

Rotary Actuator Vane Style

Series CRB1

Size: 50, 63, 80, 100

Series Variations

	Fluid		Air																
	Size		50				63				80				100				
	Vane type	Single vane (S) Double vane (D)	S		D		S		D		S		D		S		D		
	Port location	Side ported (Nil) Axial ported (E)	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	
Standard	Rotating angle	90°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		180°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		270°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		Option	100°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			190°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			280°	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft type	Double shaft	W	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Cushion	Rubber bumper	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Variations	Basic type	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	With auto switch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	With One-touch fittings	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Clean series	10-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Copper-free	20-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Option	Mounting style	With foot bracket	L	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Made to Order	Material	Stainless steel specifications for main parts	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Shaft type	Double shaft type	Double shaft (Long shaft with four chamfers)	J	●	●	●	●	●	●	●	●	●	●	●	●	●		
			Double shaft with four chamfers	Z	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
			Double shaft key	Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Single shaft type	Single shaft key	S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		Single round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		Single shaft with four chamfers	X	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Pattern	Shaft pattern	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		Rotation pattern	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	With solenoid valve	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Rotary Actuator Vane Style

Series **CRB1**

Size: 50, 63, 80, 100

How to Order

Without auto switch

CRB1 B W 80-90 S

With auto switch

CDRB1 B W 80-90 S R73

With auto switch

Mounting style

B	Basic style
L	Foot style

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

Table (1): Foot Assembly Part No.

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

Size

50
63
80
100

Number of auto switches

S	1 pc. *
Nil	2 pcs.

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

Electrical entry/Lead wire length

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

* Connectors are available only for auto switch types R73, R80, T79.

** Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m

Shaft type

W	Double shaft (Long shaft key & Four chamfers)
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Rotating angle

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

Vane type

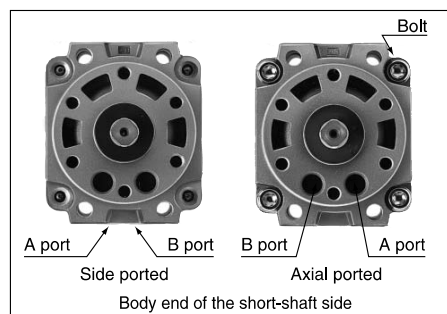
S	Single vane
D	Double vane

Auto switch

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

Connection port location

Nil	Side ported
E	Axial ported



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

Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Applicable load			
				DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)	IC circuit	Relay, PLC		
Reed switch	Grommet	No	2-wire	24 V	48 V 100 V	24 V, 48 V 100 V	R80	●	●	—			—	—
	Connector							●	●	●	●			
	Grommet	Yes			—	100 V	R73	●	●	—	—	—		
	Connector				R73C	●	●	●	●					
Solid state switch	Grommet	Yes	2-wire	24 V	12 V	—	T79	●	●	—	—	—	Relay, PLC	
	Connector							T79C	●	●	●			●
	Grommet		3-wire (NPN)		5 V, 12 V		S79	●	●	—	—	—		IC circuit
			3-wire (PNP)				S7P	●	●	—	—			

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

- **Excellent reliability and durability**
The use of bearings to support thrust and radial loads improves reliability and durability.
- **The body of the rotary actuator can be mounted directly.**
- **Two different port locations**



Specifications

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

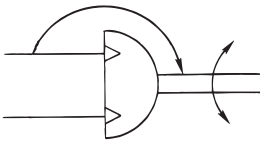
Volume

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

Weight

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

JIS Symbol



⚠ Caution

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

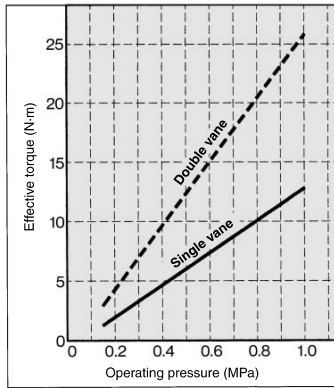
D-

20-

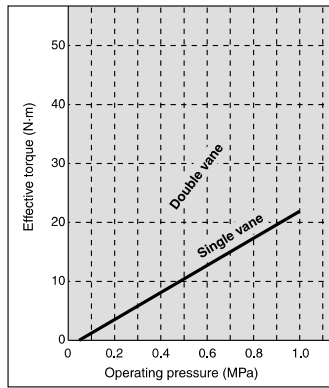
Series CRB1

Effective Output

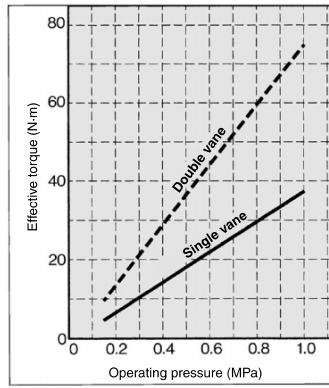
CRB1BW50



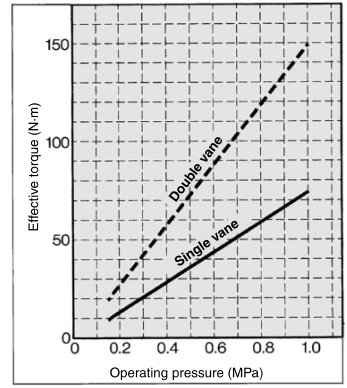
CRB1BW63



CRB1BW80



CRB1BW100



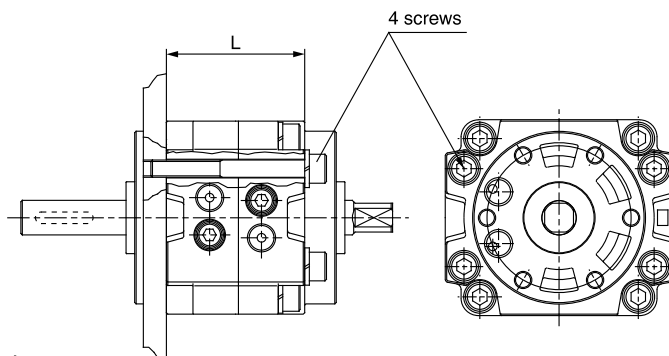
Key Position and Rotation Range

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

Top View from Long Shaft Side

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

Direct Mounting of Body



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

With One-touch Fittings

CRB1 Mounting W50F Rotating angle Vane type Port location

● With One-touch fittings

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

Specifications

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

Applicable Tubing and Size

Applicable tubing O.D/I.D (mm)	$\phi 6/\phi 4$
Applicable tubing material	Nylon, Soft nylon, Polyurethane

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

Clean Series

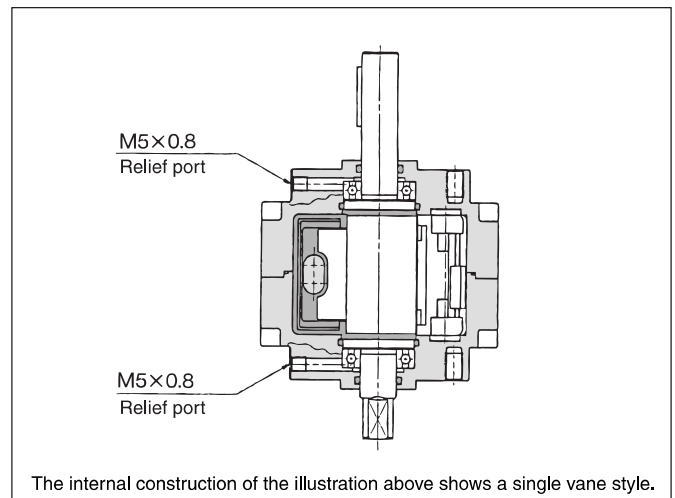
10 — CRB1BW Size Rotating angle Vane type Port location

● Clean Series, With relief port

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

Specifications

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



Copper-free

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

● Copper-free

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

Specifications

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

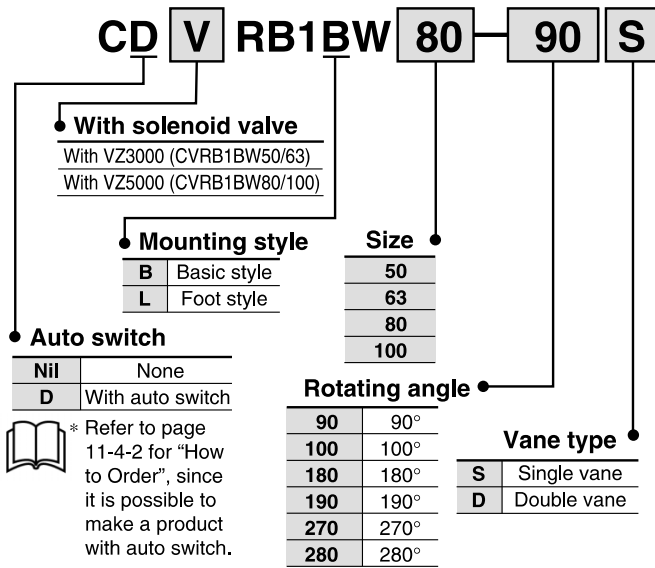
D-

20-

Series CRB1

Rotary Actuator with Solenoid Valve

How to Order



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

Specifications

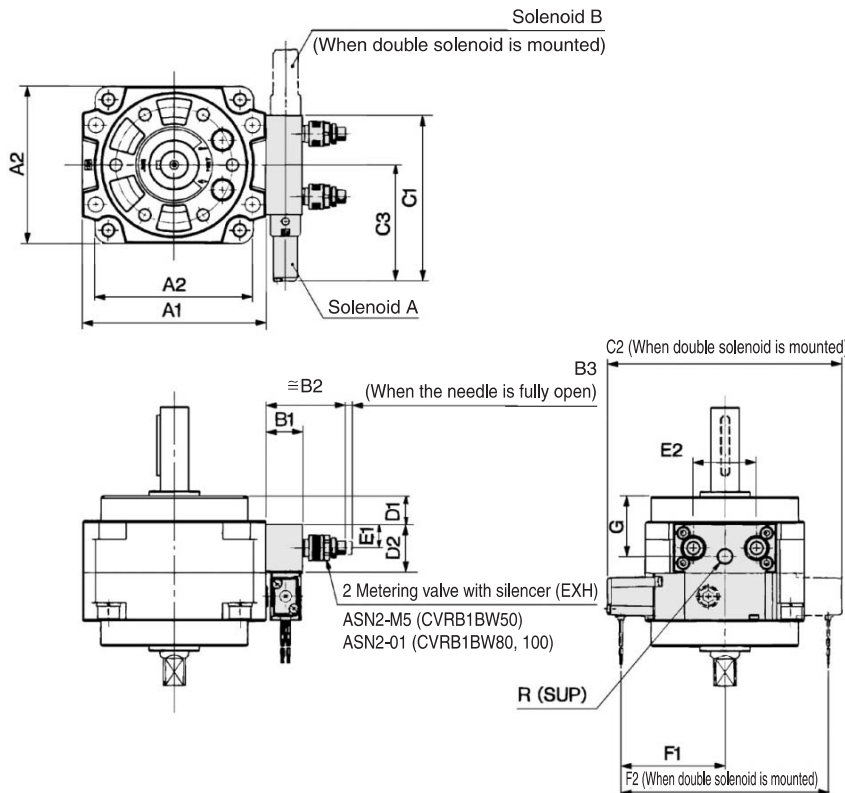
Fluid	Air
Operating pressure (MPa)	0.15 to 0.7
Rotating angle	Standard: 90°, 180°, 270°; Option: 100°, 190°, 280°
Rotation time adjustment range (s/90°)	0.3 to 1.0
Applicable solenoid valve	Size 50, 63: VZ3000, Size 80, 100: VZ5000
Operating voltage	100 VAC, 200 VAC, 24 VDC
Electrical entry	L plug connector,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

Allowable Kinetic Energy

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

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

Dimensions



- Note 1) Solenoid valve in external appearance is in the case of VZ³140-1G.
Note 2) Solenoid valve dimensions are for 2 position, and dimensions in () are for 3 position.
Note 3) Make sure to indicate the type of solenoid valve when ordering.

(mm)

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



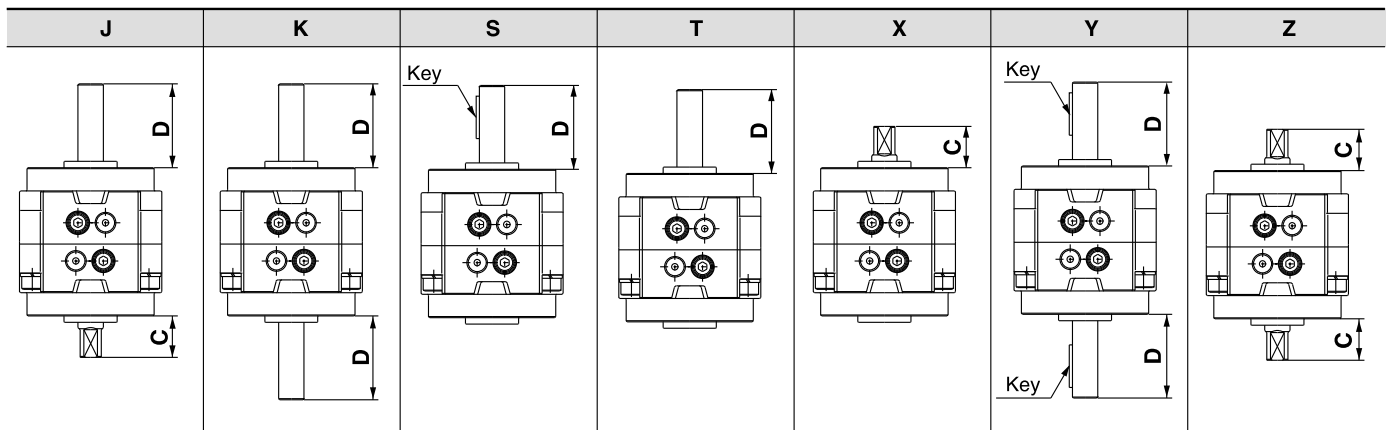
Rotary Actuator: Replaceable Shaft

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

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

Shaft type

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



(mm)

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

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

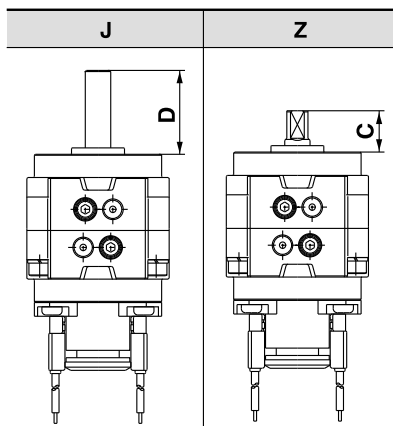
With auto switch CDRB1B J Size Rotating angle Vane type Port location Auto switch

With auto switch

Shaft type

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

(mm)



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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

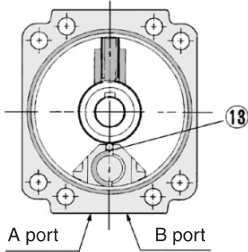
Series CRB1

Construction

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

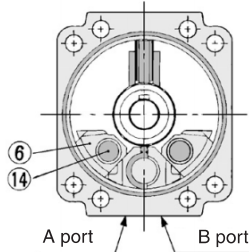
For 270° (Top view
from long shaft side)

Single vane



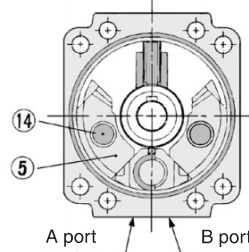
For 180° (Top view
from long shaft side)

Single vane



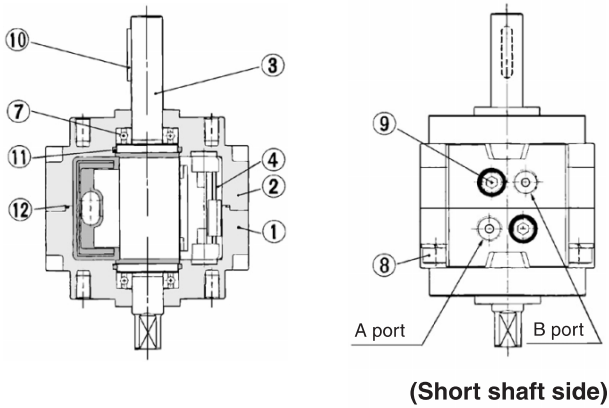
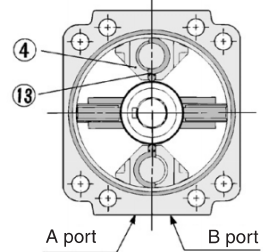
For 90° (Top view
from long shaft side)

Single vane



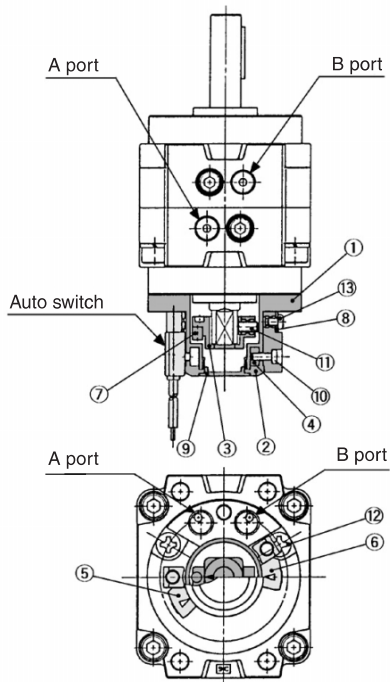
For 90° (Top view
from long shaft side)

Double vane



With auto switch

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



Component Parts

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

Component Parts

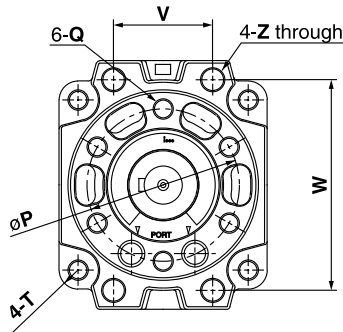
No.	Description	Material	Note
①	Cover (A)	Resin	
②	Cover (B)	Resin	
③	Magnet lever	Resin	
④	Holding block	Aluminum alloy	
⑤	Switch block (A)	Resin	
⑥	Switch block (B)	Resin	
⑦	Magnet	Magnetic body	
⑧	Arm	Stainless steel	
⑨	Rubber cap	NBR	
⑩	Round head Phillips screw	Stainless steel	
⑪	Hexagon socket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

Dimensions: 50, 63, 80, 100

Single vane type/Double vane type

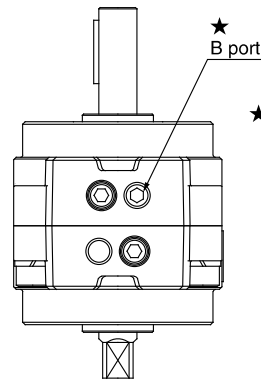
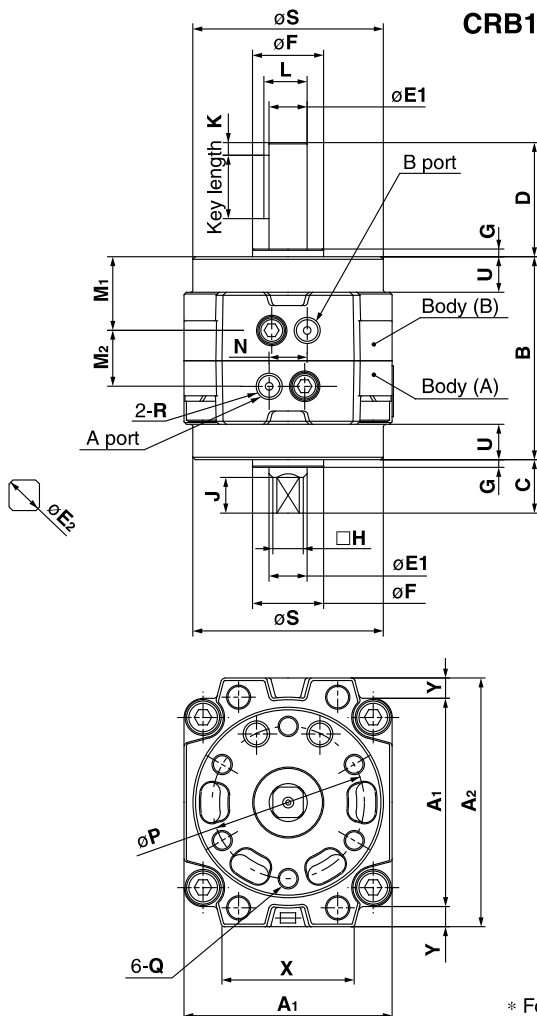
CDRB1BW□-□S/D

<Port location: Side ported>

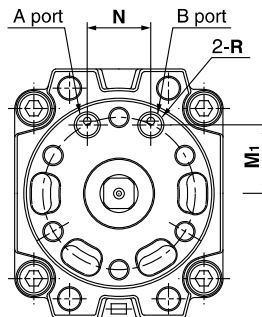


Model	Keyway dimension (mm)		
	b (h9)	h (h9)	ℓ
CRB1BW50-□□□	4 ⁰ _{-0.030}	4 ⁰ _{-0.030}	20
CRB1BW63-□□□	5 ⁰ _{-0.030}	5 ⁰ _{-0.030}	25
CRB1BW80-□□□	5 ⁰ _{-0.030}	5 ⁰ _{-0.030}	36
CRB1BW100-□□□	7 ⁰ _{-0.036}	7 ⁰ _{-0.036}	40

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



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



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

Model	A ₁	A ₂	B	C	D	E ₁ (g6)	E ₂ (h9)	F (h9)	G	H	J	K	L	M ₁	M ₂	N	P	Q	R (Rc)	S	T	U	V	W	X	Y	Z
CRB1BW50-□□	67	78	70	19.5	39.5	12 ^{-0.006} _{-0.017}	11.9 ⁰ _{-0.043}	25 ⁰ _{-0.052}	3	10	13	5	13.5	26	18	14	50	M6 x 1 depth 9	1/8	60	R6	11	34	66	46	5.5	6.5
CRB1BW50-□□E														21	—	18											
CRB1BW63-□□	82	98	80	21	45	15 ^{-0.006} _{-0.017}	14.9 ⁰ _{-0.043}	28 ⁰ _{-0.052}	3	12	14	5	17	29	22	15	60	M8 x 1.25 depth 10	1/8	75	R7.5	14	39	83	52	8	9
CRB1BW63-□□E														27	—	25											
CRB1BW80-□□	95	110	90	23.5	53.5	17 ^{-0.006} _{-0.017}	16.9 ⁰ _{-0.043}	30 ⁰ _{-0.052}	3	13	16	5	19	30	30	20	70	M8 x 1.25 depth 12	1/4	88	R8	15	48	94	63	7.5	9
CRB1BW80-□□E														29	—	30											
CRB1BW100-□□	125	140	103	30	65	25 ^{-0.007} _{-0.020}	24.9 ⁰ _{-0.052}	45 ⁰ _{-0.062}	4	19	22	5	28	35.5	32	24	80	M10 x 1.5 depth 13	1/4	108	R11	11.5	60	120	78	7.5	11
CRB1BW100-□□E														38	—	38											



