

Rotary Actuator

Free Mount Style

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

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



CRB1

CRBU

CRA1

CRQ

MRQ

MSQ

MSUB

Variations

Standard	Fluid			Air												Pages
	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	
	Rotation angle	90°		●	●	●	●	●	●	●	●	●	●	●	●	
		100°				●	●			●	●			●	●	
		180°		●	●			●	●			●	●			
		270°		●	●			●	●			●	●			
	Shaft style	Double shaft		W	●	●	●	●	●	●	●	●	●	●	●	
	Cushion	Rubber bumper						●	●	●	●	●	●	●	●	
Variations	Basic style		●	●	●	●	●	●	●	●	●	●	●	●		
	With auto switch		●		●		●		●		●		●			
	With angle adjuster		●		●		●		●		●		●			
	With auto switch and angle adjuster		●		●		●		●		●		●			
	Built-in One-touch fittings												●			
	Copper free		20-	●	●	●	●	●	●	●	●	●	●	●	●	
Made to order	Shaft style	Double shaft	Long shaft without one chamfer and short shaft with one chamfer	J	●	●	●	●	●	●	●	●	●	●	●	
			Double long shaft, same size, one chamfer to both ends	Y	●	●	●	●	●	●	●	●	●	●	●	
			Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	
		Single shaft	One chamfer	S	●	●	●	●	●	●	●	●	●	●	●	
			One round shaft	T	●	●	●	●	●	●	●	●	●	●	●	
	Patterns	Shaft 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)

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 100.2 MPa
- Size 15, 20, 300.15MPa



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.

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 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.)

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.

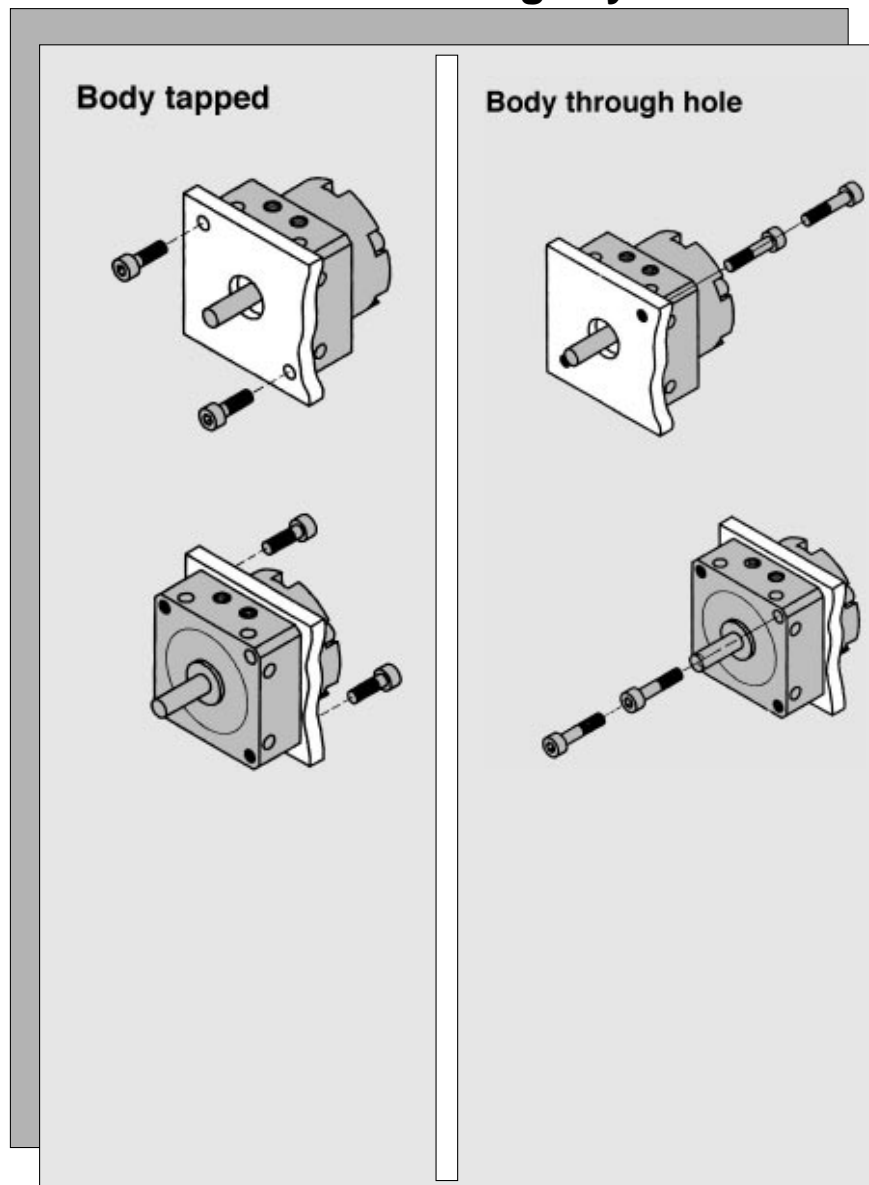
Mountable without a flange even when equipped with a unit.

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

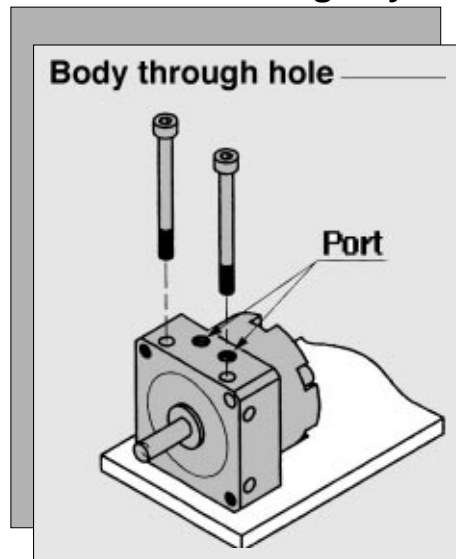
Direct Mounting In Three Directions Possible

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



CRA1

CRBU

CRA1

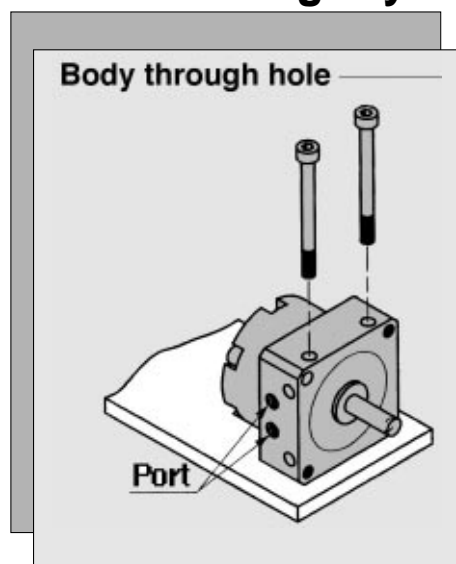
CRQ

MRQ

MSQ

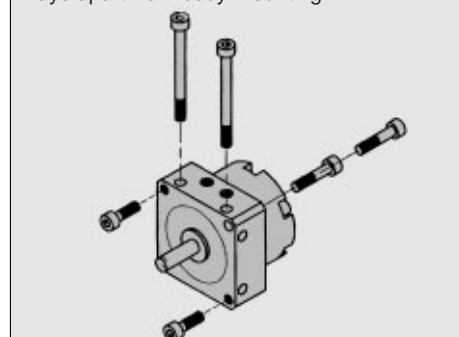
MSUB

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.



90°



180°



270°

*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 (—), Axis direction (E)

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

Angle of rotation: 90°, 180°, 270°

Connecting port locations

Body side (Fittings should be ordered separately.)

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: 20, 30

Angle of rotation: 90°, 180°, 270°

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

Auto switch: Without 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		Auto switch part no.	Lead wire	Lead wire length* (m)				Applicable loading
					DC	AC			0.5 (—)	3 (L)	5 (Z)	— (N)	
For 10/15	Reed switch	Grommet	No	2 wire	5V, 12V	5V, 12V, 24V	90	Parallel cord	●	●	●	—	IC
					5V, 12V, 100V	5V, 12V, 24V, 100V	90A	Cab tire	●	●	●	—	
					—	—	97	Parallel cord	●	●	●	—	
					—	100V	93A	Parallel cord	●	●	●	—	
					12V	—	T99	Parallel cord	●	●	—	—	Relay PLC
	Solid state switch	Grommet	Yes	3 wire (NPN)	—	—	T99V	Parallel cord	●	●	—	—	
					—	—	S99	Cab tire	●	●	—	—	
					—	—	S99V	Cab tire	●	●	—	—	
					5V, 12V	—	S99P	Cab tire	●	●	—	—	IC
					—	—	S9PV	Cab tire	●	●	—	—	
For 20/30	Reed switch	Grommet	Yes	2 wire	—	100V	R73	Parallel cord	●	●	—	—	IC
					—	—	R73C	Parallel cord	●	●	●	●	
					48V, 100V	24V, 48V, 100V	R80	Parallel cord	●	●	—	—	Relay PLC
					—	—	R80C	Parallel cord	●	●	●	●	
					12V	—	T79	Parallel cord	●	●	—	—	
	Solid state switch	Grommet	No	3 wire (NPN)	—	—	T79C	Parallel cord	●	●	●	●	
					—	—	S79	Parallel cord	●	●	—	—	IC
					5V, 12V	—	S79P	Parallel cord	●	●	—	—	
					—	—	—	—	—	—	—	—	Relay PLC
					—	—	—	—	—	—	—	—	

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

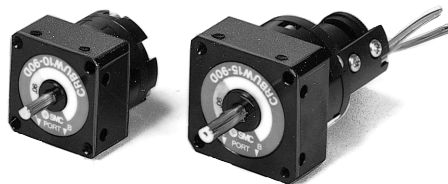
• Operating time — 1.2ms • Operating temperature range — -10° to 60°C

• Shock resistance — 300m/s² {30, 6G} (Reed switch), 1000m/s² {102G} (Solid state switch)

Free Mount Style Rotary Actuator *Series CRBU*

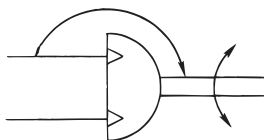


Single vane type



Double vane type

JIS symbol



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
	Allowable thrust load (N)		10	20
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
	Allowable thrust load (N)		10	20
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°	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									
		Axial direction		M3 X 0.5					M5 X 0.8				

* 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		

Series CRBU

Built-in One-touch Fittings

CRBUW Size F — Rotation angle S

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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.

