V	—	100 V	—	R73	Heavy-duty cord	●	●	—	—	—	—	Relay, PLC
			Connector						—	R73C		●	●	●	●			
	Solid state switch	—	Grommet		3-wire (NPN)		5 V, 12 V	—	—	S79		●	●	—	—	○	IC circuit	
					3-wire (PNP)				—	S7P		●	●	—	—	○		
					2-wire		12 V		—	T79		●	●	—	—	○	—	
			Connector						—	T79C		●	●	●	●	—		

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

Refer to page 11-9-24 for details on other applicable switches.

∗ Auto switches marked with "○" are made-to-order specifications.

Made to Order — Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

Order example: MSUA20 single vane type (connection port side location selected)

1. Standard type (Without auto switches), Rotation 90°, side port location
   MSUA20-90S
2. With switch unit (Without auto switches), Rotation 180°, side port location
   MDSUA20-180S
3. With switch unit + Auto switch R73, Rotation 180°, Side port location
   MDSUA20-180S-R73

Specifications

Model *2		MSUA1		MSUA3		MSUA7		MSUA20	
Vane type		Single vane		Single vane		Single vane		Single vane	
Rotating angle *1		90° ±10°	180° ±10°	90° ±10°	180° ±10°	90° ±10°	180° ±10°	90° ±10°	180° ±10°
Fluid		Air (Non-lube)							
Proof pressure (MPa)		1.05						1.5	
Ambient and fluid temperature		5 to 60°C							
Operating pressure range (MPa)		0.2 to 0.7		0.15 to 0.7				0.15 to 1.0	
Rotation time adjustment range (sec/90°)		0.07 to 0.3							
Shaft load	Allowable radial load	20 N		40 N		50 N		60 N	
	Allowable thrust load	15 N		30 N		60 N		80 N	
	Allowable moment	0.3 N·m		0.7 N·m		0.9 N·m		2.9 N·m	
Bearing		Special bearing							
Port location		Side ported or Top ported							
Port size	Side ported	M3 x 0.5		M5 x 0.8					
	Top ported	M3 x 0.5				M5 x 0.8			
Deflection accuracy		0.03 mm or less							

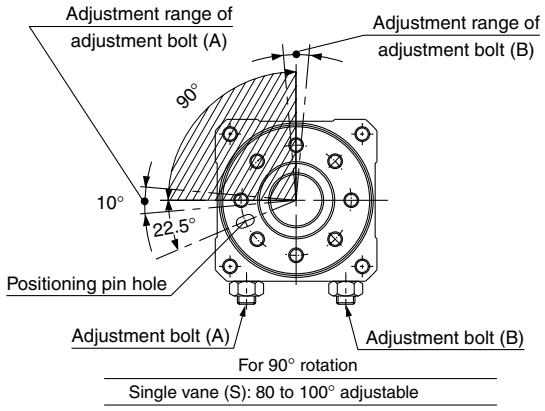
*1 Single vane 90° can be adjusted to 90° ±10° (both ends of rotation ±5° each)
Single vane 180° can be adjusted to 180° ±10° (both ends of rotation ± 5° each)
Note) Refer to page 11-1-34 for allowable kinetic energy.

* 2 Correspondence to equivalent conventional free-mount types

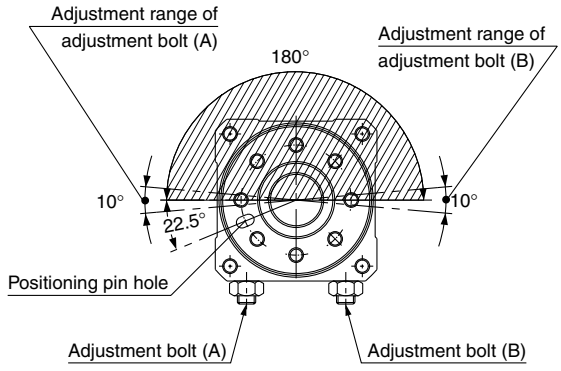
Rotary table	Free-mount rotary actuator
MSUA1	CRBU2W10
MSUA3	CRBU2W15
MSUA7	CRBU2W20
MSUA20	CRBU2W30

Table Rotation Range

Angle adjustment is possible as shown in the drawings below using adjustment bolts (A) and (B).



For 90° rotation
Single vane (S): 80 to 100° adjustable



For 180° rotation
Single vane (S): 170 to 190° adjustable

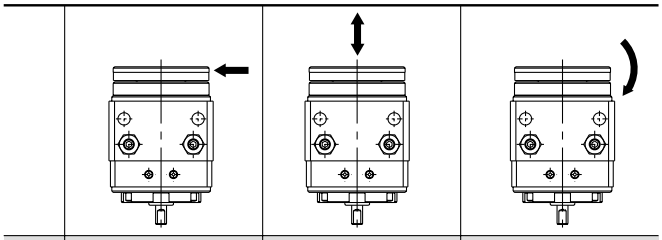
Weight

(g)

Size	Rotating angle	Basic weight Single vane	Auto switch unit + Auto switch 2 pcs.
1	90°	162	25
	180°	161	
3	90°	261.5	30
	180°	259.5	
7	90°	440	50
	180°	436	
20	90°	675	60
	180°	670.5	

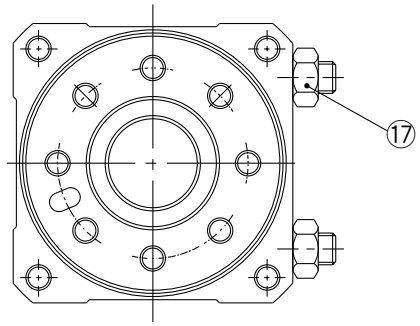
Allowable Load

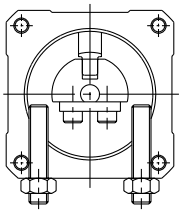
Do not permit the load and moment applied to the table to exceed the allowable values shown in the table below. (Operation above the allowable values can cause adverse effects on service life, such as play in the table and loss of accuracy.)



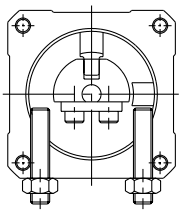
Size	Allowable radial load (N)	Allowable thrust load (N)	
1	20	15	
3	40	30	
7	50	60	
20	60	80	

Construction

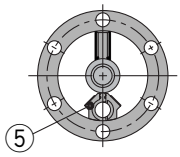




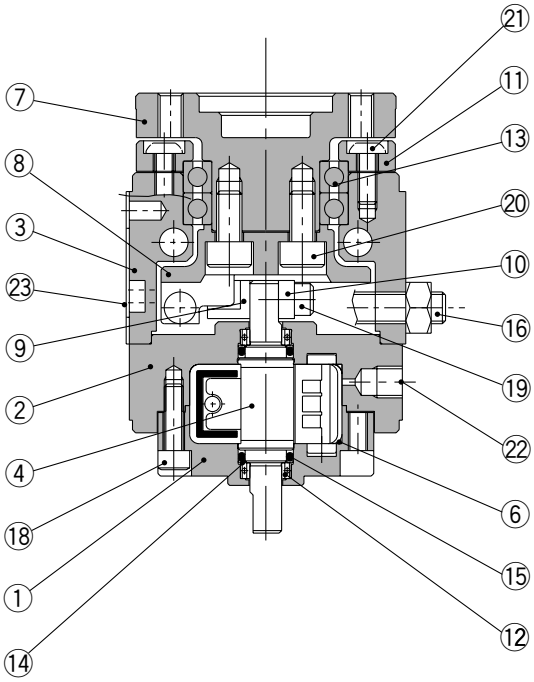
For 180°
(Indicates intermediate position)



For 90°
(Indicates A port pressurized)



Single vane



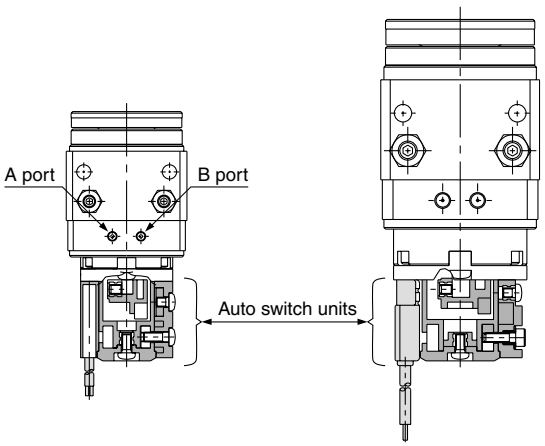
Component Parts

No.	Description	Material	Note
①	Body A	Aluminum alloy	Light gray color
②	Body B	Aluminum alloy	Light gray color
③	Body C	Aluminum alloy	Light gray color
④	Vane shaft	Stainless steel (MSUA20 is carbon steel)	Single vane
⑤	Stopper	Resin	Single vane
⑥	Stopper seal	NBR	
⑦	Table	Aluminum alloy	Light gray color
⑧	Stopper lever	Carbon steel	
⑨	Stopper guide	Stainless steel	
⑩	Lever retainer	Carbon steel	
⑪	Bearing retainer	Aluminum alloy	Light gray color
⑫	Bearing	High carbon chrome bearing steel	
⑬	Special bearing	High carbon chrome bearing steel	
⑭	Back-up ring	Stainless steel	
⑮	O-ring	NBR	
⑯	With adjustment bolt	Carbon steel	
⑰	Hexagon nut	Carbon steel	
⑱	Hexagon socket head cap screw	Stainless steel	
⑲	Hexagon socket head cap screw	Stainless steel	
⑳	Hexagon socket head cap screw	Carbon steel	
㉑	Button bolt	Carbon steel	
㉒	Hexagon socket head cap screw	Stainless steel	SE type only
㉓	Label		

∗ The plug ㉒ is used only when the connection port is type SE.

Internal construction with auto switch

MDSUA1/3 **MDSUA7/20**

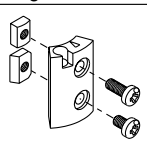
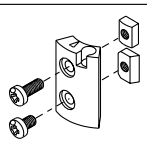
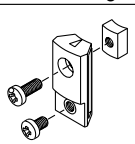


∗ Each unit can be retrofit onto a rotary actuator.
∗ When auto switches are needed after the initial order, they can be ordered separately from the rotary actuator. Auto switches should be ordered separately, since they are not included.

Model	Auto switch unit part no.
MDSUA1	P211070-1
MDSUA3	P211090-1
MDSUA7	P211060-1
MDSUA20	P211080-1

∗ Auto switches are not included with switch units.

Auto switch block unit

MDSUA1/3		**MDSUA7/20**
Right-handed	Left-handed	Combination left & right-handed
		
Part no.: P211070-8	Part no.: P211070-9	Part no.: P211060-8

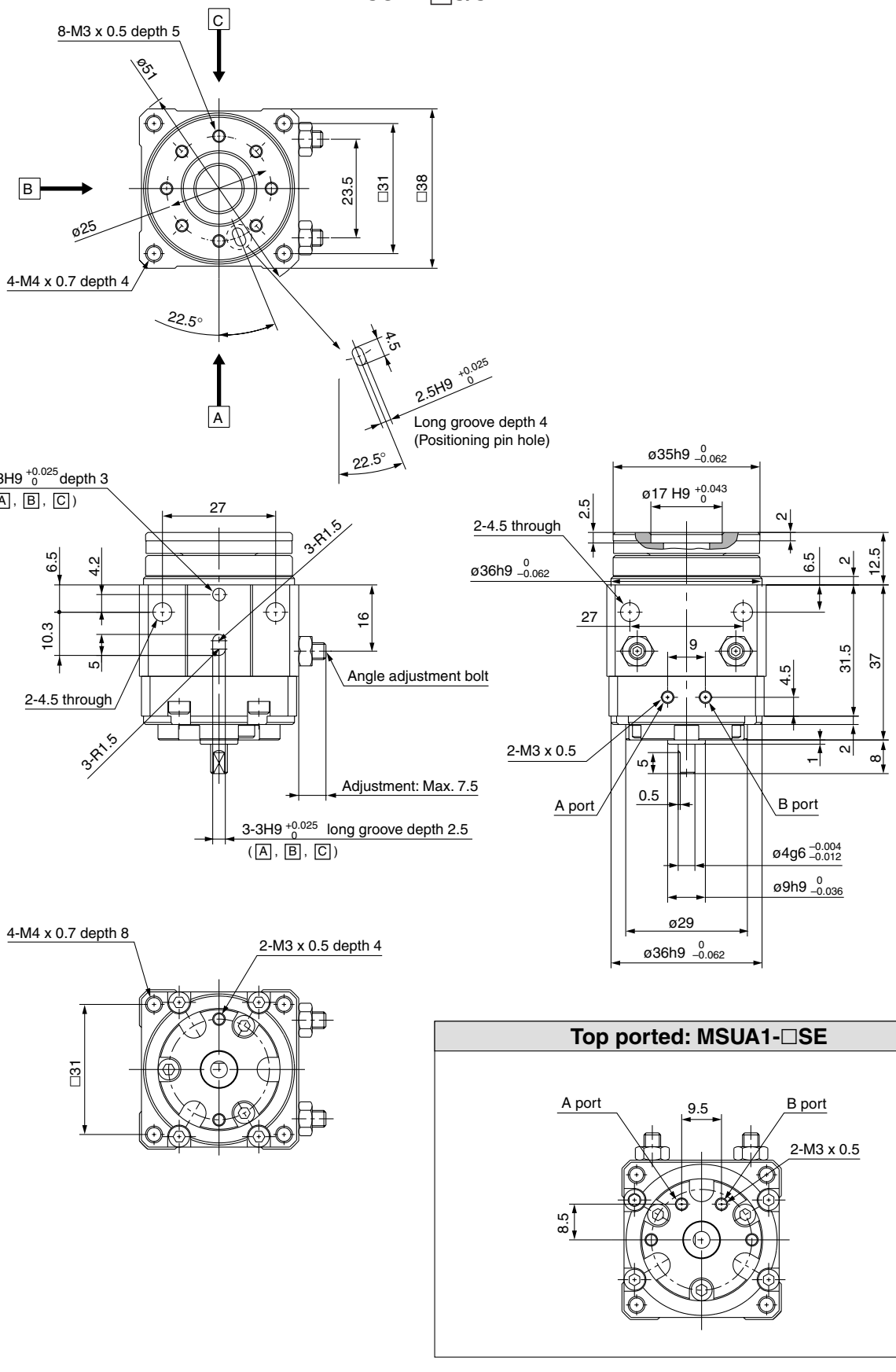
Auto switch block unit shows the necessary assembly for mounting 1 piece of auto switch to the auto switch unit.