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

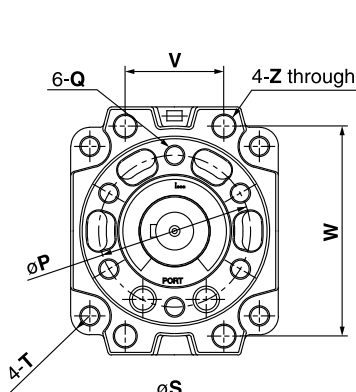
Series CRB1

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

Single vane type/Double vane type

CDRB1BW□-□S/D

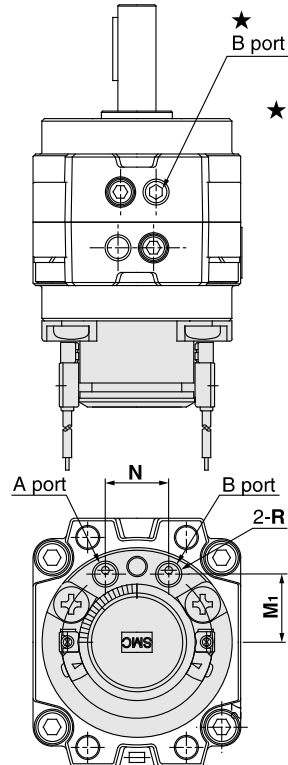
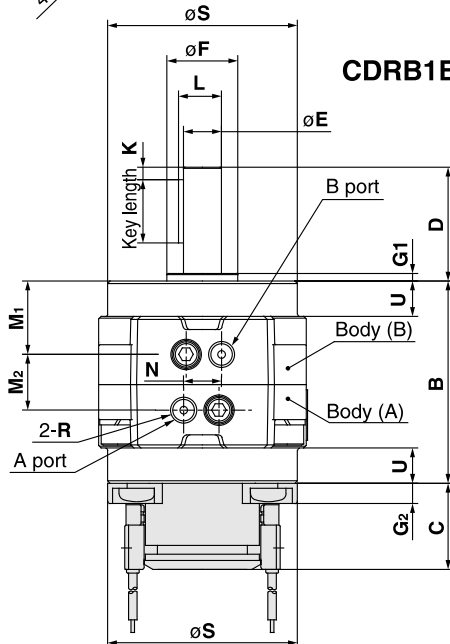
<Port location: Side ported>



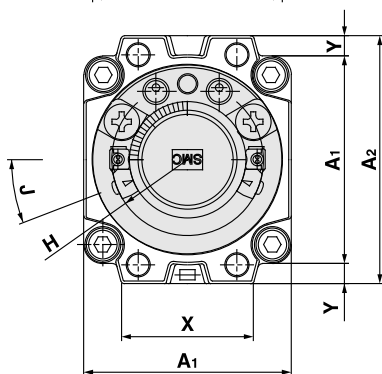
(mm)

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

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



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



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

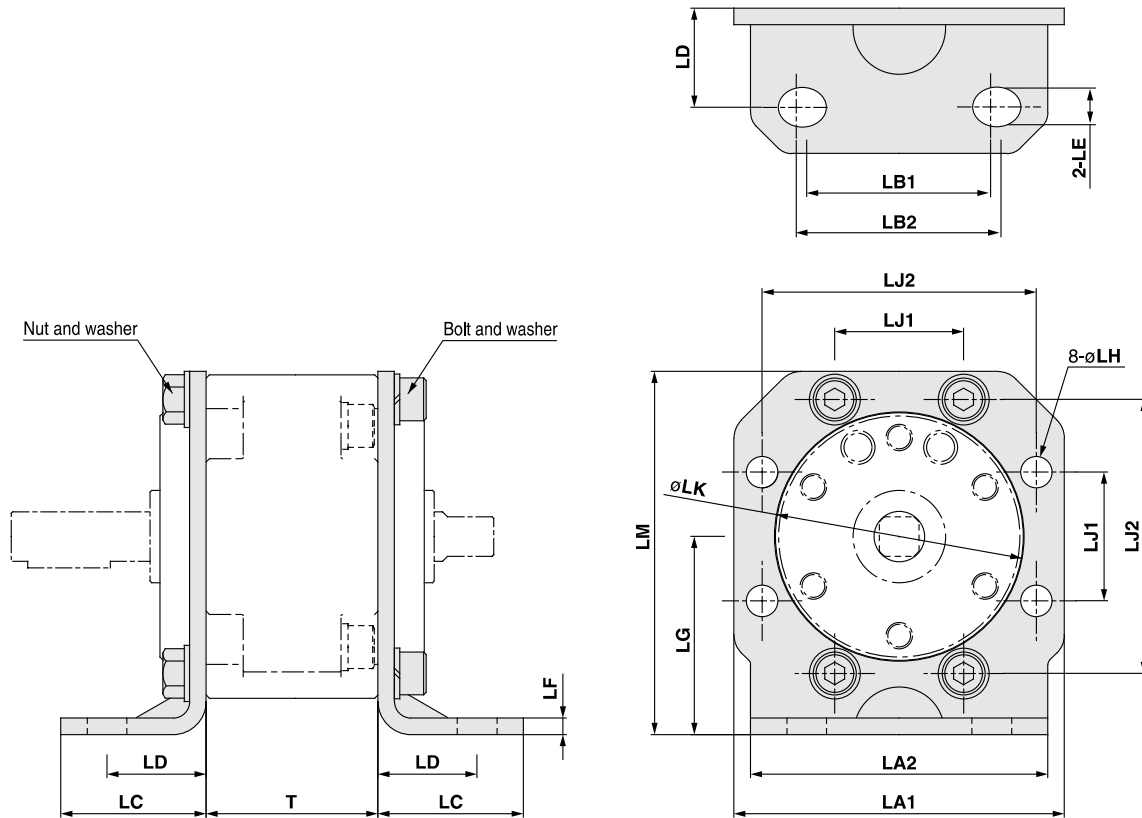
(mm)

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

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

Dimensions

Option: Foot bracket



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

(mm)

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



Note 1) The foot bracket (with bolt, nut, and washer) is not mounted on the actuator at the time of shipment.

Note 2) The foot bracket can be mounted on the rotary actuator bracket 90° intervals.

Note 3) Refer to the foot bracket assembly part no. in the table at right when foot bracket assembly is required separately.

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

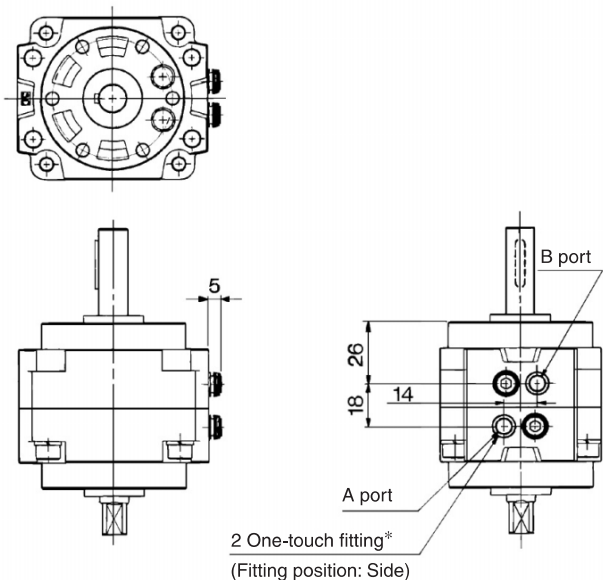
Series CRB1

With One-touch Fittings: 50

Standard

CRB1□W50F-□□

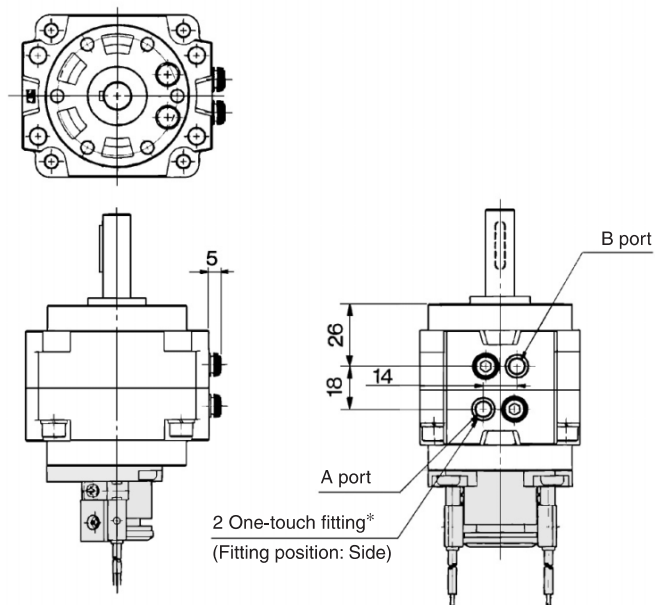
<Port location: Side ported>



With auto switch

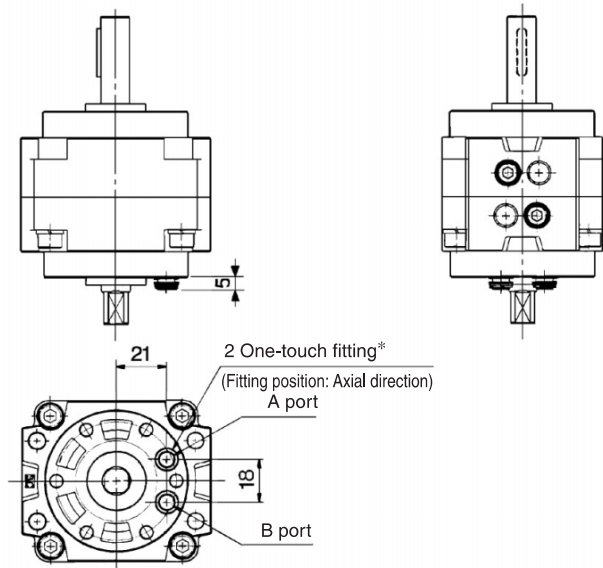
CDRB1□W50F-□□-□

<Port location: Side ported>



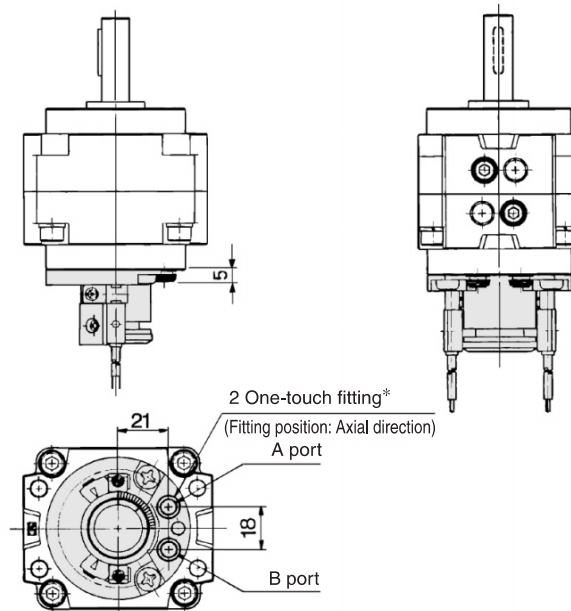
CRB1□W50F-□□E

<Port location: Axial ported>



CDRB1□W50F-□□E-□

<Port location: Axial ported>



Applicable Tubing and O.D/I.D

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

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

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

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

Simple Specials:

-XA1 to -XA24: Shaft Pattern Sequencing I

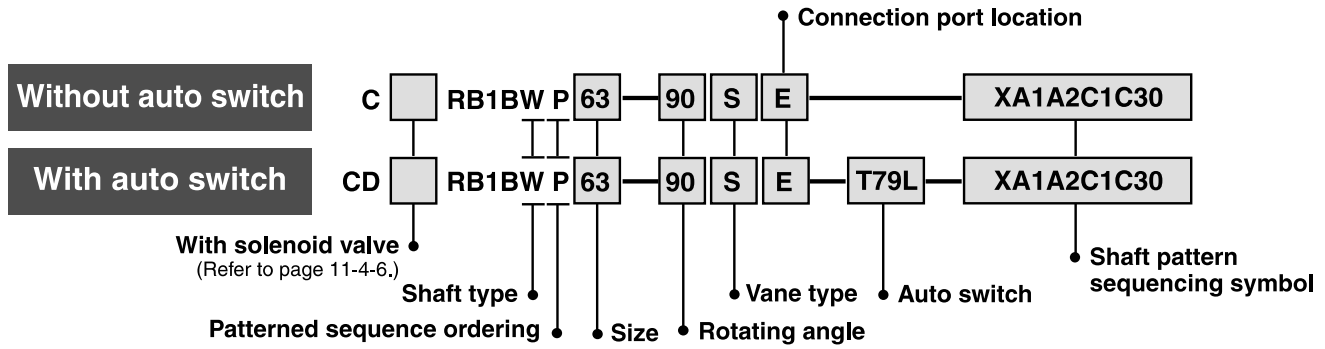
Shaft shape pattern is dealt with simple made-to-order system.

Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing I

-XA1 to XA24

Applicable shaft type: W (Standard)



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

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

● Axial: Bottom (Short shaft side)

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

● Double Shaft

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

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

Combination

XA□ Combination

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

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

XA□, XC□ Combination

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

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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

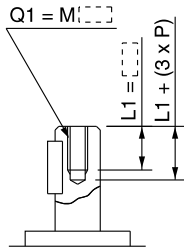
Series CRB1

Axial: Top (Long shaft side)

Symbol: **A1**

Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M3: L1 = 6 mm
- Applicable shaft type: W



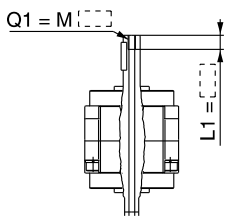
Size	Q1
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

Symbol: **A14**

Applicable to single vane type only

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

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



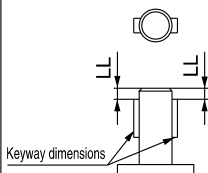
Size	50	63	80	100
Thread				
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Symbol: **A24**

Double key

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

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



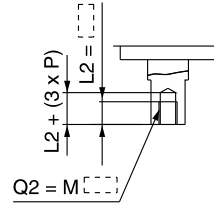
Size	Keyway dimension	LL
50	4 x 4 x 20	5
63	5 x 5 x 25	
80	5 x 5 x 36	
100	7 x 7 x 40	

Axial: Bottom (Short shaft side)

Symbol: **A2**

Machine female threads into the short shaft.

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



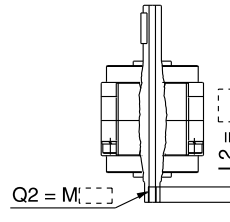
Size	Q2
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

Symbol: **A15**

Applicable to single vane type only

A special end is machined onto the short shaft, and a through hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

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



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

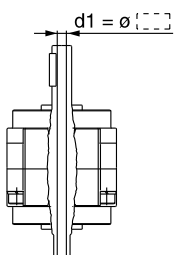
Double Shaft

Symbol: **A13**

Applicable to single vane type only

Shaft with through-hole

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



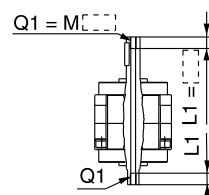
Size	d1
50	ø4 to ø5
63	ø4 to ø6
80	ø4 to ø6.5
100	ø5 to ø8

Symbol: **A16**

Applicable to single vane type only

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

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



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

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

Simple Specials:

-XA31 to -XA46: Shaft Pattern Sequencing II

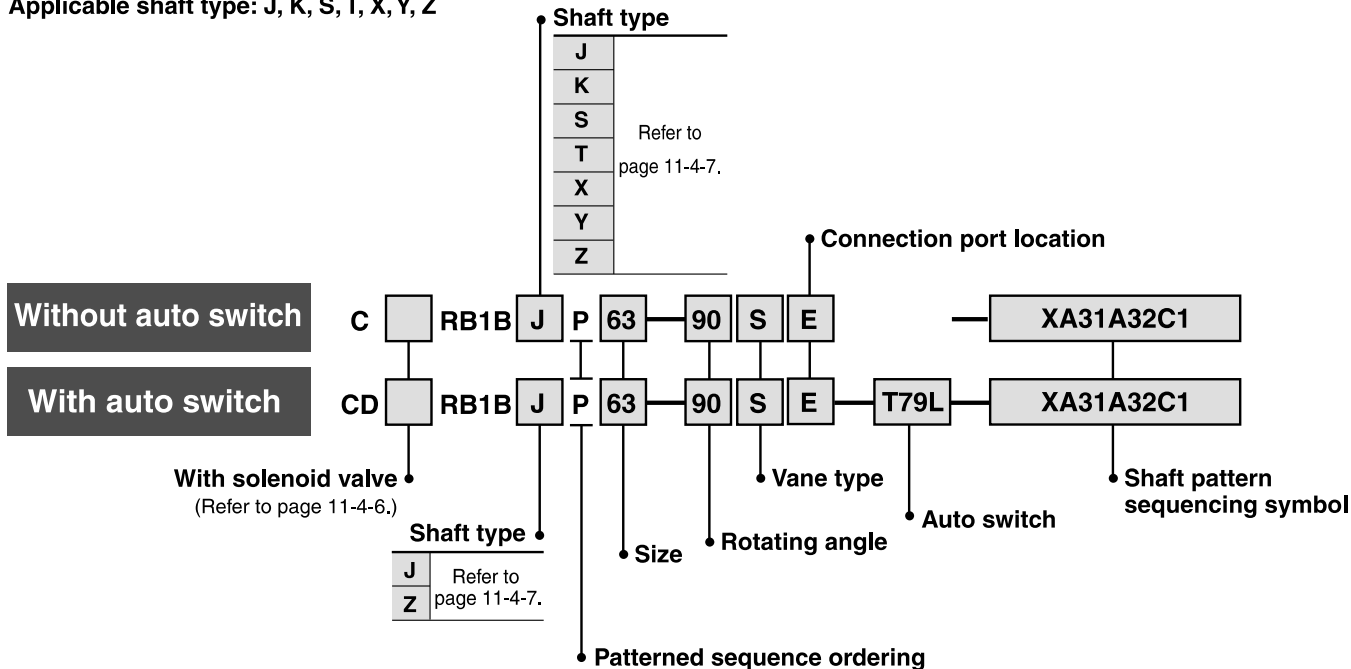
Shaft shape pattern is dealt with simple made-to-order system.

Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing II

-XA31 to XA46

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



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

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

● Axial: Bottom (Short shaft side)

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

● Double Shaft

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

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

Combination

XA□ Combination

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

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

XA□, XC□ Combinations

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

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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

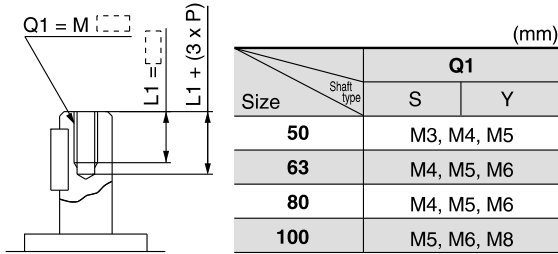
20-

Series CRB1

Axial: Top (Long shaft side)

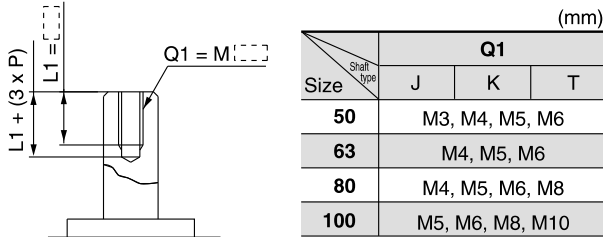
Symbol: A31 Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
- Applicable shaft types: S, Y



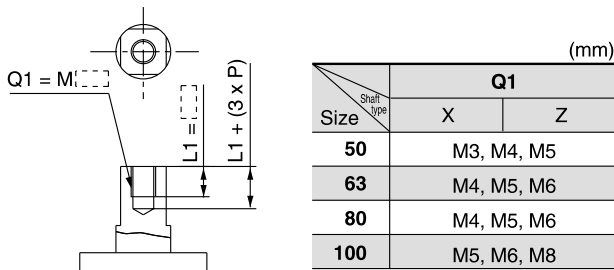
Symbol: A33 Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
- Applicable shaft types: J, K, T



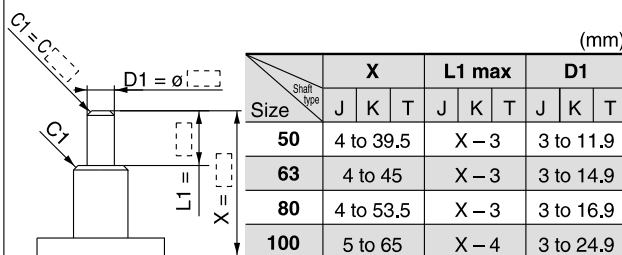
Symbol: A35 Machine female threads into the long shaft.

- The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
- Applicable shaft types: X, Z



Symbol: A37 The long shaft can be further shortened by machining it into a stepped round shaft.

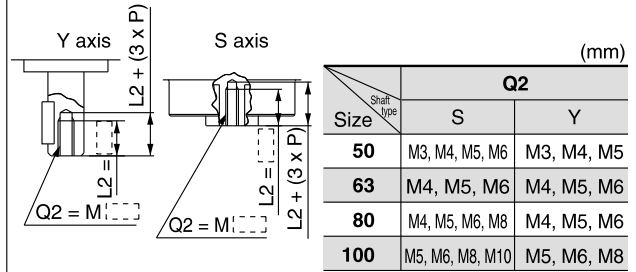
- (If shortening the shaft is not required, indicate "*" for dimension X.)
(If not specifying dimension C1, indicate "*" instead.)
- Equal dimensions are indicated by the same marker.
- Applicable shaft types: J, K, T



Axial: Bottom (Short shaft side)

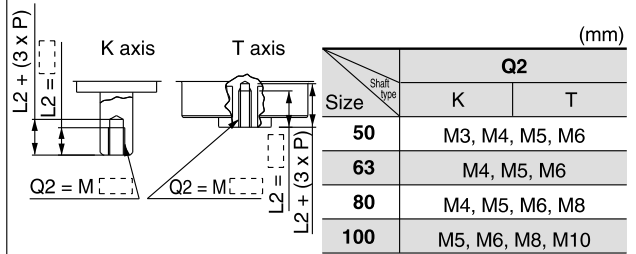
Symbol: A32 Machine female threads into the short shaft.