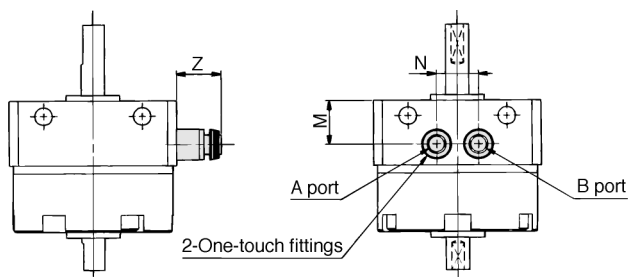
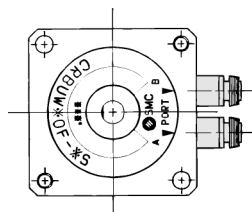
Specifications

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

↓

Copper free

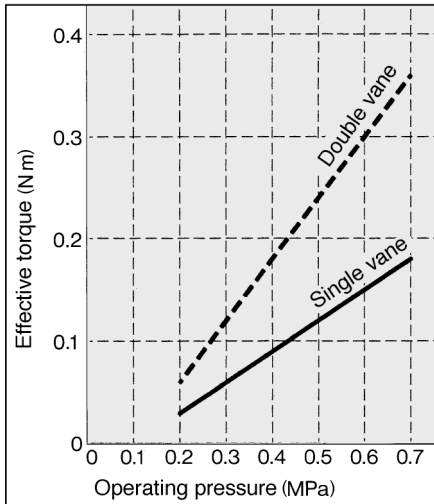
The entire standard series of vane type rotary actuators does not affect color CRTs due to copper ions or fluororesins.

Specifications

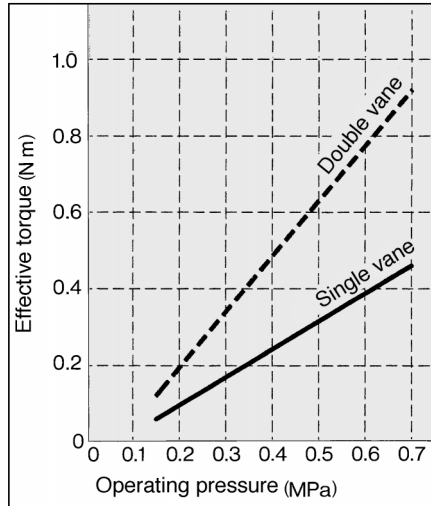
Vane style	Single vane, Double vane			
Size	10	15	20	30
Operating pressure MPa	0.2 to 0.7	0.15 to 0.7		0.15 to 1.0
Speed adjustable range	0.03 to 0.3s/90°			0.04 to 0.3s/90°
Port position	On the body side or in the axial direction			
Shaft style	Double shafts (with one flat chamfer to both ends)			
Auto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

Output

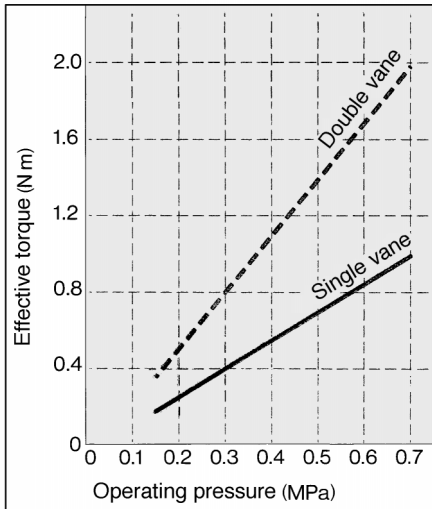
CRBUW10



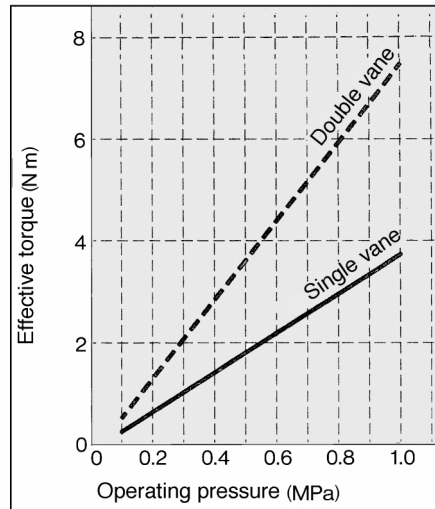
CRBUW15



CRBUW20



CRBUW30



CRB1

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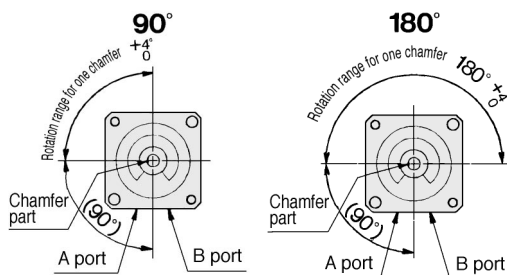
MSQ

MSUB

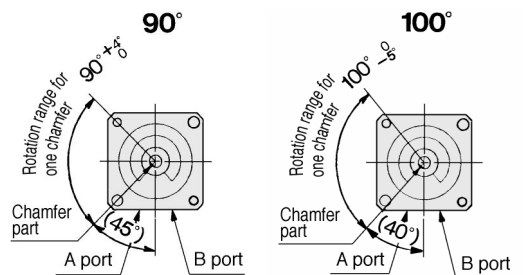
Chamfer positions and rotation range (Viewed from the long shaft side)

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

Single vane style



Double vane type

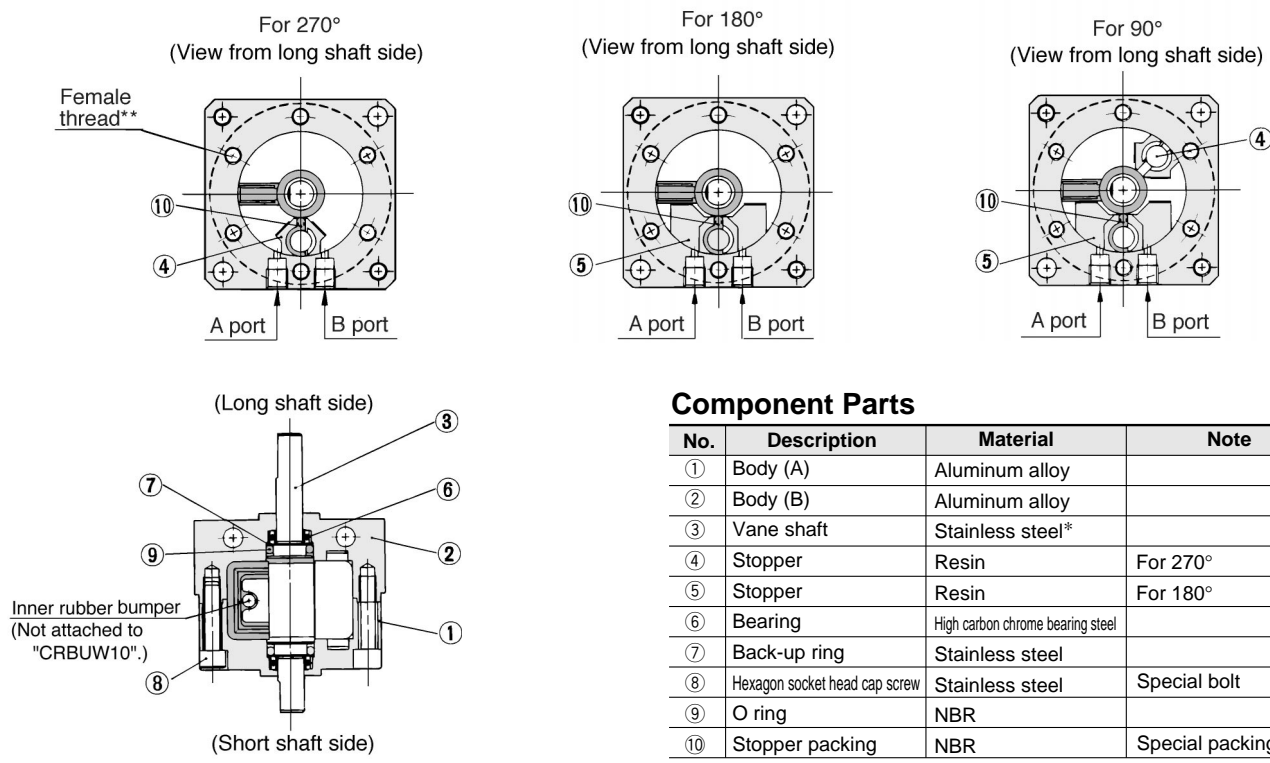


Note) For size 10 of the single vane style, the rotation angle of 90°, 180° and 270° is $+5^\circ_0$.
For size 10 of the double vane style, the rotation angle of 90° is $+5^\circ_0$.