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUA1

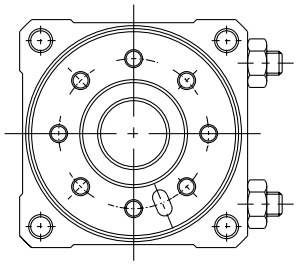
MSUA1-□S/SE



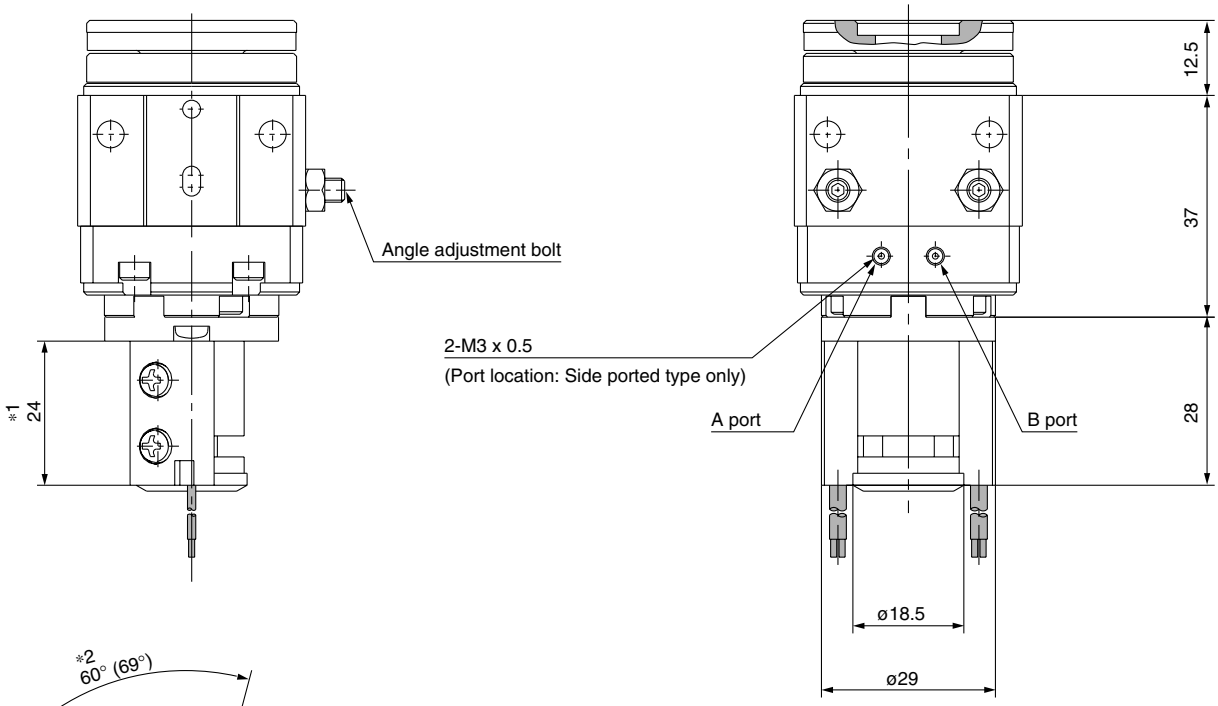
Top ported: MSUA1-□SE

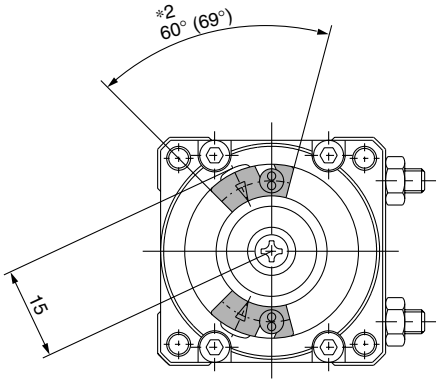
These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA1-□S

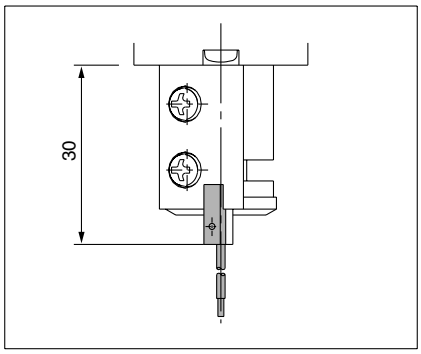


∗1) 24: When using D-90/90A/S99/S99V/S9P/S9PV/T99/T99V
30: When using D-97/93A
∗2) 60°: When using D-90/90A/97/93A
69°: When using D-S99/S99V/S9P/S9PV/T99/T99V





D-97/93A

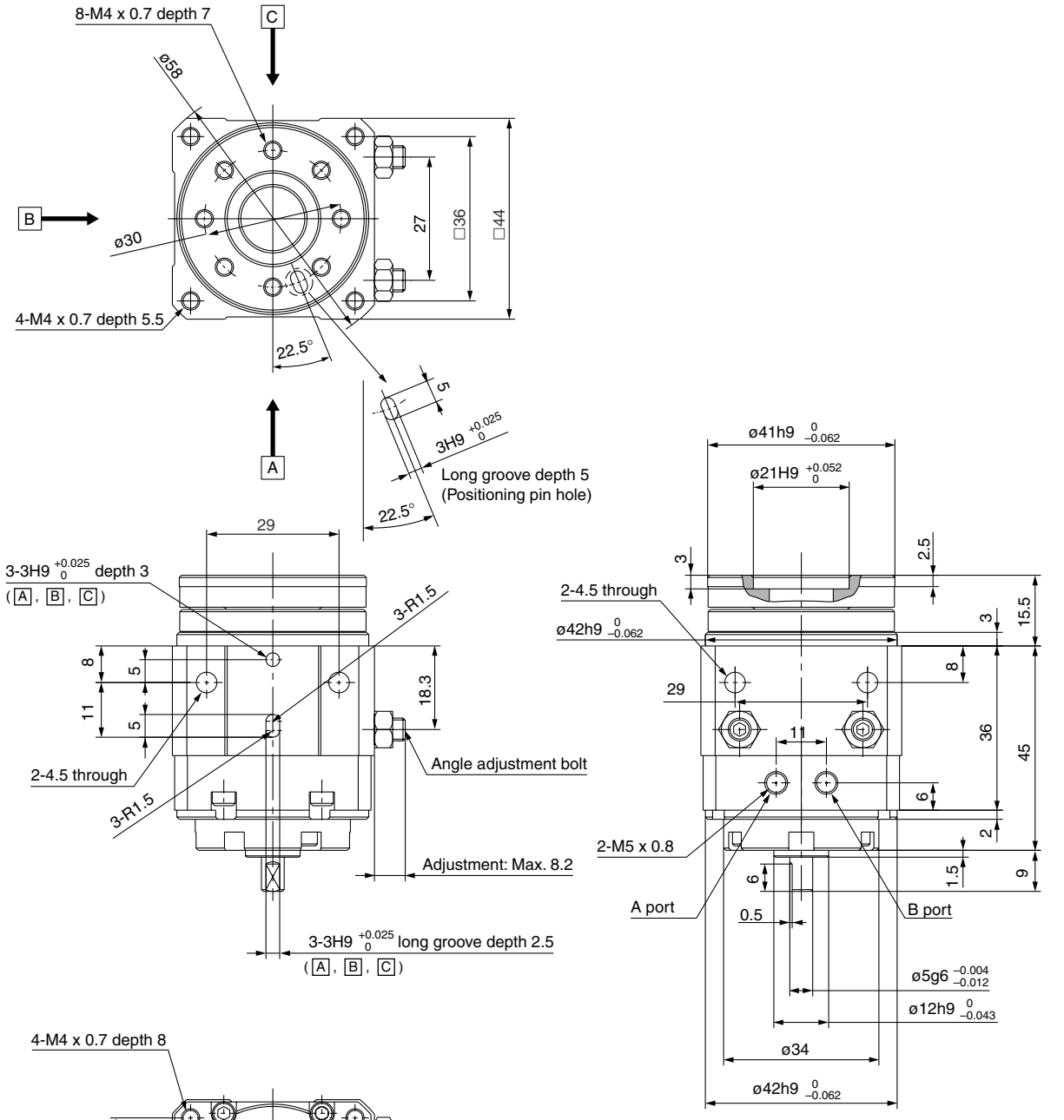


Dimensions

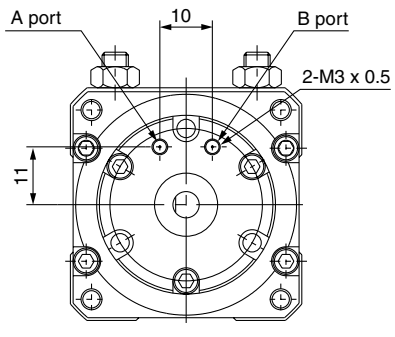
These drawings indicate the condition when the B port is pressurized.

MSUA3

MSUA3-□S/SE

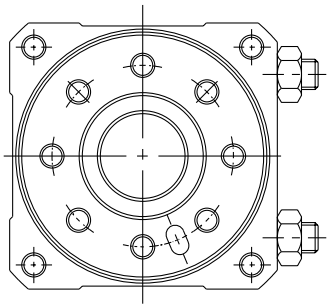


Top ported: MSUA3-□SE

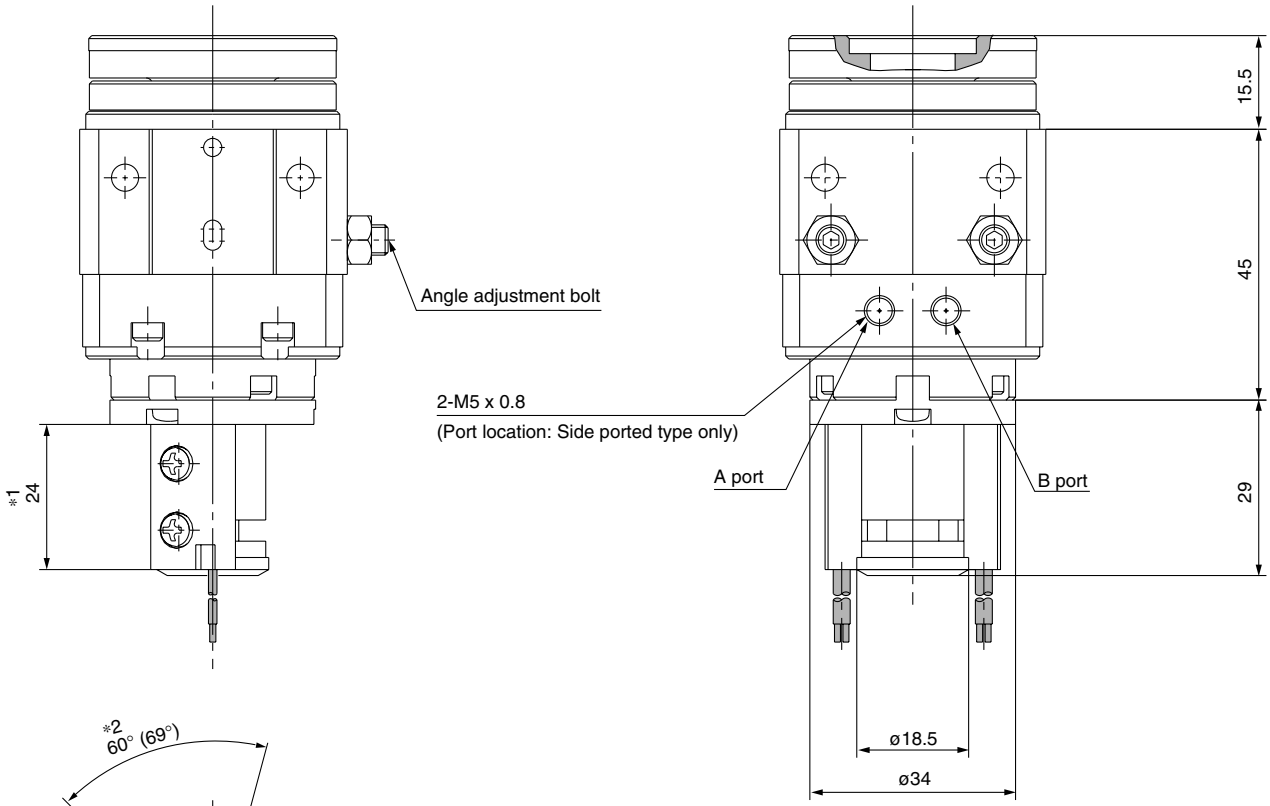


These drawings indicate the condition when the B port is pressurized.