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



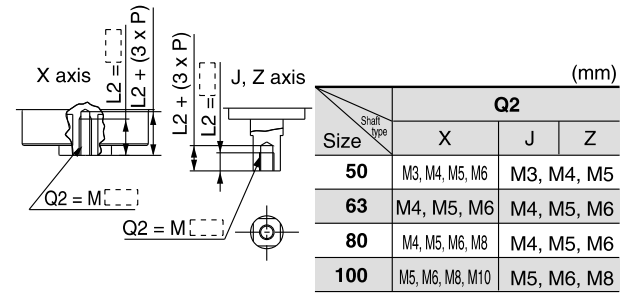
Symbol: A34 Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M3: L2 = 6 mm
- Applicable shaft types: K, T



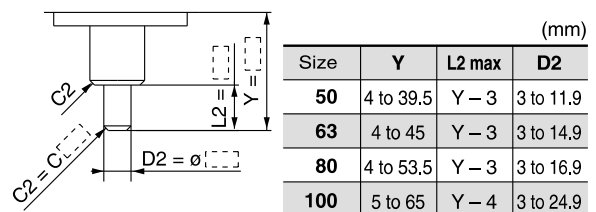
Symbol: A36 Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M3: L2 = 6 mm
- Applicable shaft types: J, X, Z



Symbol: A38 The short shaft can be further shortened by machining it into a stepped round shaft.

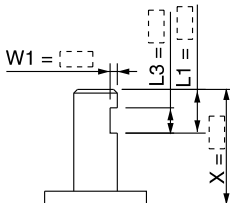
- (If shortening the shaft is not required, indicate "*" for dimension Y.)
(If not specifying dimension C2, indicate "*" instead.)
- Equal dimensions are indicated by the same marker.
- Applicable shaft type: K



Axial: Top (Long shaft side)

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

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



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

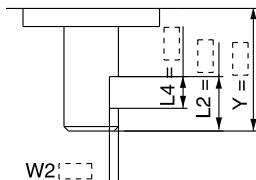
Caution

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

Axial: Bottom (Short shaft side)

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

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



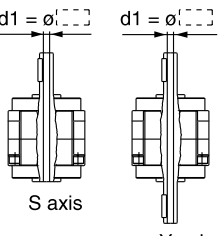
Size	Y		W2		L2 max		L4 max	
	50	11.5 to 39.5	1 to 6	Y-3	L2-2			
63	12.5 to 45	1 to 7.5	Y-3	L2-2				
80	13.5 to 53.5	1 to 8.5	Y-3	L2-2				
100	18.5 to 65	1 to 12.5	Y-4	L2-2				

Size	W1, W2	L1-L3, L2-L4	Size	W1, W2	L1-L3, L2-L4
50	4.5 to 6	2 to 5.5	80	6.5 to 8.5	2 to 6.5
63	6 to 7.5	2 to 3	100	10.5 to 12.5	2 to 6.5

Double Shaft

Symbol: A39 Applicable to single vane type only

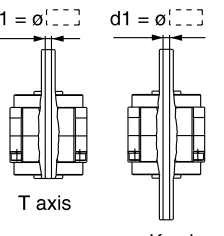
Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: S, Y



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

Symbol: A40 Applicable to single vane type only

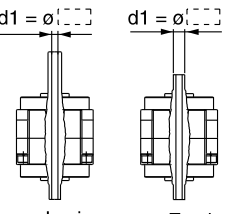
Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: K, T



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

Symbol: A41 Applicable to single vane type only

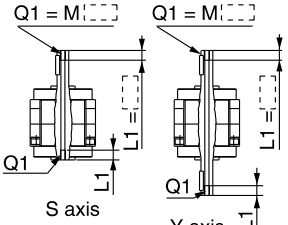
Shaft with through-hole
• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: J, X, Z



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

Symbol: A42 Applicable to single vane type only

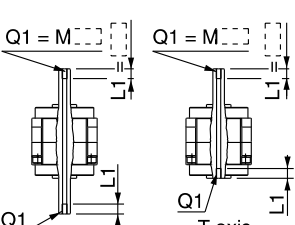
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.
• The maximum dimension L1 is, as a rule, twice the thread size.
• Applicable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



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

Symbol: A43 Applicable to single vane type only

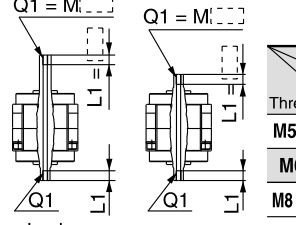
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through holes, whose diameter is equivalent to the diameter of the pilot holes.
• The maximum dimension L1 is, as a rule, twice the thread size.
• Applicable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



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

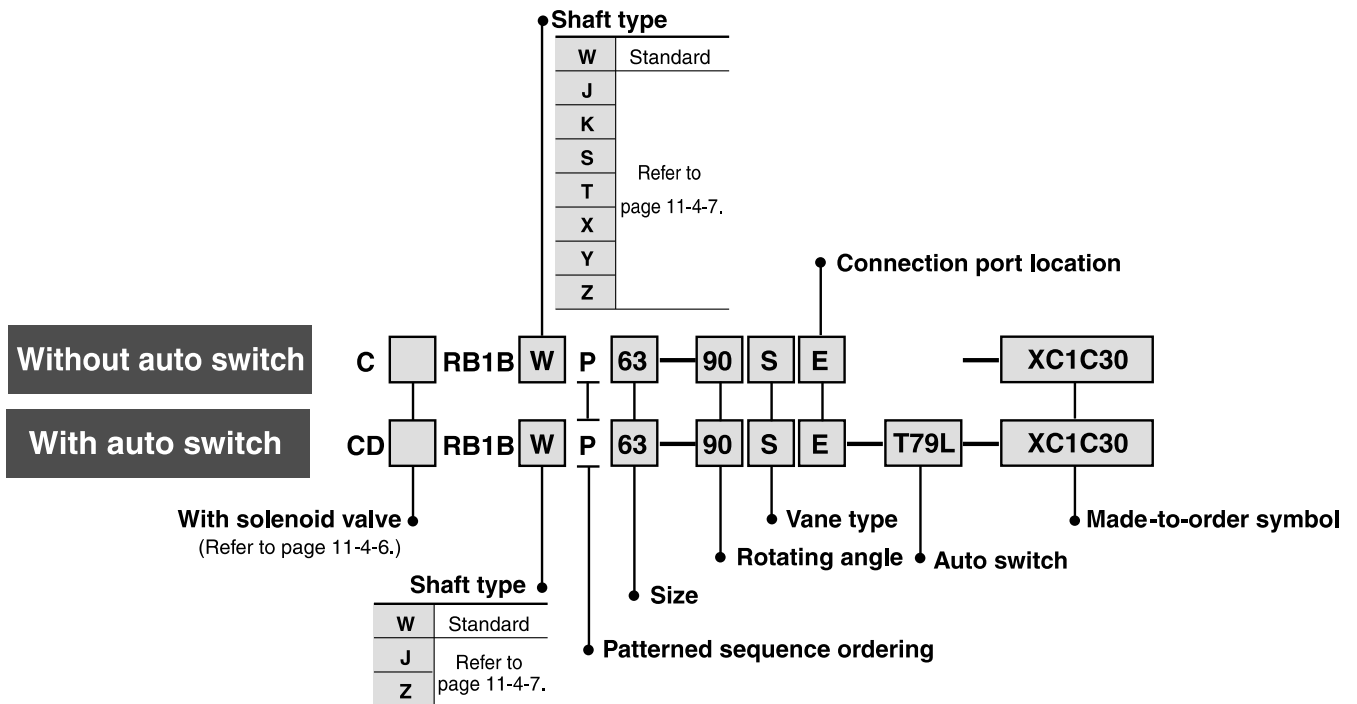
Symbol: A44 Applicable to single vane type only

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



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

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



Made-to-Order Symbol

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

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

Combination

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

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

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

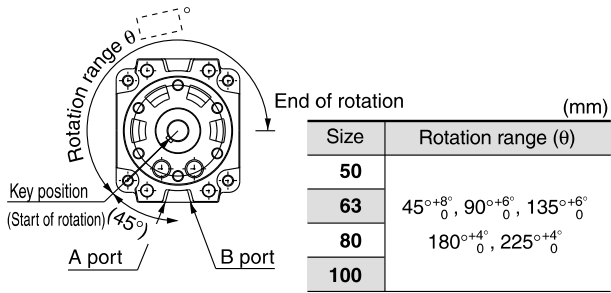
Symbol: C4 Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (90° down from the top to the right side).

Size	Rotation range θ
50	$45^{\circ+8^{\circ}}_0, 90^{\circ+8^{\circ}}_0, 135^{\circ+6^{\circ}}_0$
63	
80	
100	

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

Symbol: C5

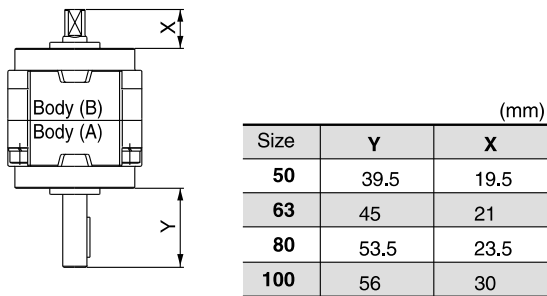
Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (45° down from the top to the left side).



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

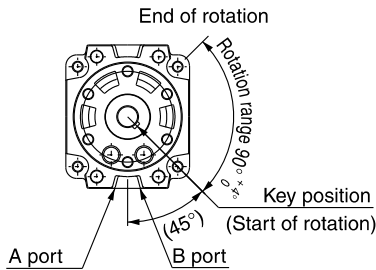
Symbol: C7

The shafts are reversed.



Symbol: C27

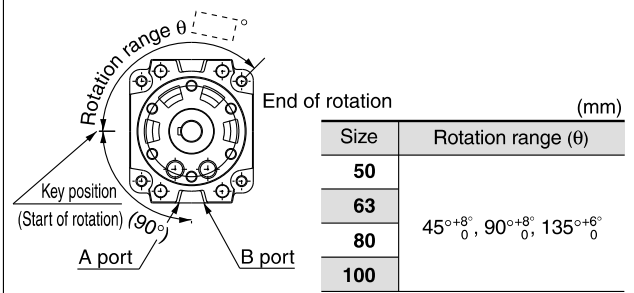
Change of rotation. (Applicable to double vane type only)
Rotation: 90° Rotation starts from the horizontal line (45° down from the top to the right side).



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

Symbol: C6

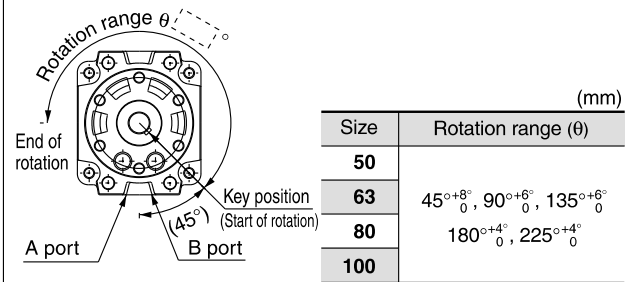
Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (90° down from the top to the left side).



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

Symbol: C26

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



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

Symbol: C30

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

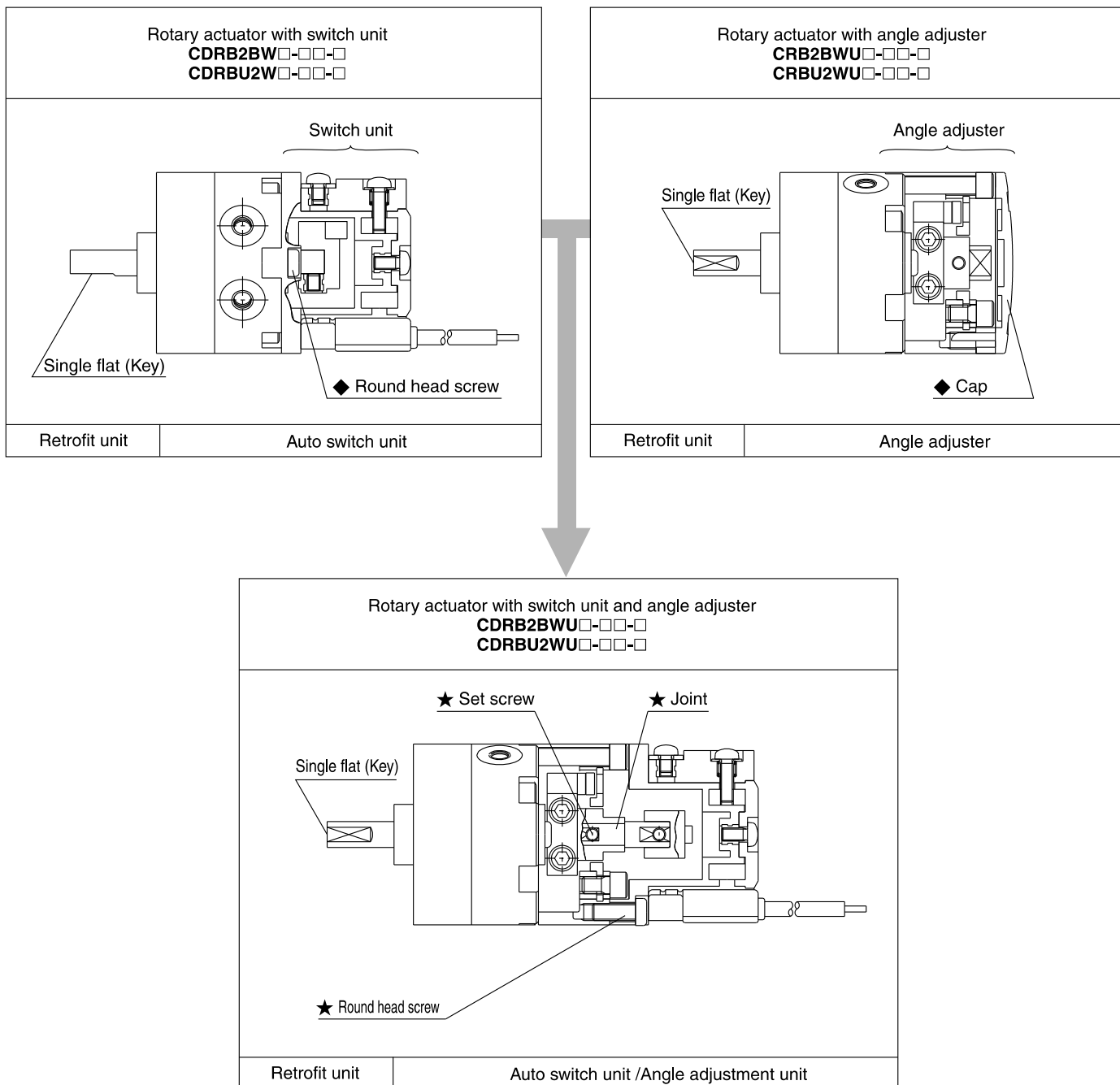
D-

20-

Series **CRB2/CRBU2/CRB1** Rotary Actuators Component Unit

Auto Switch Unit and Angle Adjuster

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



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

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

Note) Illustrations above show Series CRB2BW.

Component Unit Series **CRB2/CRBU2/CRB1**

1 Auto Switch Unit Part No.

Each unit can be retrofitted to the rotary actuator.

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

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

2 Switch Block Unit Part No.

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

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

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

3 Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

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

4 Auto Switch Angle Adjuster Part No.

Each unit can be retrofitted to the rotary actuator.

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

5 Joint Unit Part No.

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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Series CRB2/CRBU2

Installation of Angle Adjuster

Specifications

Single Vane Type

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

Note 1) Use rotary actuator for 270°.

Note 2) Connection ports are side ports only.

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

Double Vane Type

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

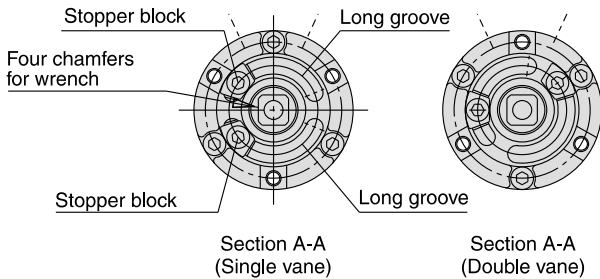
Note 1) Since the maximum angle of the rotation adjustment range will be limited by the rotation when using a rotary actuator for 90°, make sure to take this into consideration when ordering. Rotary actuator for 90° should be used to adjust the angle of 85° or less as a guide.

Note 2) Connection ports are side ports only.

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

Rotation Adjustment Method

Remove the resin cap in the illustrations below, slide the stopper block on the long groove and lock it into the appropriate position to adjust the rotation and rotation position. Protruding four chamfers for wrench on the output shaft that rotates allows manual operation and convenient positioning. (Refer to the rotation setting examples shown in the next page for details.)



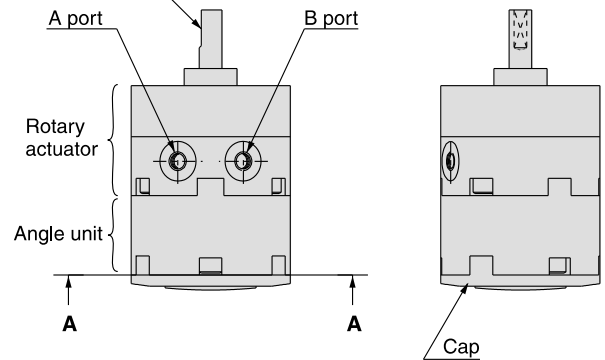
Note) For size 40, each stopper block comes with 2 holding bolts.

Recommended Tightening Torque for Holding Stopper Block

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

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

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



Other Operating Method

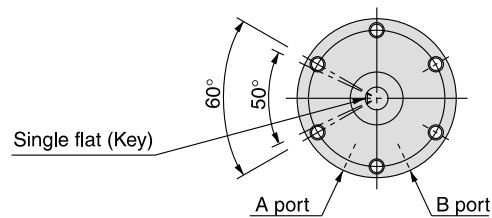
Although one stopper block is mounted on each long groove for standard specifications as shown in the illustrations below, 2 stopper blocks can be mounted on one long groove.

Angle adjustment range when 2 stopper blocks are mounted on a single long groove

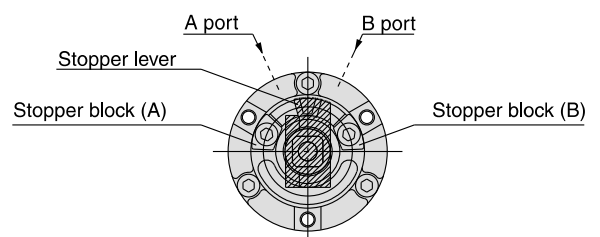
Size: 10, 4050°

Size: 15, 20, 3060°

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



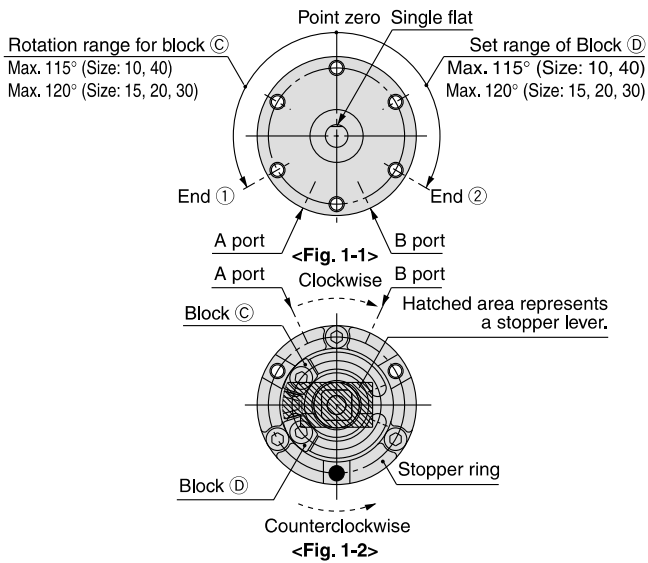
<Figure a>



<Figure b>

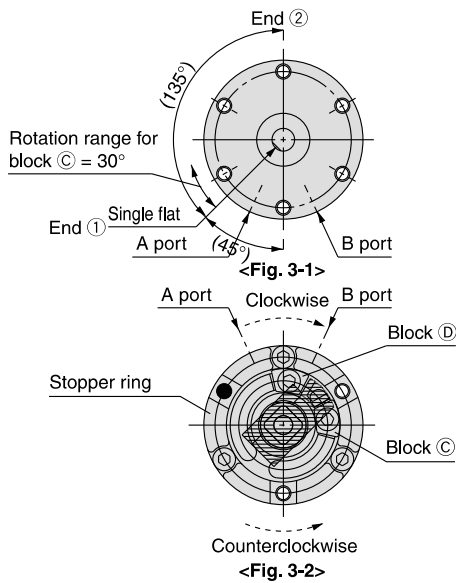
Rotation Setting Example

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



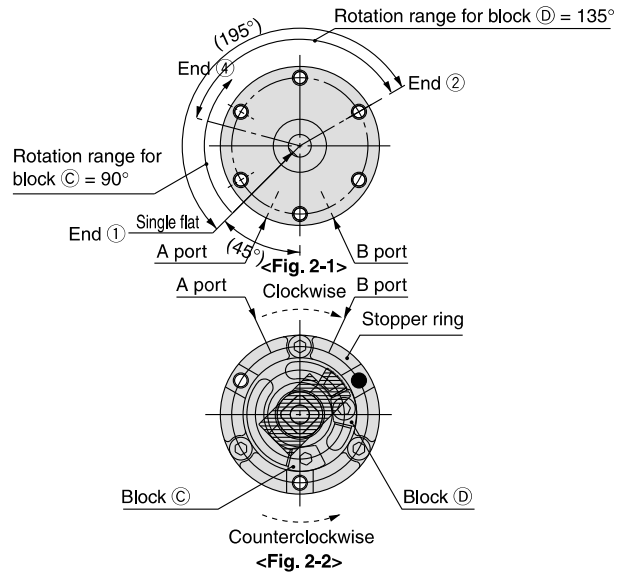
Lock block D in Fig. 1-2, and move block C clockwise to allow the rotation of the shaft with single flat in Fig. 1-1 from point zero to end of rotation ①. When block C is locked and block D is moved counterclockwise, the shaft with single flat in Fig. 1-1 rotates from point zero to end of rotation ②. The maximum rotation range of the shaft with single flat is as follows: Sizes 10, 40: up to 230°; Sizes 15, 20, 30: up to 240° (Fig. 1-2 shows when the rotation is 0°).

