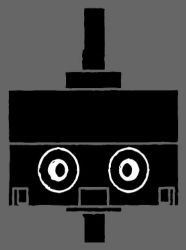


Rotary Actuator

Series CRB1

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

Variations/Size: 10, 15, 20, 30

Fluid: Air

Vane style: Single vane (S), Double vane (D)

Port location: Body side (–), Body axis direction (E)

		Item	Code	10 Single vane (S) Body side	10 Single vane (S) Axial direction	10 Double vane (D) Body side	10 Double vane (D) Axial direction	15 Single vane (S) Body side	15 Single vane (S) Axial direction	15 Double vane (D) Body side	15 Double vane (D) Axial direction	20, 30 Single vane (S) Body side	20, 30 Single vane (S) Axial direction	20, 30 Double vane (D) Body side	20, 30 Double vane (D) Axial direction	Page
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

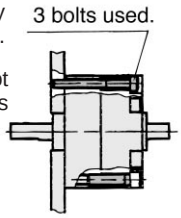
High reliability

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)

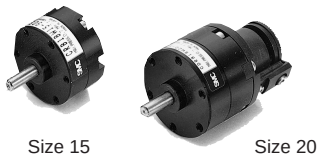
Body can be used as a flange

(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

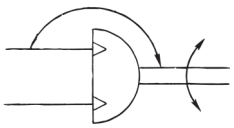
Single vane

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**

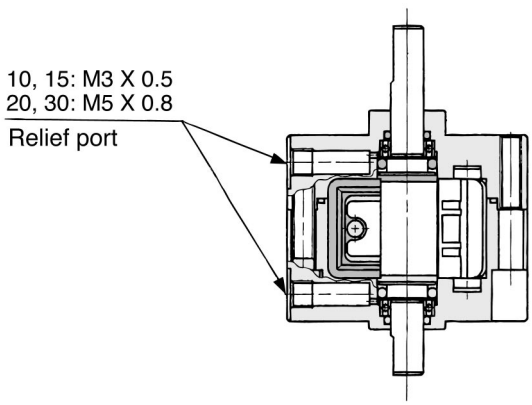
Clean series

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

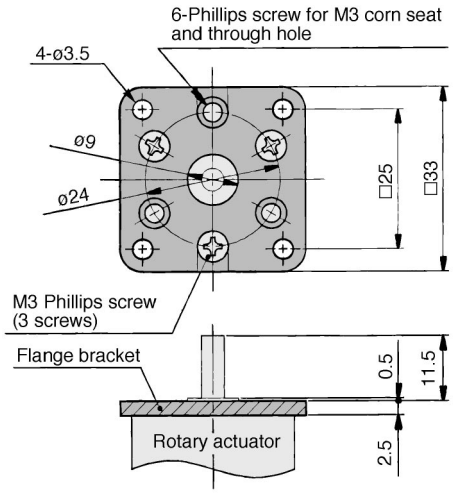
Model				Flange ass'y part No.
Basic style	With auto swicth	With angle adjuster	With angle adjuster and auto switch	
CRB1FW10	CDRB1FW10	CRB1FWU10	CDRB1FWU10	P211070-2
CRB1FW15	CDRB1FW15	CRB1FWU15	CDRB1FWU15	P211090-2
CRB1FW20	CDRB1FW20	CRB1FWU20	CDRB1FWU20	P211060-2
CRB1FW30	CDRB1FW30	CRB1FWU30	CDRB1FWU30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

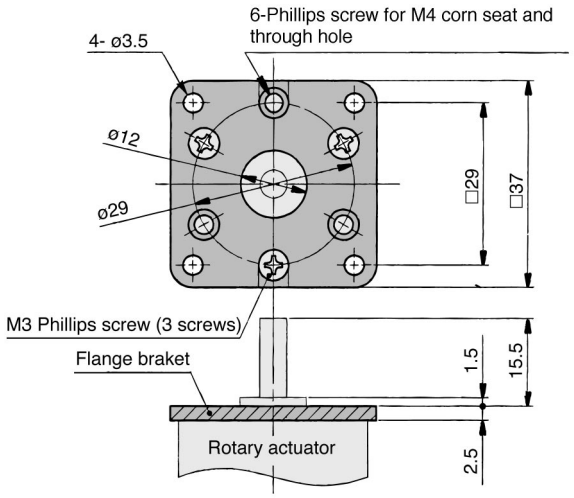
CAD

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)

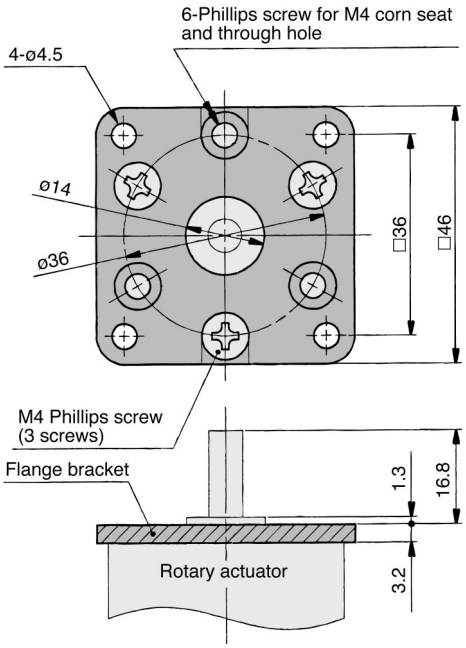
Ass'y Part Number: P211070-2 (For C□RB1FW□10)



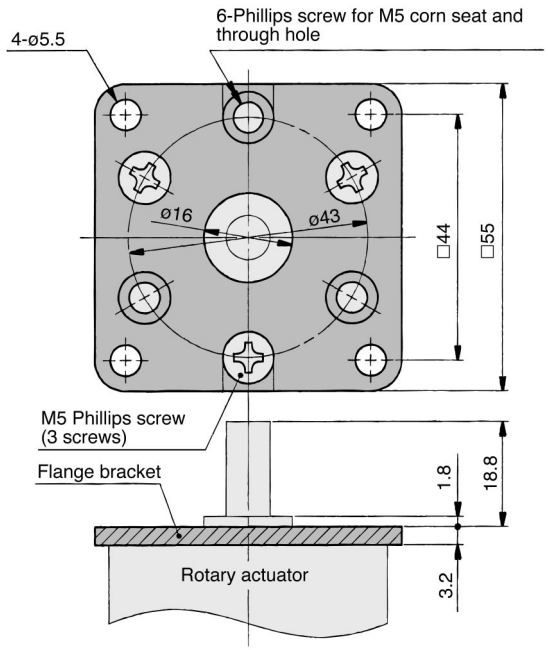
Ass'y Part Number: P211090-2 (For C□RB1FW□15)



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

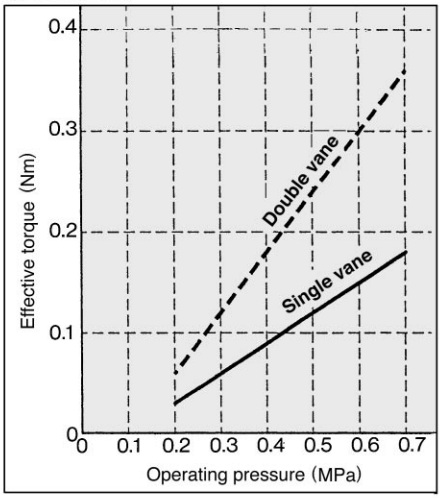


Ass'y Part Numer: P211080-2 (For C□RB1FW□30)