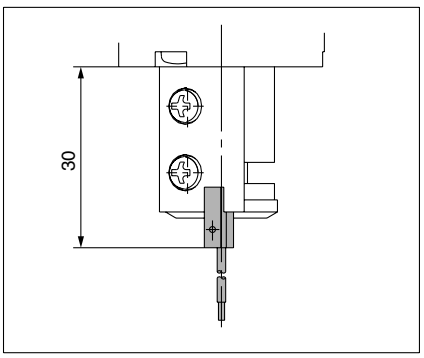
With auto switch: MDSUA3-□S



∗ 1) 24: When using D-90/90A/S99/S99V/S9P/S9PV/T99/T99V
30: When using D-97/93A
∗ 2) 60°: When using D-90/90A/97/93A
69°: When using D-S99/S99V/S9P/S9PV/T99/T99V



D-97/93A

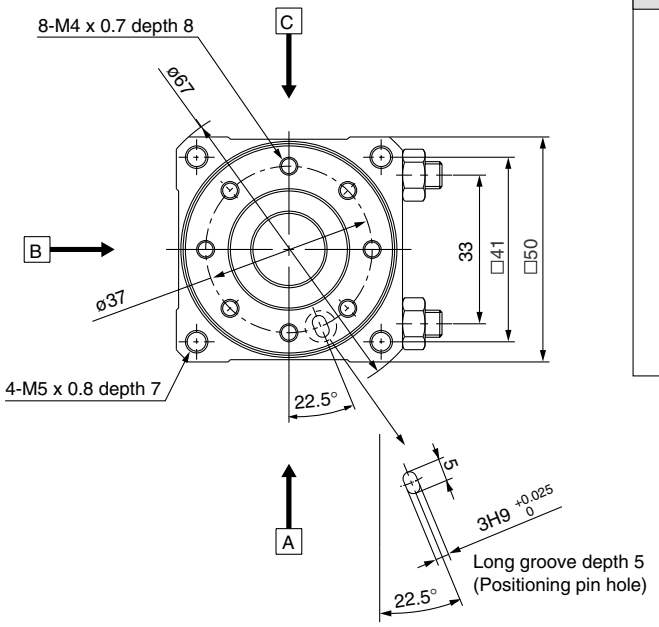


Dimensions

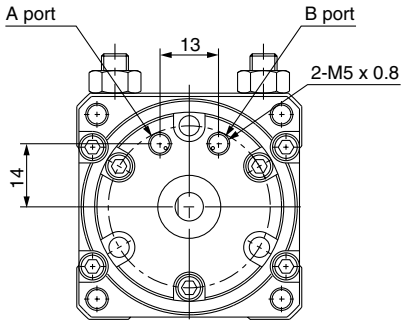
These drawings indicate the condition when the B port is pressurized.

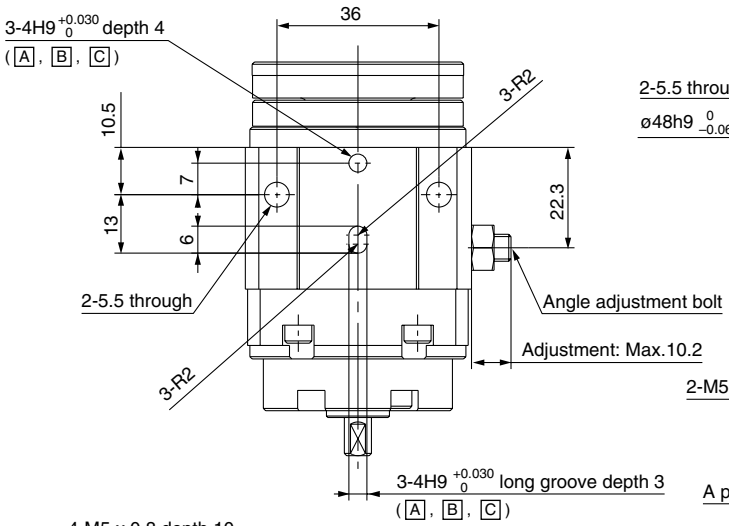
MSUA7

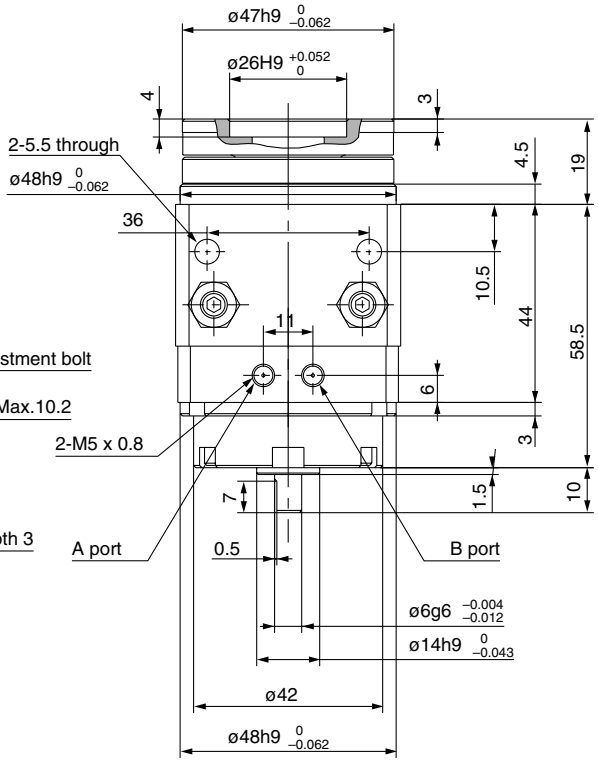
MSUA7-□S/SE

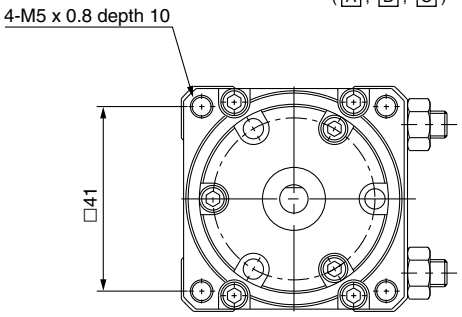


Top ported: MSUA7-□SE



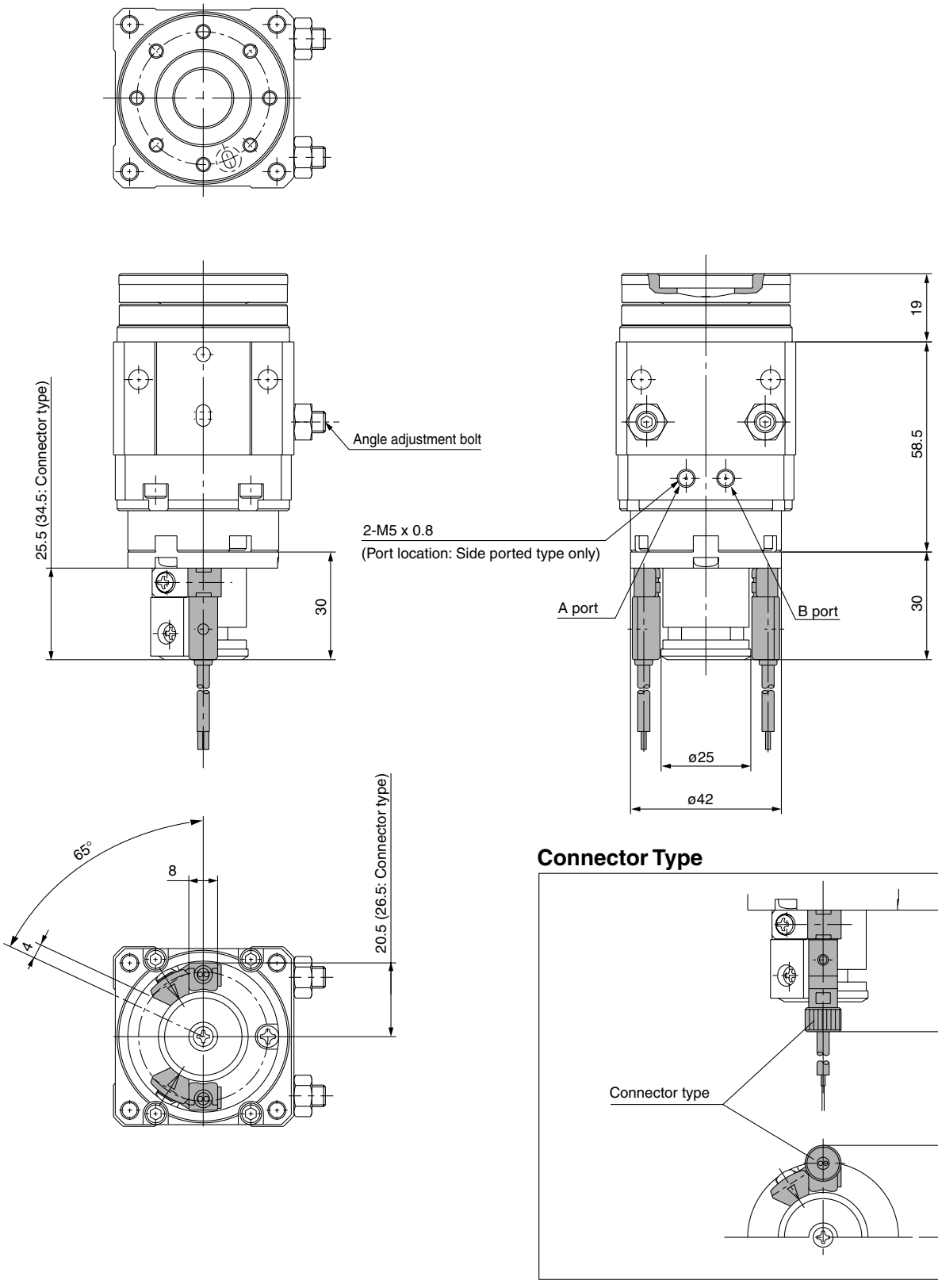




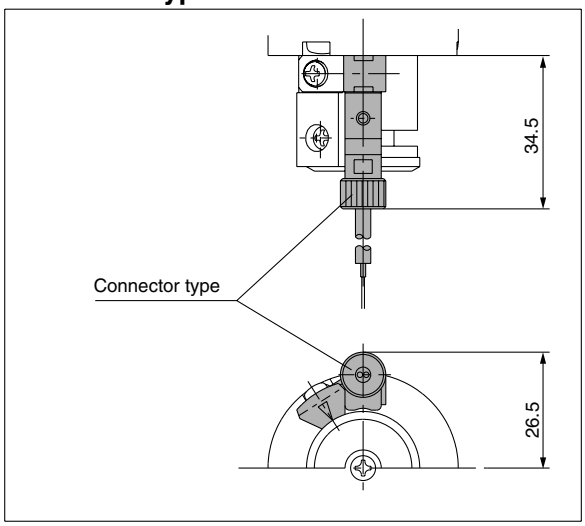


These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA7-□S



Connector Type

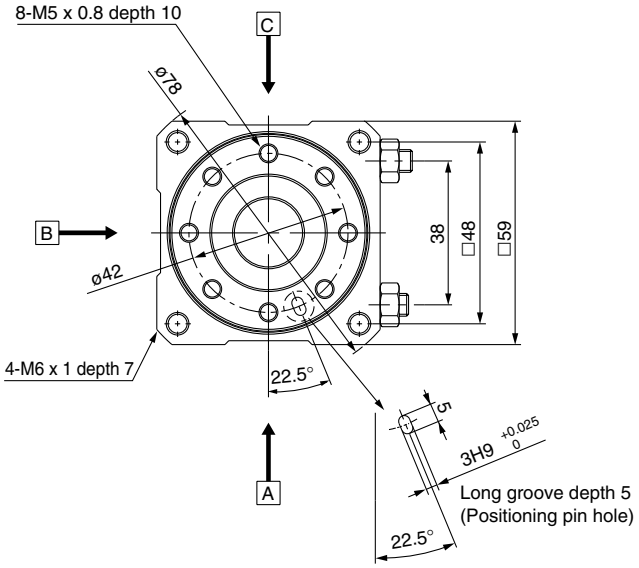


Dimensions

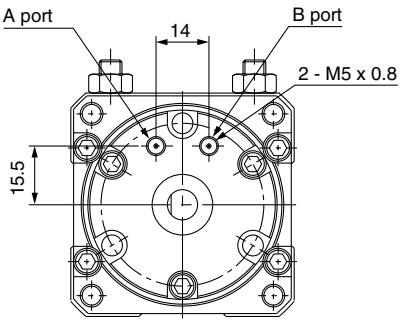
These drawings indicate the condition when the B port is pressurized.