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



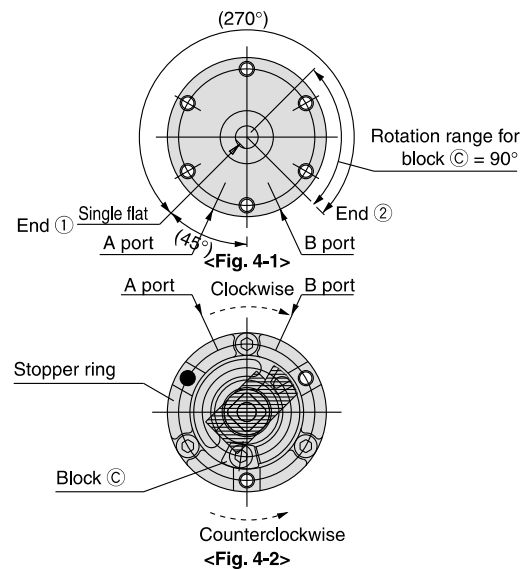
Lock block C in Fig. 3-2 and move block D counterclockwise to allow the rotation of the shaft with single flat in Fig. 3-1 from end of rotation ① to end of rotation ②. However, since the internal stopper will come into contact with the vane at end of rotation ①, make sure that the stopper lever stops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

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



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

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



The maximum rotation range of the shaft with single flat is 270°, from end of rotation ① to end of rotation ②, when using the actuator for 270° and end of rotation ① side in Fig. 4-1 is stopped with the internal stopper and end of rotation ② side is adjusted using block C. The rotation can be adjusted within 90° from end of rotation ②. Note that block C cannot be moved and set 90° counterclockwise from its position in Fig. 4-2 since the internal stopper will come into contact with the vane.

Note 1) Mounting of the stopper ring shown in Examples 2, 3, and 4 are not applicable for size 10.

Note 2) ● marks in the illustrations above indicate the position of the stopper ring assembly.

Note 3) Select the appropriate rotation of the rotary actuator by itself after careful consideration of the content of "installation of angle adjuster".

Note 4) For size 40, each block comes with 2 holding bolts.

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Series CDRB2/CDRBU2/CRB1 With Auto Switch

Applicable Auto Switch

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

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

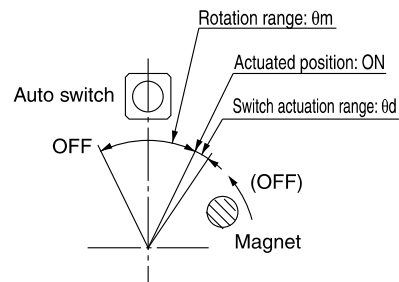
Operating Range and Hysteresis

* Operating range: θ_m

The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the switch turns OFF as the magnet travels the same direction.

* Hysteresis range: θ_d

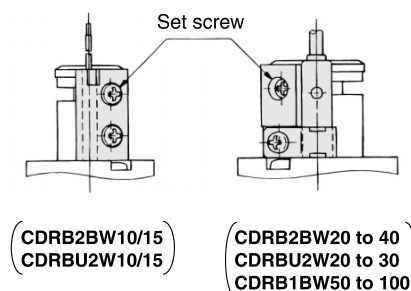
The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the switch turns OFF as the magnet travels the opposite direction.



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

How to Change the Detecting Position of Auto Switch

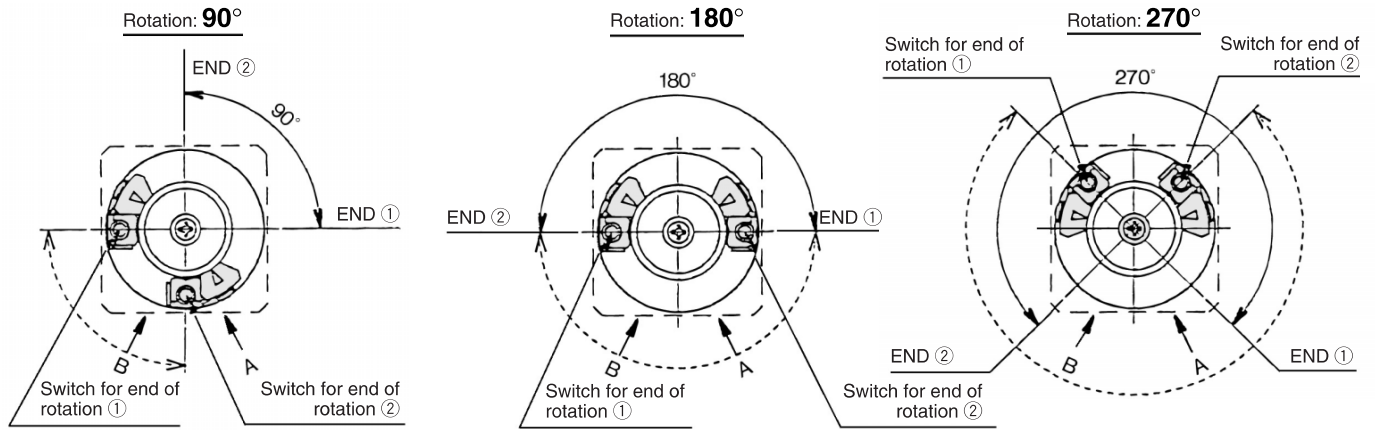
* When setting the detection location, loosen the tightening screw a bit and move a switch to the preferred location and then tighten again and fix it. At this time, if tightened too much, screw can become damaged and unable to fix location. Be sure to set the tightening torque around 0.49 N·m.



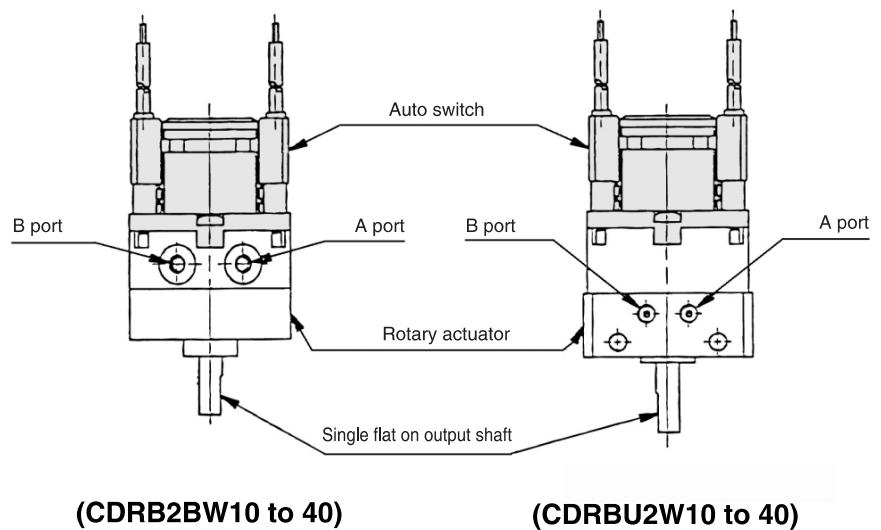
Adjustment of Auto Switch

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

<Single vane>



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



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

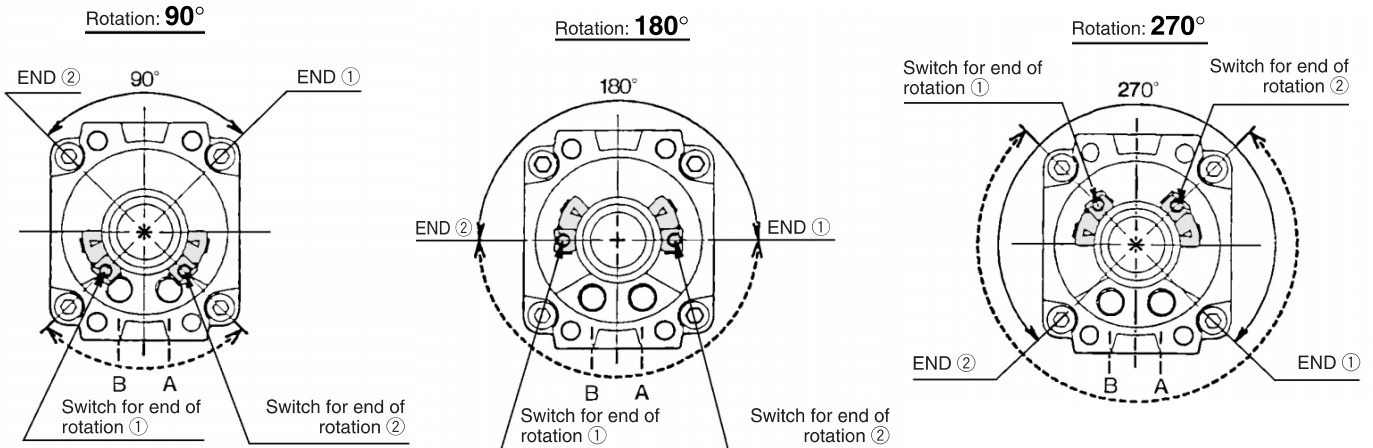
Series CDRB2/CDRBU2/CRB1

Adjustment of Auto Switch

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

Size: 50, 63, 80, 100

<Single vane>



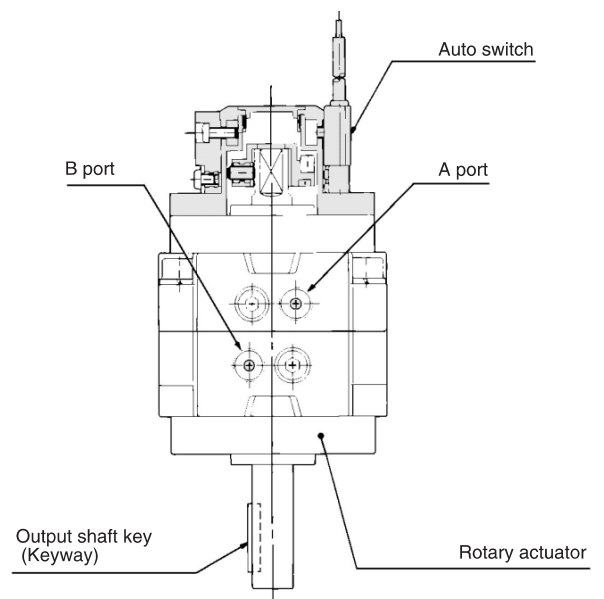
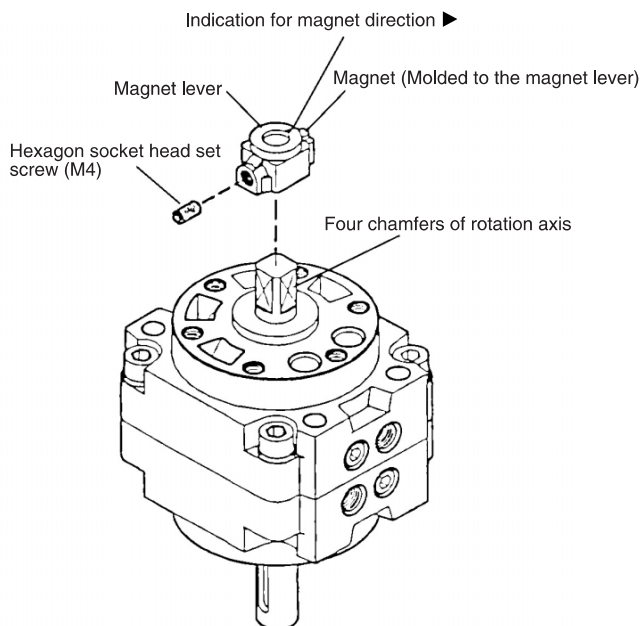
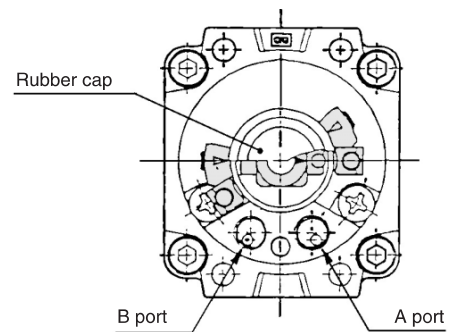
* Solid-lined curves indicate the rotation range of the output key (keyway). When the key is pointing to end of rotation ①, the switch for end of rotation ① will operate, and when the key is pointing to end of rotation ②, the switch for end of rotation ② will operate.

* Broken-lined curves indicate the rotation range of the built-in magnet. Rotation range of the switch can be decreased by either moving the switch for end of rotation ② clockwise or moving the switch for end of rotation ② counterclockwise. Auto switch in the illustrations above is at the most sensitive position.

* Each auto switch unit comes with one right-hand and one left-hand switch.

* The magnet position can be checked with a convenient ► indication by removing a rubber cap when adjusting the auto switch position.

* Since four chamfers are machined into the axis of rotation, a magnet position can be readjusted at 90° intervals.



Rotary Actuator Vane Style

Series CRB2

Size: 10, 15, 20, 30, 40

Series Variations

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

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

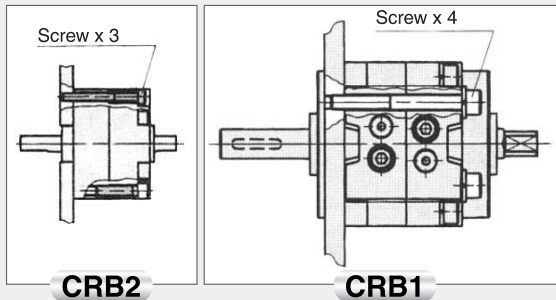
Rotary Actua

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

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

Direct mounting

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



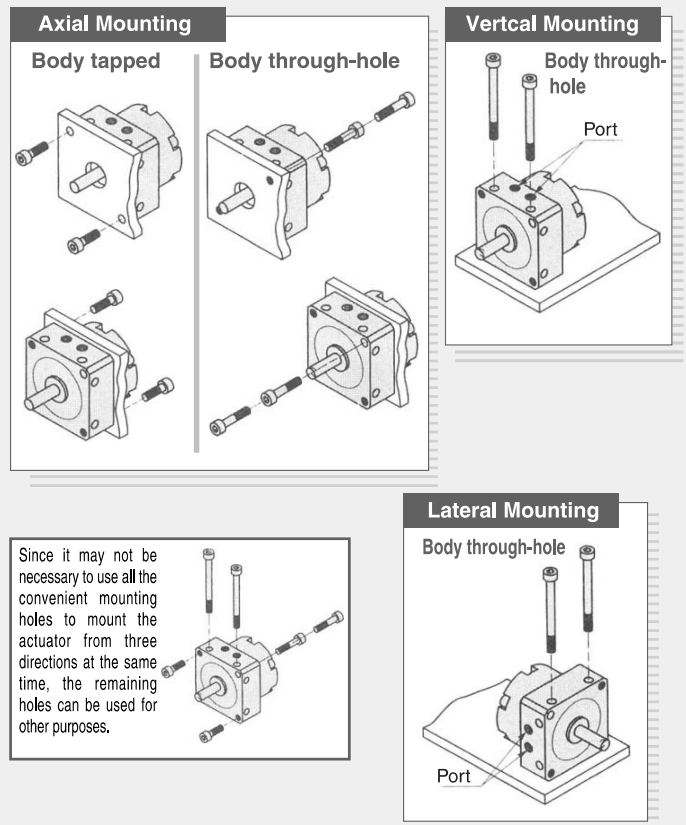
Unrestricted auto switch mounting position

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



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

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



Excellent reliability and durability

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

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

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

Low pressure operation

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

Min. operating pressure

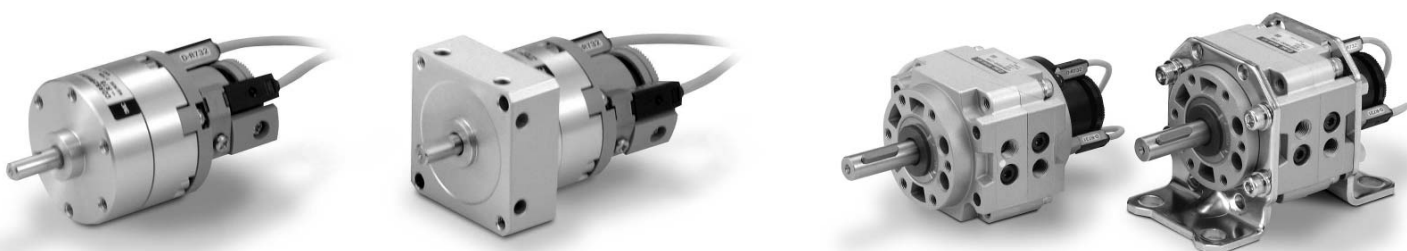
Size 10: 0.2 MPa

Size 15 to 100: 0.15 MPa

Block (Unit) type construction

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

Basic Type + Switch Unit



tor Vane Style

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



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



CRB1/Size:
50, 63, 80, 100

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

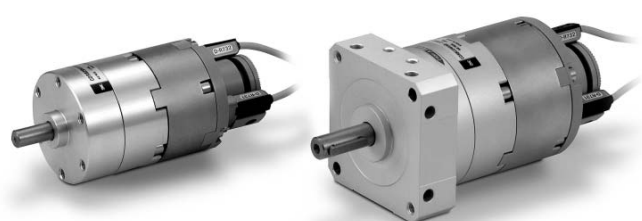
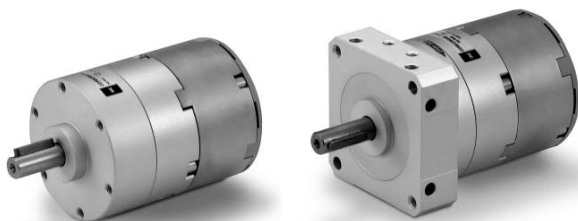
Although the outside dimensions of the double vane construction actuators are equivalent to those of the single vane construction type (except for size 10), double vane construction can get twice the torque of the single vane style.

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

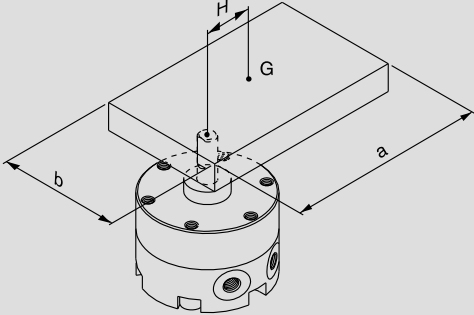
- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MRQ
- D-
- 20-

Basic Type + Angle Adjuster

Basic Type + Angle Adjuster + Switch Unit



Series CRB2/CRBU2/CRB1 Model Selection

Selection Procedure	Formula	Selection Example										
<p>1 Operating conditions</p> <p>Operating conditions are as follows:</p>	<ul style="list-style-type: none"> • Model used • Operating pressure • Load type <ul style="list-style-type: none"> Ts (N·m) Tf (N·m) Ta (N·m) • Load configuration • Rotation time t (s) • Rotation • Load mass m (kg) • Distance between central axis and center of gravity H (mm) 	 <p>Rotary actuator: CRB2BW30-90S, Pressure: 0.5 MPa Mounting position: Vertical, Type of load: Inertial load Ta Load configuration: 60 mm x 40 mm (Rectangular plate) Rotation time (t): 0.3 s, Rotation: 90° ($\theta = \pi/2$) Load mass (m): 0.15 kg, Distance between central axis and center of gravity (H): 30 mm</p>										
<p>2 Required torque</p> <p>Confirm the type of load as shown below, and select an actuator that satisfies the required torque.</p> <ul style="list-style-type: none"> • Static load: Ts • Resistance load: Tf Load type • Inertial load: Ta 	<p>Effective torque $\geq Ts$ Effective torque $\geq (3 \text{ to } 5) Tf$ Effective torque $\geq 10 Ta$</p> <p>Effective torque</p>	<p>Inertial load</p> $10 \times Ta = 10 \times I \times \dot{\omega} = 10 \times 0.0002 \times \pi / 0.3^2 = 0.07 \text{ N}\cdot\text{m} < \text{Effective torque OK}$ <p>Note) I is obtained by substituting the value of inertia moment ⑤. $\dot{\omega} = \frac{2\theta}{t^2}$ ($\dot{\omega}$: Angular acceleration)</p>										
<p>3 Rotation time</p> <p>Confirm that it is within the adjustable range of rotation time.</p>	<table border="1"> <thead> <tr> <th>Model</th> <th>Rotation time adjustment range for stable operation S/90°</th> </tr> </thead> <tbody> <tr> <td>CRB2BW/CRBU2W10 to 20</td> <td>0.03 to 0.3</td> </tr> <tr> <td>CRB2BW/CRBU2W30</td> <td>0.04 to 0.3</td> </tr> <tr> <td>CRB2BW/CRBU2W40</td> <td>0.07 to 0.5</td> </tr> <tr> <td>CRB1BW50 to 100</td> <td>0.1 to 1</td> </tr> </tbody> </table>	Model	Rotation time adjustment range for stable operation S/90°	CRB2BW/CRBU2W10 to 20	0.03 to 0.3	CRB2BW/CRBU2W30	0.04 to 0.3	CRB2BW/CRBU2W40	0.07 to 0.5	CRB1BW50 to 100	0.1 to 1	<p>0.3/90° OK</p>
Model	Rotation time adjustment range for stable operation S/90°											
CRB2BW/CRBU2W10 to 20	0.03 to 0.3											
CRB2BW/CRBU2W30	0.04 to 0.3											
CRB2BW/CRBU2W40	0.07 to 0.5											
CRB1BW50 to 100	0.1 to 1											
<p>4 Allowable loads</p> <p>Confirm that the radial load, thrust load, and moment are within the allowable ranges.</p>	<p>Thrust load: $m \times 9.8 \leq \text{Allowable load}$</p> <p>Allowable load</p>	<p>$0.15 \times 9.8 = 1.47 \text{ N} < \text{Allowable load OK}$</p>										
<p>5 Moment of inertia</p> <p>Find the load's moment of inertia "I" for the energy calculation.</p>	$I = m \times (a^2 + b^2) / 12 + m \times H^2$ <p>Moment of inertia</p>	$I = 0.15 \times (0.06^2 + 0.04^2) / 12 + 0.15 \times 0.03^2 = 0.0002 \text{ kg}\cdot\text{m}^2$										
<p>6 Kinetic energy</p> <p>Confirm that the load's kinetic energy is within the allowable value.</p>	<p>$1/2 \times I \times \omega^2 = < \text{Allowable energy}$ $\omega = 2\theta / t$ (ω: Terminal angular velocity) θ: Rotation angle (rad) t: Rotation time (s)</p> <p>Allowable kinetic energy/Rotation time</p>	$1/2 \times (0.0002) \times (2 \times (\pi / 2) / 0.3)^2 = 0.01096 \text{ J} < \text{Allowable energy OK}$										

Effective Torque

(N·m)

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

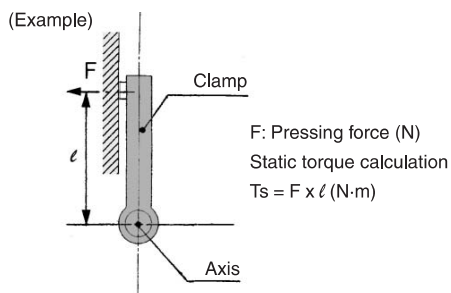
Load Type

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

● Static load: Ts

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

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



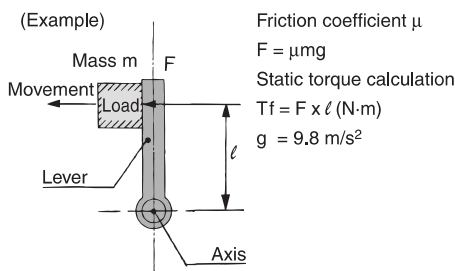
● Resistance load: Tf

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

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

* Actuator effective torque \geq (3 to 5) Tf

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



● Inertial load: Ta

The load which must be rotated by the actuator

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

* Actuator effective torque \geq S·Ta
(S is 10 times or more)

Accelerating torque calculation $Ta = I \cdot \dot{\omega}$ (N·m)

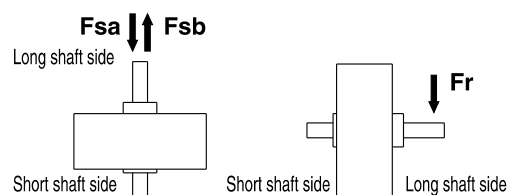
I: Moment of inertia
Refer to page 11-1-30.
 $\dot{\omega}$: Angular acceleration
 $\dot{\omega} = \frac{2\theta}{t^2}$ (rad/s²)
 θ : Rotation angle (rad)
t: Rotation time (S)



Allowable Load

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

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



Rotary Actuator Vane Style

Series *CRB2*

Size: 10, 15, 20, 30, 40

How to Order

Without auto switch

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

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

CRB2 **B** **W** **180** **S** **E**

CDRB2 **F** **W** **180** **S** **90** **L**

CDRB2 **B** **W** **180** **S** **R73** **L**

Size

10
15
20
30
40

Connecting port location

Nil	Side ported
E	Axial ported

Number of auto switches

S	1 pc.*
Nil	2 pcs.