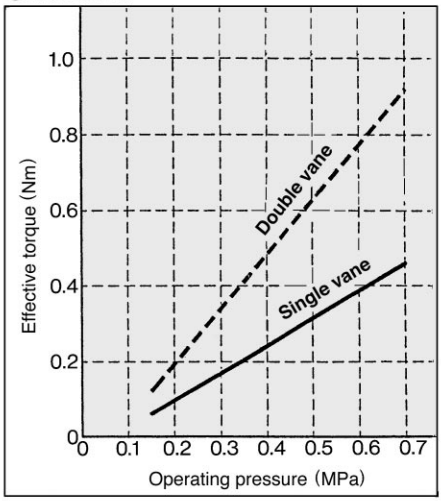


Effective Output

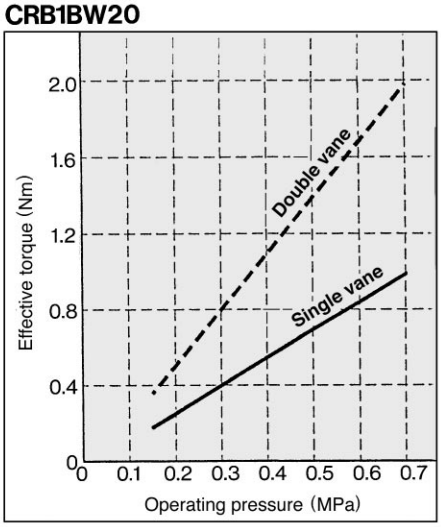
CRB1BW10



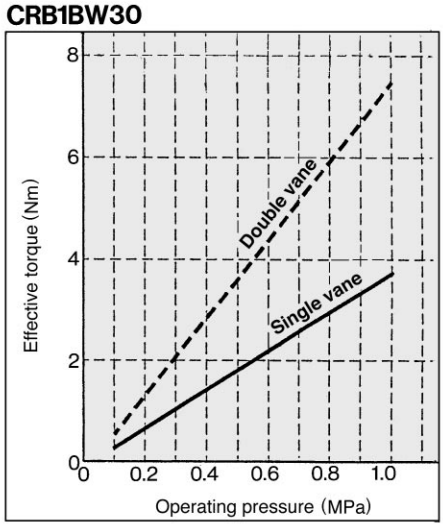
CRB1BW15



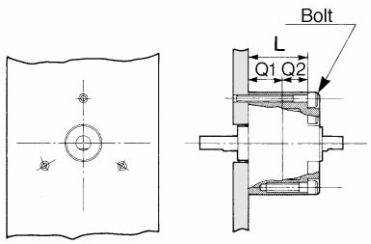
CRB1BW20



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.

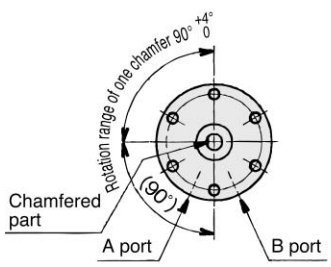
*Refer to p.1.1-9, and 1.1-10 for dimensions of Q1 and Q2.

Rotation Range/From long shaft side.

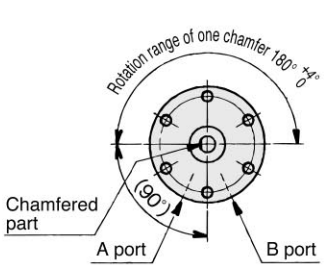
(The chamfering locations shown below indicate the states when pressurized from B port.)

Single Vane **Double Vane**

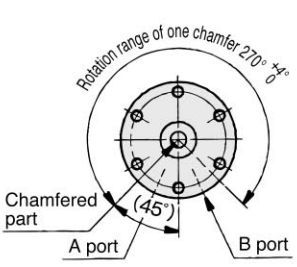
90°



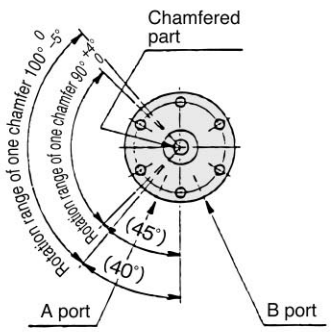
180°



270°



90°, 100°



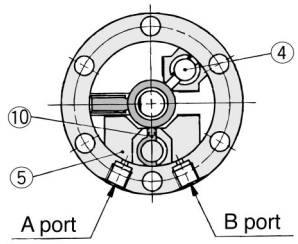
Note) For single and double vane styles: The cross angle rotation of 90°, 180°, and 270° will be $^{+5^\circ}_{0}$ only for size 10.

Construction/Size: 10, 15, 20, 30

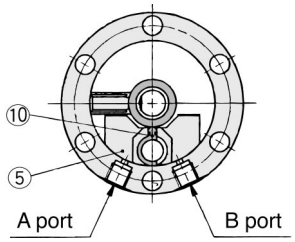
Single vane

- 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.

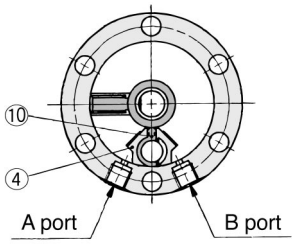
For 90°
(From long shaft side)



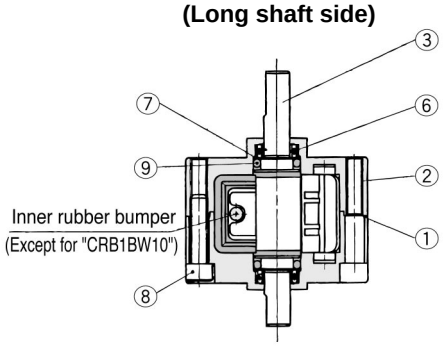
For 80°
(From long shaft side)



For 270°
(From long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

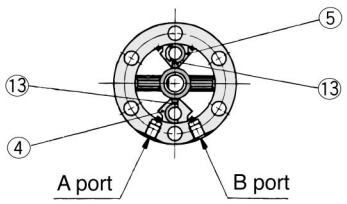
No.	Descroption	Material	Note
①	Body (A)	Aluminum alloy	Black
②	Body (B)	Aluminum alloy	Black
③	Vane shaft	Stainless steel*	
④	Stopper	Resin	For 270°
⑤	Stopper	Resin	For 180°
⑥	Bearing	High carbonate chrome steel	
⑦	Back-up ring	Stainless steel	Special bolt
⑧	Hexagon socket head cap screw	Stainless steel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

*Carbon steel for CRB1BW30.

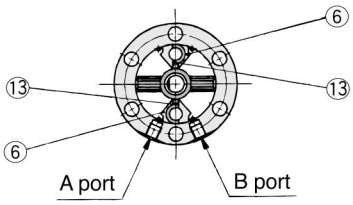
Double vane

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

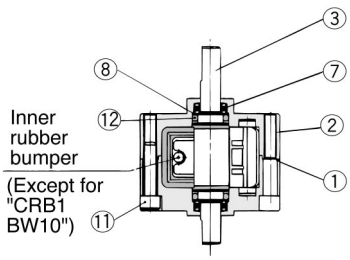
For 90°
(From long shaft side)



For 100°
(From long shaft side)



(Long shaft side)



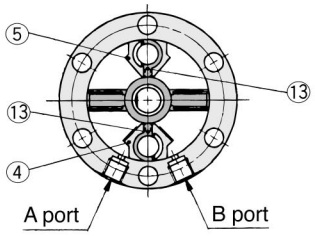
(Short shaft side)

Component Parts

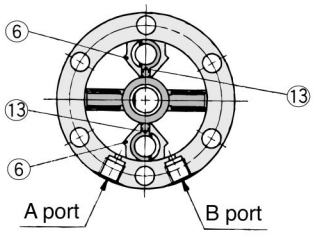
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	Black
②	Body (B)	Aluminum alloy	Black
③	Vane shaft	Carbon steel	
④	Stopper	Stainless steel	
⑤	Stopper	Resin	
⑥	Stopper	Stainless steel	
⑦	Bearing	High carbonate chrome steel	
⑧	Back-up ring	Stainless steel	

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

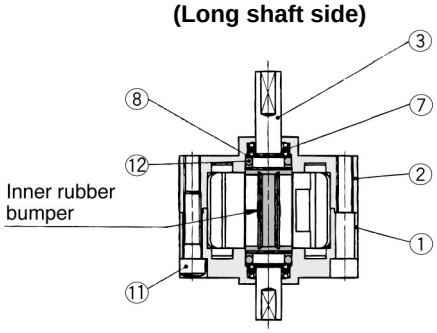
For 90°
(From long shaft side)



For 100°
(From long shaft side)



(Long shaft side)



(Short shaft side)