Series CRBU

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**)



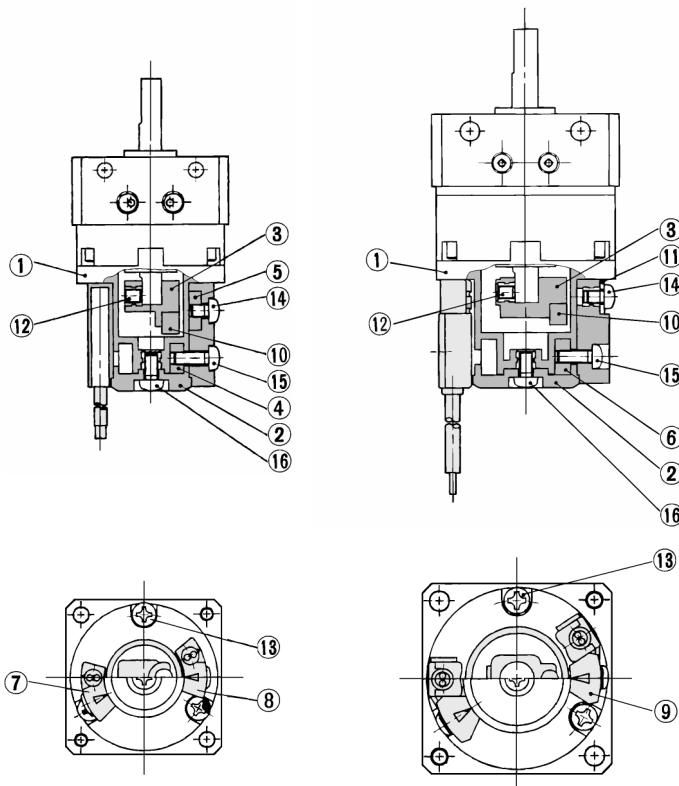
Component Parts

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 CDRBUW20/30-□S



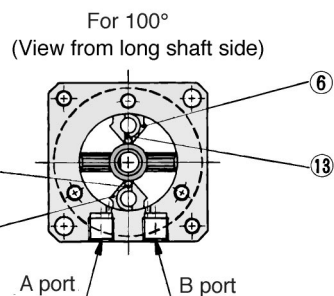
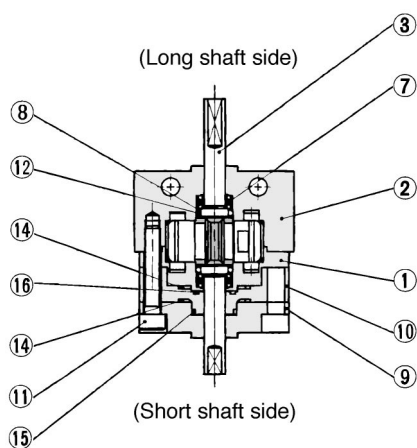
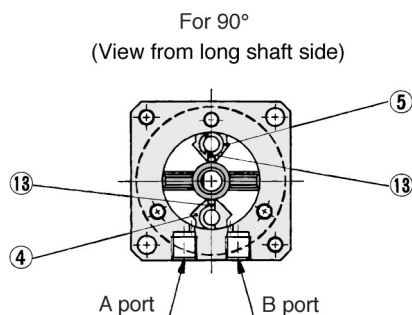
Auto Switch Attached Style/Component Parts

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**



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	

CRB1

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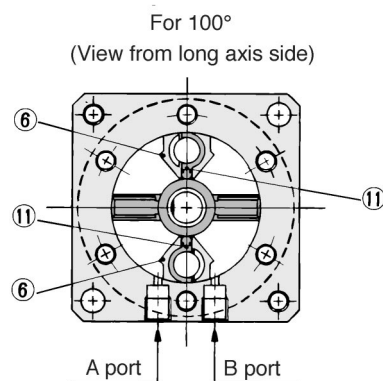
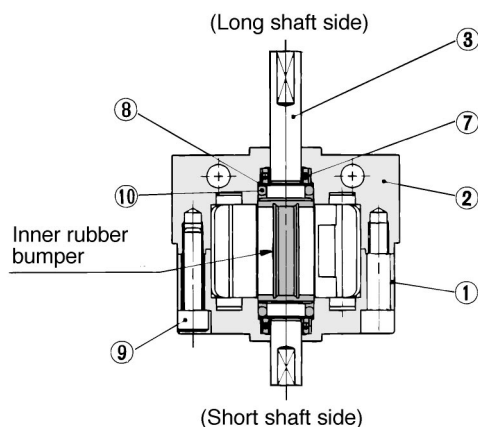
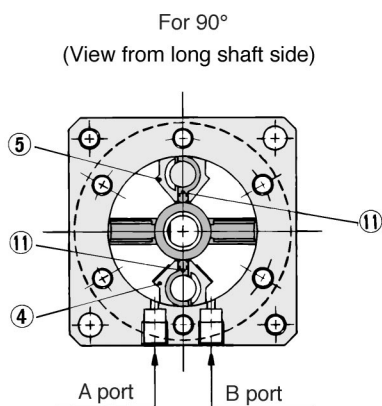
CRQ

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Standard: **CRBUW15/20/30-□D**



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	

Series CRBU

Standard Style Dimensions/Single Vane Style



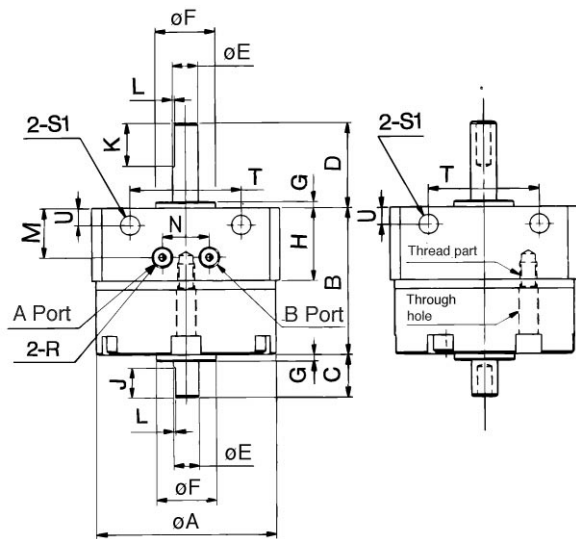
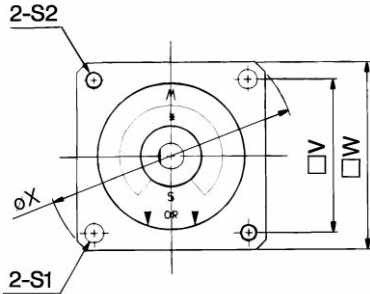
Standard Style



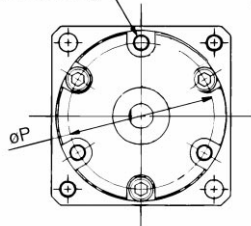
(The dimensions below show pressurization to B port of the actuators for 90° and 180°. Refer to p.1.2-7 for further information.)

Port locations: Body side

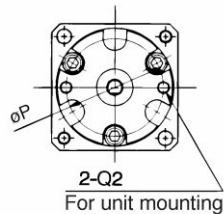
CRBUW□-□S



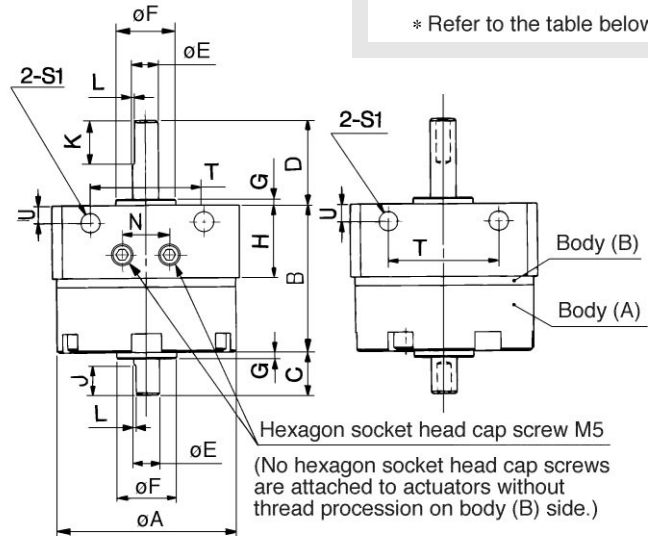
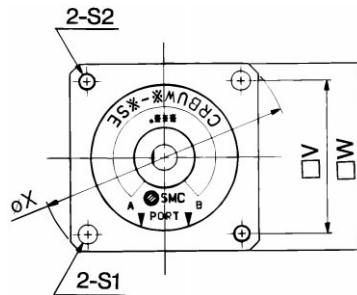
3-Q1
For unit mounting



CRBUW10-□S
<Port locations: Body side>

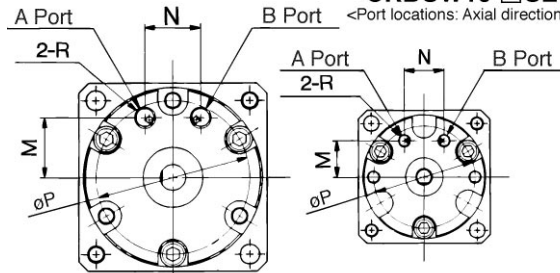


Port locations: Axial direction
CRBUW□-□SE

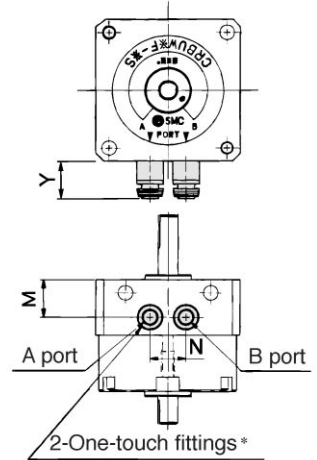


Hexagon socket head cap screw M5
(No hexagon socket head cap screws are attached to actuators without thread procession on body (B) side.)

CRBUW10-□SE
<Port locations: Axial direction>



One-touch fittings: Size 20/30



* Refer to the table below.