Electrical entry/Lead wire length

Nil	Grommet/Lead wire 0,5 m
L	Grommet/Lead wire: 3 m
C	Grommet/lead wire 0,5 m
CL	Grommet/Lead wire: 3 m
CN	Grommet/Without lead wire

Auto switch

Nil	Without auto switch
-----	---------------------

Mounting style

B	Basic style
F	Flange style

* F: Except size 40

Shaft type

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

Rotating angle

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

Vane type

S	Single vane
D	Double vane

* Fittings are sold separately.

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

* Connectors are available only for auto switch types D-R73, D-R80, D-T79.

** Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

Applicable Auto Switch

Refer to page 11-1-1 for further information on auto switches.

Applicable size	Type	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model	Lead wire type	Lead wire length (m) *				Applicable load		
					DC	AC			0.5 (Nil)	3 (L)	5 (Z)	None (N)			
For 10 and 15	Reed switch	Grommet	No	2-wire	24 V	5 V, 12 V	5 V, 12 V, 24 V	90	Parallel cord	●	●	●	—	IC circuit	
						5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	90A	Heavy-duty cord	●	●	●	—		
						—	—	97	Parallel cord	●	●	●	—		
						—	100 V	93A	Heavy-duty cord	●	●	●	—		
						12 V	—	T99	Heavy-duty cord	●	●	—	—		
						—	—	T99V	Heavy-duty cord	●	●	—	—		
	Solid state switch	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	S99	Heavy-duty cord	●	●	—	—	IC circuit
							—	—	S99V	Heavy-duty cord	●	●	—	—	
							—	—	S9P	Heavy-duty cord	●	●	—	—	
							—	—	S9PV	Heavy-duty cord	●	●	—	—	
							—	—	R73	Heavy-duty cord	●	●	—	—	
							—	—	R73C	Heavy-duty cord	●	●	●	—	
For 20, 30 and 40	Reed switch	Grommet	Yes	2-wire	24 V	—	100 V	R80	Heavy-duty cord	●	●	—	—	IC circuit	
						—	—	R80C	Heavy-duty cord	●	●	●	—		
						48 V, 100 V	24 V, 48 V, 100 V	T79	Heavy-duty cord	●	●	—	—		
						—	—	T79C	Heavy-duty cord	●	●	●	—		
						12 V	—	S79	Heavy-duty cord	●	●	—	—		
						—	—	S7P	Heavy-duty cord	●	●	—	—		
	Solid state switch	Grommet	No	3-wire (NPN)	24 V	5 V, 12 V	—	—	R73	Heavy-duty cord	●	●	—	—	IC circuit
							—	—	R73C	Heavy-duty cord	●	●	●	—	
							—	—	R80	Heavy-duty cord	●	●	—	—	
							—	—	R80C	Heavy-duty cord	●	●	●	—	
							—	—	T79	Heavy-duty cord	●	●	—	—	
							—	—	T79C	Heavy-duty cord	●	●	●	—	

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

Flange Assembly Part No.

(For details, refer to page 11-2-10.)

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

Single Vane Specifications



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

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

Double Vane Specifications

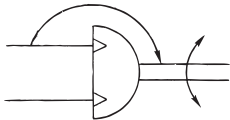
Model (Size)		CRB2BW10-□D			CRB2BW15-□D			CRB2BW20-□D			CRB2BW30-□D			CRB2BW40-□D		
Vane type		Double vane														
Rotating angle		90°, 100°														
Fluid		Air (Non-lube)														
Proof pressure (MPa)		1.05									1.5					
Ambient and fluid temperature		5 to 60°C														
Max.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

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

Note 2) The upper numbers in this section in the table indicate the energy factor when the rubber bumper is used (at the end of the rotation), and the lower numbers indicate the energy factor when the rubber bumper is not used.

Note 3) Adjustment range in the table is for 100°. For 90°, refer to page 11-2-9. (cm³)

JIS Symbol



Volume

Vane type	Single vane															Double vane											
	CRB2BW10-□S			CRB2BW15-□S			CRB2BW20-□S			CRB2BW30-□S			CRB2BW40-□S			CRB2BW10-□D		CRB2BW15-□D		CRB2BW20-□D		CRB2BW30-□D		CRB2BW40-□D			
Rotation	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Volume	1 (0.6)	1.2	1.5	1.5 (1.0)	2.9	3.7	4.8 (3.6)	6.1	7.9	11.3 (8.5)	15	20.2	25 (18.7)	31.5	41	1.0	1.1	2.6	2.7	5.6	5.7	14.4	14.5	33	34		

≠ Values inside () are volume of the supply side when A port is pressurized.

Weight

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

Series CRB2

Rotary Actuator: Replaceable Shaft

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

Without auto switch

CRB2B

J

Size

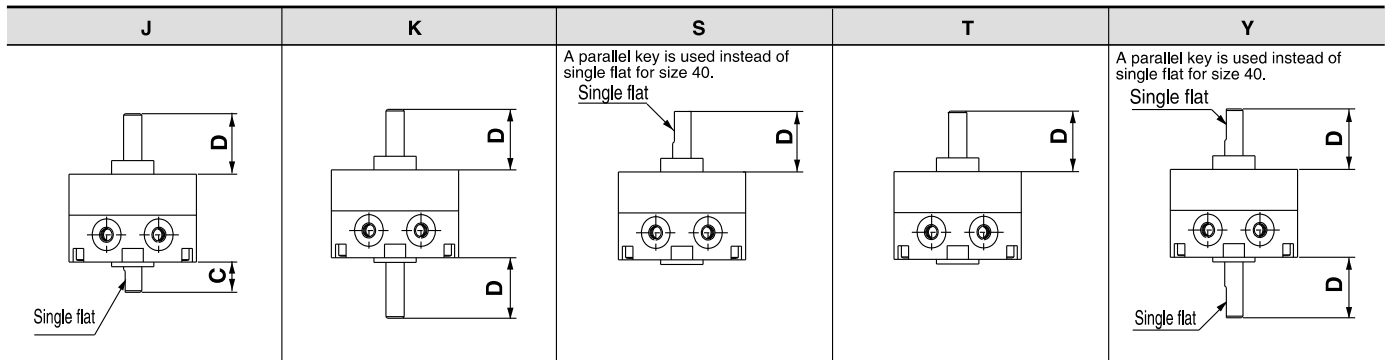
Rotating angle

Vane type

Port location

Shaft type

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



(mm)

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

Note 1) Only side ports are available except for basic type.

Note 2) Dimensions and tolerance of the shaft and single flat (a parallel keyway for size 40) are the same as the standard.

With auto switch
With angle adjusted

CDRB2B J U

Size

Rotating angle

Vane type

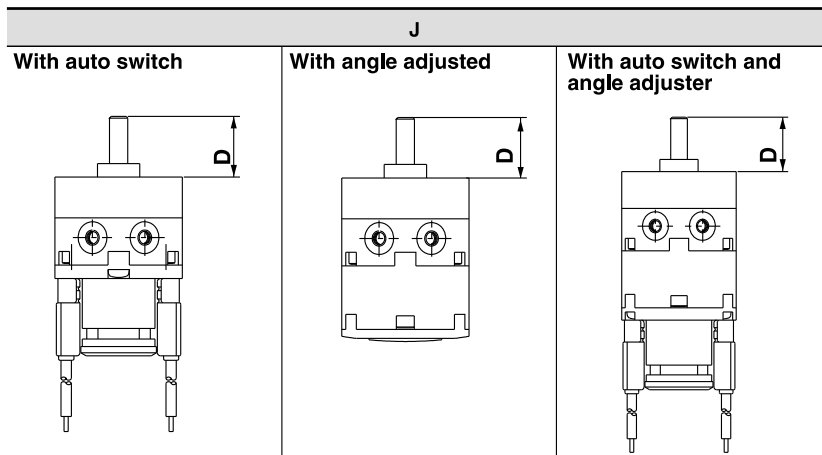
Auto switch

With angle adjuster

Shaft type

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

(mm)



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

Note 1) Only side ports are available except for basic type.

Note 2) Dimensions and tolerance of the shaft and single flat (a parallel keyway for size 40) are the same as the standard.

Copper-free

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

└ Copper-free

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

Specifications

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

⚠ Precautions

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

Angle Adjuster

⚠ Caution

1. In case of a rotary actuator for a 90° or 180° application, the maximum angle will be limited by the rotation of the rotary actuator itself. Make sure to take this into consideration when ordering.

In case of a rotary actuator for a 90° or 180° application, angle adjustment at the maximum angle of 90° or 180°, respectively, is not feasible. This is due to the fact that the rotation of the rotary actuator is limited to $90^{\circ} \pm 4^{\circ}$ or $180^{\circ} \pm 4^{\circ}$, respectively. Therefore, for the single vane type, use a rotary actuator with a rotation angle of 270°, and for the double vane type, use a rotary actuator with a rotation of 100°. When operating a rotary actuator with a rotation of 90° or 180°, the rotation should be adjusted to within 85° and 175°, respectively, as a guide.

2. Connection ports are side ports only.

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Series CRB2

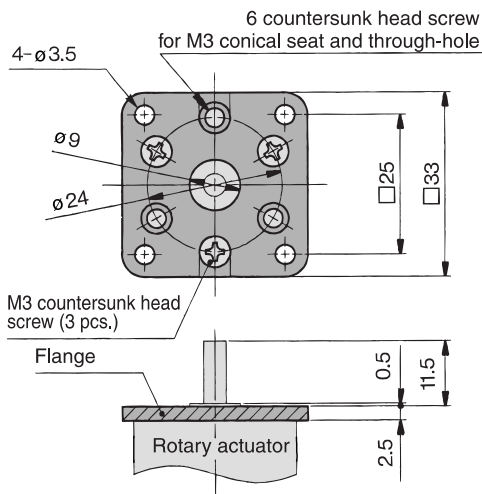
Option Specifications: Flange (Size: 10, 15, 20, 30)



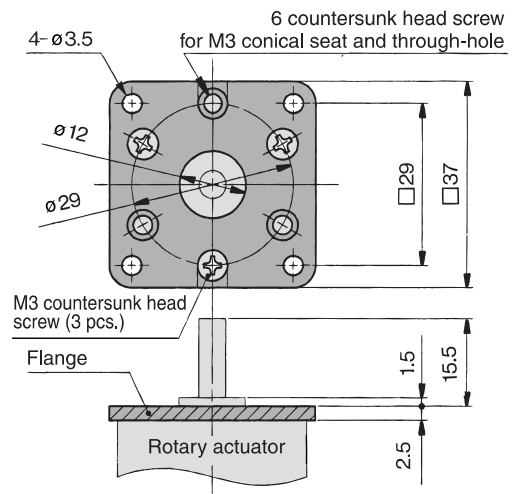
Basic type	Type			Flange assembly part no.
	With auto switch	With angle adjuster	With angle adjuster and auto switch	
CRB2FW10	CDRB2FW10	CRB2FWU10	CDRB2FWU10	P211070-2
CRB2FW15	CDRB2FW15	CRB2FWU15	CDRB2FWU15	P211090-2
CRB2FW20	CDRB2FW20	CRB2FWU20	CDRB2FWU20	P211060-2
CRB2FW30	CDRB2FW30	CRB2FWU30	CDRB2FWU30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

Note 1) The flange (with countersunk head screws) is not mounted on the actuator at the time of shipment.
 Note 2) The flange can be mounted on the rotary actuator at 60-degree intervals.

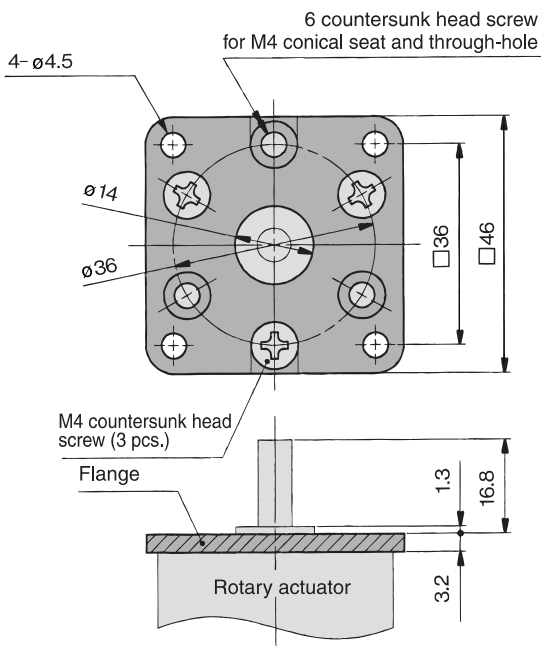
Assembly Part No.: P211070-2 (for C□RB2FW□10)



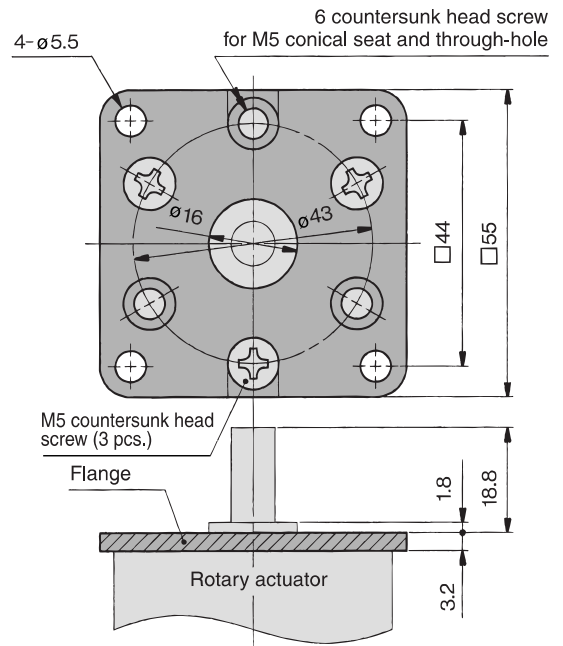
Assembly Part No.: P211090-2 (for C□RB2FW□15)



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



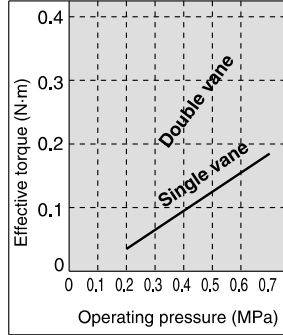
Assembly Part No.: P211080-2 (for C□RB2FW□30)



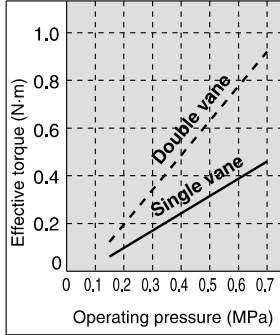
Effective Output

Direct Mounting of Body

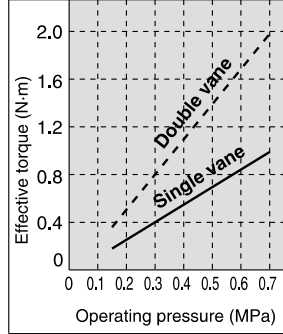
CRB2BW10



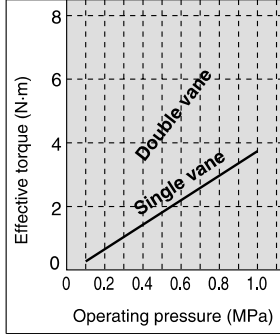
CRB2BW15



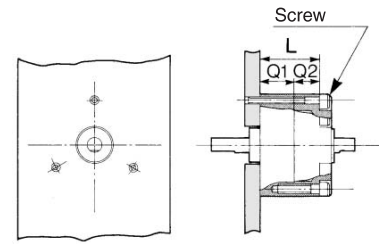
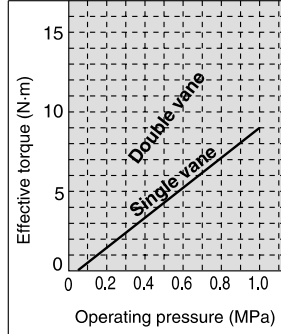
CRB2BW20



CRB2BW30



CRB2BW40



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

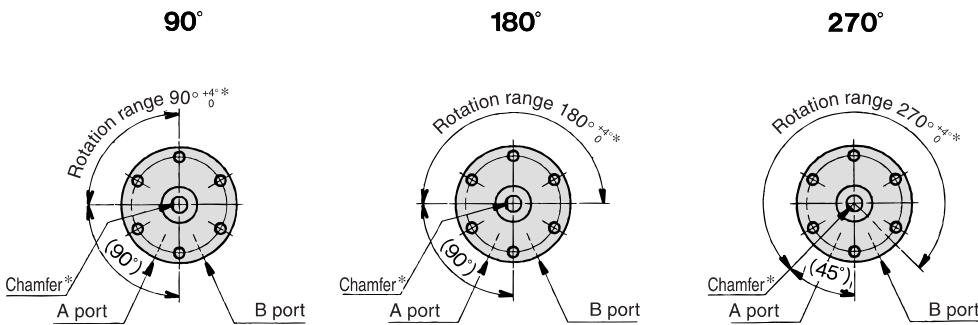
Model	L	Screw
CRB2BW10	11.5 *	M2.5
CRB2BW15	16	M2.5
CRB2BW20	24.5	M3
CRB2BW30	34.5	M4
CRB2BW40	39.5	M4

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

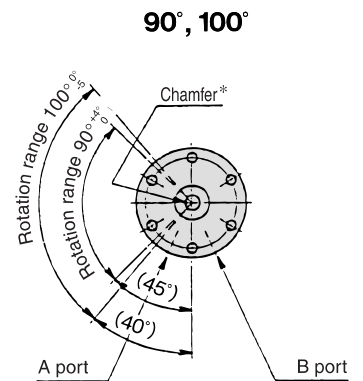
Chamfered Position and Rotation Range: Top View from Long Shaft Side

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

Single vane type



Double vane type



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



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

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

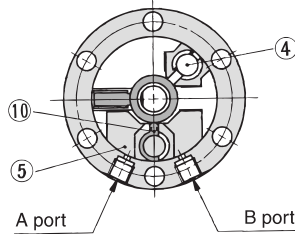
Series CRB2

Construction: 10, 15, 20, 30, 40

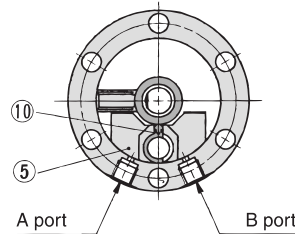
Single vane type

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

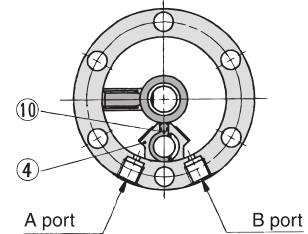
For 90°
(Top view from long shaft side)



For 180°
(Top view from long shaft side)

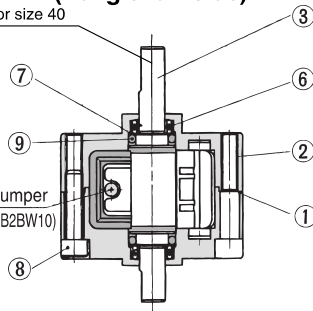


For 270°
(Top view from long shaft side)



(Long shaft side)

Parallel keyway for size 40



Internal rubber bumper
(Not applicable to CRB2BW10)

(Short shaft side)

Component Parts

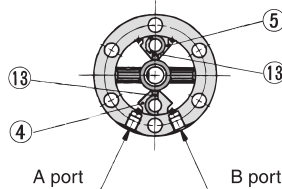
No.	Description	Material	Note
①	Body (A)	Aluminum alloy	White
②	Body (B)	Aluminum alloy	White
③	Vane shaft	Stainless steel *	
④	Stopper	Resin	For 270°
⑤	Stopper	Resin	For 180°
⑥	Bearing	High carbon chrome bearing steel	
⑦	Back-up ring	Stainless steel	
⑧	Hexagon socket head cap screw	Stainless steel	Special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

* Carbon steel for CRB2BW30 and CRB2BW40.

Double vane type

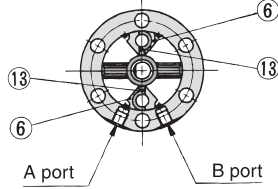
CRB2BW10-□D Illustrations below show the intermediate rotation position when A or B port is pressurized.

For 90°
(Top view from long shaft side)

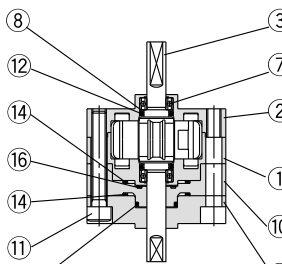


(Long shaft side)

For 100°
(Top view from long shaft side)



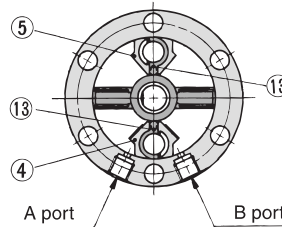
(Long shaft side)



(Short shaft side)

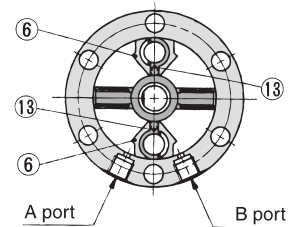
CRB2BW15/20/30/40-□D Illustrations below show size 20 actions.