Component Parts

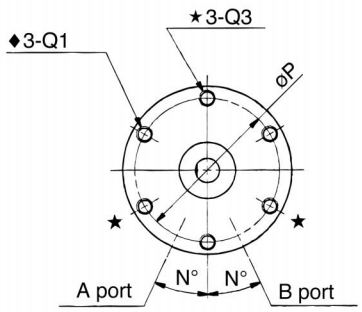
No.	Description	Material	Note
⑨	Cover	Aluminum alloy	Black
⑩	Plate	Resin	Black
⑪	Hexagon socket head cap screw	Stainless steel	Special bolt
⑫	O ring	NBR	
⑬	Stopper packing	NBR	Special packing
⑭	Gasket	NBR	Special packing
⑮	O ring	NBR	
⑯	O ring	NBR	

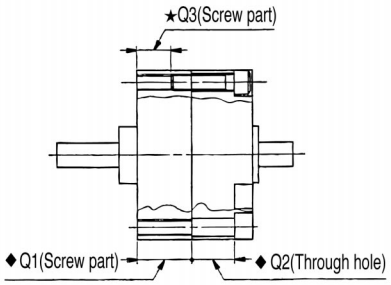
Series CRB1

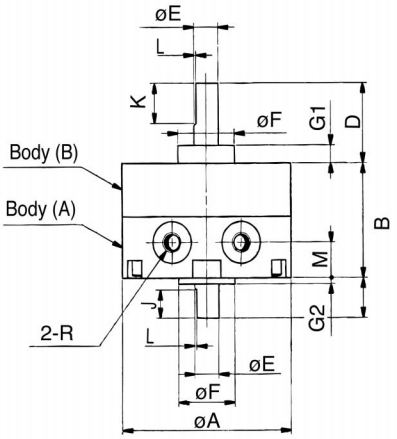
Size 10, 15, 20, 30

Single vane

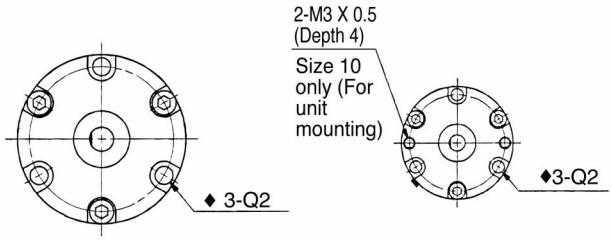
Port locations: Body side/
CRB1BW□-□S



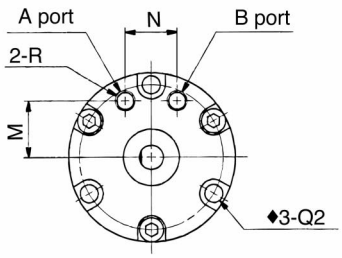




Port locations: Body side/
CRB1BW10-□S



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.

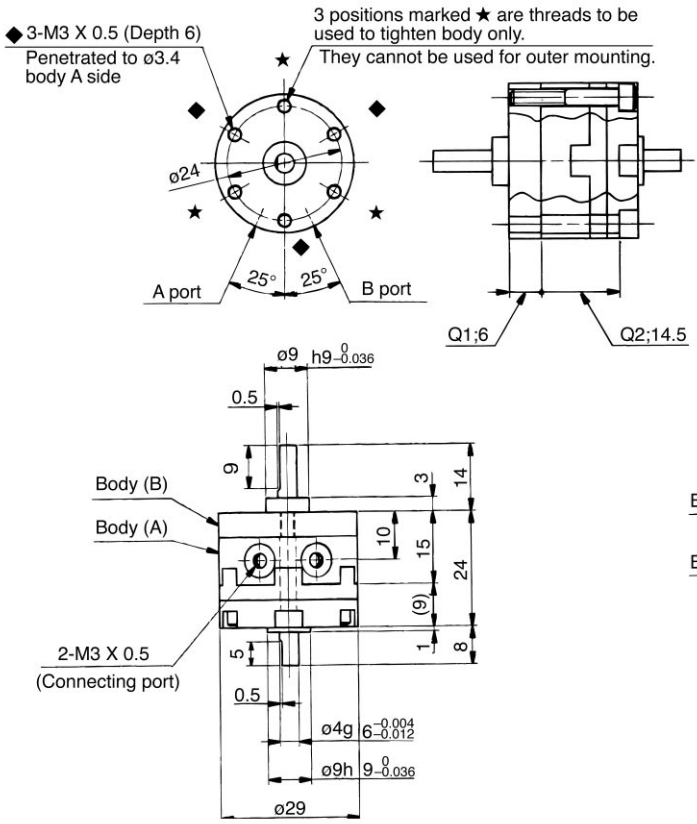
Note) There are port locations in ★parts for CRB1BW15, 20, 30.

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							

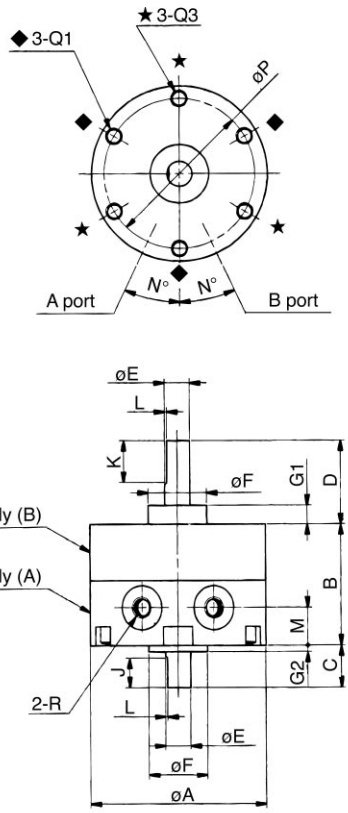
Port location: Body side
CRB1BW [Size] -□S·····SCRB [Size] , #1
Port location: Axial direction
CRB1BW [Size] -□SE·····SCRB [Size] , #3

Double vane

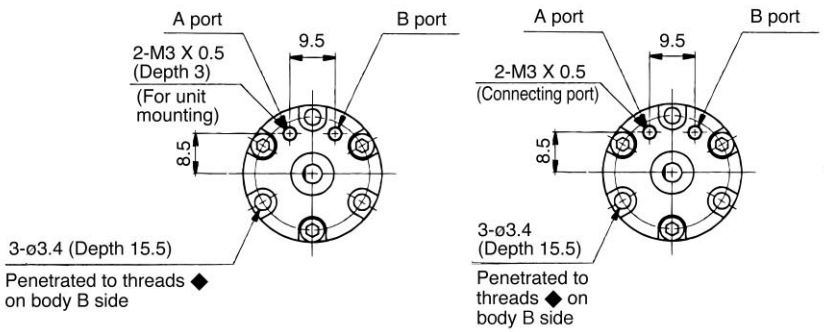
Port locations: Body side/
CRB1BW10-□D



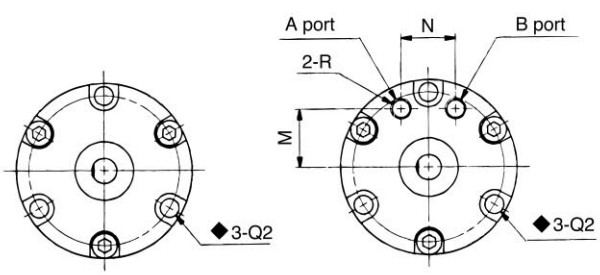
Port locations: Body side/
CRB1BW15, 20, 30-□D



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

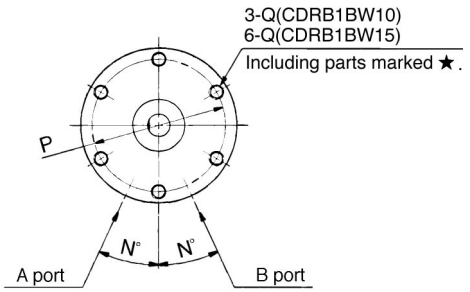
*Joint unit (Required when connecting auto switch to angle adjusting unit.)