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	M5 X 0.8	3.5	M3 X 0.5	17	3	25	31	41
CRBUW10-□SE	29	22	8	14	4 ^{-0.004} _{-0.012}	9 ⁰ _{-0.043}	1	15.5	5	9	0.5	8.5	9.5	24	—	M3 (4)	M3 X 0.5	3.5	M3 X 0.5	17	3	25	31	41
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	34	25	9	18	5 ^{-0.004} _{-0.012}	12 ⁰ _{-0.043}	1.5	15.5	6	10	0.5	11	10	29	M3 X 0.5	—	M3 X 0.5	3.5	M3 X 0.5	21	3	29	36	48
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	42	34.5	10	20	6 ^{-0.004} _{-0.012}	14 ⁰ _{-0.043}	1.5	17	7	10	0.5	14	13	36	M4 X 0.7	—	M5 X 0.8	4.5	M4 X 0.7	26	4	36	44	59
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	50	47.5	13	22	8 ^{-0.005} _{-0.014}	16 ⁰ _{-0.043}	2	17.5	8	12	1	15.5	14	43	M5 X 0.8	—	M5 X 0.8	5.5	M5 X 0.8	29	5	42	52	69

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



Port location (Body side)

CRBUW□Size□S.....SCRB□Size□, #2

Port location (Axial direction)

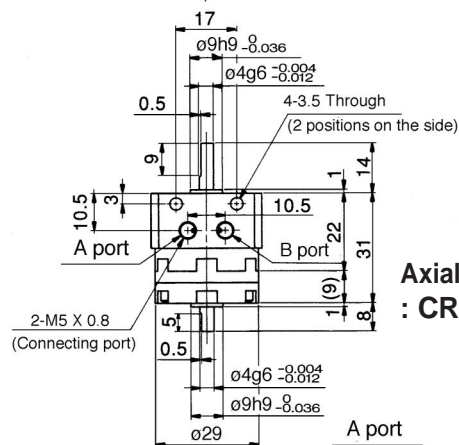
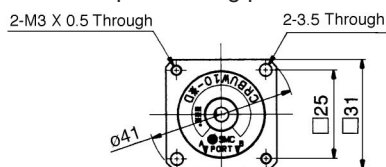
CRBUW□Size□SE.....SCRB□Size□, #4

* Applicable tube material: Nylon, Soft nylon, Polyurethane

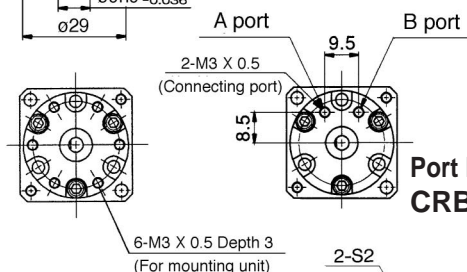
* Sizes apart from the ones shown above are the same as standard style.

Standard Style Dimensions/ Double Vane Style

Port locations: Body side
CRBUW10-□D

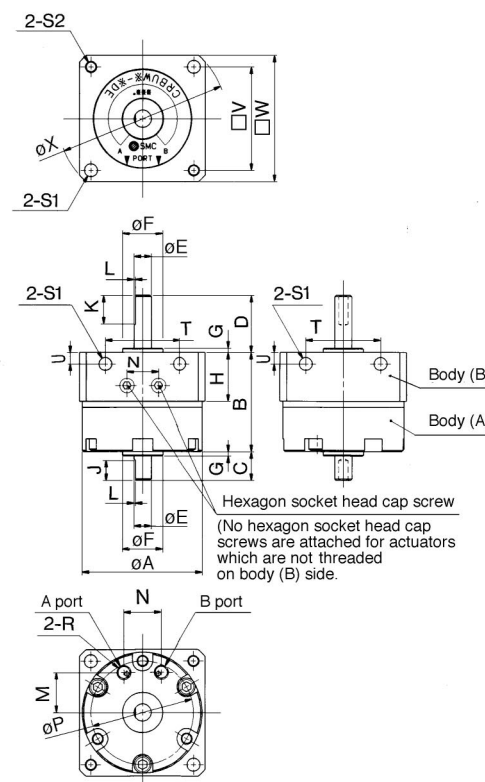


Axial Direction (Port Locations)
: CRBUW10-□DE



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

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



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												12	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 |
| ③ Angle adjusting unit | ④ Angle adjusting unit with auto switch |
| ⑤ Joint unit | |



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

Free Mount Style Rotary Actuator *Series CDRBU*

With Auto Switch Dimensions/Single Vane Style

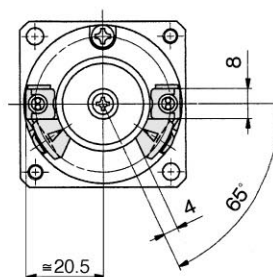
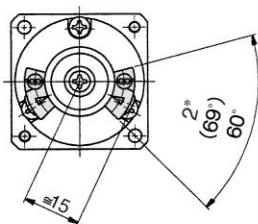
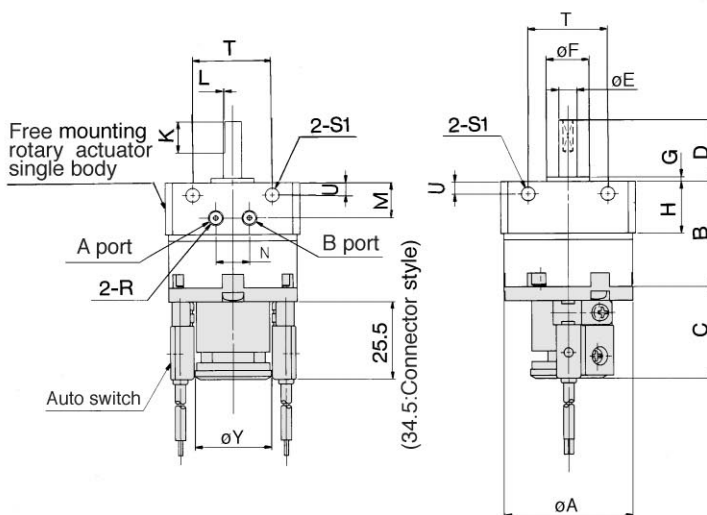
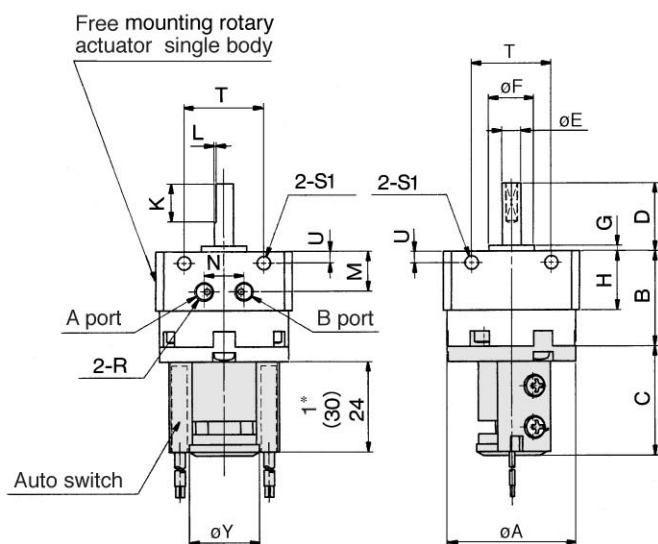
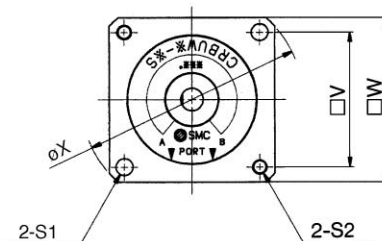
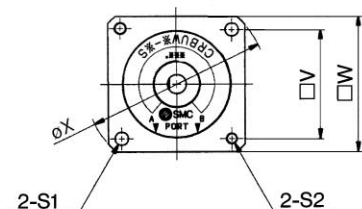


* The dimensions below show pressurization to B port of actuators for 90° and for 180°.

CDRBUW10, 15-□S

Refer to p.1.2-5 for further information.

CDRBUW20, 30-□S



- * 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.

(Approx. 26.5: Connector style)



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

CDRBUW [Size]-S.....SCRB [Size], #8



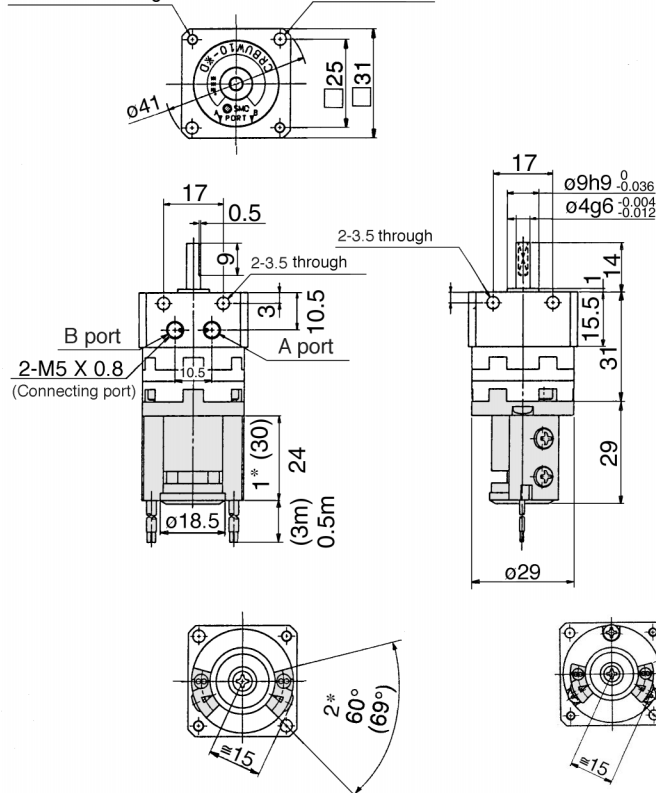
Series CDRBU

With Auto Switch Dimensions/Double Vane Style

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

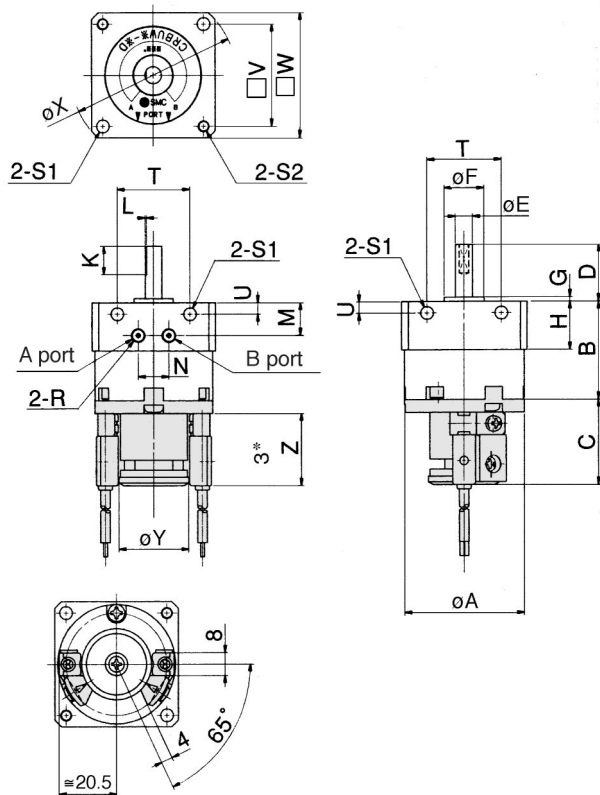
CDRBUW10-□D

2-M3 X 0.5 through 2-3.5 through



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. * 3) 25.5: When auto switches grommet type "D-R73, R80, S79, S7P, T79" 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. 34.5: When auto switches connector type "D-R73, R80, T79" types are used.
69°: When auto switches "D-S99(V), T99(V), S9P(V)" 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

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

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

Rotation angle

Application	Symbol	Rotation angle
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 applicable auto switch part number.