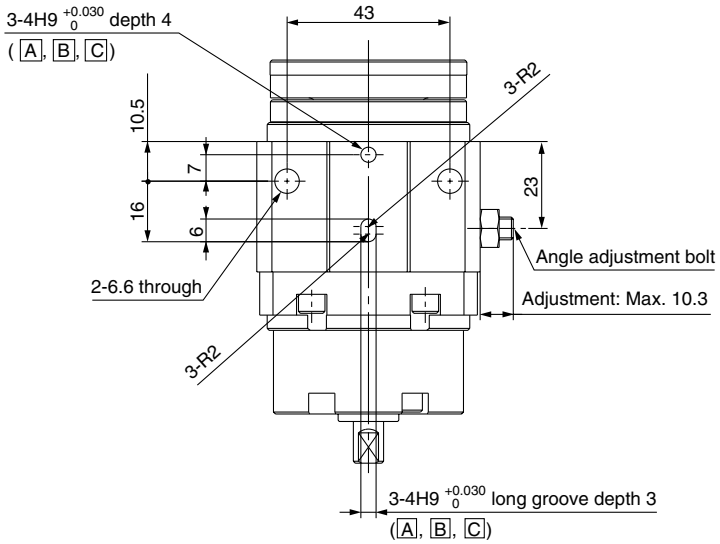
MSUA20

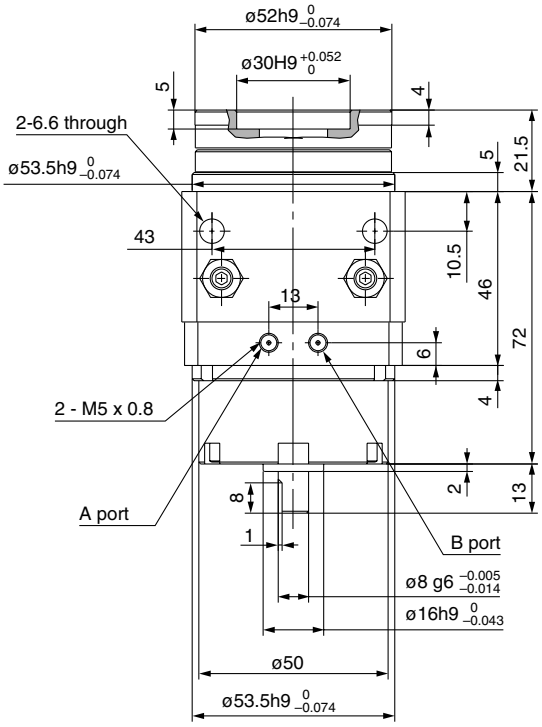
MSUA20-□S/SE

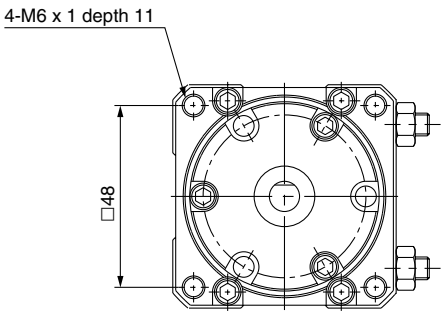


Top ported: MSUA20-□SE



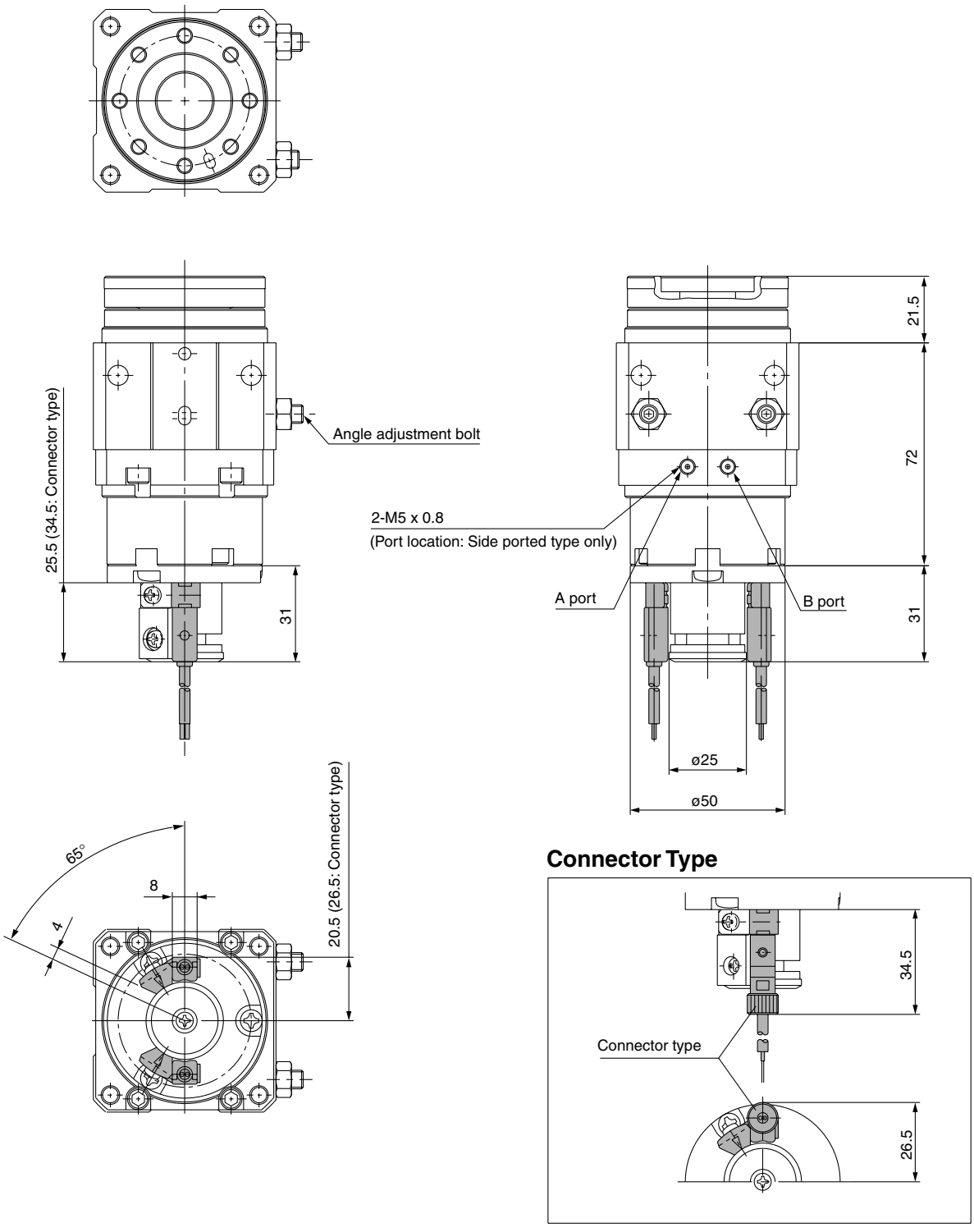






These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA20-□S



Connector Type

Rotary Table: Basic Type
Vane Style
Series MSUB
Size: 1, 3, 7, 20

How to Order

Without auto switch MSUB 20 — 90 S □

With auto switch M D SUB 20 — 90 S — T79 L □

Bearing type

B	Basic type

Free mount type

Connection port location

Nil	Side ported
E	Axial ported

Available with side ported only, when equipped with switch unit.

With auto switch unit

Nominal size (Torque)

1	MSUB1
3	MSUB3
7	MSUB7
20	MSUB20

Rotating angle

Application	Symbol	Rotating angle
Single vane	90	90°
	180	180°
Double vane	90	90°

Rotation adjustment range
Single vane: Both ends ±5° each
Double vane: Both ends ±2.5° each

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.
∗ Auto switches are shipped together (but not assembled).

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

∗ Available only with R73, R80 and T79 type connectors.
∗∗ 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

Number of auto switches

S	1 pc. ∗
Nil	2 pcs.

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

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

Applicable model	Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire type	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
MDSUB1 MDSUB3	Reed switch	—	Grommet	Yes	2-wire	24 V	—	—	—	97	Parallel cord	●	●	●	—	—	—	Relay, PLC
								100 V	—	93A	Heavy-duty cord	●	●	●	—			
	Solid state switch	—			3-wire (NPN)		5 V, 12 V	—	S99V	S99		●	●	—	—	○	IC circuit	
					3-wire (PNP)				S9PV	S9P		●	●	—	—	○		
					2-wire		12 V		T99V	T99		●	●	—	—	○	—	
MDSUB7 MDSUB20	Reed switch	—	Grommet	Yes	2-wire	24 V	—	100 V	—	R73	Heavy-duty cord	●	●	—	—	—	—	Relay, PLC
			Connector						—	R73C		●	●	●	●			
	Solid state switch	—	Grommet		3-wire (NPN)		5 V, 12 V	—	—	S79		●	●	—	—	○	IC circuit	
					3-wire (PNP)				—	S7P		●	●	—	—	○		
					2-wire		12 V		—	T79		●	●	—	—	○	—	
			Connector						—	T79C		●	●	●	●	—		

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

Refer to page 11-5-30 for details on other applicable switches.

∗ Auto switches marked with "○" are made-to-order specifications.

Made to Order Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

Order example: MSUA20 single vane type (connection port side location selected)
1. Standard type (Without auto switches), Rotation 90°, side port location MSUB20-90S
2. With switch unit (Without auto switches), Rotation 180°, Side port location MDSUB20-180S
3. With switch unit + Auto switch R73, Rotation 180°, Side port location MDSUB20-180S-R73

Specifications

Model *3		MSUB1			MSUB3			MSUB7			MSUB20		
Vane type		Single vane		Double vane	Single vane		Double vane	Single vane		Double vane	Single vane		Double vane
Rotating angle *1		90° ±10°	180° ±10°	90° ± 5°	90° ±10°	180° ±10°	90° ± 5°	90° ±10°	180° ±10°	90° ± 5°	90° ±10°	180° ±10°	90° ± 5°
Fluid		Air (Non-lube)											
Proof pressure (MPa)		1.05									1.5		
Ambient and fluid temperature		5 to 60°C											
Operating pressure range (MPa)		0.2 to 0.7			0.15 to 0.7						0.15 to 1.0		
Rotation time adjustment range (sec/90°)		0.07 to 0.3											
Shaft load	Allowable radial load	20 N			40 N			50 N			60 N		
	Allowable thrust load *2	15 N			30 N			60 N			80 N		
		10 N			15 N			30 N			40 N		
	Allowable moment	0.3 N·m			0.7 N·m			0.9 N·m			2.9 N·m		
Bearing		Bearing											
Port location		Side ported or Top ported											
Port size	Side ported	M3 x 0.5			M5 x 0.8								
	Top ported	M3 x 0.5						M5 x 0.8					

*1 Single vane 90° can be adjusted to 90° ±10° (both ends of rotation ±5° each)
Single vane 180° can be adjusted to 180° ±10° (both ends of rotation ± 5° each)
Double vane 90° type can be adjusted to 90° ±5° (both ends of rotation ±2.5° each)
• Rotation angles other than 90° and 180° (single vane) are available by special order.

*2 The allowable thrust load is directional. For details refer to the allowable load table below.

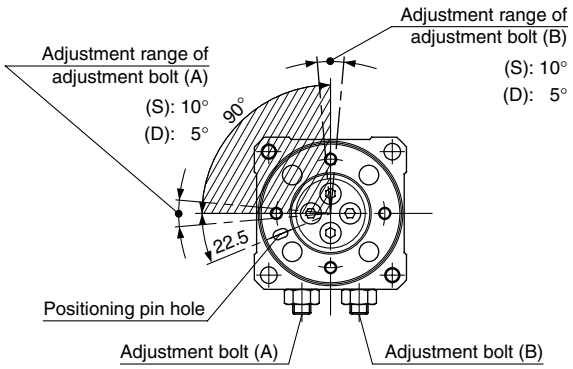
Note) Refer to page 11-1-34 for allowable kinetic energy.

*3 Correspondence to equivalent conventional free-mount types

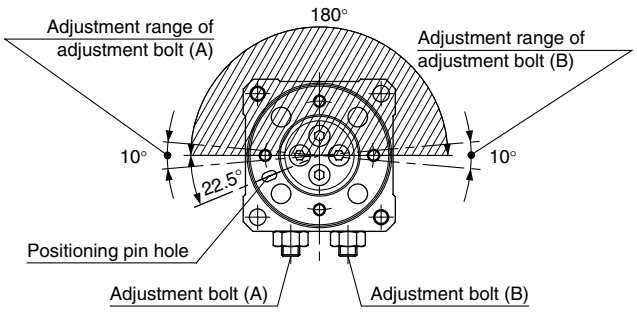
Rotary table		Free-mount rotary actuator
MSUB1	→	CRBU2W10
MSUB3	→	CRBU2W15
MSUB7	→	CRBU2W20
MSUB20	→	CRBU2W30

Table Rotation Range

Angle adjustment is possible as shown in the drawings below using adjustment bolts (A) and (B).



For 90° rotation
Single vane (S): 80° to 100° adjustable
Double vane (D): 85° to 95° adjustable



For 180° rotation
Single vane (S): 170° to 190° adjustable
* The double vane type is not available with 180° rotation.

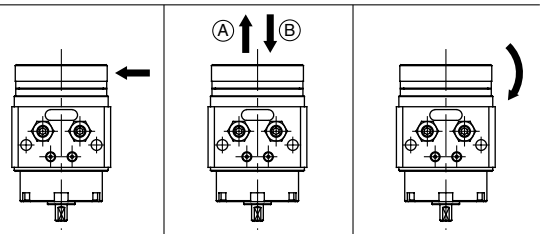
Weight

(g)

Size	Rotation angle	Basic weight		Auto switch unit + Auto switch 2 pcs.
		Single vane	Double vane	
1	90°	145	150	25
	180°	140	—	
3	90°	230	240	30
	180°	225	—	
7	90°	360	375	50
	180°	355	—	
20	90°	510	580	60
	180°	505	—	

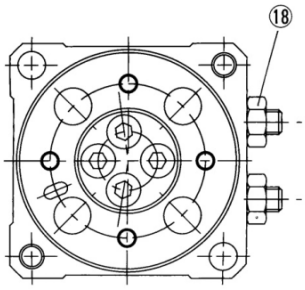
Allowable Load

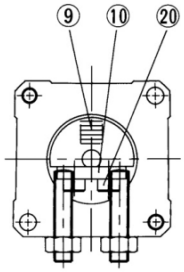
Do not permit the load and moment applied to the table to exceed the allowable values shown in the table below. (Operation above the allowable values can cause adverse effects on service life, such as play in the table and loss of accuracy.)