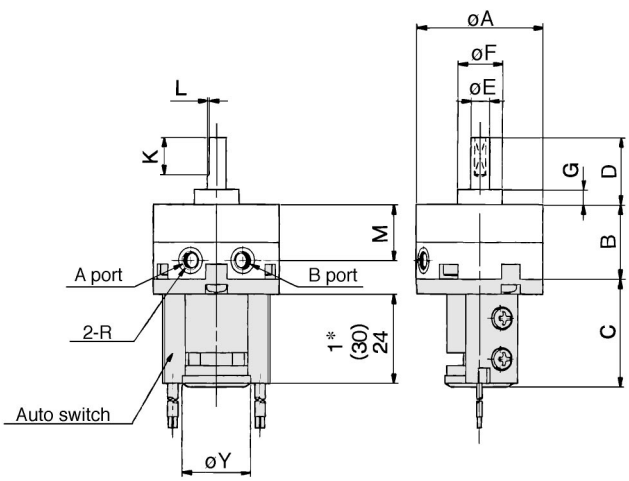
⚠ Precaution

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

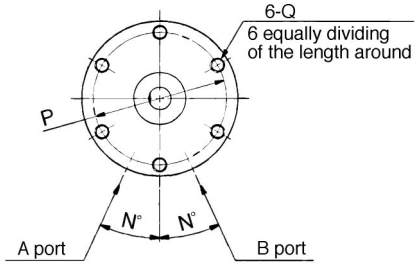
Size 10, 15, 20, 30/With auto switch

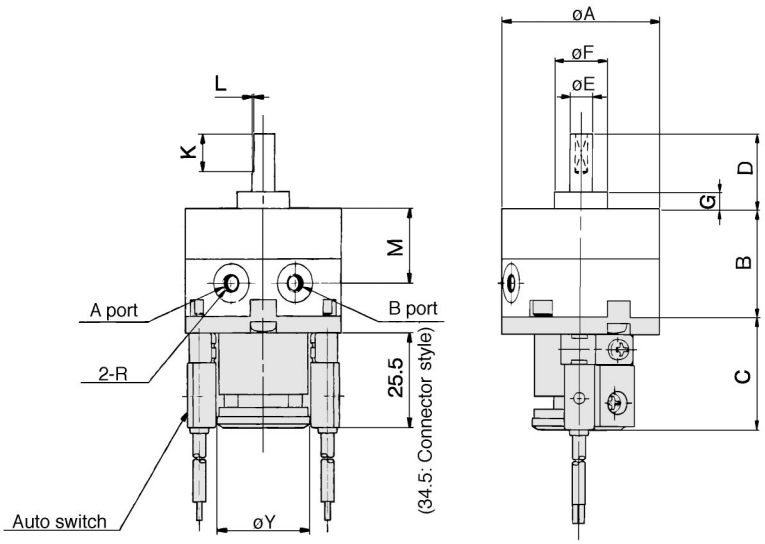
Single vane
CDRB1BW10/15-□ S

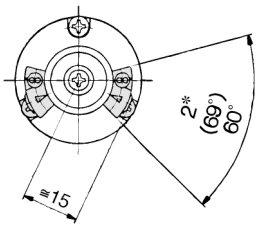


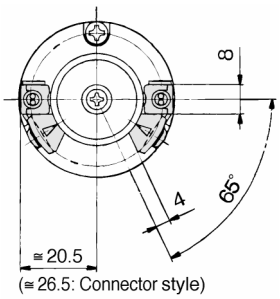


Single vane
CDRB1BW20/30-□S









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

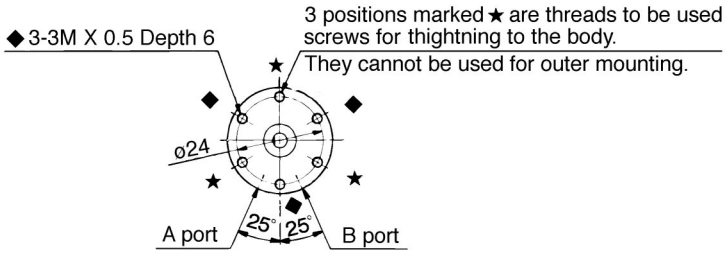
∗1. 24: When auto switches of "D-90", "90A", "S99(V)", "T99(V)", "S9P(V)", styles are being used.
30: When "D-97", "93A" styles are being used.
∗2. 60°: When auto switches of "D-90", "90A", "97", "93A" styles are being used.
69°: When auto switches of "D-S99(V)", "T99(V)", "S9P(V)" styles are being used.
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.

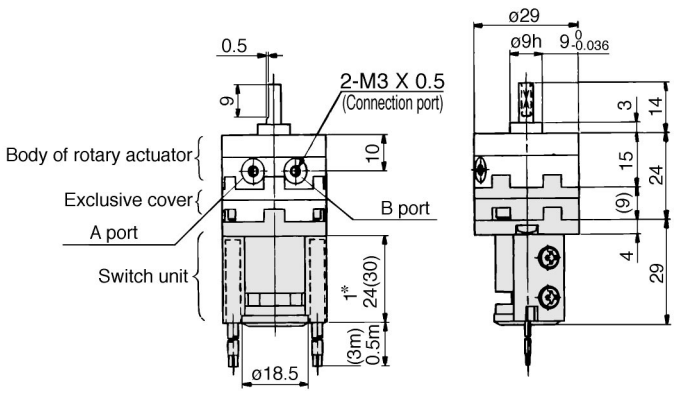
Model	A	B	C	D	E (g6)	F (h9)	G	K	L	M	N	P	Q	R 90°	R 180°	R 270°	Y
CDRB1BW10-□S	29	15	29	14	4	9	3	9	0.5	10	25	24	M3 X 0.5Depth5	M5 X 0.8		M3 X 0.5	18.5
CDRB1BW15-□S	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 X 0.5Depth5	M5 X 0.8		M3 X 0.5	18.5
CDRB1BW20-□S	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 X 0.7Depth7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

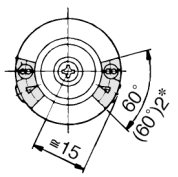
CAD CDRB1BW Size -S·····SCRB Size , #7

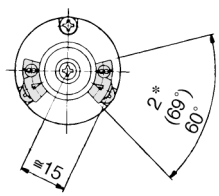
Double vane

CDRB1BW10-□D







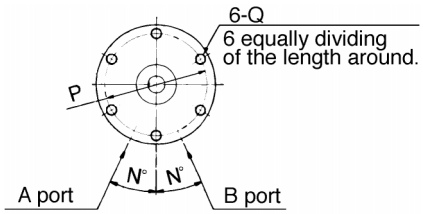


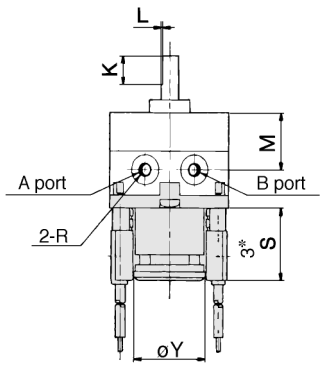
CDRB1BW15-□D

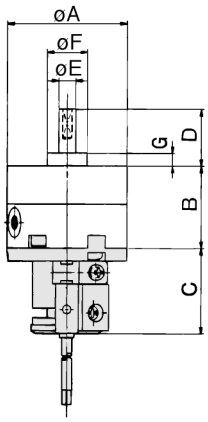
Double vane

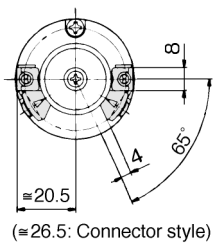
CRB1BW15/20/30-□D

(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.