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: 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		Auto switch part no.	Lead wire	Lead wire length* (m)				Applicable loading
					DC	AC			0.5 (—)	3 (L)	5 (Z)	— (N)	
For 10/15	Reed switch	Grommet	No	2 wire	24V	5V,12V	90	Parallel cord	●	●	●	●	IC
						5V,12V, 100V	90A	Cab tire	●	●	●	●	
						—	97	Parallel cord	●	●	●	●	
						100V	93A	—	●	●	●	●	
	Solid state switch	Grommet	Yes	3 wire (NPN)	24V	12V	T99	Cab tire	●	●	—	—	Relay PLC
						—	T99V		●	●	—	—	
						—	S99		●	●	—	—	
						—	S99V		●	●	—	—	
						5V,12V	S9P		●	●	—	—	
						—	S9PV		●	●	—	—	
For 20/30	Reed switch	Grommet	Yes	2 wire	24V	—	R73	Cab tire	●	●	—	—	—
						—	R73C		●	●	●	●	
						48V, 100V	R80		●	●	—	—	
						100V	R80C		●	●	●	●	
	Solid state switch	Grommet	No	3 wire (NPN)	24V	12V	T79	Cab tire	●	●	—	—	Relay PLC
						—	T79C		●	●	●	●	
						—	S79		●	●	—	—	
						—	S79C		●	●	—	—	
						5V,12V	S7P		●	●	—	—	
						—	S7PV		●	●	—	—	

* Symbols for each wire length

0.5m: — Ex.) R73C
3m: L EX.) R73CL
5m: Z EX.) R73CZ
—: N EX.) R73CN

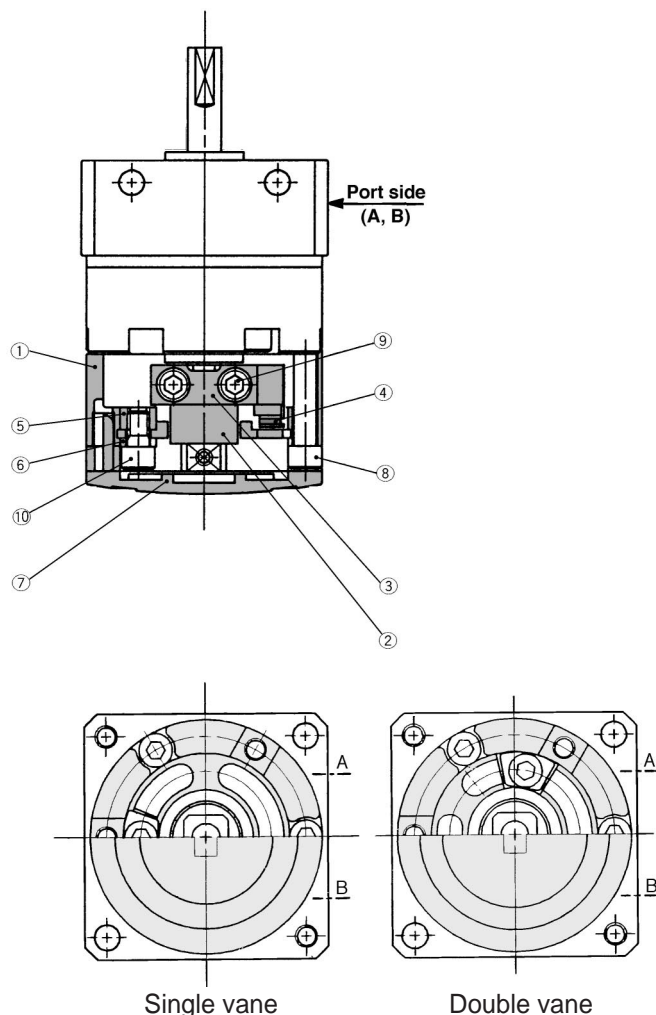
• Operating time — 1.2ms • Operating temperature range — -10° to 60°
• Shock resistance — 300m/s² {30.6G} (Reed switch),
1000m/s² {102G} (Solid state switch)

Series **C** **D** **RBUWU**

Construction/Single Vane, Double Vane

With angle adjuster

CRBUW10/15/20/30 - □^S_D



Single vane

Double vane

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.
⑬	Hexagon nut	Stainless steel	
⑭	Round head Phillips screw	Stainless steel	Note)
⑮	Magnet lever	—	Note)

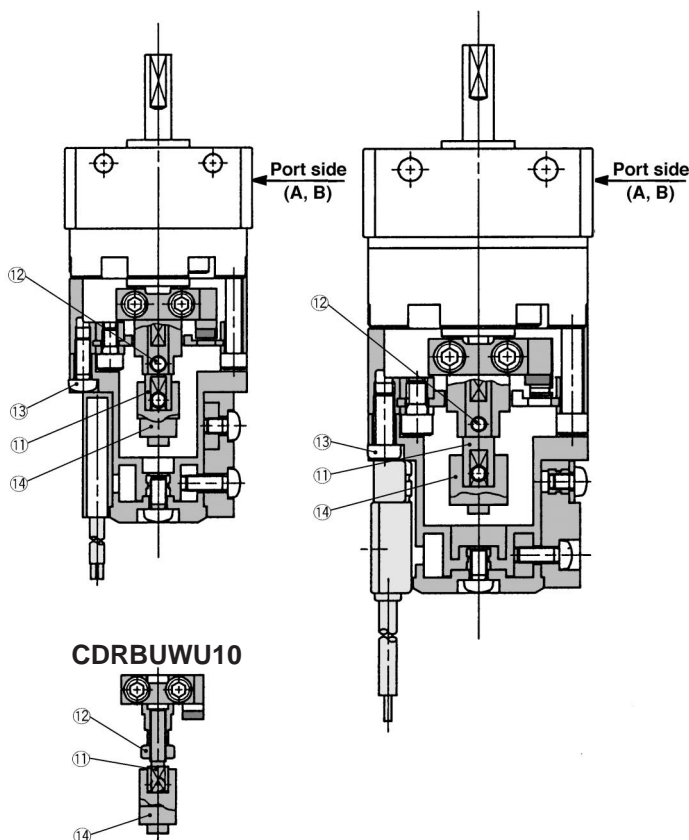


Note) It is consisted of an auto switch unit and an angle adjusting unit. Refer to p.1.0-23 and 1.0-24 for further specifications.

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.

⚠ 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°.

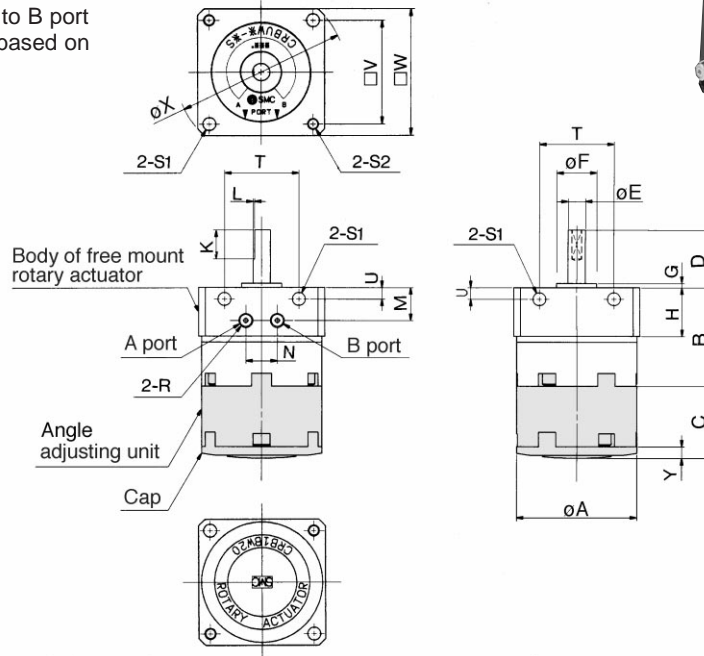
- ② All connecting port positions are on the body side.
③ The allowable kinetic energy is the same as the specifications of the rotary actuator unit itself.
④ To make a 90° adjustment on the double vane type, use a rotary actuator for a 100° application.

Free Mount Style Rotary Actuator with Angle Adjuster *Series CRBUWU*

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



Basic style

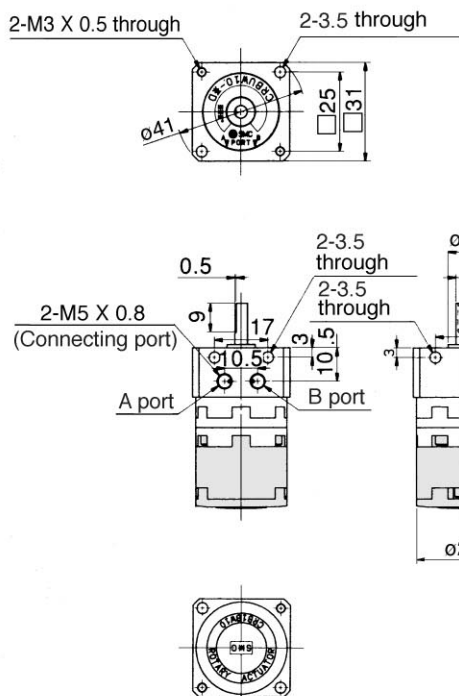
CRBUWU [Size] -S.....SCRB [Size] , #6

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

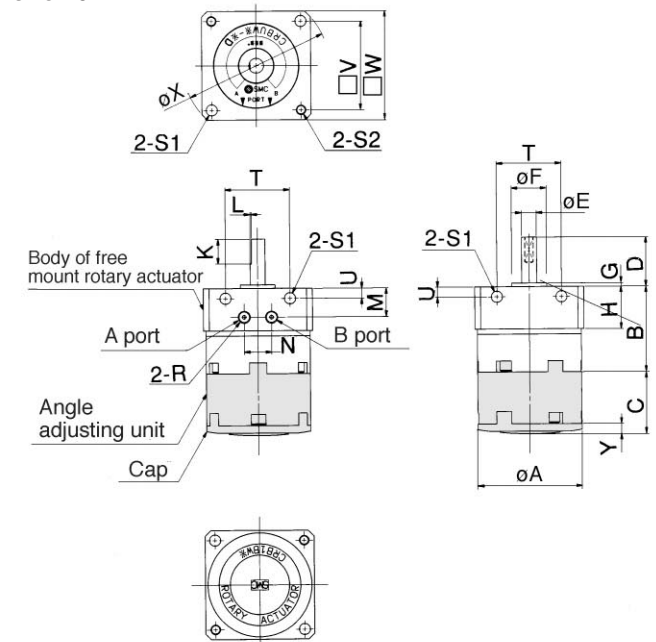
*The dimensions below show rotation middle points during pressurization to A port or B port.