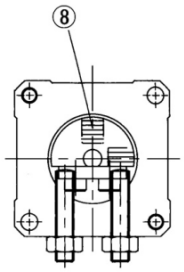
Size	Allowable radial load (N)	Allowable thrust load (N)		Allowable moment (N·m)
1	20	Ⓐ 15	Ⓑ 10	0.3
3	40	30	15	0.7
7	50	60	30	0.9
20	60	80	40	2.9

Construction/Component Parts

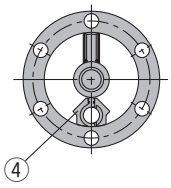




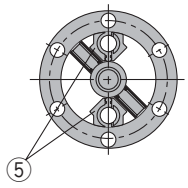
For 180°
(Figure in the middle position)



For 90°
(Figure with pressure to A port)

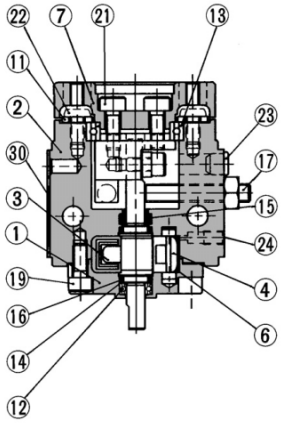


Single vane
(Figure in the middle position for 180°)

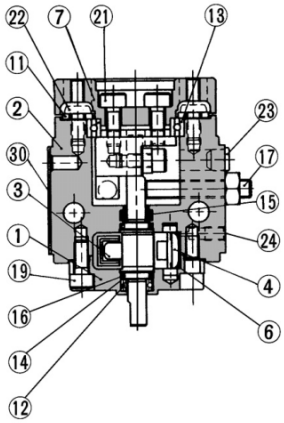


Double vane
(Figure with pressure to A port)

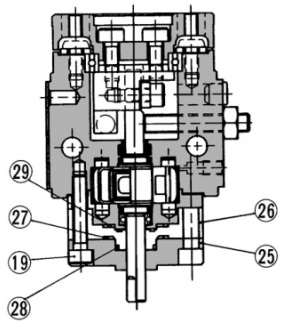
Single vane: Size 1



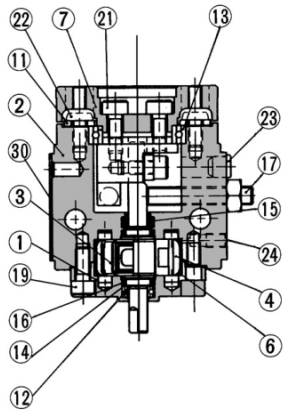
Single vane: Size 3, 7, 20



Double vane: Size 1



Double vane: Size 3, 7, 20



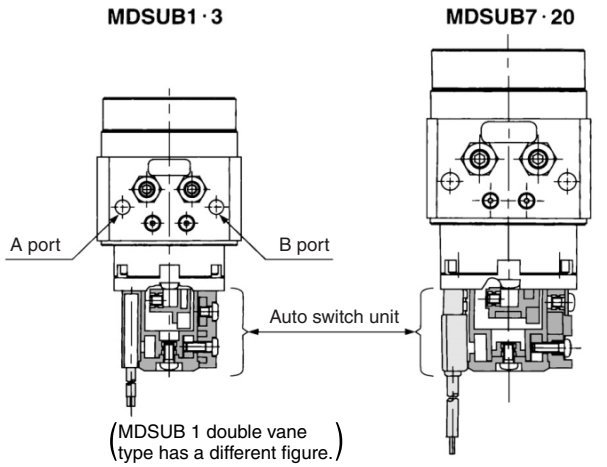
Component Parts

No.	Description	Material	Note
①	Body (A)	Aluminum alloy	Light gray color
②	Body (B)	Aluminum alloy	Light gray color
③	Vane shaft	Stainless steel (MSUB20: Carbon steel)	Single vane
		Carbon steel	Double vane
④	Stopper	Resin	Single vane
⑤	Stopper	Stainless steel	Double vane
⑥	Stopper seal	NBR	
⑦	Table	Aluminum alloy	Light gray color
⑧	Stopper lever (D)	Carbon steel	
⑨	Stopper lever (S)	Carbon steel	
⑩	Lever retainer	Carbon steel	
⑪	Ring collar	Carbon steel	
⑫	Bearing	High carbon chrome bearing steel	
⑬	Bearing	High carbon chrome bearing steel	
⑭	Back-up ring	Stainless steel	
⑮	Scraper	NBR	
⑯	O-ring	NBR	
⑰	Adjustment bolt	Carbon steel	
⑱	Hexagon nut	Stainless steel	
⑲	Hexagon socket head cap screw	Stainless steel	
⑳	Hexagon socket head cap screw	Stainless steel	
㉑	Hexagon socket head cap screw	Stainless steel	
㉒	Button bolt	Carbon steel	
㉓	Rubber cap	NBR	
㉔	Hexagon socket head set screw	Stainless steel	
㉕	Cover	Aluminum alloy	SE type only
㉖	Plate	Resin	
㉗	Gasket	NBR	
㉘	O-ring	NBR	
㉙	O-ring	NBR	
㉚	Label		

∗ The plug ㉔ is used only when the connection port is type SE.

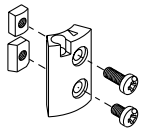
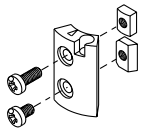
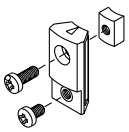
Internal construction with auto switch

Units are common for both single and double vane.



Model	Auto switch unit part no.
MDSUB1	P211070-1
MDSUB3	P211090-1
MDSUB7	P211060-1
MDSUB20	P211080-1

∗ Auto switches are not included with switch units.

Auto switch block unit		
MDSUB1/3		**MDSUB7/20**
Right-handed	Left-handed	Combination left & right-handed
		
Part no.: P211070-8	Part no.: P211070-9	Part no.: P211060-8

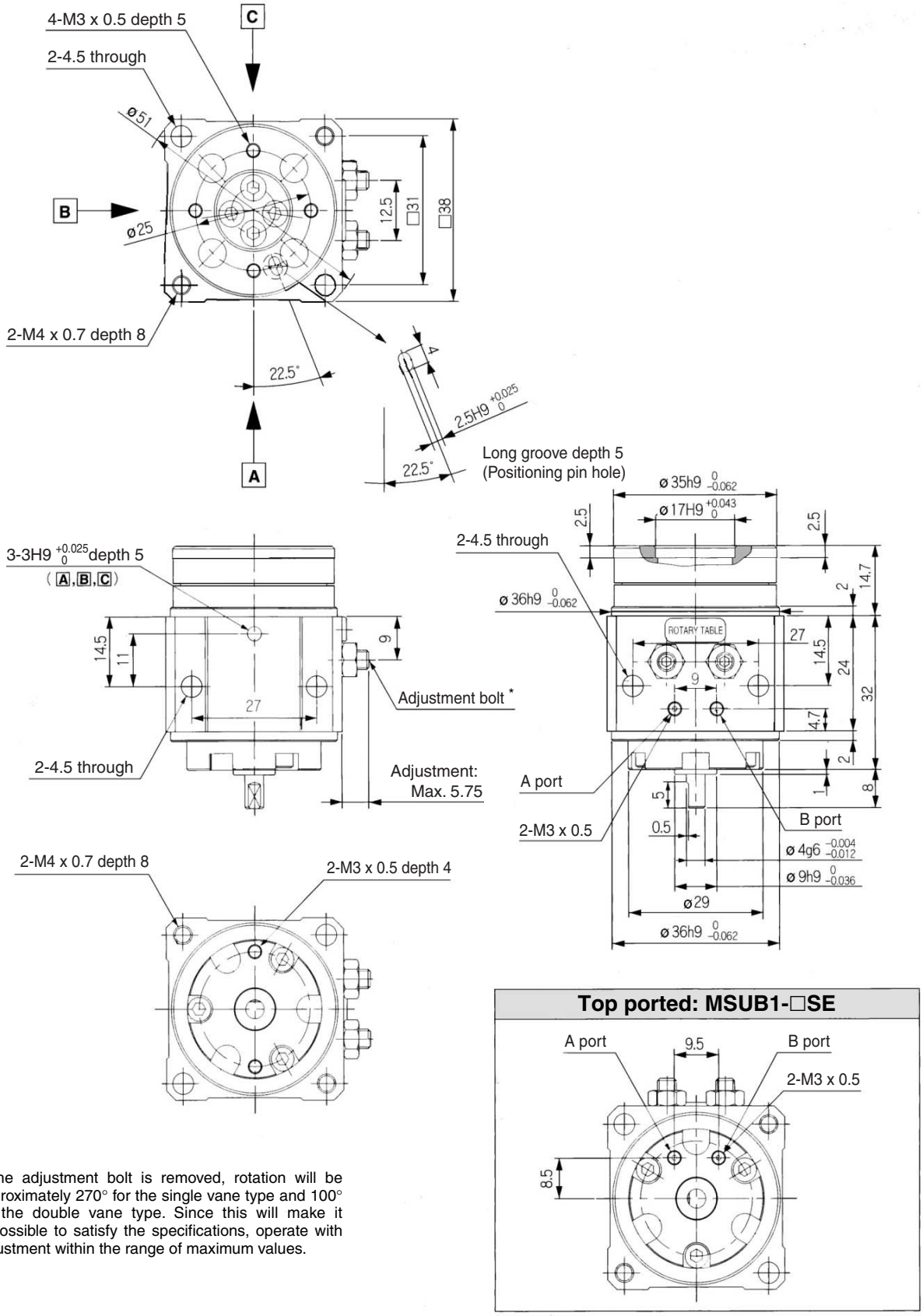
∗ Auto switch block unit shows the necessary assembly for mounting 1 piece of auto switch to the auto switch unit.

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUB1 (Single vane)

MSUB1-□S/SE

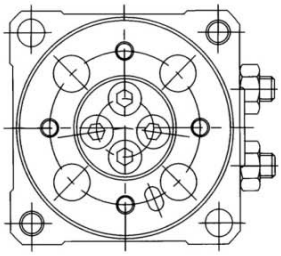


Top ported: MSUB1-□SE

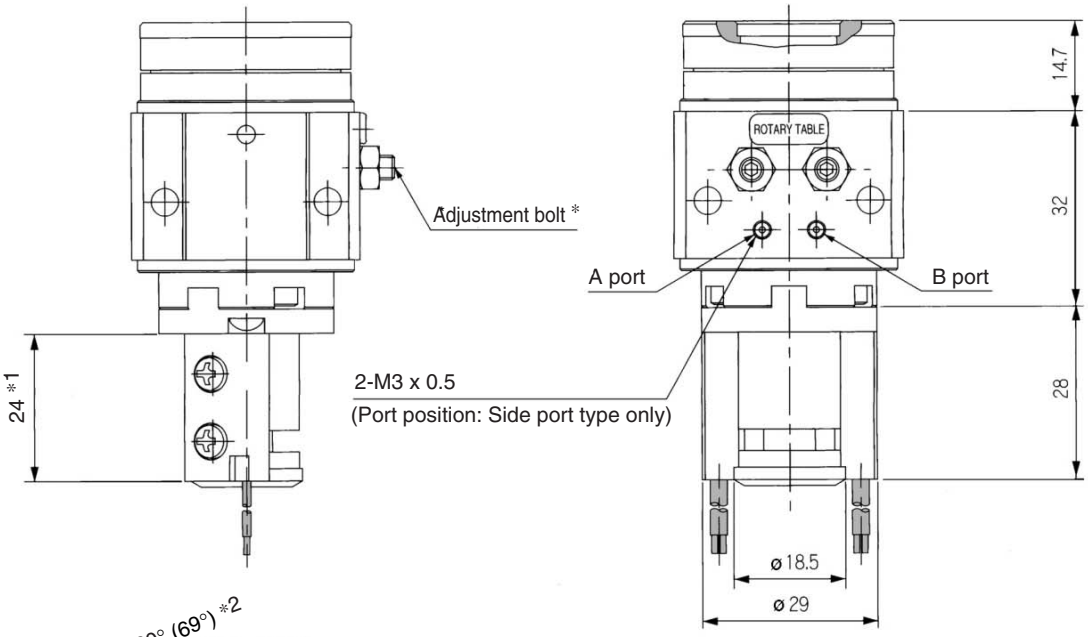
* If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

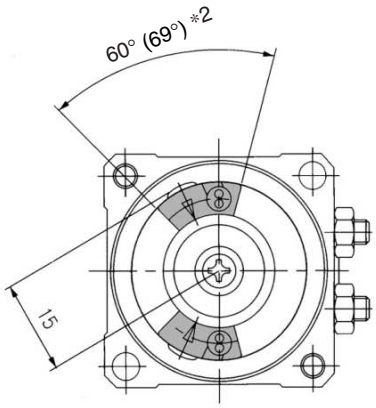
These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUB1-□S

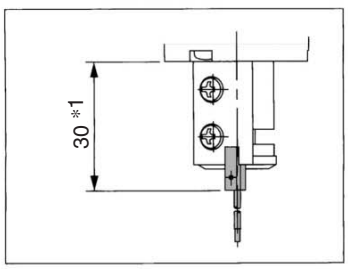


∗1) 24: When using FD-90/90A/S99(V)/T99(V)/S9P(V)
30: When using D-97/93A
∗2) 60°: When using D-90/90A/97/93A
69°: When using D-S99(V)/T99(V)/S9P(V)





D-97/93A



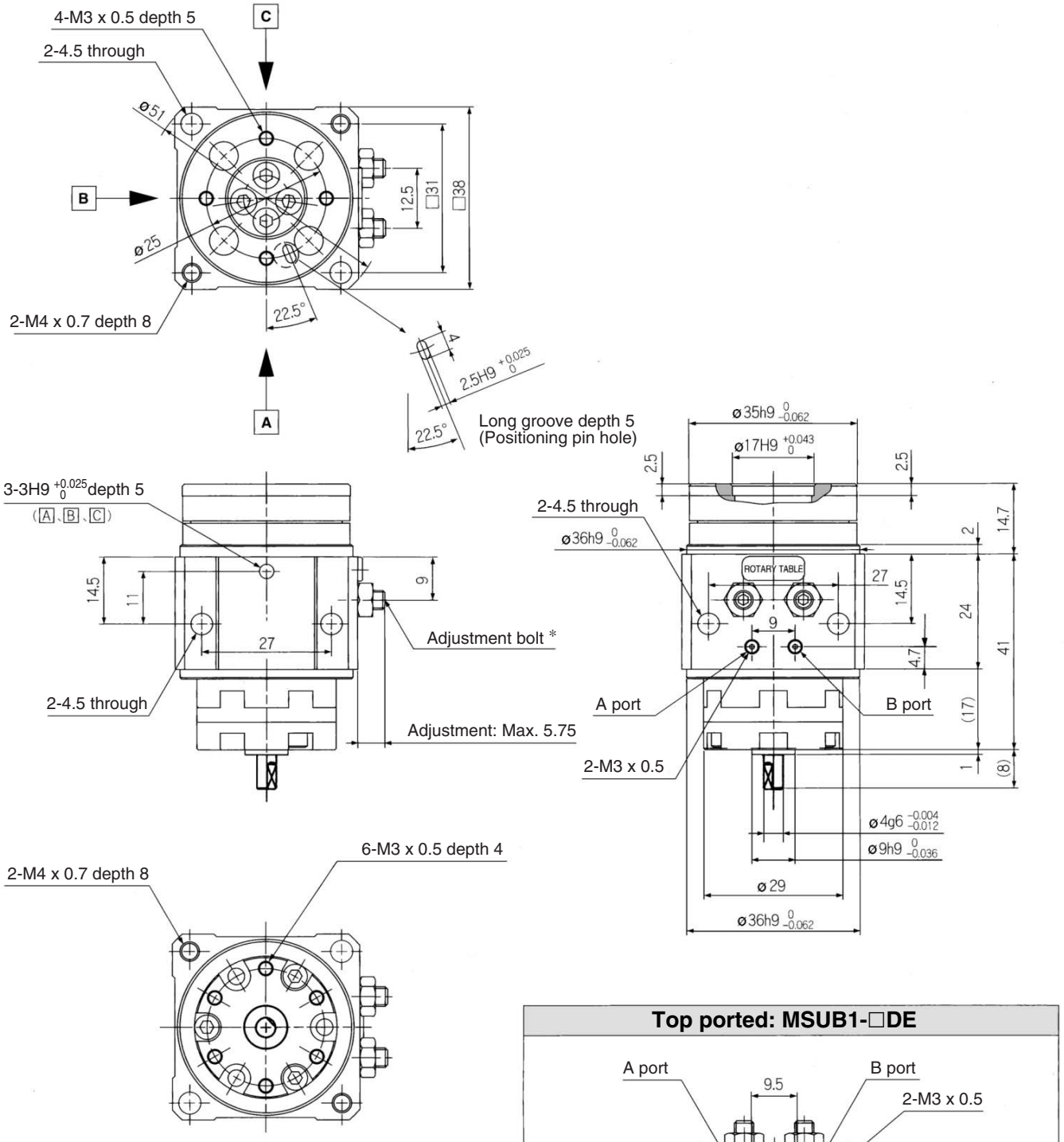
∗ If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

Dimensions

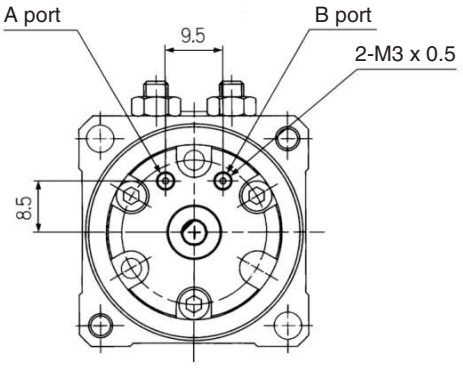
These drawings indicate the condition when the B port is pressurized.