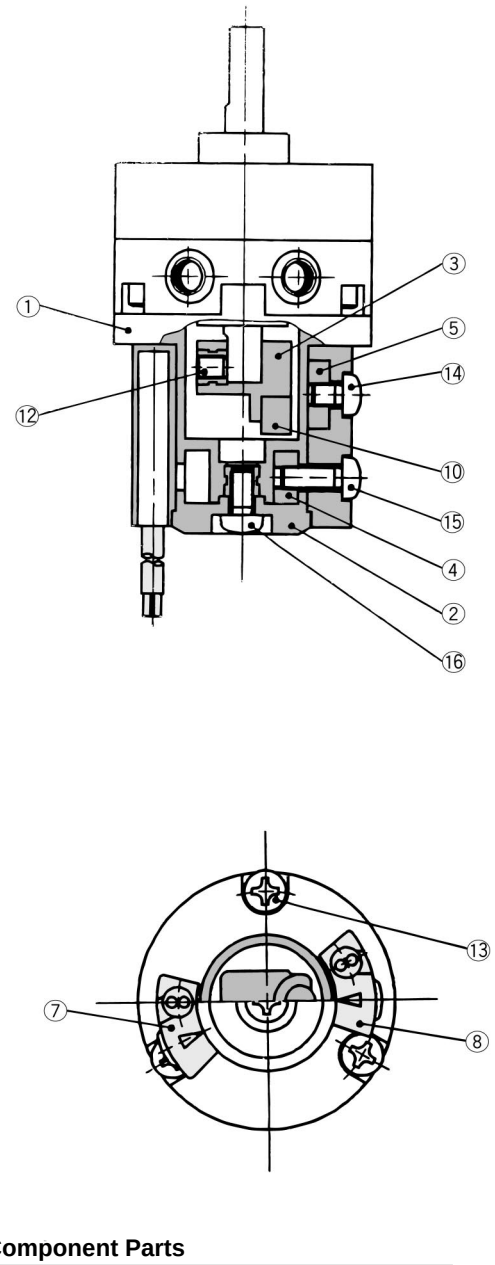
Model	A	B	C	D	E(g6)	F(h9)	G	K	L	M	N	P	Q	R		S		Y
														90°	100°			
CDRB1BW15-□D	34	20	29	18	5	12	4	10	0.5	15	25	29	M3 X 0.5Depth5	M3 X 0.5		24∗1	30∗1	18.5
CDRB1BW20-□D	42	29	30	20	6	14	4.5	10	0.5	20	25	36	M4 X 0.7Depth7	M5 X 0.8		25.5∗3	34.5∗3	25
CDRB1BW30-□D	50	40	31	22	8	16	5	12	1	30	25	43	M5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

Construction

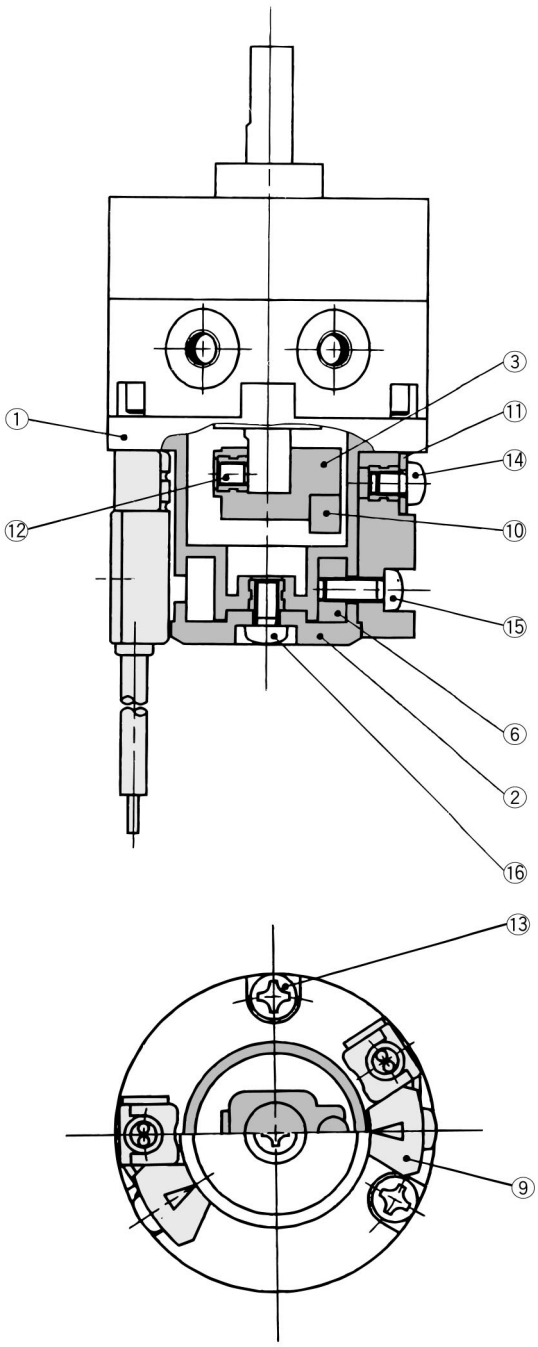
- Single vane
  The dimensions below show pressurization to B port of the switches for 90° and 180°.
- Double vane
  The dimensions below show the rotation middle position during pressurization to A port or B port.

(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

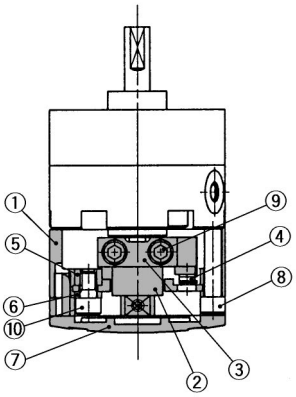
●Operating time — 1.2ms
●Shock resistance— 300m/s^2 (Reed switch), 1000m/s^2 (Solid state switch)

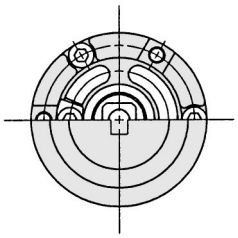
●Operating temperature range — –10°C to 60°C

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

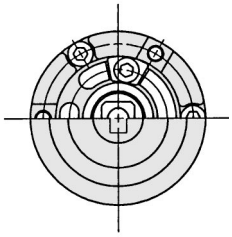
With angle adjusting unit

CRB1BWU10/15/20/30-□S/D





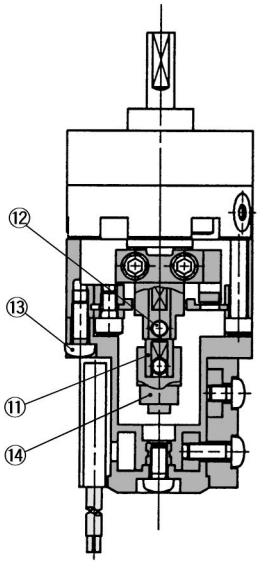
Single vane

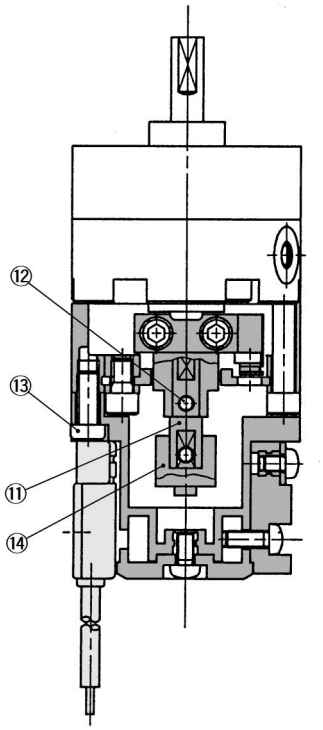


Double vane

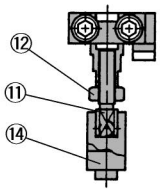
With angle adjusting unit and auto switch

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.