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

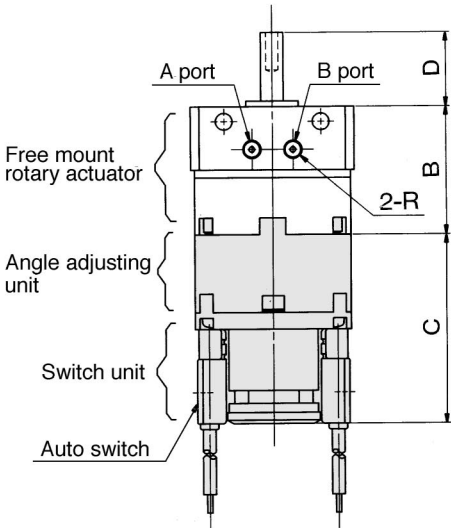
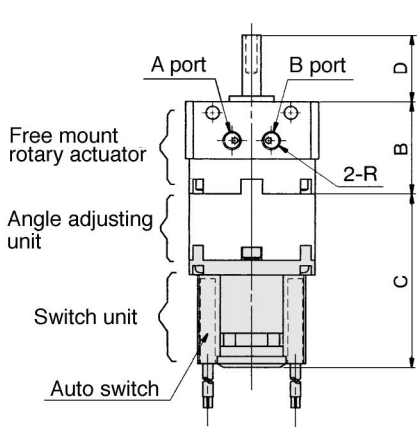
Series CDRBUWU

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.



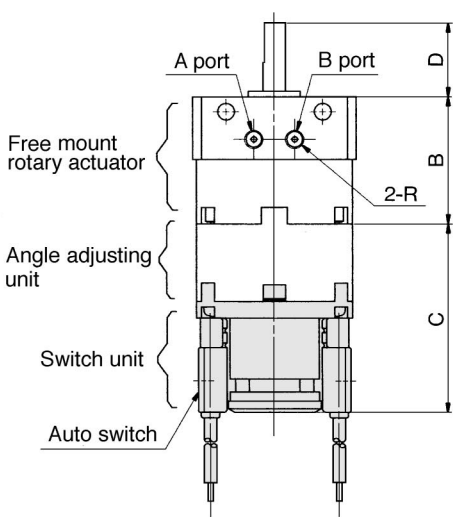
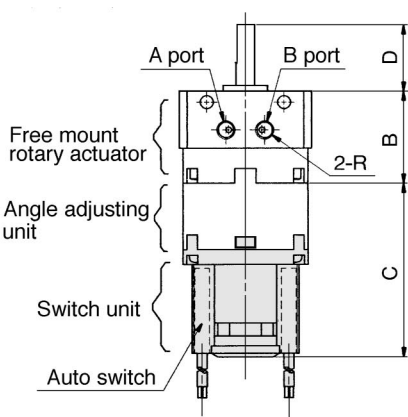
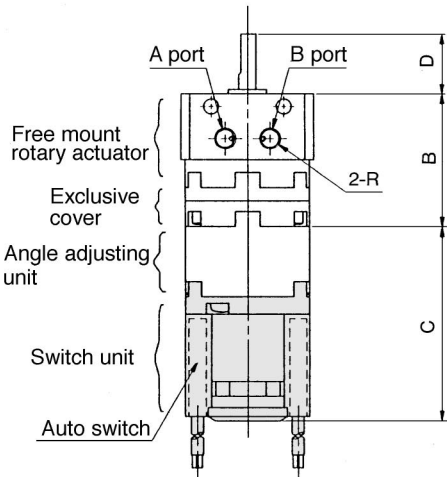
With auto switch
 CDRBUWU-□SizeS.....SCRB□Size, #10

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

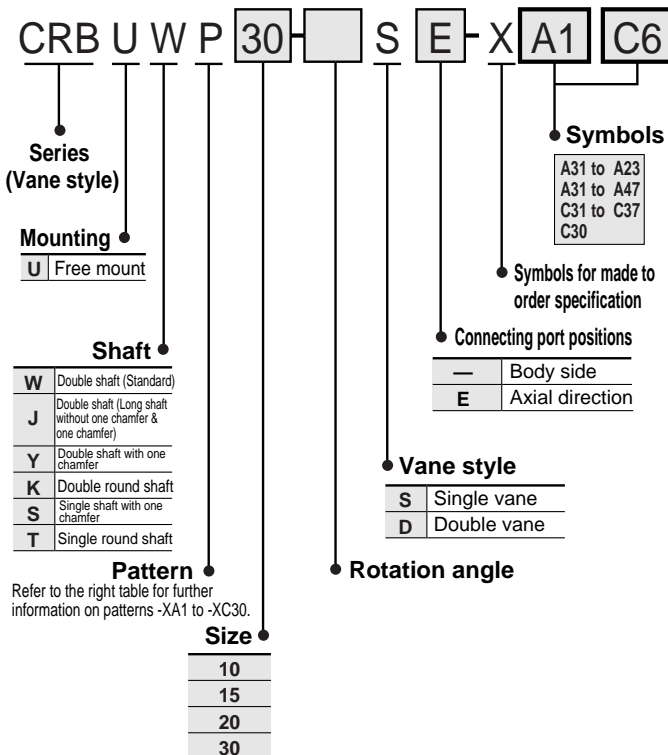
A wide selection of models is now available, as non-standard shaft configurations for the CRB1 Series (Sizes: 50, 80, 100) are provided in 46 types of patterns.

Additional reminders

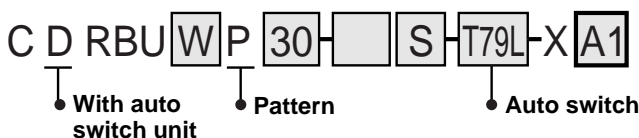
- Enter the dimensions within a range that allows for additional machining.
- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- The length of the unthreaded portion is 2 to 3 pitches.
- The thread pitch is based on coarse metric threads.
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 mentioned in "How to Order".
- 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)



With auto switch For pattern A1



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		Applicable size
		Upward	Downward	
-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	—	●	10
-XA 5	Round shaft with steps	●	—	
-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	●	—	
-XA10	Change in length of the standard product's chamfer part	—	●	30
-XA11	2 flat chamfers	●	—	
-XA12	2 flat chamfers	—	●	15
-XA13	Shaft through hole	●	●	
-XA14	Shaft through hole and female thread	●	—	
-XA15	Shaft through hole and female thread	—	●	20
-XA16	Shaft through hole and female thread	●	●	
-XA17	Shaft is shortened	●	—	10
-XA18	Shaft is shortened	—	●	
-XA19	Shaft is shortened	●	●	
-XA20	Reverse mounting of the shaft	●	●	15
-XA21	Round shaft with steps and two flat chamfers	●	—	
-XA22	Round shaft with steps and two flat chamfers	—	●	20
-XA23	Right angled chamfer	●	—	

Shaft shape/J, K, S, T, Y: Made to order

Symbol	Specification	Shaft direction	Applicable shaft type					Applicable size
			J	K	S	T	Y	
-XA31	Rod end female thread	●	—	—	—	—	—	15
-XA32	Rod end female thread	—	●	—	—	—	—	
-XA33	Rod end female thread	●	—	●	—	—	—	20
-XA34	Rod end female thread	—	●	●	—	—	—	
-XA37	Round shaft with steps	●	—	●	—	—	—	10, 15, 20, 30
-XA38	Round shaft with steps	—	●	—	—	—	—	
-XA39	Shaft through hole	●	—	—	—	—	—	15
-XA40	Shaft through hole	●	—	—	—	—	—	
-XA41	Shaft through hole	●	—	—	—	—	—	
-XA42	Shaft through hole and female thread	●	—	—	—	—	—	20
-XA43	Shaft through hole and female thread	●	—	—	—	—	—	
-XA44	Shaft through hole and female thread	●	—	—	—	—	—	30
-XA45	Intermediate chamfer	●	—	—	—	—	—	
-XA46	Intermediate chamfer	—	●	—	—	—	—	10, 15, 20, 30
-XA47	Key groove	●	—	—	—	—	—	
-XC 1	A connecting port is added to the side end of the body (A)	—	—	—	●	●	●	10
-XC 2	2 thread parts of the body (B) are used as through holes	—	—	—	●	●	●	
-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)	—	—	—	●	●	●	
-XC 6	Rotation angle is changed. (90° to the left from the starting point)	—	—	—	●	●	●	20
-XC 7	Reverse mounting of the shaft	—	—	—	●	—	—	
-XC30	Fluorine grease	—	—	—	●	●	●	30



Note) Standard style (double shafts: W) is also available for "-XC1" to "XC30".



Refer to p.1.2-4 for further information.

CRB1

CRBU

CRA1

CRQ

MRQ

MSQ

MSUB

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

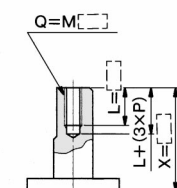
Change of shaft end shape

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.)

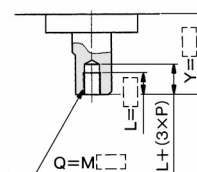


- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule.

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.)