MSUB1 (Double vane)

MSUB1-□D



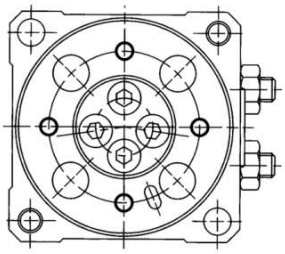
Top ported: MSUB1-□DE



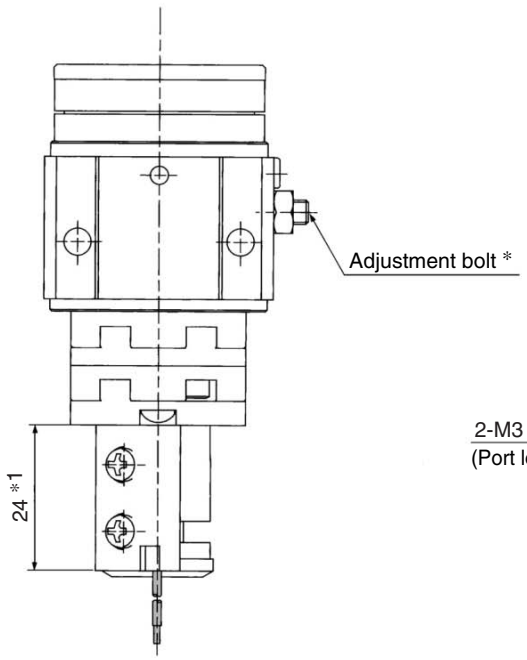
* If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

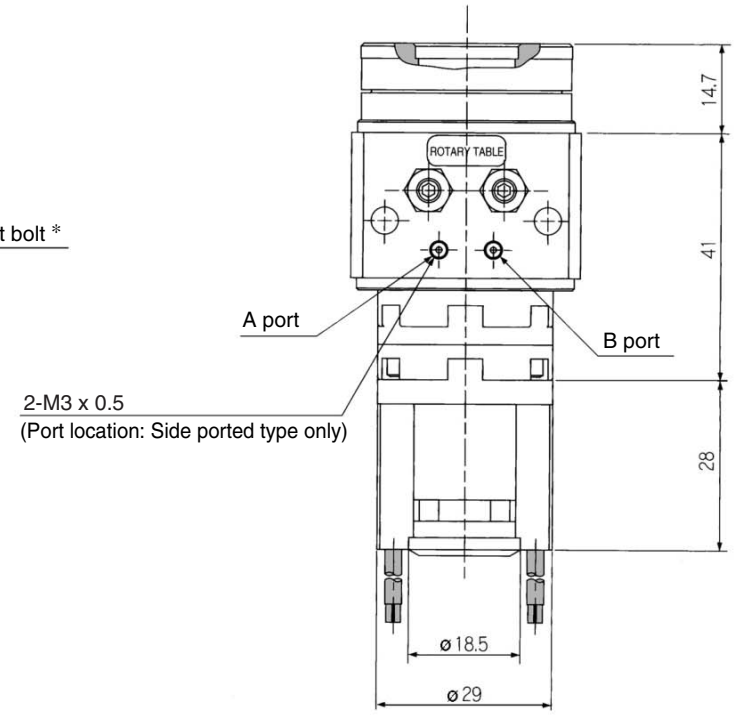
These drawings indicate the condition when the B port is pressurized.

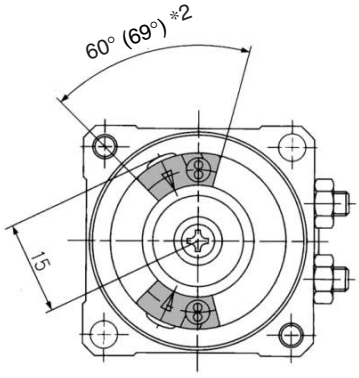
With auto switch: MDSUB1-□D



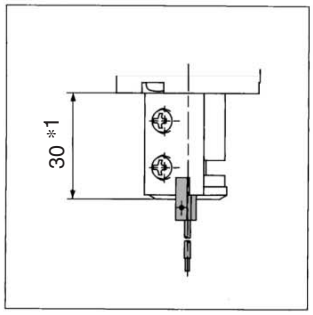
∗1) 24: When using D-90/90A/S99(V)/T99(V)/S9P(V)
30: When using D-97/93A
∗2) 60°: When using D-90/90A/97/93A
69°: When using D-S99(V)/T99(V)/S9P(V)







D-97/93A



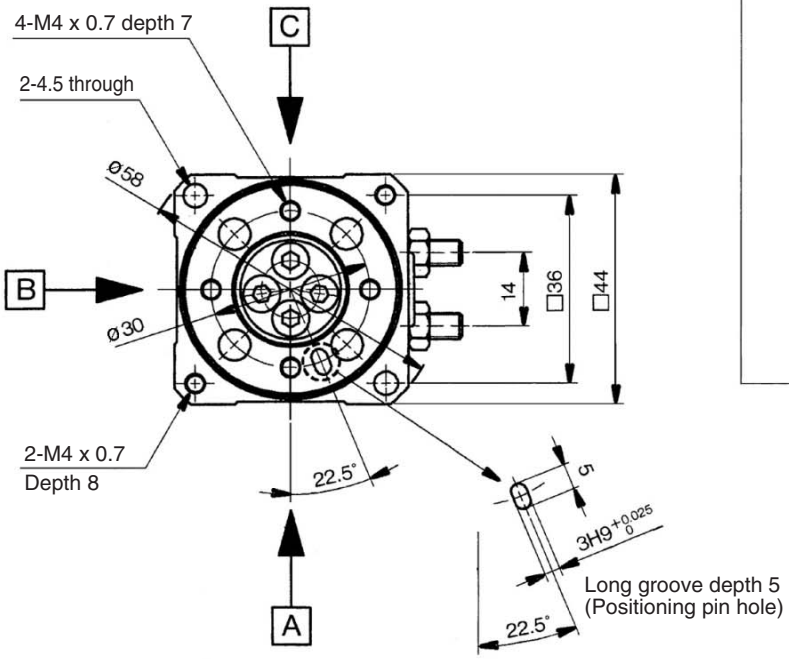
∗ If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

Dimensions

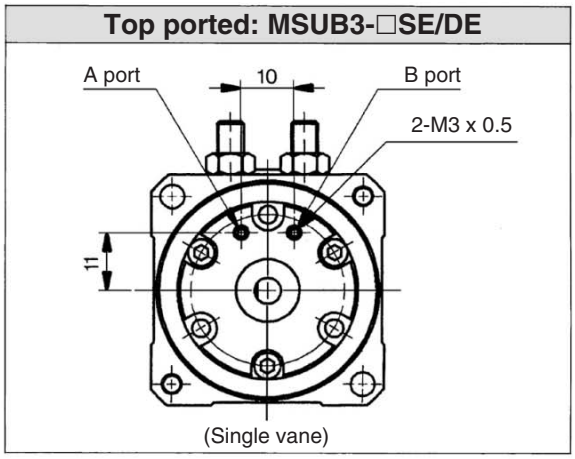
These drawings indicate the condition when the B port is pressurized.

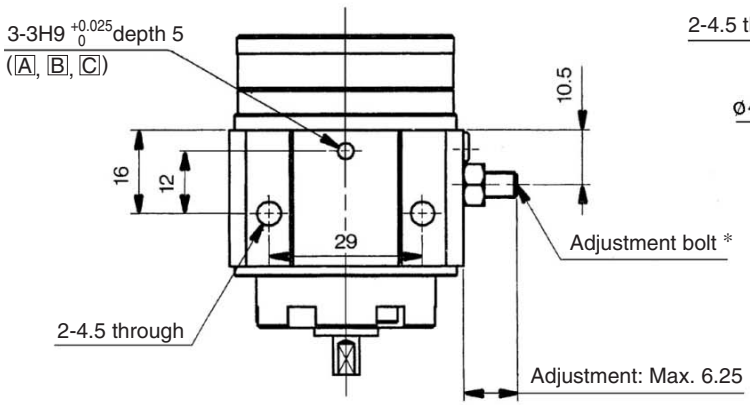
MSUB3 (Single vane/Double vane)

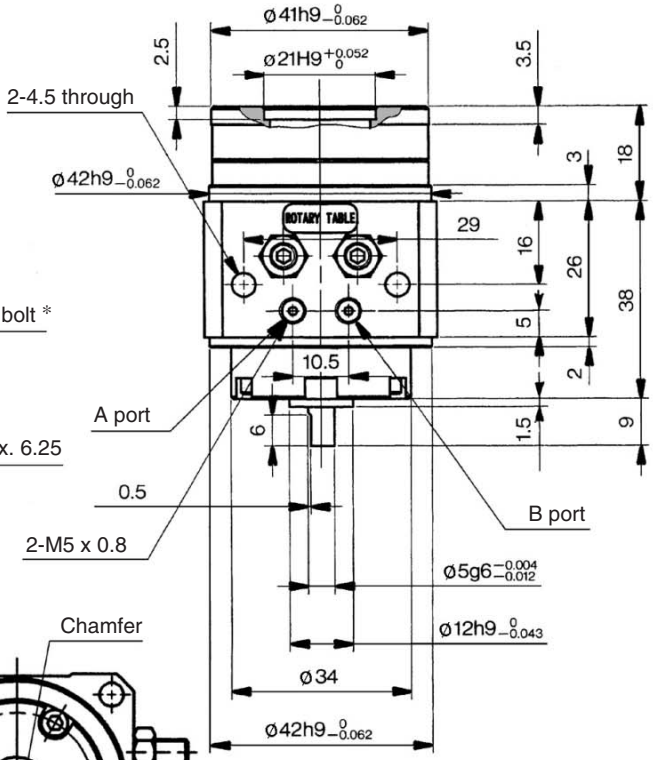
MSUB3-□S/D

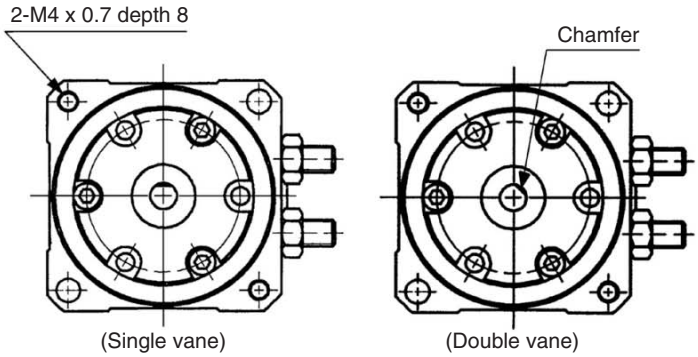


Top ported: MSUB3-□SE/DE







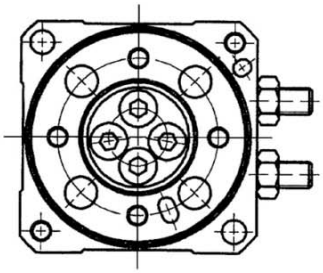


The outside drawings show the single vane type, but only the position of the chamfered sections shown in the above drawings differs from single and double vane.