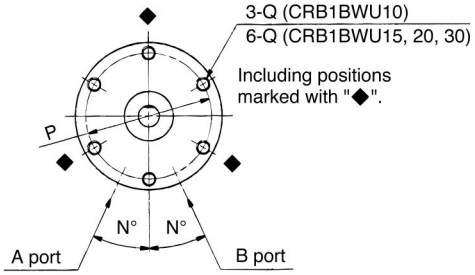
Rotation angle of rotary actuator body	Range of rotation angle
$270^{\circ}{}^{+4}_{0}$	0° to 230° (Size: 10)*1
	0° to 240° (size: 15, 20, 30)
$180^{\circ}{}^{+4}_{0}$	0° to 175°
$90^{\circ}{}^{+4}_{0}$	0° to 85°

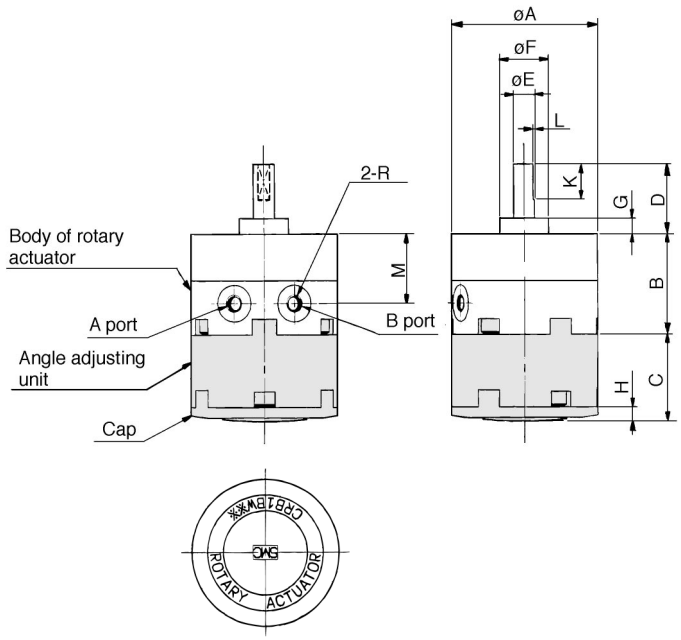
*1 The maximum adjustable angle of the angle adjustment unit for size 10 is 230°.
②All the positions of the connecting ports are on the body side.
③The allowable kinetic energy is the same as that of the specification of the rotary actuator unit.
④To make a 90° adjustment on the double vane type, use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

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

Single vane

CRB1BWU10/15/20/30-□S

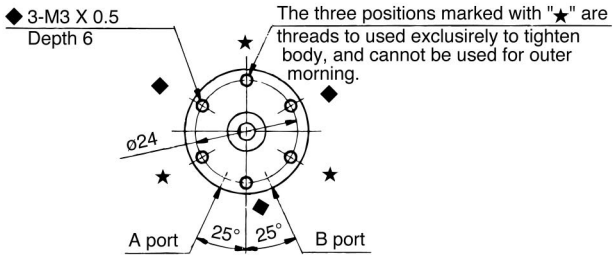


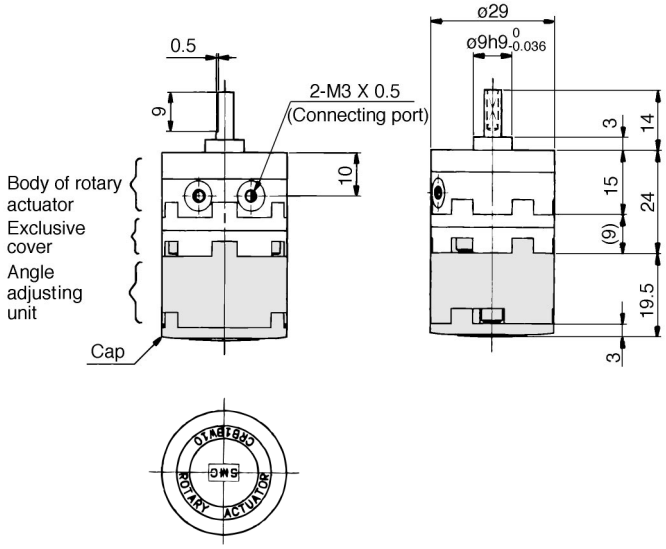


Dimensions below show pressurization to A port of the switches for 90°.
Refer to p.1.1-7.

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		——	

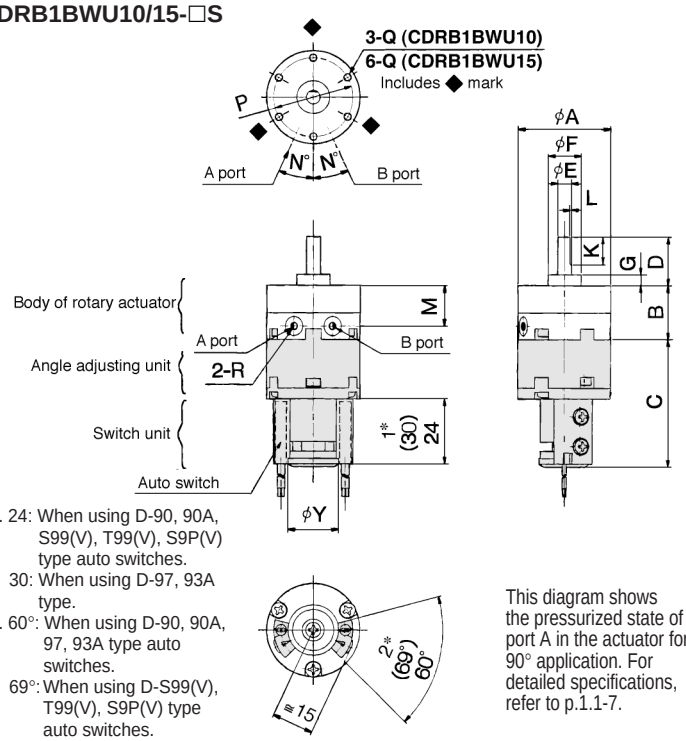
CAD CRB1BWU Size -S ·····SCRB Size , #5

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.

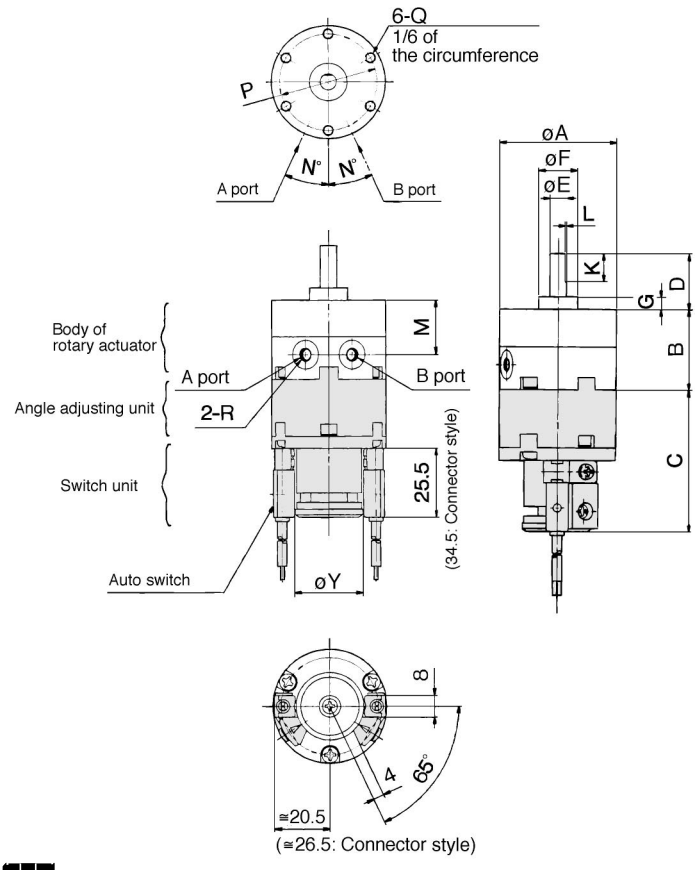
This diagram shows the pressurized state of port A in the actuator for 90° application. For detailed specifications, refer to p.1.1-7.

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

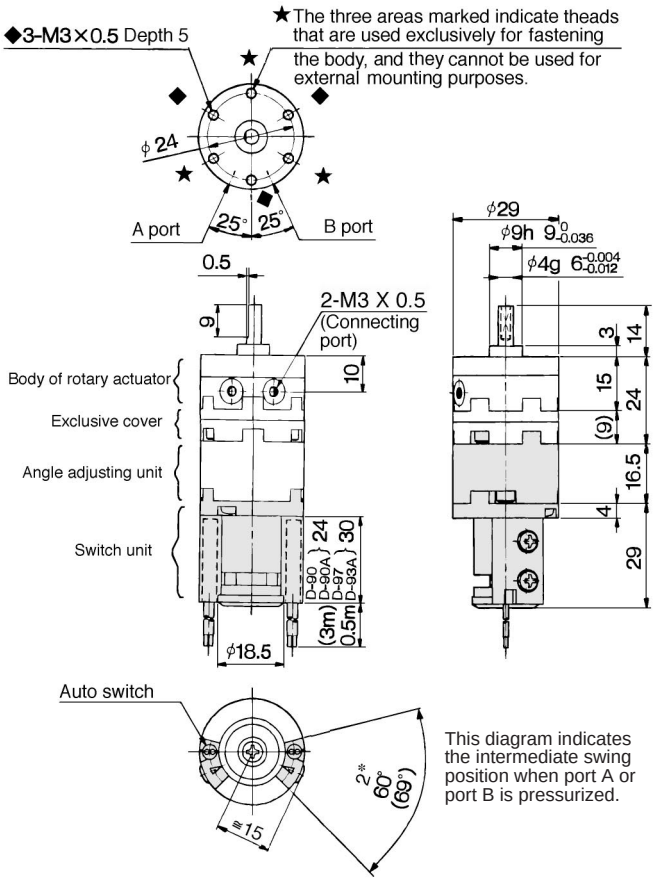
CDRB1BWU20/30-□S



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.