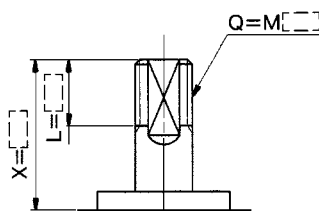


- Size 10mm is not manufacturable.
- L dimension (maximum size) is 2 times as large as the thread size as a rule. Ex.) M3: L = 6mm

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

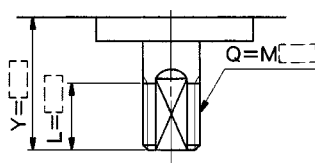
The shaft can be further shortened by machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



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

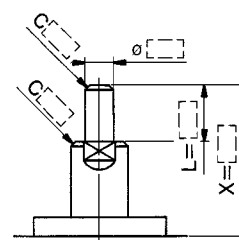
The shaft can be further shortened by machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)



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

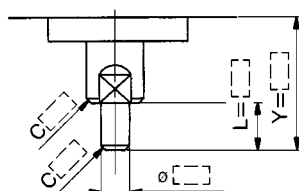
The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



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

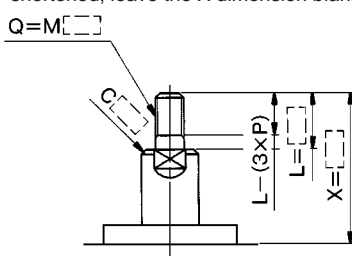
The shaft can be further shortened by machining a round shoulder on the long end of the shaft. (If the shaft is not to be shortened, leave the Y dimension blank.)



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

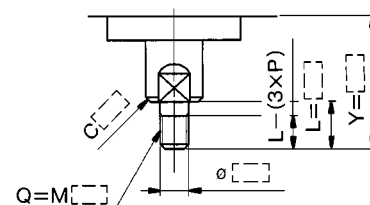
The shaft can be further shortened by machining a round shoulder and machining male threads on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



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.)



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

Series CRBU

Mode to Order Specifications

Symbol

-XA1 to XA17

CRB1

CRBU

CRA1

CRQ

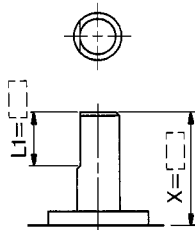
MRQ

MSQ

MSUB

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.)

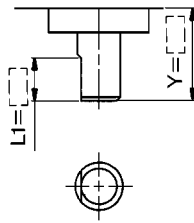


(mm)

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.)

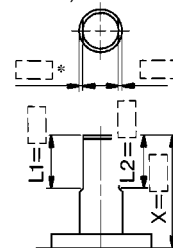


(mm)

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.)



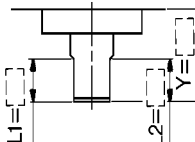
(mm)

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, L1 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 L1 and Y dimensions blank.)



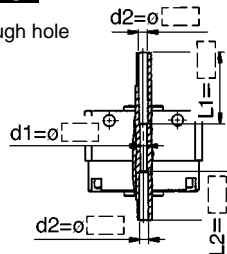
(mm)

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) to (Y - 2)	Y - 2

*1.5mm or more, L1: Standard chamfering part

Symbol: A13 Applicable only to single vane.

Shaft through hole

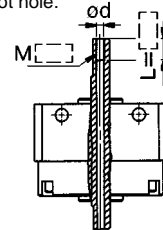


- For size 15mm, d1 = $\phi 2.5$, L1 = max. 18.
- For size 15mm only, inscribe the L1, L2, and d1 dimensions when d2 is 2.6 or more
- Sizes 20mm and 30mm, d1 = d2
- The minimum range of the machinable dimension for the d2 area is 0.1mm.

Size	d1	d2
15	$\phi 2.5$	$\phi 2.5$ to 3
20	—	$\phi 2.5$ to 4
30	—	$\phi 2.5$ 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.

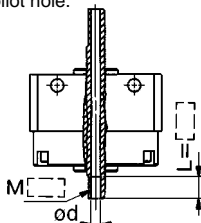


- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt. Example: For M3 bolt: L max. = 6mm

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

Symbol: 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.

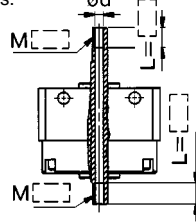
Example: For M4 bolt: L max. = 8mm

(mm)

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

Symbol: 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.

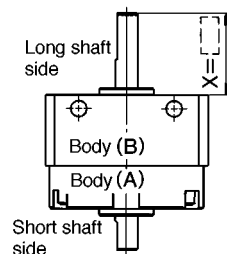
Example: For M5 bolt: L max. = 10mm

(mm)

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

Symbol: A17

Shorten the long 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

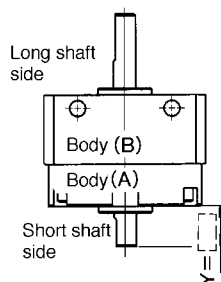
-XA18 to XA23

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

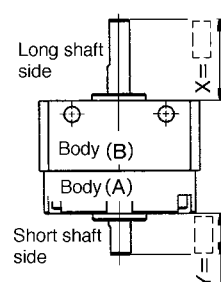
Shorten the short end of the shaft.



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

Symbol: A19

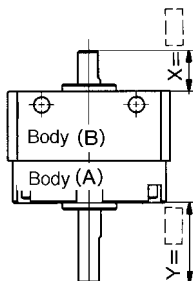
Shorten both the long end and the short end of the shaft.



Size	X (mm)	Y (mm)
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

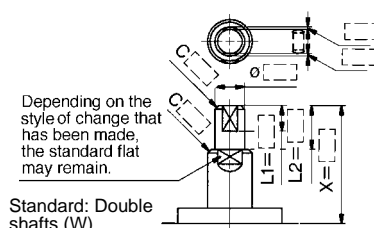
Reverse the assembly of the shaft (thus shortening the long end and the short end of the shaft).



Size	X (mm)	Y (mm)
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

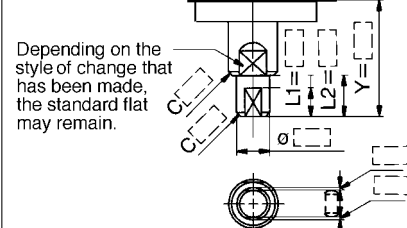
The shaft can be further shortened by machining a round shoulder and double flats on the long end of the shaft. (If the shaft is not to be shortened, leave the X dimension blank.)



Size	X (mm)	L1max (mm)	L2 (mm)
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.)

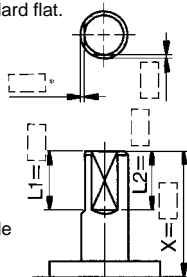


Size	Y (mm)	L1max (mm)	L2 (mm)
10	4 to 8	Y-2.5	L1 + 1.5
15	4.5 to 9	Y-3	L1 + 1.5
20	5 to 10	Y-3.5	L1 + 2
30	7 to 13	Y-5	L1 + 3

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.



Standard: Double shafts (W)

Size	X (mm)	L1 (mm)	L2max (mm)
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

Series CRBU

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

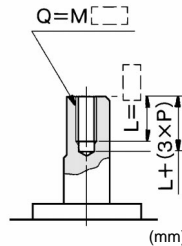
Additional reminders

- 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

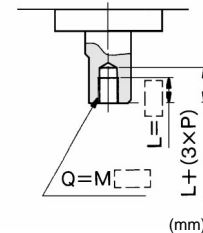


Shaft form Size	Q	
	S	Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

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

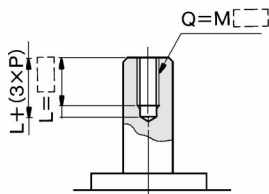


Shaft form Size	Q	
	S	Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

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

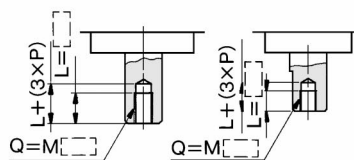


Shaft form Size	Q		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		

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

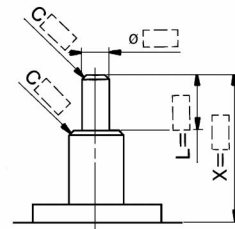


Shaft form Size	Q		
	J	K	T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		

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

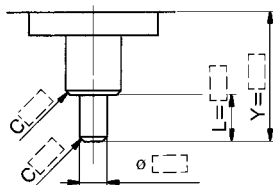


Shaft form Size	J			K			T		
	X			Lmax			X - 1		
10	2 to 14			X - 1			X - 1		
15	3 to 18			X - 1.5			X - 1.5		
20	3 to 20			X - 1.5			X - 1.5		
30	3 to 22			X - 2			X - 2		

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

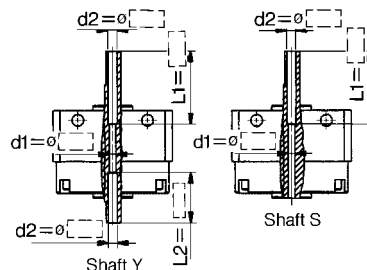


Size	Y	Lmax
10	2 to 14	Y - 1
15	3 to 18	Y - 1.5
20	3 to 20	Y - 1.5
30	3 to 22	Y - 2

Symbol: A39

Applicable only to single vane style.

Shaft through hole (Shafts S and Y are machined additionally)

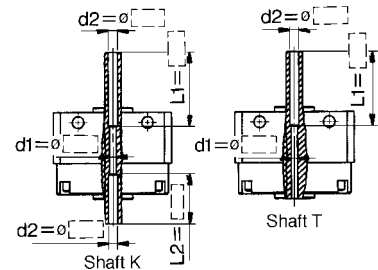


Shaft form Size	S		Y	
	d1	d2	d1	d2
15	2.5	2.5 to 3	2.5	2.5 to 3
20	—	2.5 to 4	2.5	2.5 to 4
30	—	2.5 to 4.5	2.5	2.5 to 4.5

Symbol: A40

Applicable only to single vane style.

Shaft through hole (Shafts K and T are machined additionally)



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

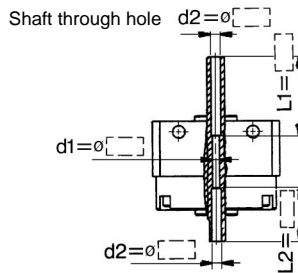
Change of shaft end shape/Applicable shaft style: J, K, S, T, Y

-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.