For 90°
(Top view from long shaft side)

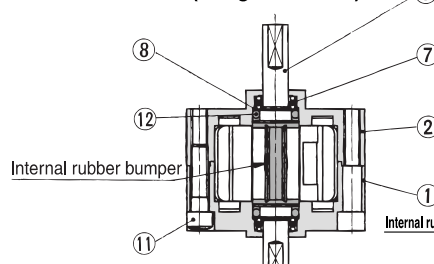


(Long shaft side)

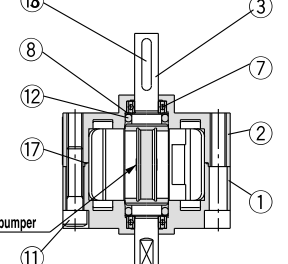
For 100°
(Top view from long shaft side)



(Long shaft side)



(Short shaft side)



(Short shaft side)
For size 40

Component Parts

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

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

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

Construction (With auto switch unit)

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

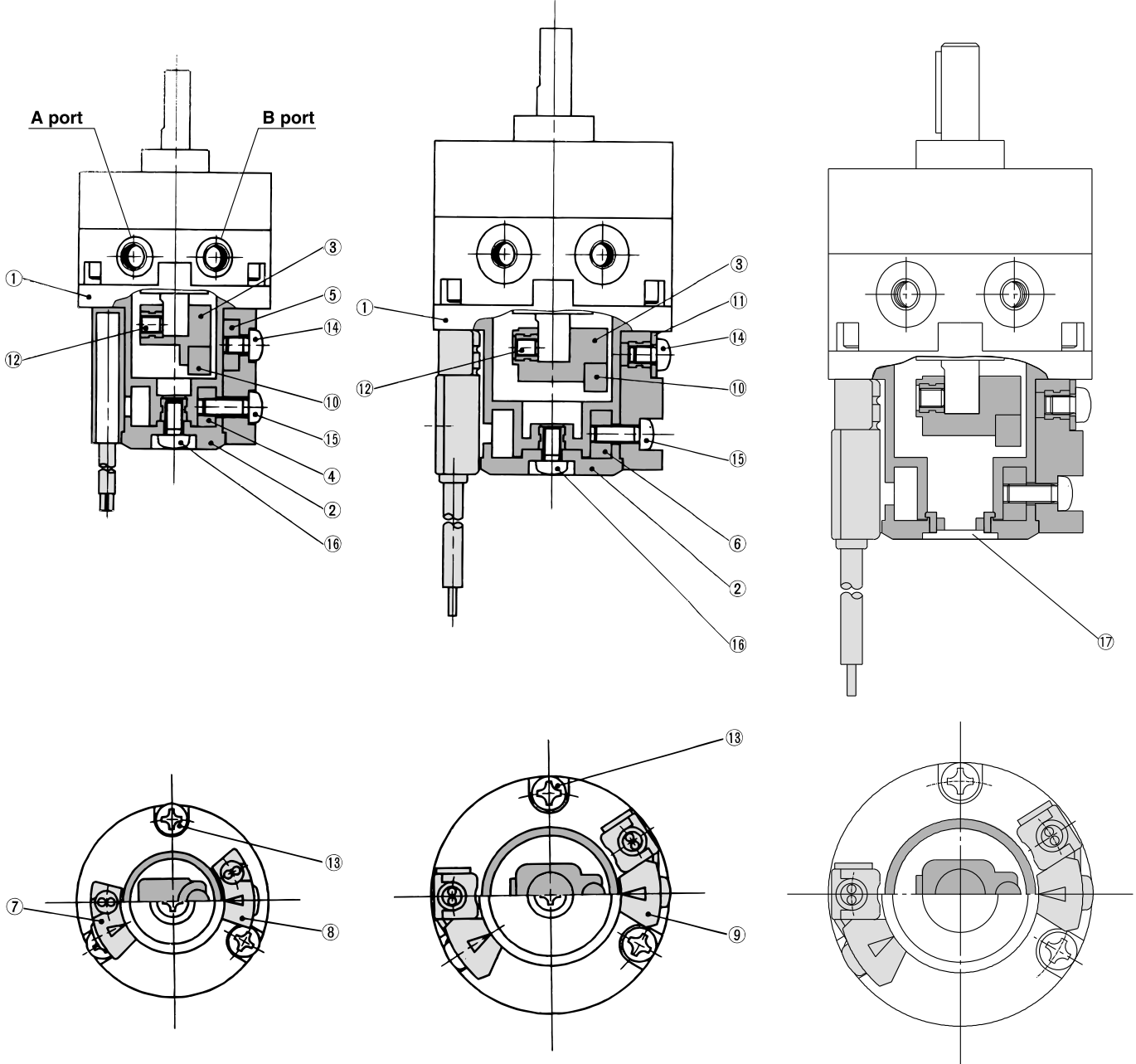
(Same switch units are used for both single and double vane types.)

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

CDRB2BW10/15-□ $\frac{S}{D}$

CDRB2BW20/30-□ $\frac{S}{D}$

CDRB2BW40-□ $\frac{S}{D}$



Component Parts

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

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

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

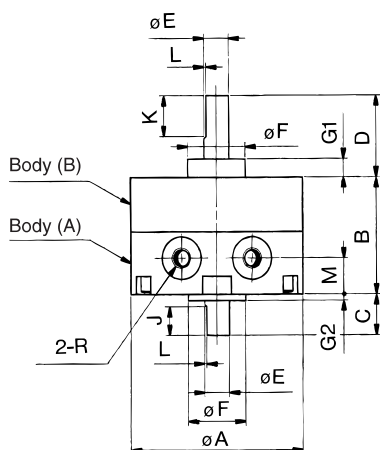
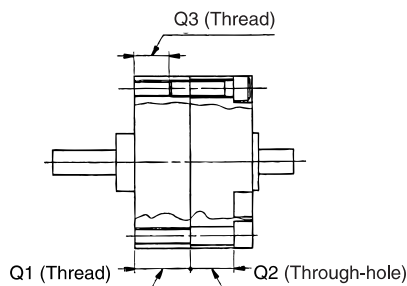
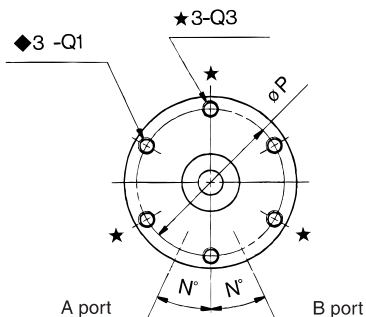
Series CRB2

Dimensions: 10, 15, 20, 30

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

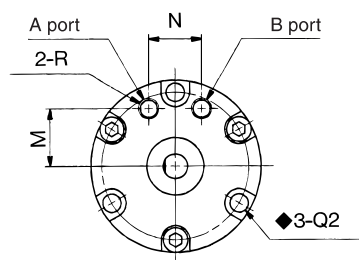
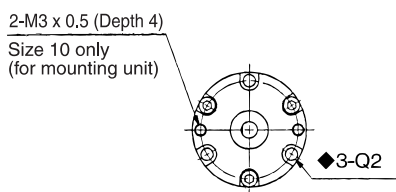
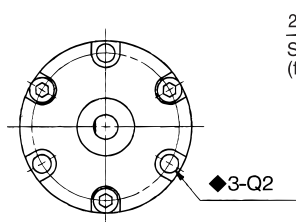
CRB2BW□-□S

<Port location: Side ported>



CRB2BW10-□S
<Port location: Side ported>

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



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

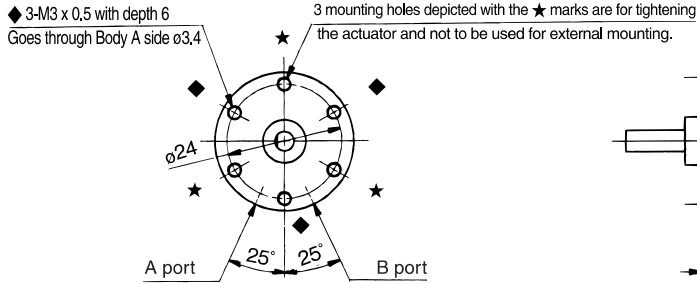
Note) The pre-drilled mounting threads for CRB2BW15, 20, and 30, 3 mounting holes depicted with the ★ marks are for tightening the actuator and not to be used for external mounting.

(mm)

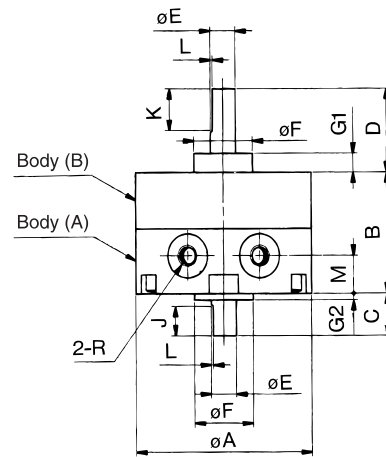
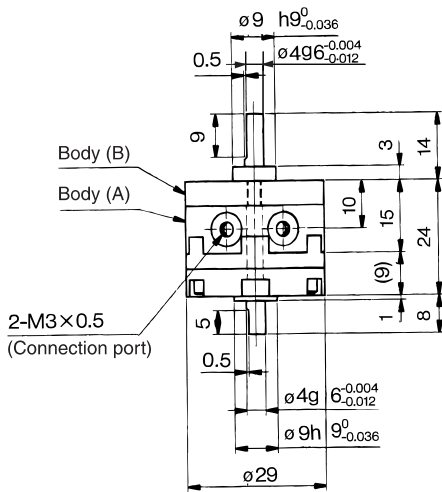
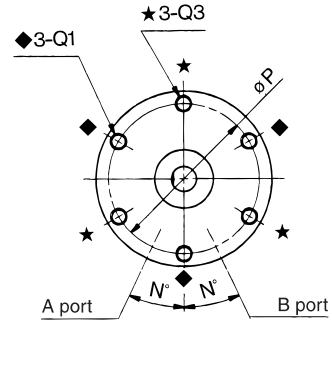
Model	A	B	C	D	E (g6)	F (h9)	G1	G2	J	K	L	M	N	P	◆Q1	◆Q2	★Q3	R		
																		90°	180°	270°
CRB2BW10-□S	29	15	8	14	4 ^{-0.004} _{-0.012}	9 ⁰ _{-0.036}	3	1	5	9	0.5	5	25	24	M3 (6)	3.4 (5.5)	—	M5	M3	
CRB2BW10-□SE												8.5	9.5					M3	M3	
CRB2BW15-□S	34	20	9	18	5 ^{-0.004} _{-0.012}	12 ⁰ _{-0.043}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

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

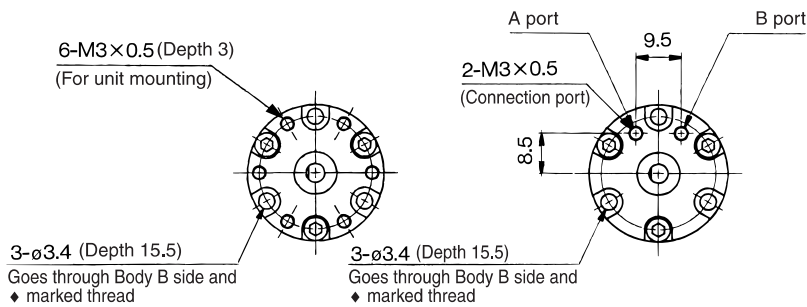
CRB2BW10-□D <Port location: Side ported>



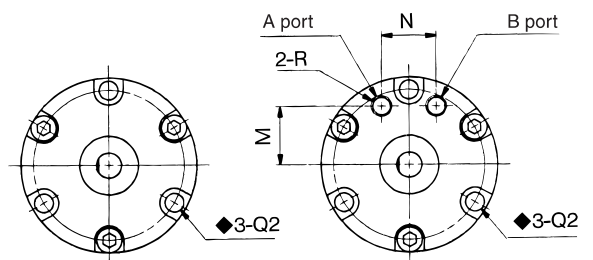
CRB2BW15/20/30-□D <Port location: Side ported>



CRB2BW10-□DE <Port location: Axial ported>



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



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Model	A	B	C	D	E (g6)	F (h9)	G1	G2	J	K	L	M	N	P	Q (Depth)			R	
															◆Q1	◆Q2	★Q3	90°	100°
CRB2BW15-□D	34	20	9	18	5^{-0.004}-0.012	12⁰-0.043	4	1.5	6	10	0.5	5	25	29	M3	3.4	M3	M3	
CRB2BW15-□DE															(10)	(6)	(5)		
CRB2BW20-□D	42	29	10	20	6^{-0.004}-0.012	14⁰-0.043	4.5	1.5	7	10	0.5	9	25	36	M4	4.5	M4	M5	
CRB2BW20-□DE															(13.5)	(11)	(7.5)		
CRB2BW30-□D	50	40	13	22	8^{-0.005}-0.014	16⁰-0.043	5	2	8	12	1.0	10	25	43	M5	5.5	M5	M5	
CRB2BW30-□DE															(18)	(16.5)	(10)		

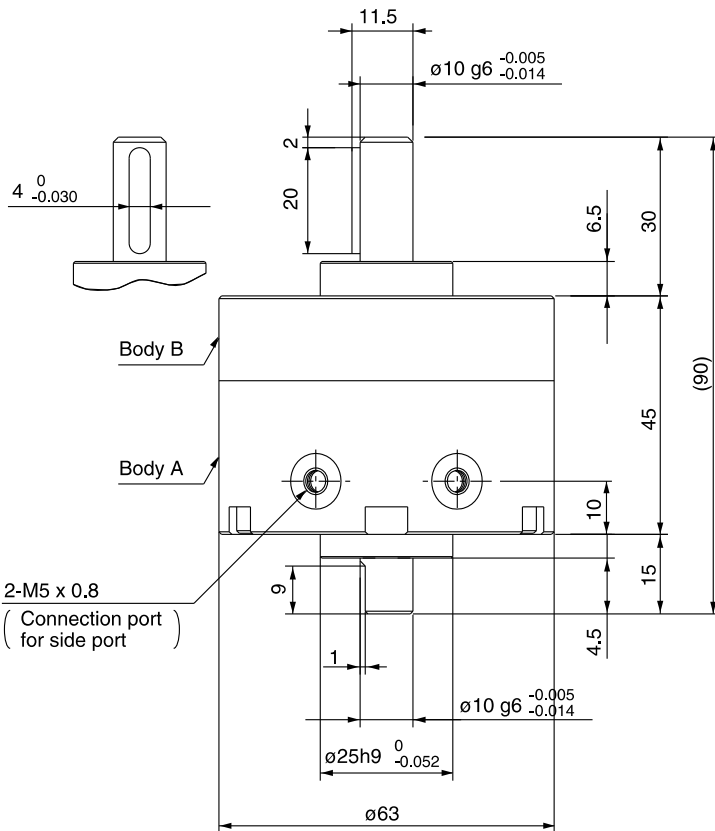
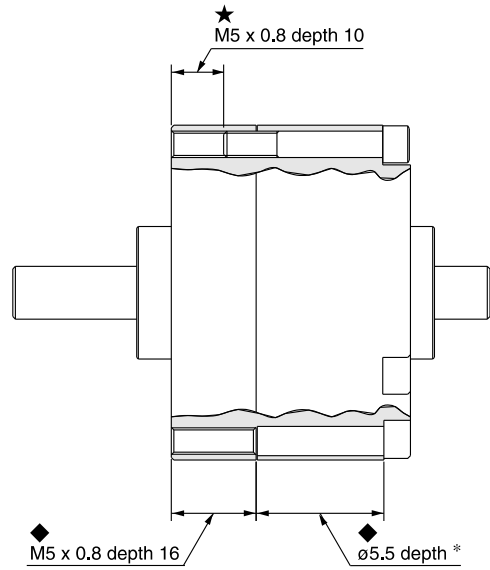
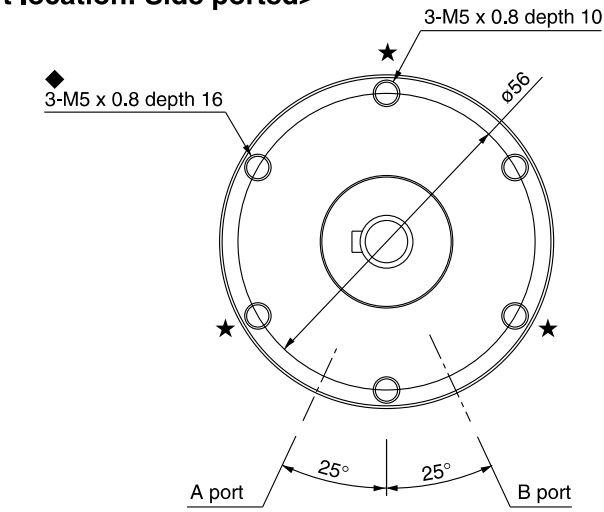
Series CRB2

Dimensions: 40

Single vane type/Double vane type

CRB2BW40-□S/D

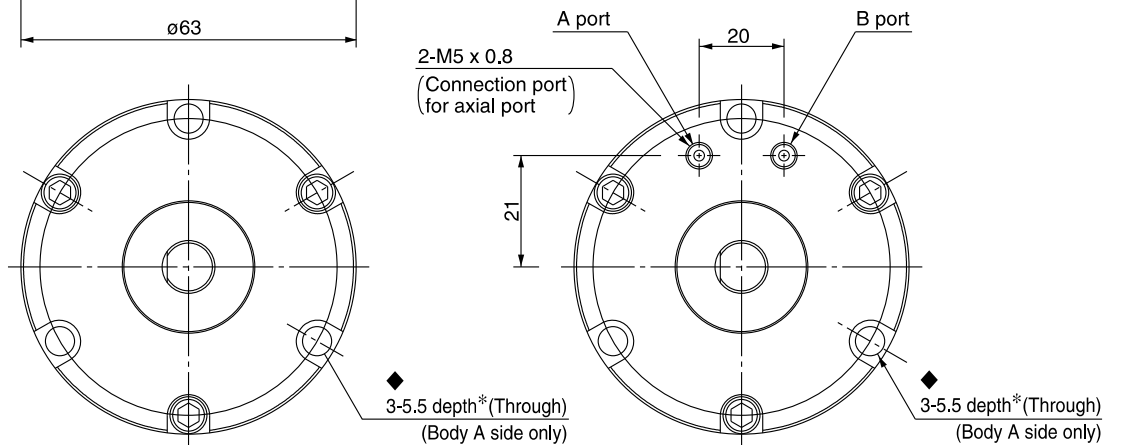
<Port location: Side ported>



(mm)

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

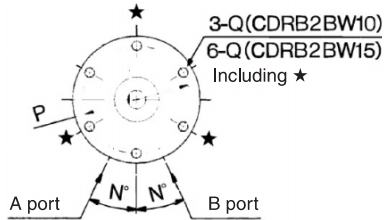
CRB2BW40-□SE/DE
<Port location: Axial ported>



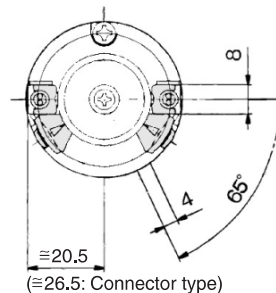
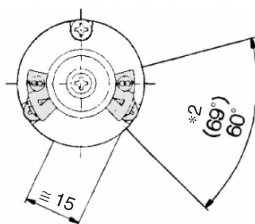
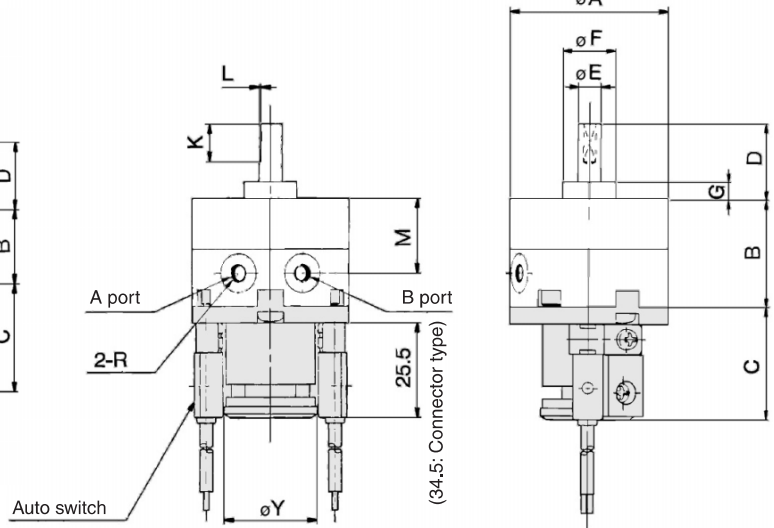
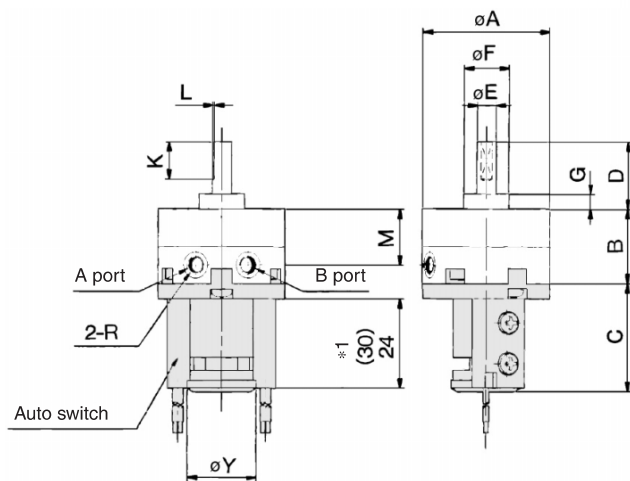
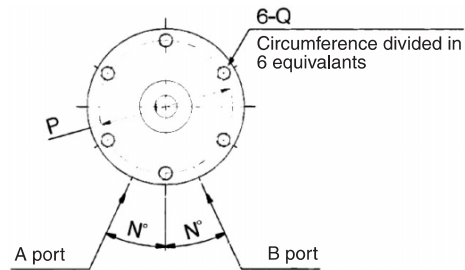
Dimensions: 10, 15, 20, 30 (With auto switch unit)

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

CDRB2BW10/15-□S



CDRB2BW20/30-□S



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

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

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

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

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

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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

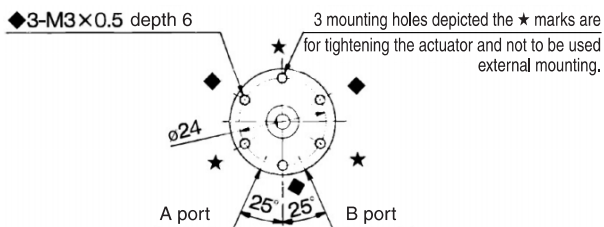
20-

Series CDRB2

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

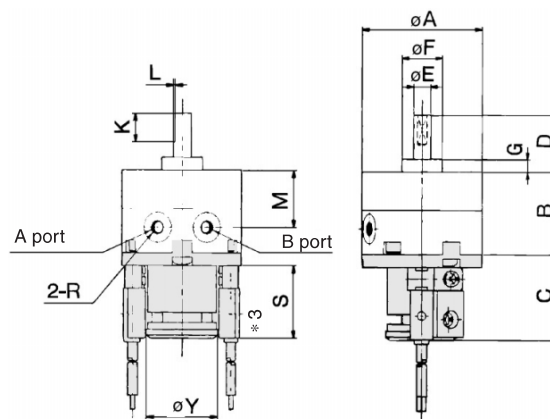
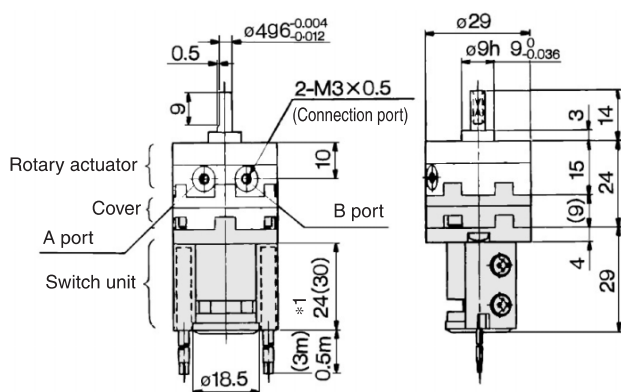
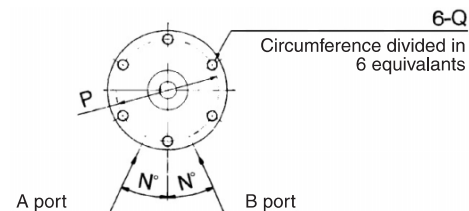
Double vane type • Illustrations below show the intermediate rotation position when A or B port is pressurized.