1 Change of shaft end shape

Symbols
-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

- CRB1: 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

- P: Provided in patterns
- Size

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

- X: 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

- D: With auto switch unit
- P: Provided in patterns
- R73L: 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		Applicable size
		Upper	Lower	
-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		Shaft type					Applicable size
		Upper	Lower	J	K	S	T	Y	
-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

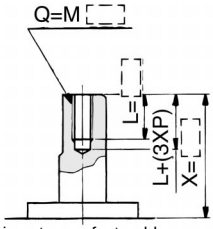
1 Change of shaft end shape — -XA2 to XA8

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.)



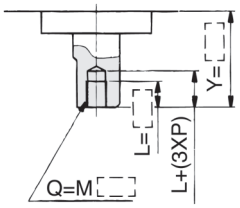
- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.
  Ex.) M3: L = 6mm

(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.)



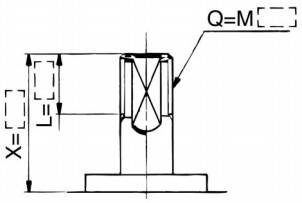
- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.
  Ex.) M3: L = 6mm

(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.)

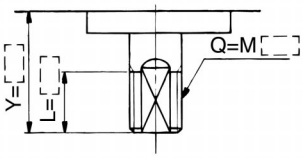


(mm)

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.)

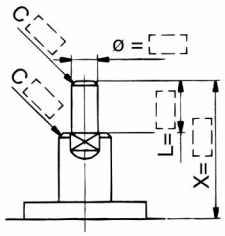


(mm)

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.)

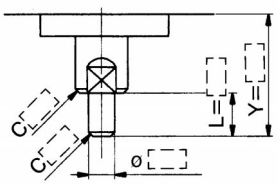


(mm)

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.)

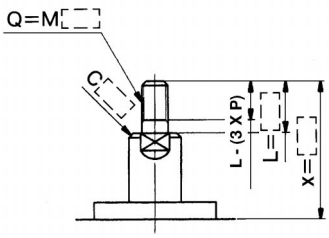


(mm)

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.)

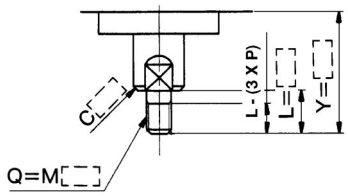


(mm)

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.

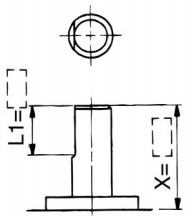
Symbols

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.)

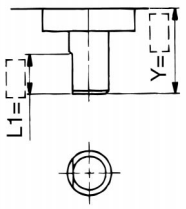


(mm)

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.)

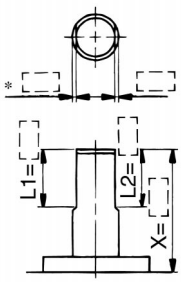


(mm)

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.)



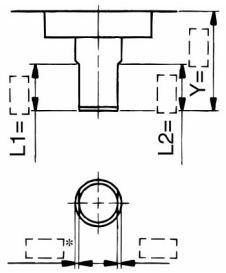
*: 0.5mm or more
L1: Standard chamfering part

(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

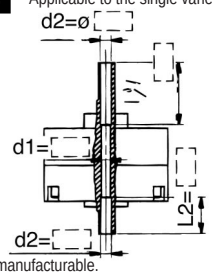
(mm)

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.

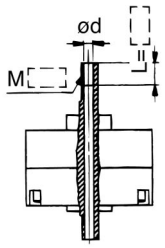
(mm)

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

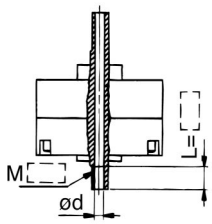
(mm)

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

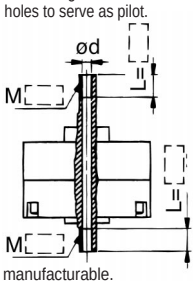
(mm)

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.



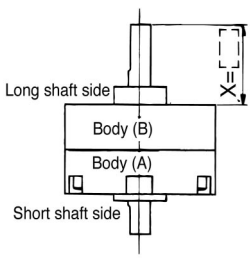
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
  Example: For M5 bolt: L max. = 10 mm

(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

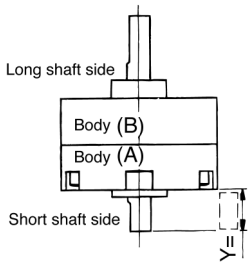
-XA18 to XA23

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.

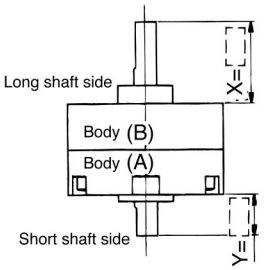


(mm)

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.

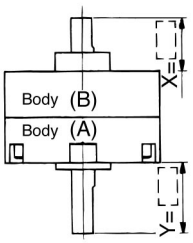


(mm)

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.)

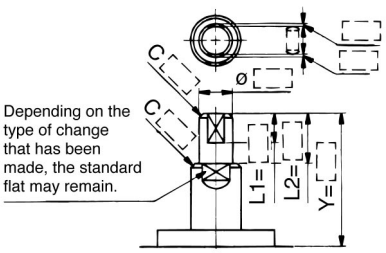


(mm)

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.)

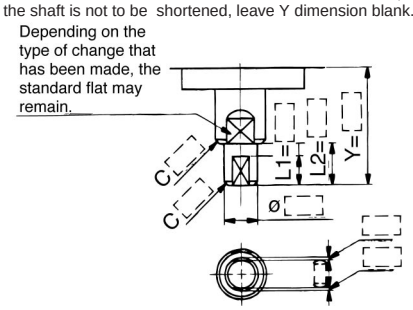


(mm)

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)

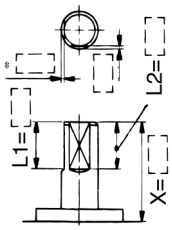
Size	Y	L1max	L2
10	4 to 8	Y-2.5	L1+1.5
15	4.5 to 9	Y-3	L1+1.5
20	5 to 10	Y-3.5	L1+2
30	7 to 13	Y-5	L1+3

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

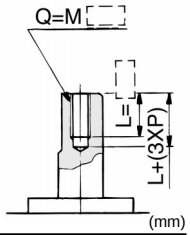
Additional reminders

- 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



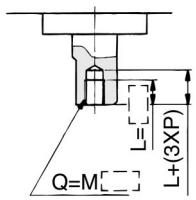
(mm)

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



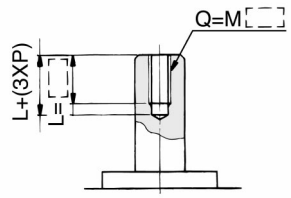
(mm)

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



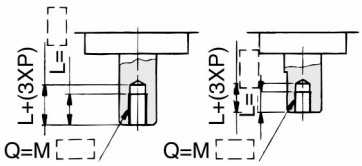
(mm)

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



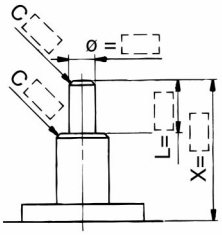
(mm)

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



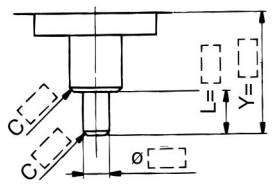
(mm)