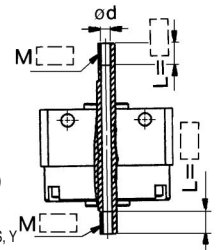


- Size 10 is not manufacturable.
- For size 15 is $d1 = 2.5$, $L1 = \max$. 18
The minimum range of the machinable dimension for the d2 area is 0.1mm.
Enter the L1, L2, and d1 dimensions when $d2$ is $\phi 2.6$ or more.
- For sizes 20 and 30 are $d1 = d2$.
- Applicable shaft configuration — shaft J

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.

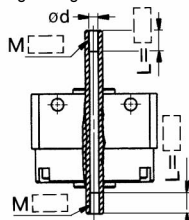


- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
(Example: For M5 bolt: L max. 0 = 10mm.)
However, for the short end of shaft S: For M5 bolt: L max. = 7.5 mm.
- Applicable shaft configurations — shafts S, Y

		(mm)					
Thread	Size	15		20		30	
	Shaft form	S	Y	S	Y	S	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.

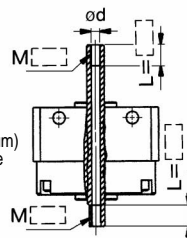


- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
(Example: For M5 bolt: L max. = 10mm.)
However, for the short end of shaft T: For M5 bolt: L max. = 7.5mm.
- Applicable shaft configurations — shafts K, T

		(mm)					
Thread	Size	15		20		30	
	Shaft form	K	T	K	T	K	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.

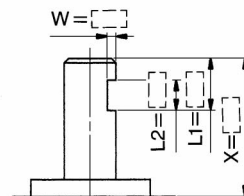


- Size 10 is not manufacturable.
- The L dimension (maximum) is, as a rule, twice the size of the bolt.
(Example: For M5 bolt: L max. = 10mm.)
- Applicable shaft configuration — shaft J

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.)

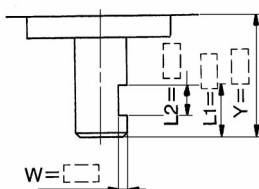


• Applicable shaft configurations — Shaft J, K, T (mm)

Size	J			K			T			L1max			L2max		
	X			W			J			J			J		
10	6.5 to 14	—	—	0.5 to 2	—	—	X-3	—	—	X-3	—	—	L1-1	—	—
15	8 to 18	—	—	0.5 to 2.5	—	—	X-4	—	—	X-4	—	—	L1-1	—	—
20	9 to 20	—	—	0.5 to 3	—	—	X-4.5	—	—	X-4.5	—	—	L1-1	—	—
30	11.5 to 22	—	—	0.5 to 4	—	—	X-5	—	—	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.)

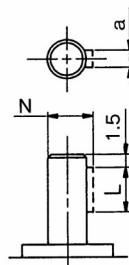


• Applicable shaft configurations — Shaft K (mm)

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 _{0.025}	10	6.8
30	3h _{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
10	1 to 2	1 to 3
15	1.5 to 2.5	1 to 3
20	2 to 3	1 to 3
30	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 **Symbol** Connecting ports are added to the end side of the body(A) **-XC1**

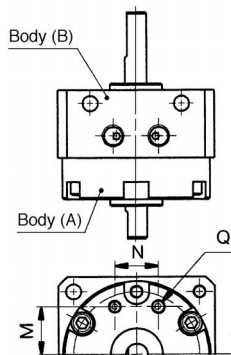
CRBUWP Refer to "How to Order" on p.1.2-19. **-XC1**

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 **Symbol** 2 thread parts of the body (B) are machined to be through holes **-XC2**

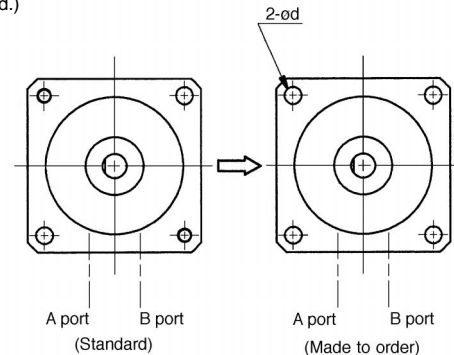
CRBUWP Refer to "How to Order" on p.1.2-19. **-XC2**

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

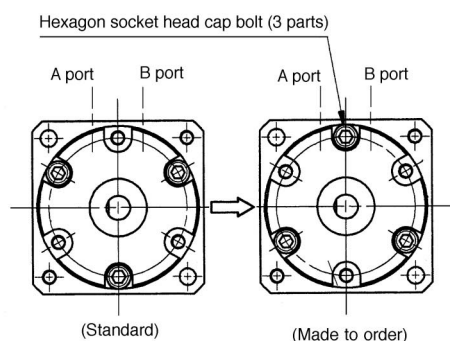
5 **Symbol** Positions of the body tightening bolts are changed. **-XC3**

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 **Symbol** Rotating range is changed.(90° to the right from the starting point) **-XC4**

CRBUWP Refer to "How to Order" on p.1.2-19. **-XC4**

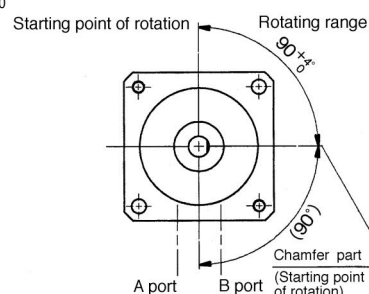
Symbol

*SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are indicated. Rotating range is changed. (90° to the right from the starting point)

*There are no standard chamfering parts on shafts S and T.

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 $\pm 5^\circ$.

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.

CRB1

CRBU

CRA1

CRQ

MRQ

MSQ

MSUB

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.)

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.

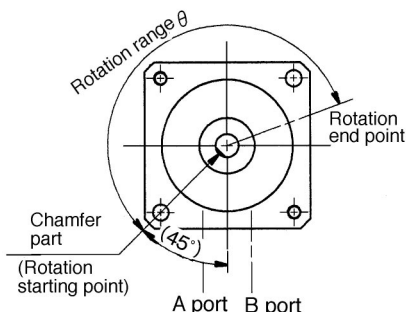
Change in angle of rotation.

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.

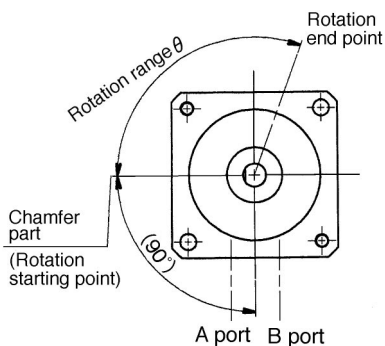
Change in angle of rotation

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°

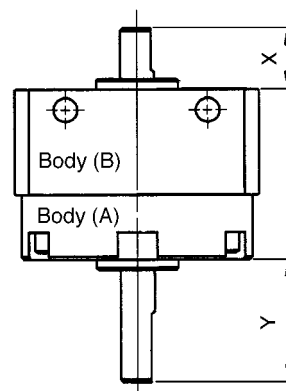


Rotation starting point is on the one chamfering position when pressurized to B port.

8 Reverse Mounting of Rotary Shaft -XC7

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

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.

Series CRBU

Made to Order Specifications

Shaft Variations/Shaft Style: J, Y, K, S, T

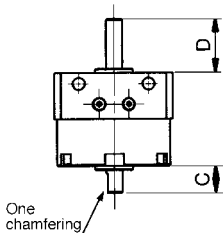
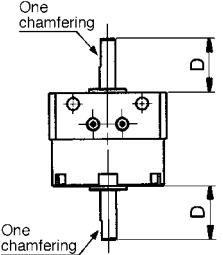
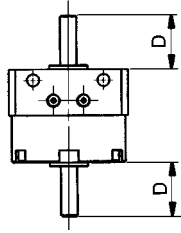
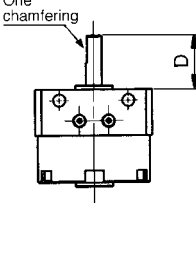
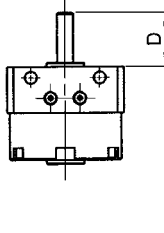
Consult SMC for further information on specifications, size and delivery.

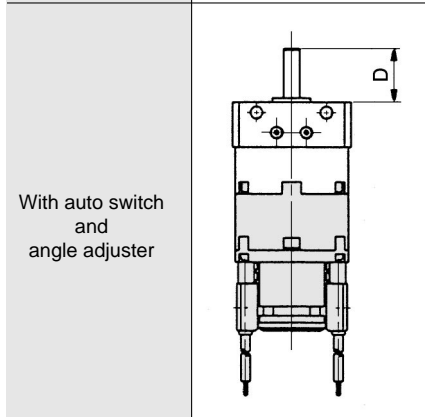
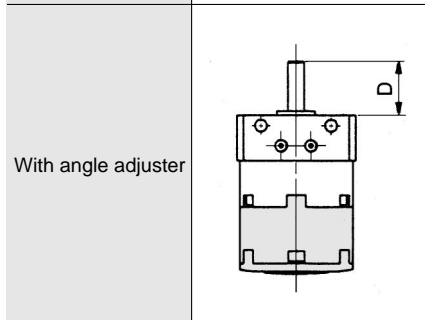
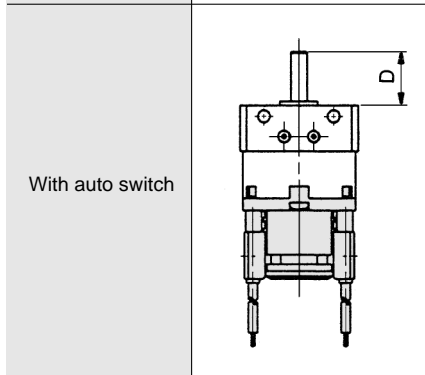
10 Shaft Variations

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			Single Rod	
Shaft Style	Long axis without one chamfering and with one chamfering	One chamfer	Round shaft	One chamfer	Round shaft
Basic style					



How to Order Basic Style CRBU

Refer to "How to Order" on p.1.2-4.

Axis form

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

* Only J type is available for auto switch attached style and angle adjuster attached style.

Vane style

S	Single vane
D	Double vane

With Unit CDRBUJU

Refer to "How to Order" on p.1.2-15.

Size Angle of rotation S

With auto switch unit

With angle adjuster
J only

No. of auto switches
Auto switch

Vane type

S	Single vane
D	Double vane

	(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.

CRB1

CRBU

CRA1

CRQ

MRQ

MSQ

MSUB