CDRB2BW10-□D

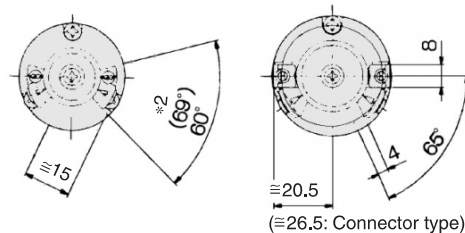
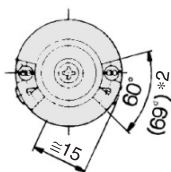


CDRB2BW15/20/30-□D

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



CDRB2BW15-□D CDRB2BW20/30-□D



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

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

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

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

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

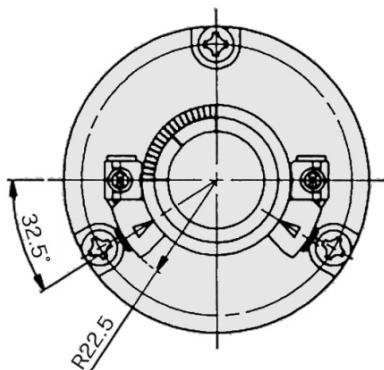
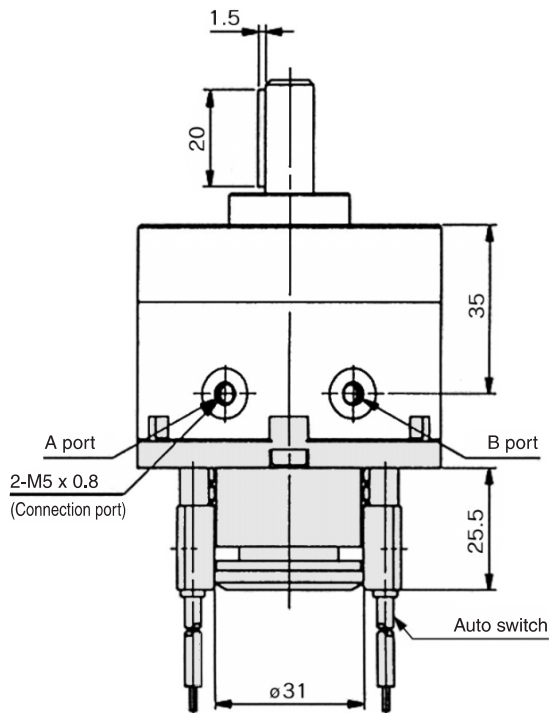
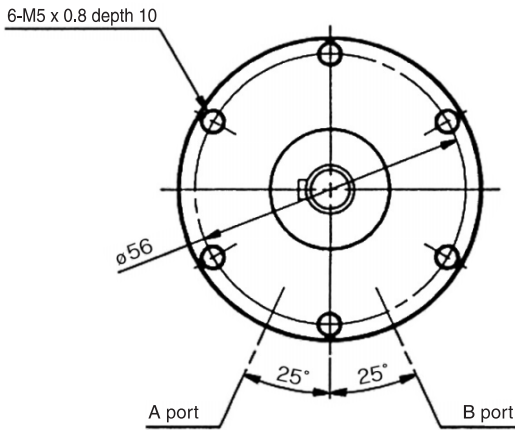
The length (Dimension S) is 34.5 when any of the following connector type auto switches are used: D-R73, D-R80, and D-T79

(mm)

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

Dimensions: 40 (With auto switch unit)

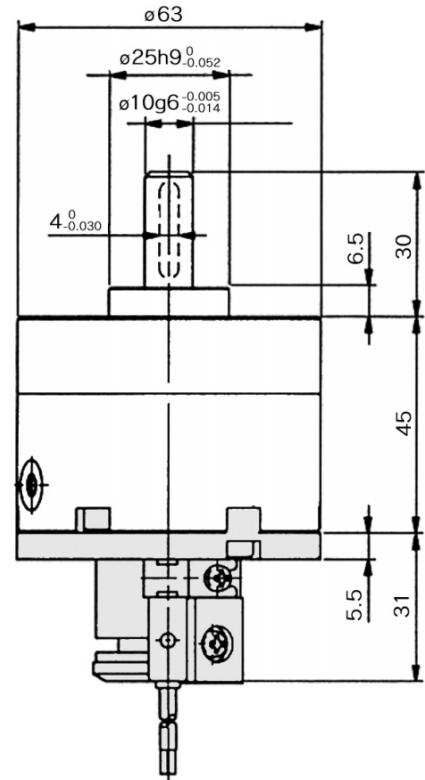
Single vane type/Double vane type
CDRB2BW40-□S/D



(mm)

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

Keyway dimensions



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

Rotary Actuator with Angle Adjuster Vane Style

Series **CRB2BWU**

Size: 10, 15, 20, 30, 40

How to Order

Without auto switch



CRB2 **B** WU **10** — **180** **S**

Size

10
15
20
30
40

Size

10
15

With auto switch
Size: 10, 15

CDRB2 **F** WU **10** — **180** **S** — **90** **L**

With auto switch
Size: 20, 30, 40

CDRB2 **B** WU **20** — **180** **S** — **R73** **L**

With auto switch
(With switch unit)

Mounting style

B	Basic style
F	Flange style

* F: Except size 40



With angle adjuster

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

Vane type

S	Single vane
D	Double vane

Auto switch

Nil	Without auto switch
------------	---------------------

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

Number of auto switches

S	1 pc.*
Nil	2 pcs.

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

Electrical entry/Lead wire length

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

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

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

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

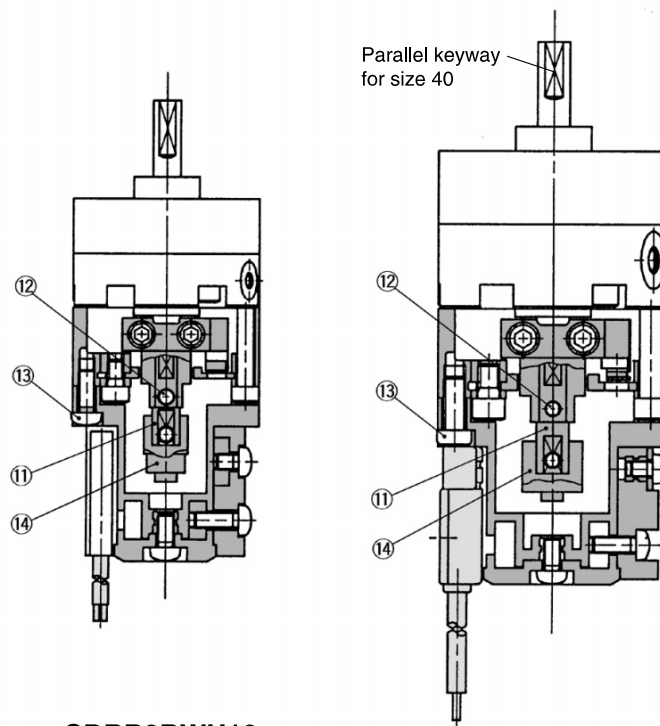
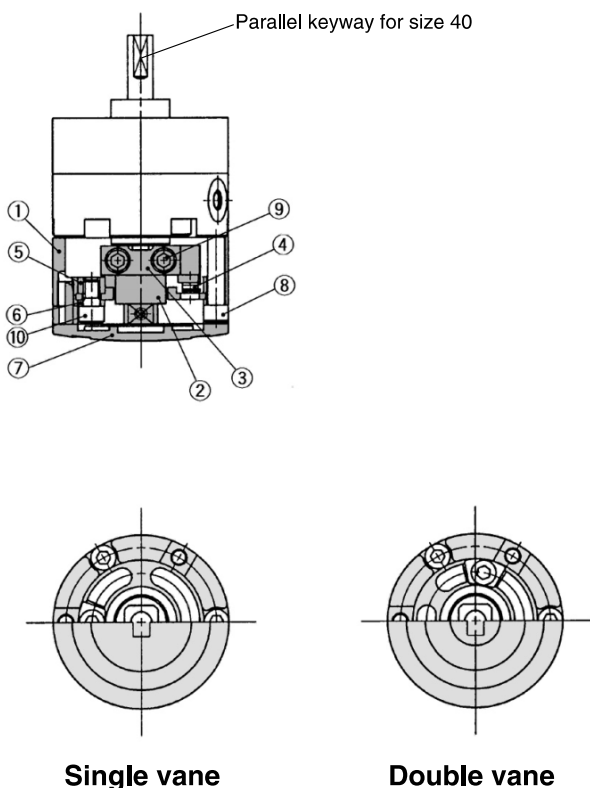
* Lead wire length symbols: 0.5 m Nil (Example) R73C
3 m L (Example) R73CL
5 m Z (Example) R73CZ
None N (Example) R73CN

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

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

With angle adjuster
CRB2BWU10/15/20/30/40-□^S_D

With angle adjuster + Auto switch unit
CDRB2BWU10/15-□^S_D CDRB2BWU20/30/40-□^S_D



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

Component Parts

No.	Description	Material	Note
①	Stopper ring	Aluminum die-casted	
②	Stopper lever	Carbon steel	
③	Lever retainer	Carbon steel	Zinc chromated
④	Rubber bumper	NBR	
⑤	Stopper block	Carbon steel	Zinc chromated
⑥	Block retainer	Carbon steel	Zinc chromated
⑦	Cap	Resin	
⑧	Hexagon socket head cap screw	Stainless steel	Special screw
⑨	Hexagon socket head cap screw	Stainless steel	Special screw
⑩	Hexagon socket head cap screw	Stainless steel	Special screw
⑪	Joint	Aluminum alloy	Note)
⑫	Hexagon socket head cap screw	Stainless steel	Hexagon nut will be used for size 10 only.
	Hexagon nut	Stainless steel	
⑬	Round head Phillips screw	Stainless steel	Note)
⑭	Magnet lever	—	Note)

Note) These items (No. ⑪, ⑬, and ⑭) consist of auto switch unit and angle adjuster. Refer to pages 11-4-20 to 11-4-21 for detailed specifications.

⚠ Precautions

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

Angle Adjuster

⚠ Caution

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

Rotating angle of the rotary actuator	Rotating angle adjustment range
270° ⁺⁴ ₀	0° to 230° (Size: 10, 40) * 0° to 240° (Size: 15, 20, 30)
180° ⁺⁴ ₀	0° to 175°
90° ⁺⁴ ₀	0° to 85°

* The maximum adjustment angle of the angle adjuster for size 10 and 40 is 230°.

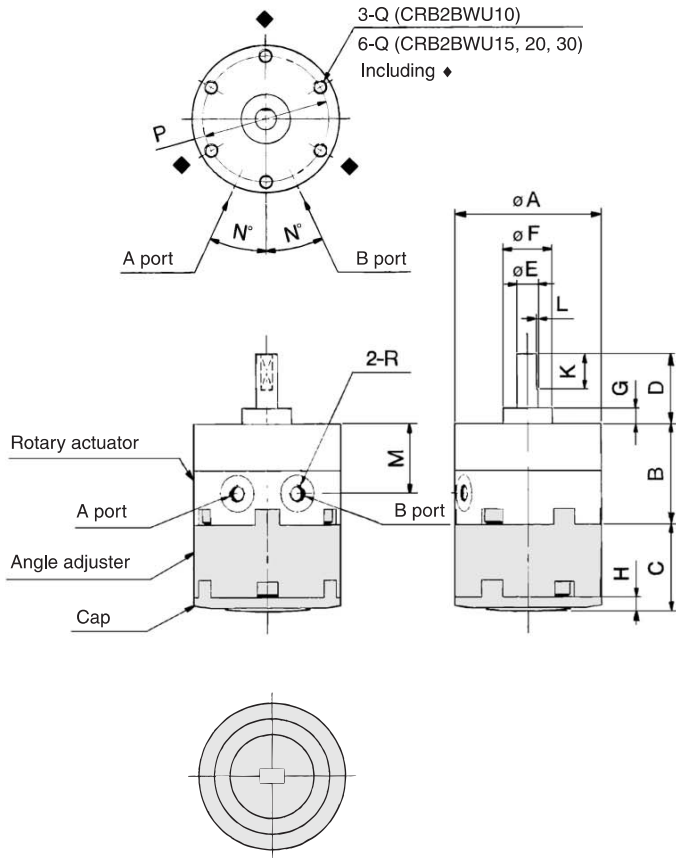
2. Connection ports are side ports only.
3. The allowable kinetic energy is the same as the specifications of the rotary actuator by itself (i.e., without angle adjuster).
4. Use a 100° rotary actuator if you desire to adjust the angle to 90° using a double vane type.

Series CRB2BWU

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

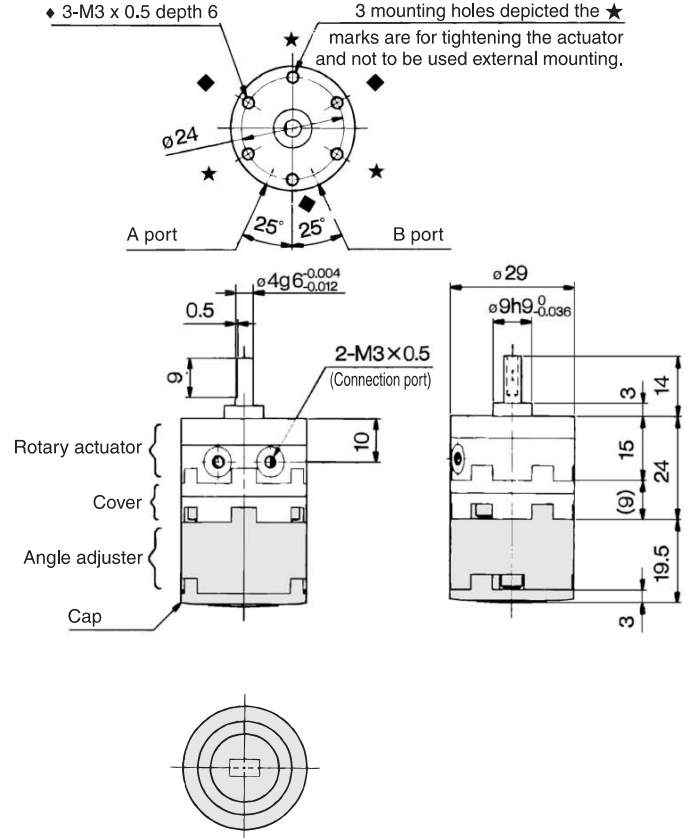
Single vane type CRB2BWU10/15/20/30-□S

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



Double vane type CRB2BWU10-□D

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



Double vane type CRB2BWU15/20/30-□D

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

(mm)

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

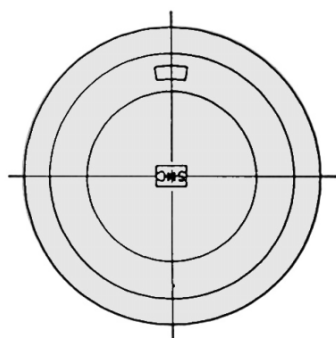
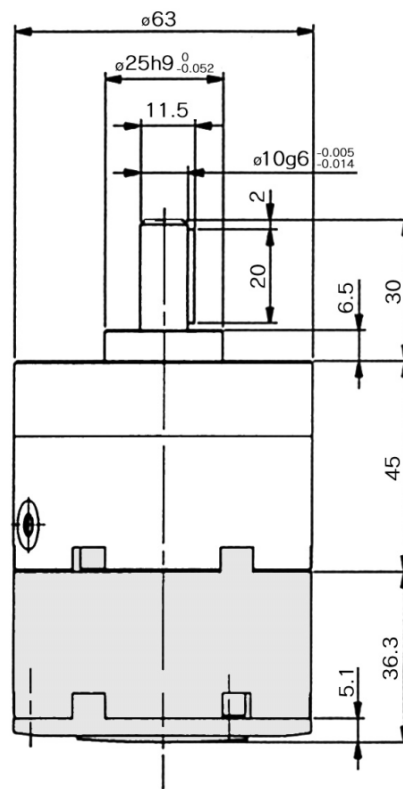
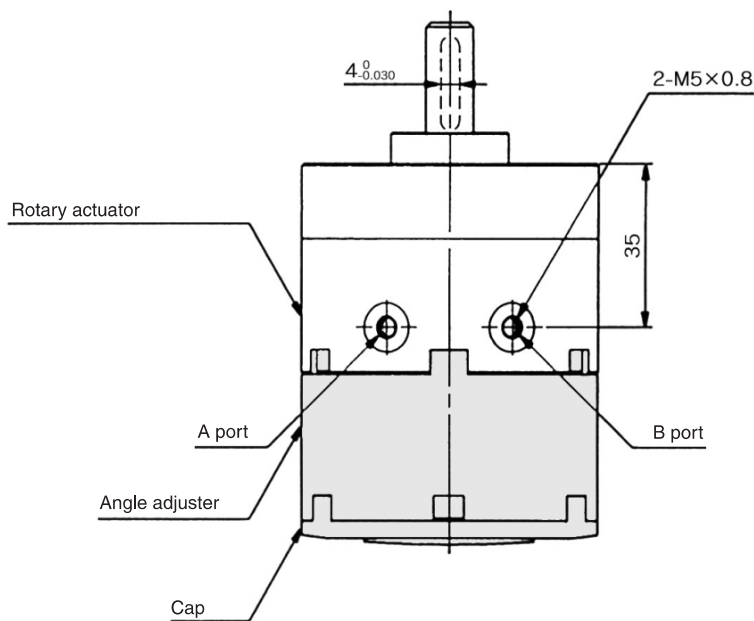
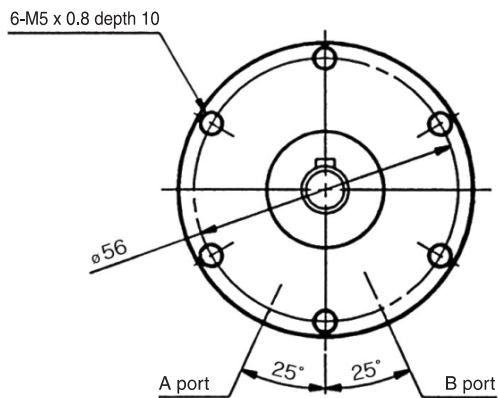
Model	R			
	90°	100°	180°	270°
CRB2BWU10-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU10-□D	*Refer to the drawing.			—
CRB2BWU15-□S	M5 x 0.8	—	M5 x 0.8	M3 x 0.5
CRB2BWU15-□D	M3 x 0.5			—
CRB2BWU20-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU20-□D	M5 x 0.8			—
CRB2BWU30-□S	M5 x 0.8	—	M5 x 0.8	
CRB2BWU30-□D	M5 x 0.8			—

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

Dimensions: 40 (With angle adjuster)

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

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



(mm)

Model	Keyway dimensions		
	b (h9)	h (h9)	ℓ
CRB2BWU40-□□□	4 _{-0.030}	4 _{-0.030}	20

Series CRB2BWU

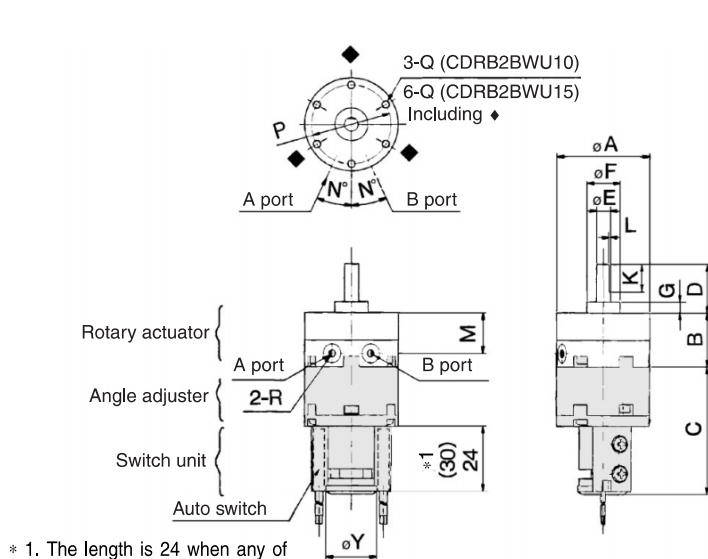
Dimensions: 10, 15, 20, 30 (With angle adjuster and auto switch unit)

Single vane type CDRB2BWU10/15-□S

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

Double vane type CDRB2BWU10-□D

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

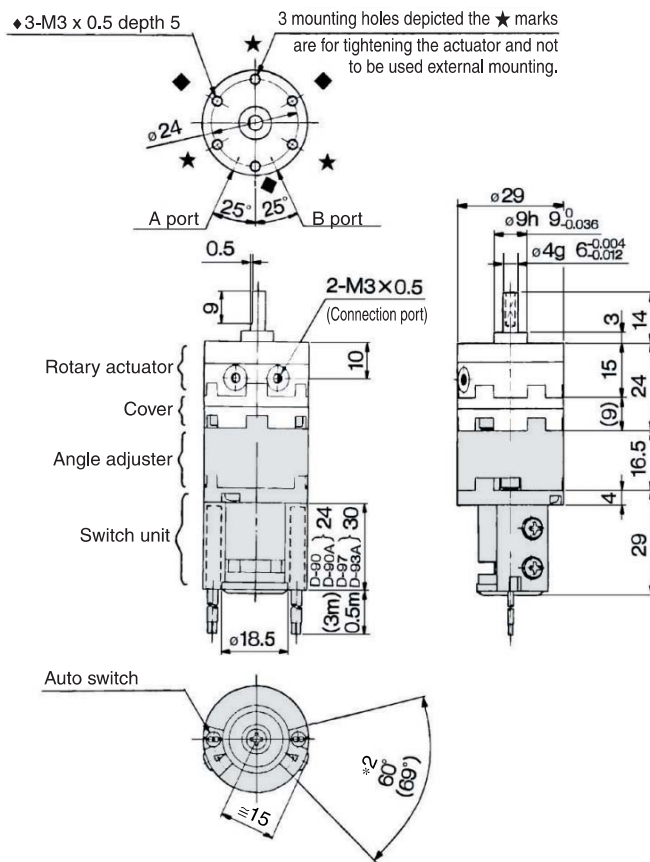
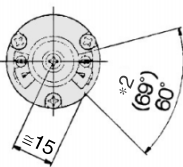


* 1. The length is 24 when any of the following auto switches are used: D-90, D-90 A, D-S99(V), D-T99(V), and D-S9P(V).