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



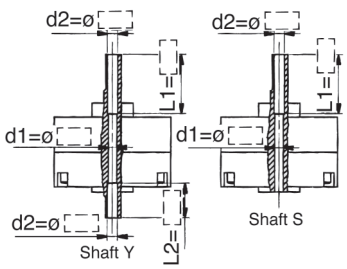
(mm)

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

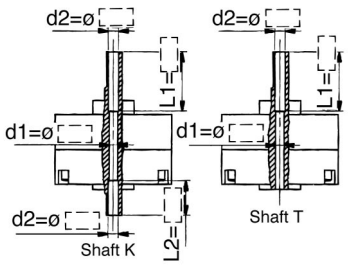
(mm)

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

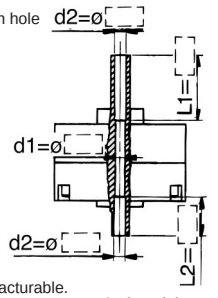
2 Change of shaft end shape/Applicable shaft style: Shaft style J, K, S, T, Y-XA41 to XA47

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⬚



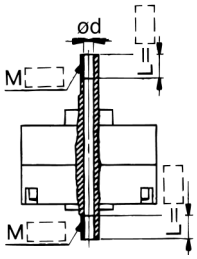
- Size 10 is not manufacturable.
- For size 15 is d1 = 2.5, L1 = max. 18 The minimum range of the machinable dimension for the d2 area is 0.1mm. Enter the L1, L2, and d1 dimensions when d2 is ø2.6 or more.
- For sizes 20 and 30 are d1 = d2.
- Applicable shaft styles — shaft J

(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.



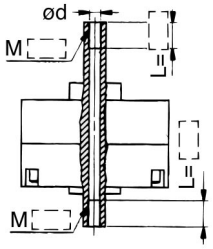
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.) However, for the short end of shaft S: For M5 bolt: L max. = 7.5mm.
- Applicable shaft styles — shafts S, Y

(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.



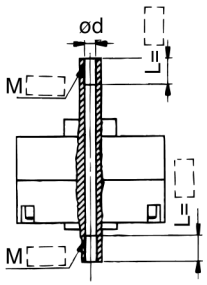
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.) However, for the short end of shaft T: For M5 bolt: L max. = 7.5mm.
- Applicable shaft styles — shafts K, T

(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.



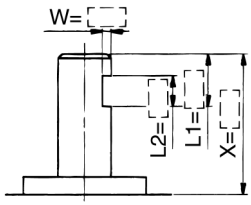
- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. (Example: For M5 bolt: L max. = 10mm.)
- Applicable shaft styles— shaft J

(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).



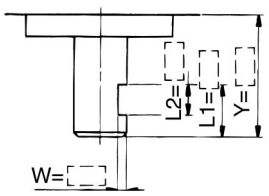
- Applicable shaft styles — shafts J, K, T

(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).



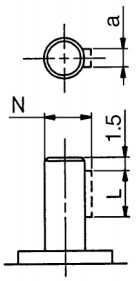
- Applicable shaft styles — shaft K

(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

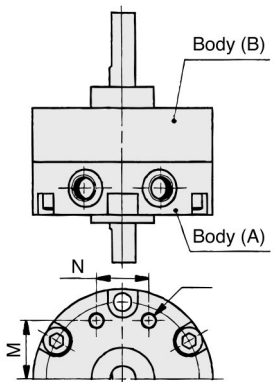
CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC1

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

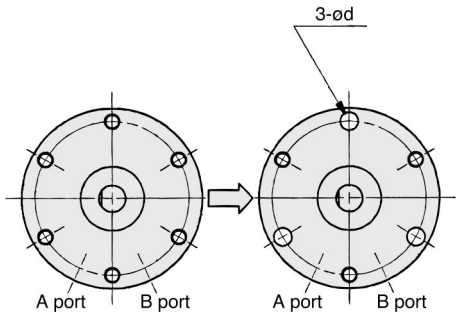
CRB1BWP Refer to the "How to Order" on p.1.1-20. -XC2

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)

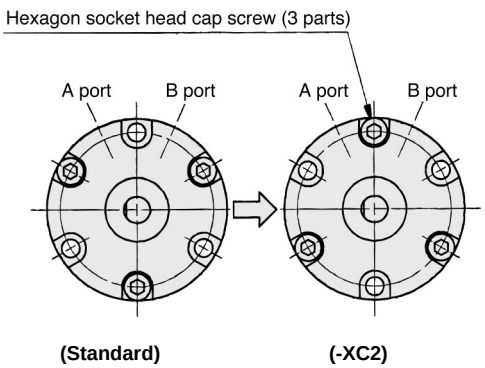
5 Location change of body tightening bolt

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

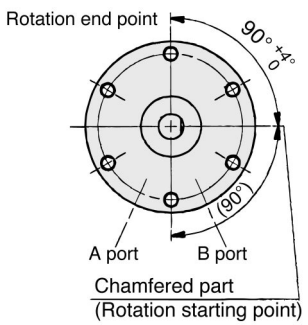
Symbols

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

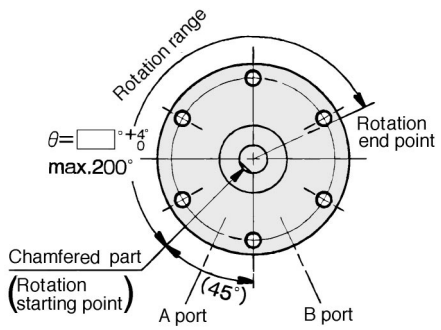
Symbol

-XC5	45°
-XC6	90°

∗Write required angle in □ below.

Symbol: XC5 Applicable only to single vane style.

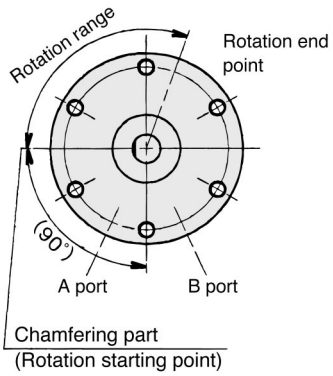
Rotation starting point is located at the angle of 45°.
Angle error of "CRB1BW10" is from 0° to +5°.
Port sizes of "CRB1BW10" and "CRB1BW15" are M3.



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°.

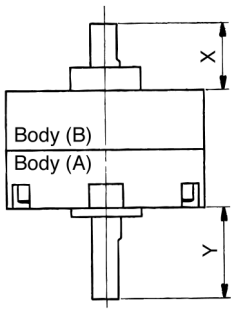
θ=□°+4 0
max.110°



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.

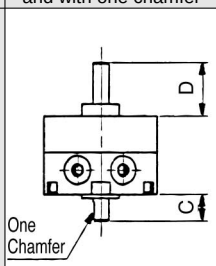
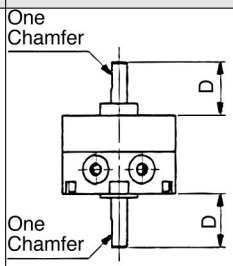
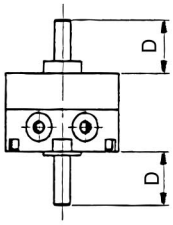
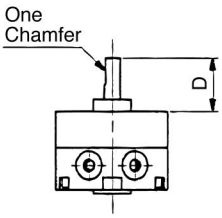
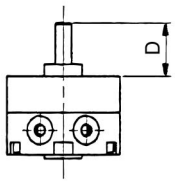
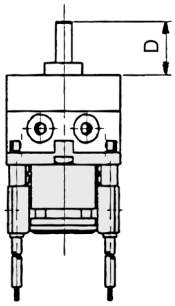
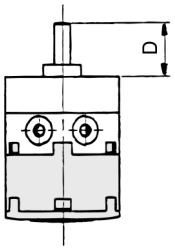
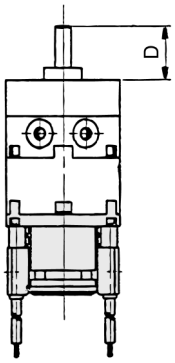
Series CRB1/Size: 10, 15, 20, 30
Made to Order Specifications
Shaft Variations/Shaft Styles: J, Y, K, S, T

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.