* If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

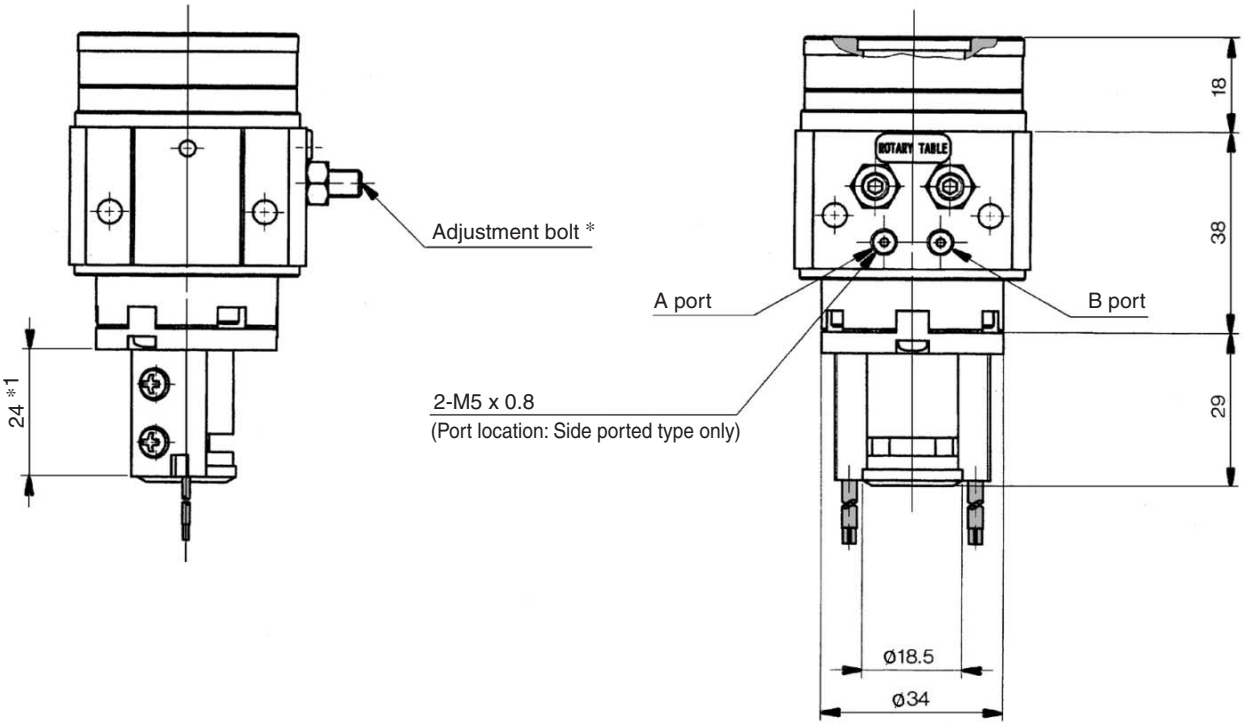
These drawings indicate the condition when the B port is pressurized.

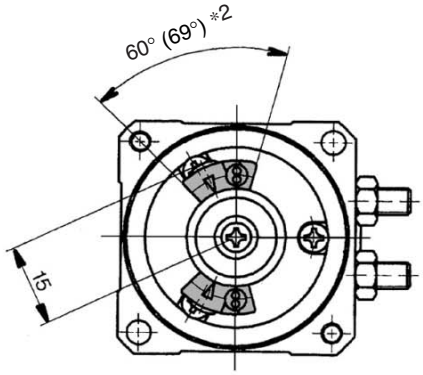
With auto switch: MDSUB3



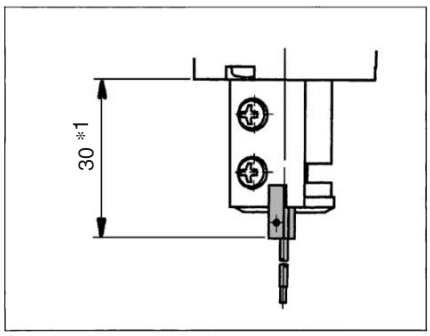
∗1) 24: When using D-90/90A/S99(V)/T99(V)/S9P(V)
30: When using D-97/93A
∗2) 60°: When using D-90/90A/97/93A
69°: When using D-S99(V)/T99(V)/S9P(V)

∗ If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.





D-97/93A

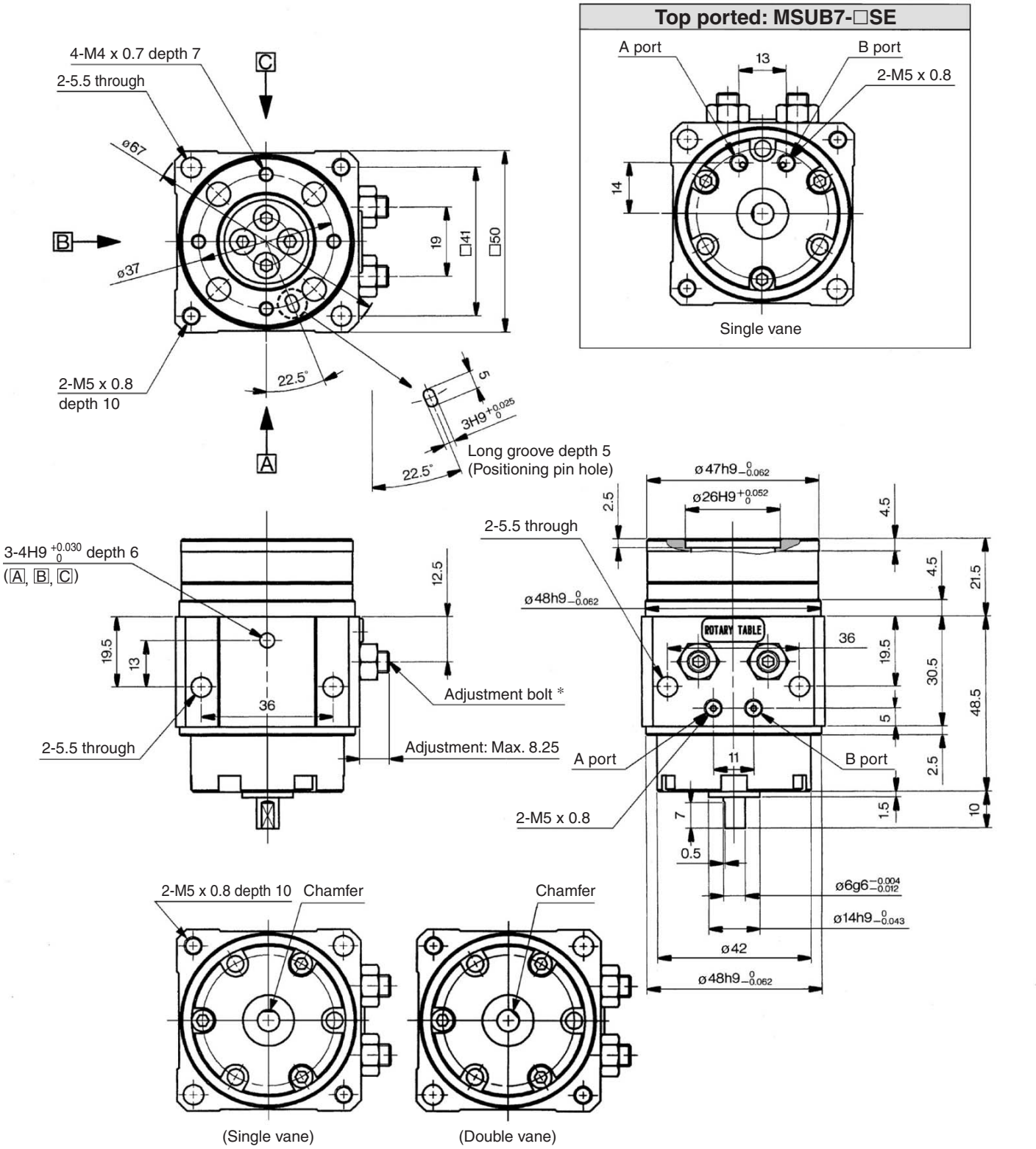


Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUB7 (Single vane/Double vane)

MSUB7-□S/D



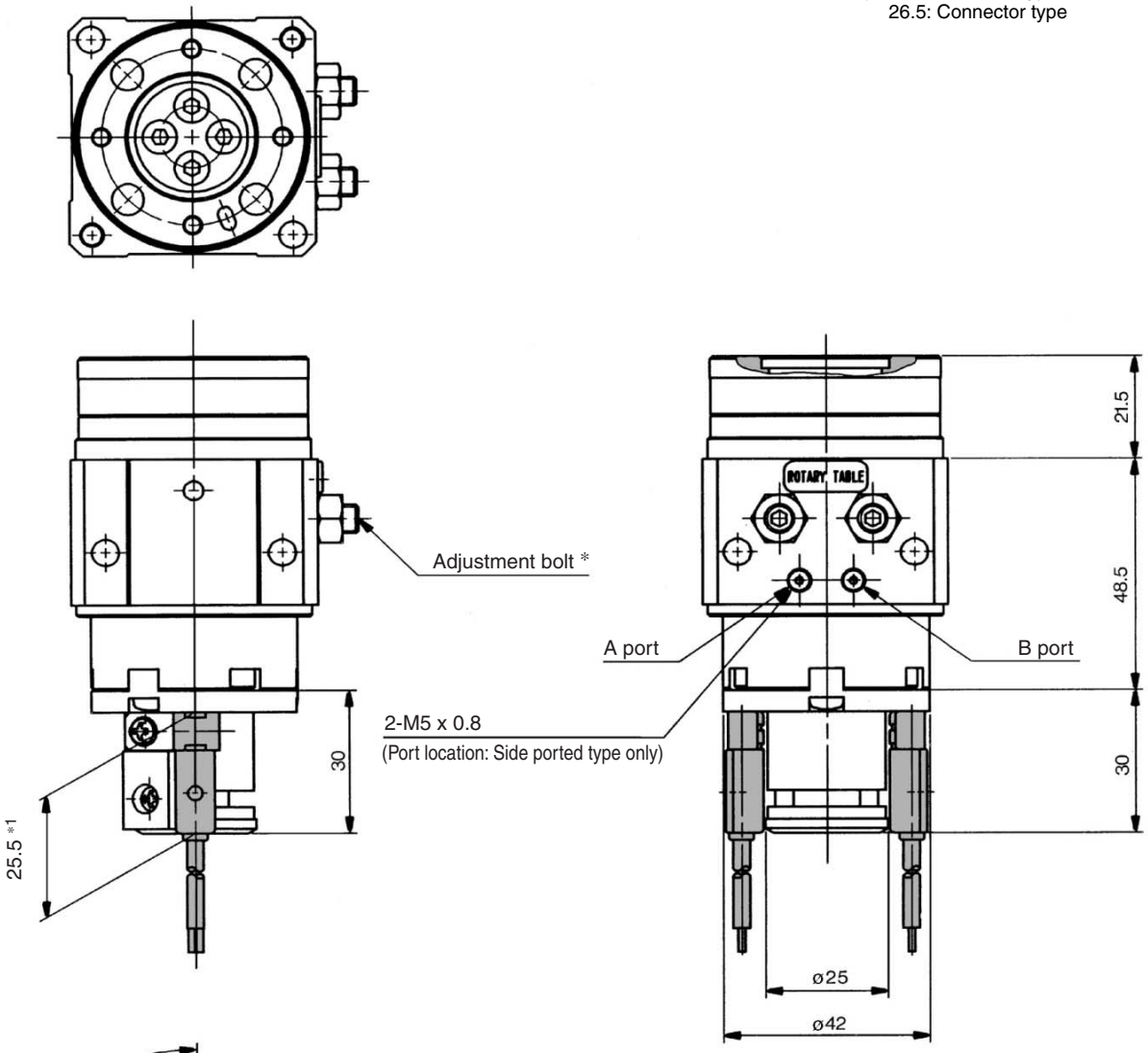
The outside drawings show the single vane type, but only the position of the chamfered sections shown in the above drawings differs from single and double vane.

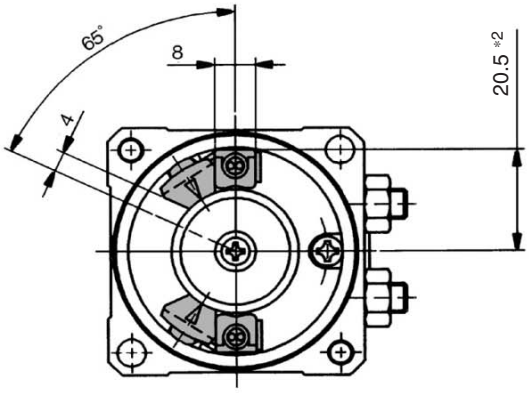
* If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

These drawings indicate the condition when the B port is pressurized.

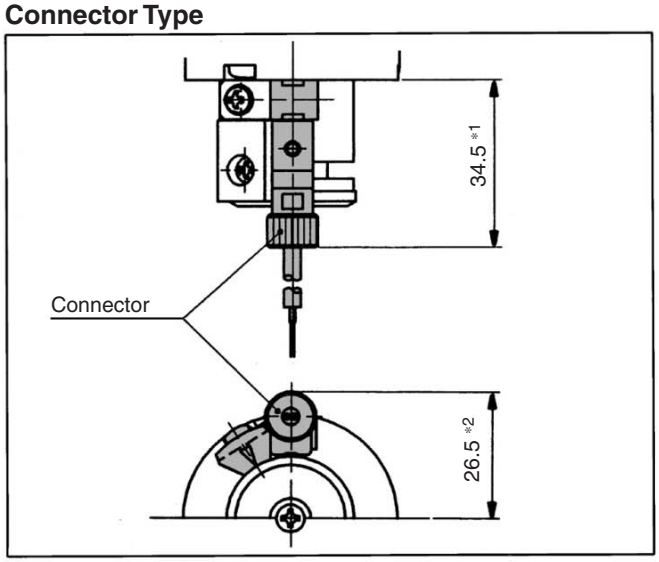
With auto switch: MDSUB7

∗1) 25.5: Grommet type
34.5: Connector type
∗2) 20.5: Grommet type
26.5: Connector type





Connector Type



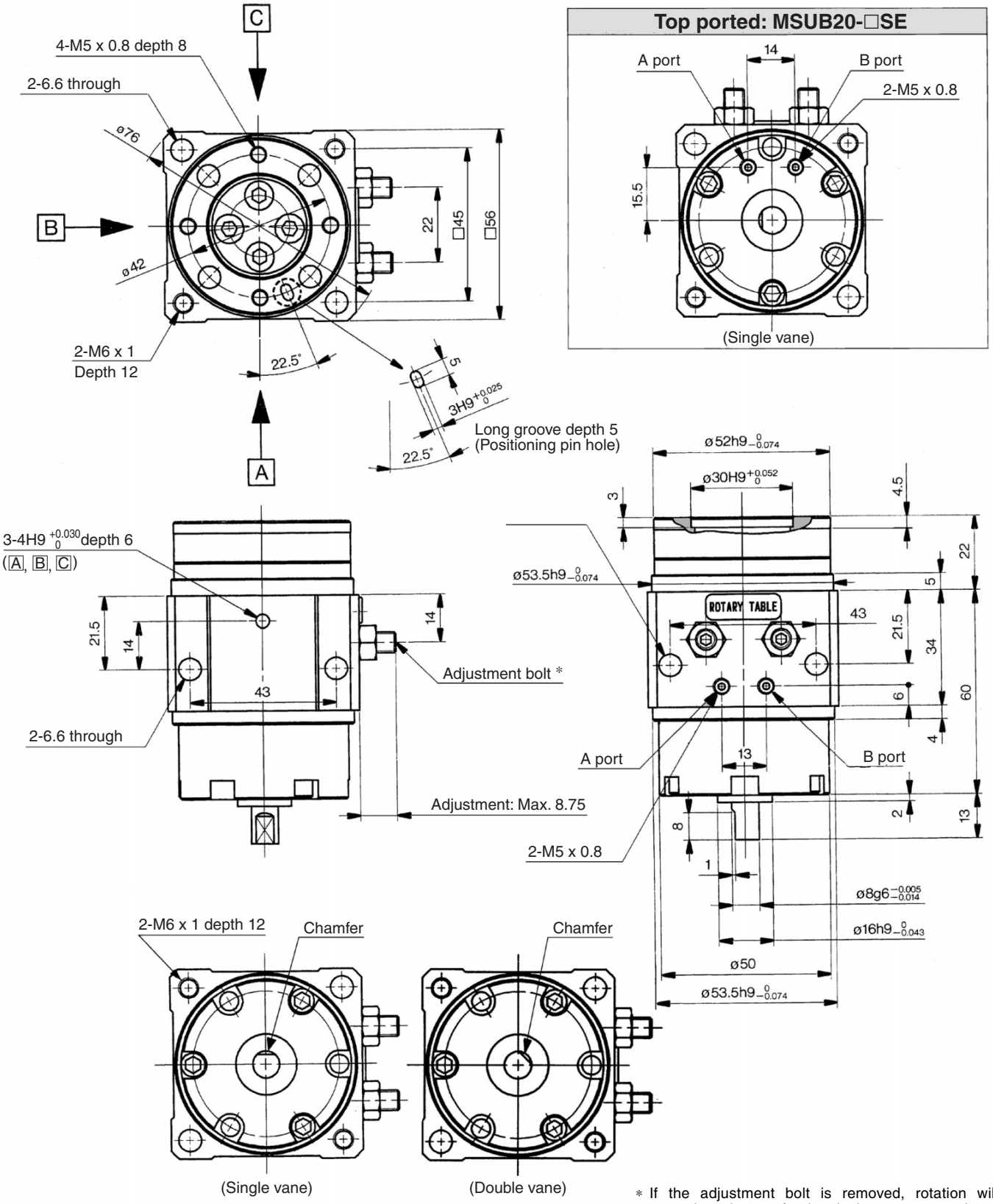
∗ If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUB20 (Single vane/Double vane)

MSUB20-□S/D



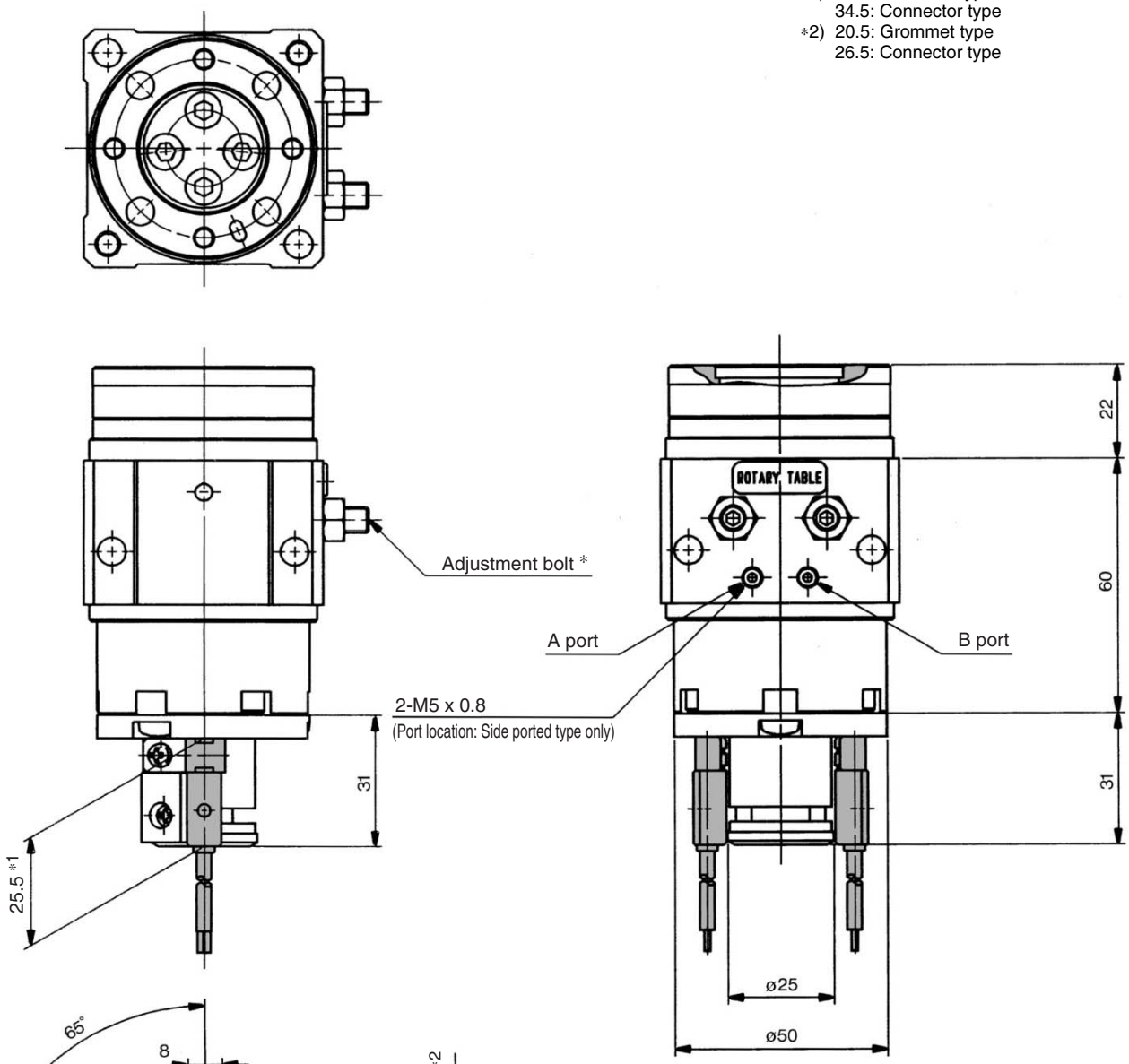
The outside drawings show the single vane type, but only the position of the chamfered sections shown in the above drawings differs from single and double vane.

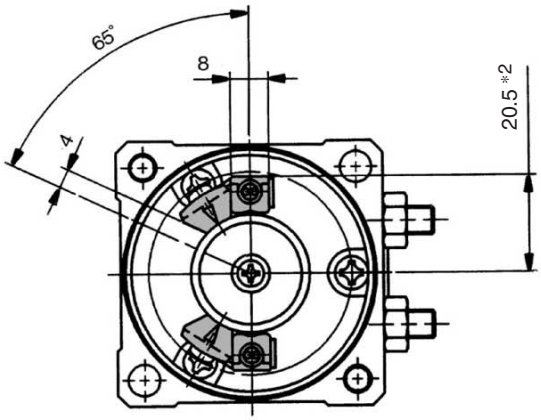
* If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUB20

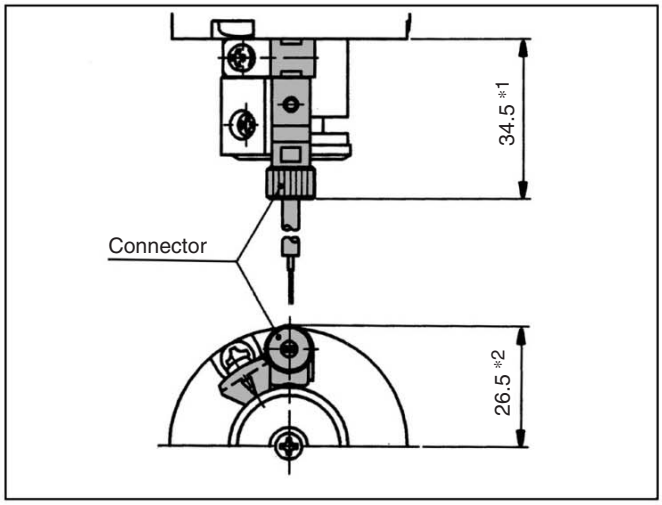
∗1) 25.5: Grommet type
34.5: Connector type
∗2) 20.5: Grommet type
26.5: Connector type





∗ If the adjustment bolt is removed, rotation will be approximately 270° for the single vane type and 100° for the double vane type. Since this will make it impossible to satisfy the specifications, operate with adjustment within the range of maximum values.

Connector Type



Series MDSU
Auto Switch Specifications

The auto switches below are also mountable in addition to the models in “How to Order”. Refer to pages 11-11-10 to 11-11-15 for detailed auto switch specifications.

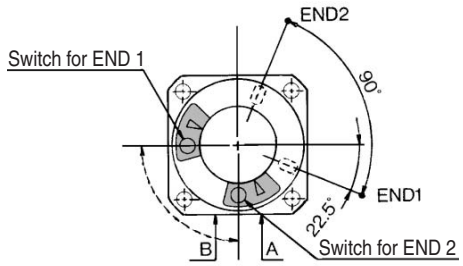
Applicable series	Type	Model	Electrical entry (Entry direction)	Features
MDSU□1 **MDSU□3**	Reed switch	D-90	Grommet (In-line)	With no indicator light, Parallel cord
		D-90A	Grommet (In-line)	With no indicator light, Heavy-duty cord
MDSU□7 **MDSU□20**		D-R80	Grommet (In-line)	No indicator light
		D-R80C	Connector (In-line)	

Table Positioning Pin Hole Rotation Range and Auto Switch Mounting Position

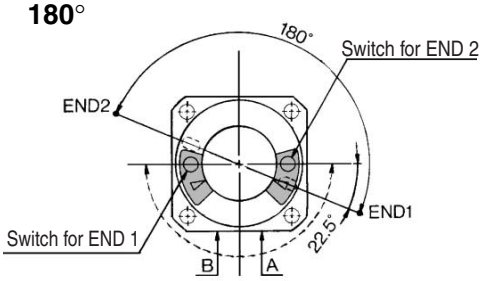
MSU□1/3

Single vane type

90°

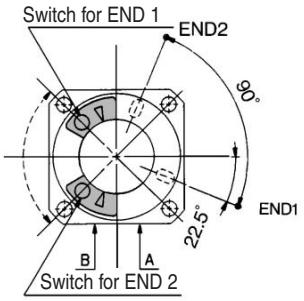


180°



Double vane type (MSUB only)

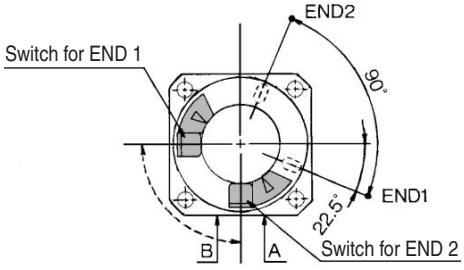
90°



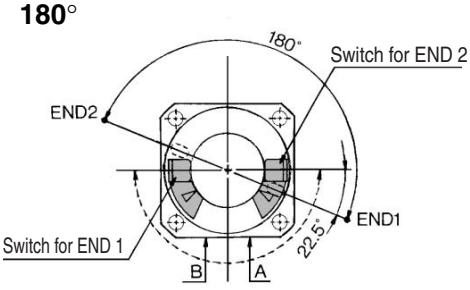
MSU□7/20

Single vane type

90°

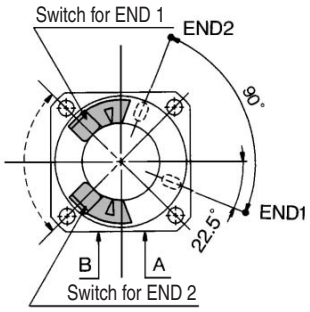


180°

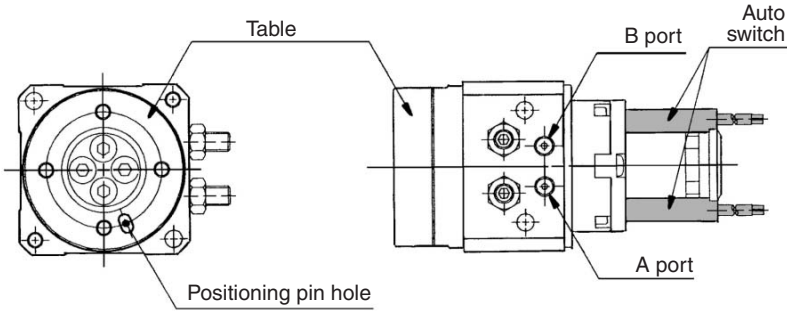


Double vane type (MSUB only)

90°



- In drawings that show the rotation range, the arrows on the solid line 90° (180°) indicate the rotation range of the positioning pin holes on the table surface. When the pin hole is at END1, the END1 switch operates, and when the pin hole is at END2, the END2 switch operates.
- The arrows on the broken line indicate the rotation range of the internal magnet. The rotation range of each switch can be reduced by moving the END1 switch clockwise and the END2 switch counterclockwise.



Auto Switch Operating Angle and Hysteresis Angle

Model	Operating angle	Hysteresis angle
MDSU□1, 3	110°	10°
MDSU□7, 20	90°	

Refer to page 11-4-24 for operating angle of auto switch and angle of hysteresis and the procedure for moving the auto switch detection position.