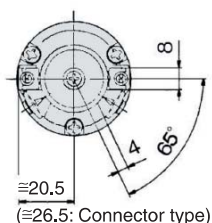
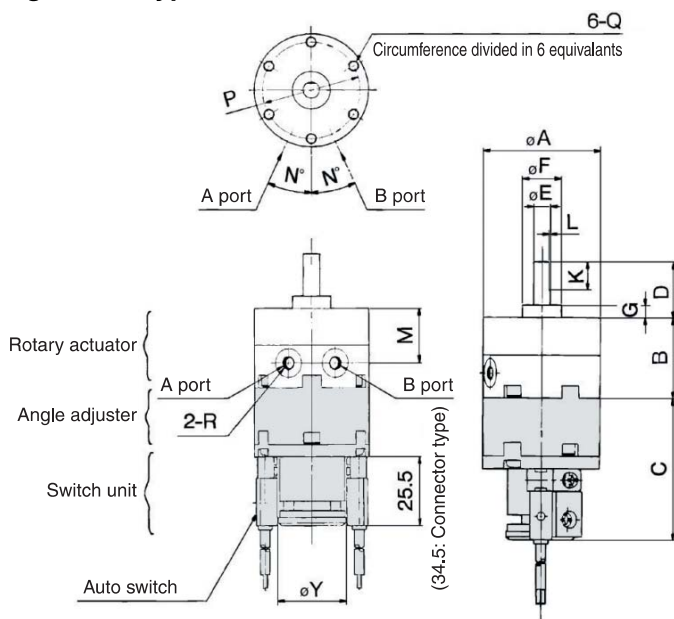
The length is 30 when any of the following auto switches are used: D-97 and D-93A.

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

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



Single vane type



Double vane type CDRB2BWU15/20/30-□D

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

(mm)

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

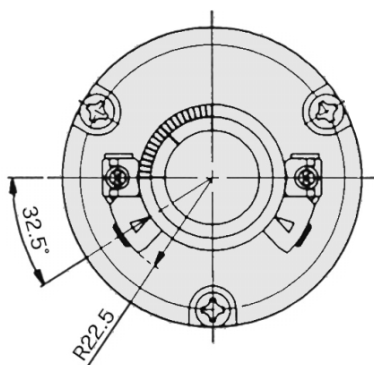
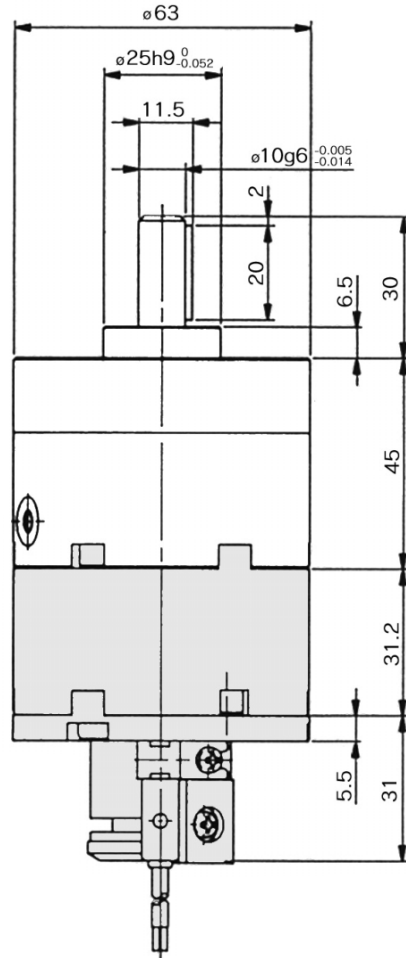
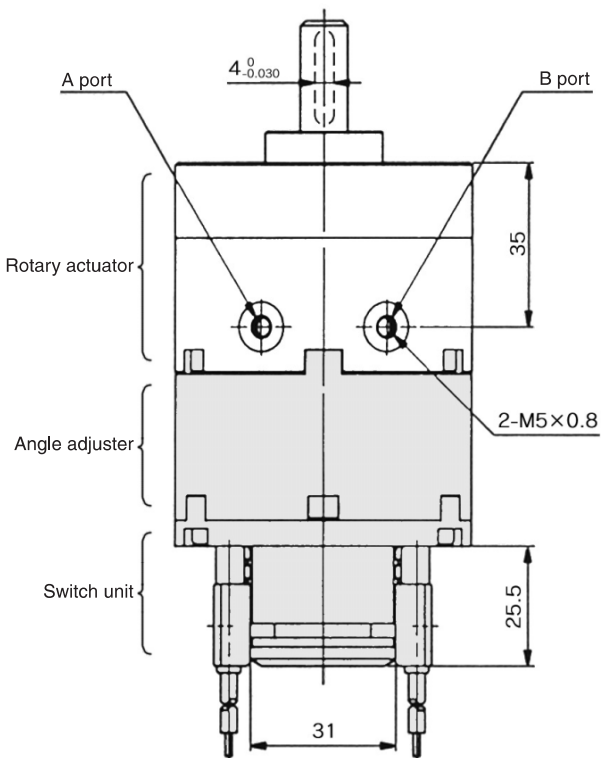
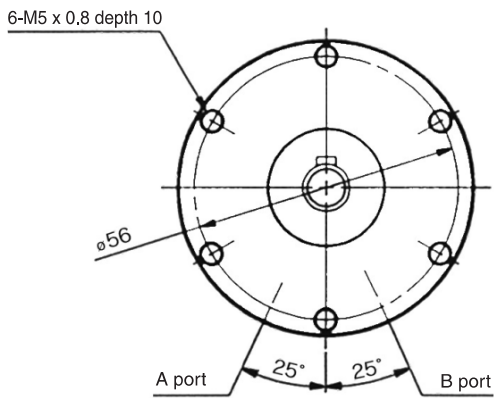
Model	N	P	Y	Q	R			
					90°	100°	180°	270°
CDRB2BWU10-□S	25	24	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
* Refer to the drawing.					—			
CDRB2BWU15-□S	25	29	18.5	M3 x 0.5 depth 5	M5 x 0.8	—	M5 x 0.8	M5 x 0.8
CDRB2BWU15-□D					M3 x 0.5		—	
CDRB2BWU20-□S	25	36	25	M4 x 0.7 depth 7	M5 x 0.8	—	M5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

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

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

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

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



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

(mm)

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

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

Simple Specials:

-XA1 to -XA24: Shaft Pattern Sequencing I

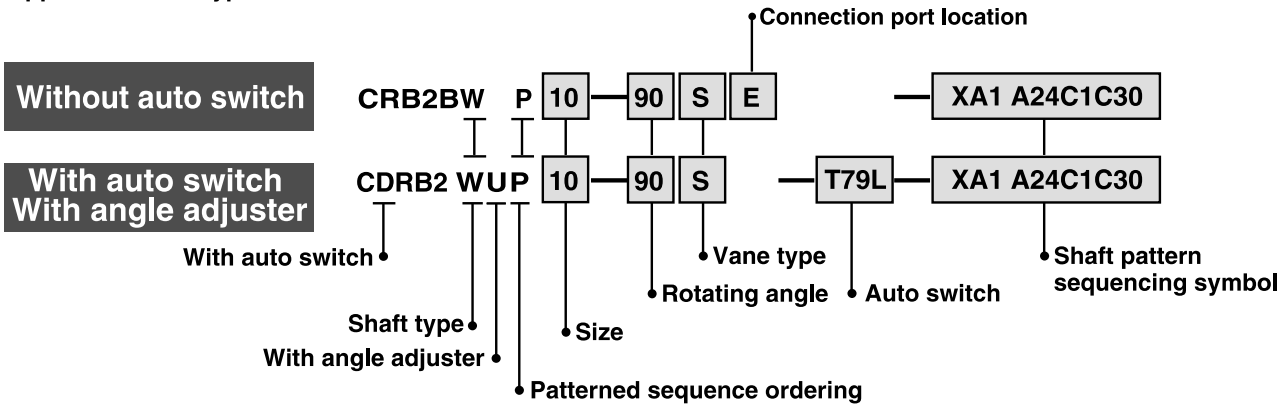
Shaft shape pattern is dealt with simple made-to-order system.

Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing I

-XA1 to XA24

Applicable shaft type: W (Standard)



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

Symbol	Description	Applicable size				
		10	15	20	30	40
XA1	Shaft-end female thread		●	●	●	
XA3	Shaft-end male thread	●	●	●	●	
XA5	Stepped round shaft	●	●	●	●	
XA7	Stepped round shaft with male thread	●	●	●	●	
XA9	Modified length of standard chamfer	●	●	●	●	
XA11	Two-sided chamfer	●				●
XA14 *	Shaft through-hole + Shaft-end female thread		●	●	●	
XA17	Shortened shaft	●	●	●	●	●
XA21	Stepped round shaft with double-sided chamfer	●	●	●	●	
XA23	Right-angle chamfer	●	●	●	●	
XA24	Double key					●

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

● Axial: Bottom (Short shaft side)

Symbol	Description	Applicable size				
		10	15	20	30	40
XA2 *	Shaft-end female thread		●	●	●	●
XA4 *	Shaft-end male thread	●	●	●	●	●
XA6 *	Stepped round shaft	●	●	●	●	●
XA8 *	Stepped round shaft with male thread	●	●	●	●	●
XA10 *	Modified length of standard chamfer	●	●	●	●	●
XA12 *	Two-sided chamfer	●	●	●	●	●
XA15 *	Shaft through-hole + Shaft-end female thread		●	●	●	●
XA18 *	Shortened shaft	●	●	●	●	●
XA22 *	Stepped round shaft with double-sided chamfer	●	●	●	●	●

● Double Shaft

Symbol	Description	Applicable size				
		10	15	20	30	40
XA13 *	Shaft through-hole		●	●	●	●
XA16 *	Shaft through-hole + Double shaft-end female thread		●	●	●	●
XA19 *	Shortened shaft	●	●	●	●	
XA20 *	Reversed shaft	●	●	●	●	●

Combination

XA□ Combination

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

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

XA□, XC□ Combination

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

Symbol	Description	Applicable size	Combination
			XA1 to XA24
XC1 *	Change connection port location	10, 15, 20, 30, 40	●
XC2 *	Change threaded hole to through-hole	15, 20, 30, 40	●
XC3 *	Change the screw position	10, 15, 20, 30, 40	●
XC4	Change rotation range		●
XC5	Change rotation range between 0 to 200°		●
XC6	Change rotation range between 0 to 110°		●
XC7 *	Reversed shaft		—
XC30	Fluorine grease		●

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

A total of four XA□ and XC□ combinations is available.

Example: -XA1A24C1C30
-XA2C1C4C30

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

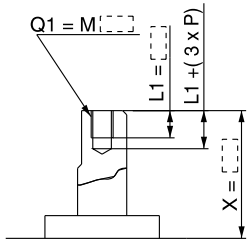
20-

Series CRB2

Axial: Top (Long shaft side)

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

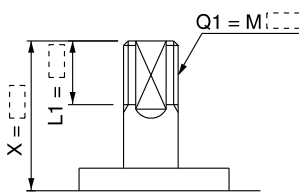
- (If shortening the shaft is not required, indicate "*" for dimension X.)
- Not available for size 10.
 - The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
 - Applicable shaft type: W



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

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

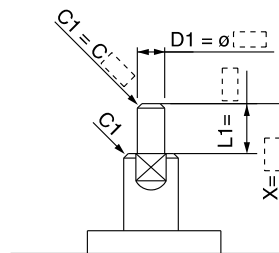
- (If shortening the shaft is not required, indicate "*" for dimension X.)
- Applicable shaft type: W



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

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

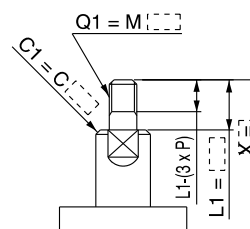
- (If shortening the shaft is not required, indicate "*" for dimension X.)
- Applicable shaft type: W
 - Equal dimensions are indicated by the same marker.
(If not specifying dimension C1, indicate "*" instead.)



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

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

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

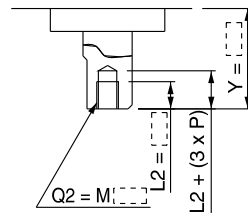


Size	X	L1 max	Q1
10	7.5 to 14	X - 3	M3
15	10 to 18	X - 4	M3, M4
20	12 to 20	X - 4.5	M3, M4, M5
30	14 to 22	X - 5	M3, M4, M5, M6

Axial: Bottom (Short shaft side)

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

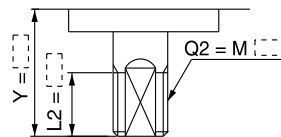
- (If shortening the shaft is not required, indicate "*" for dimension Y.)
- Not available for size 10.
 - The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M3: L2 = 6 mm
 - Applicable shaft type: W



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

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

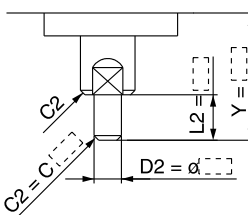
- (If shortening the shaft is not required, indicate "*" for dimension Y.)
- Applicable shaft type: W



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

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

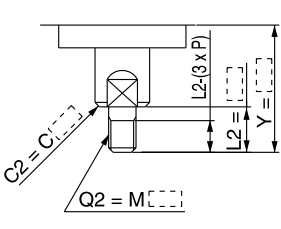
- (If shortening the shaft is not required, indicate "*" for dimension Y.)
- Applicable shaft type: W
 - Equal dimensions are indicated by the same marker.
(If not specifying dimension C2, indicate "*" instead.)



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

Symbol: A8 The short shaft can be further shortened by machining it into a stepped round shaft with male threads.

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



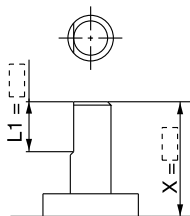
Size	Y	L2 max	Q2
10	5.5 to 8	Y - 1	M3
15	7.5 to 9	Y - 1.5	M3, M4
20	9 to 10	Y - 1.5	M3, M4, M5
30	11 to 13	Y - 2	M3, M4, M5, M6
40	14 to 15	Y - 4.5	M3, M4, M5, M6, M8

Axial: Top (Long shaft side)

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

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

- Applicable shaft type: W



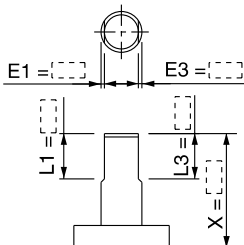
Size	X	L1
10	5 to 14	9 - (14 - X) to (X - 3)
15	8 to 18	10 - (18 - X) to (X - 4)
20	10 to 20	10 - (20 - X) to (X - 4.5)
30	10 to 22	12 - (22 - X) to (X - 5)

Symbol: A11 The long shaft can be further shortened by machining a double-sided chamfer onto it.

(If altering the standard chamfer and shortening the shaft are not required, indicate "*" for both the L1 and X dimensions.)

- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore size of $\phi 30$.

- Applicable shaft type: W



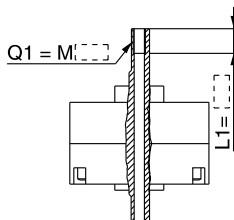
Size	X	L1	L3 max
10	5 to 14	9 - (14 - X) to (X - 3)	X - 3
15	8 to 18	10 - (18 - X) to (X - 4)	X - 4
20	10 to 20	10 - (20 - X) to (X - 4.5)	X - 4.5
30	10 to 22	12 - (22 - X) to (X - 5)	X - 5

Symbol: A14 Applicable to single vane type only

A special end is machined onto the long shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

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

- Applicable shaft type: W

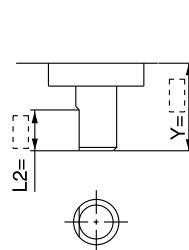


M	Size	15	20	30	40
M3 x 0.5		$\phi 2.5$	$\phi 2.5$	$\phi 2.5$	$\phi 2.5$
M4 x 0.7		—	$\phi 3.3$	$\phi 3.3$	—
M5 x 0.8		—	—	$\phi 4.2$	—

Axial: Bottom (Short shaft side)

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

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



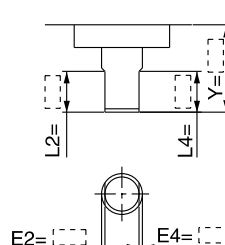
Size	Y	L2
10	3 to 8	5 - (8 - Y) to (Y - 1)
15	3 to 9	6 - (9 - Y) to (Y - 1.5)
20	3 to 10	7 - (10 - Y) to (Y - 1.5)
30	5 to 13	8 - (13 - Y) to (Y - 2)
40	7 to 15	9 - (15 - Y) to (Y - 2)

Symbol: A12 The short shaft can be further shortened by machining a double-sided chamfer onto it.

(If altering the standard chamfer and shortening the shaft are not required, indicate "*" for both the L2 and Y dimensions.)

- Since L2 is a standard chamfer, dimension E2 is 0.5 mm or more, and 1 mm or more with shaft bore sizes of $\phi 30$ or $\phi 40$.

- Applicable shaft type: W



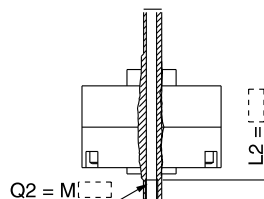
Size	Y	L2	L4 max
10	3 to 8	5 - (8 - Y) to (Y - 1)	Y - 1
15	3 to 9	6 - (9 - Y) to (Y - 1.5)	Y - 1.5
20	3 to 10	7 - (10 - Y) to (Y - 1.5)	Y - 1.5
30	5 to 13	8 - (13 - Y) to (Y - 2)	Y - 2
40	7 to 15	9 - (15 - Y) to (Y - 4.5)	Y - 4.5

Symbol: A15 Applicable to single vane type only

A special end is machined onto the short shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

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

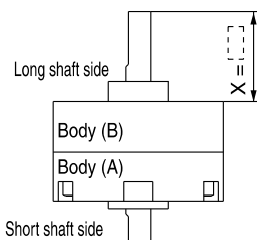
- Applicable shaft type: W



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

Symbol: A17 Shorten the long shaft.

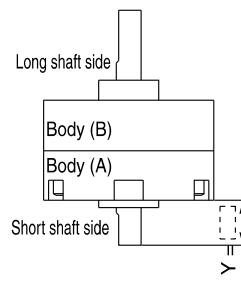
- Applicable shaft type: W



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

Symbol: A18 Shorten the short shaft.

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



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

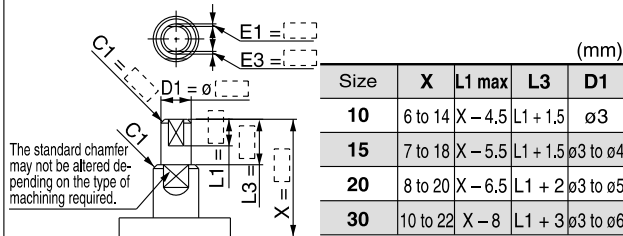
Series CRB2

Axial: Top (Long shaft side)

Symbol: A21 The long shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer.

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

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

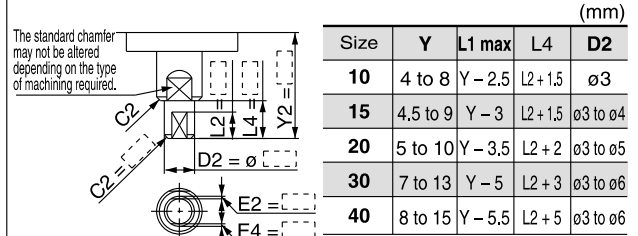


Axial: Bottom (Short shaft side)

Symbol: A22 The short shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer.

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

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
- (If not specifying dimension C2, indicate "*" instead.)

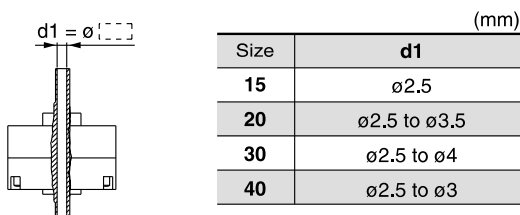


Double Shaft

Symbol: A13 Applicable to single vane type only

Shaft with through-hole

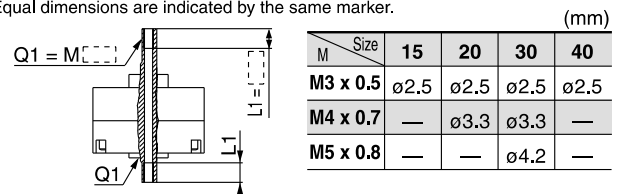
- Not available for size 10.
- Minimum machining diameter for d1 is 0.1 mm.
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: W



Symbol: A16 Applicable to single vane type only

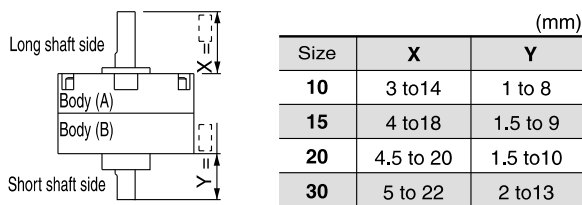
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

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



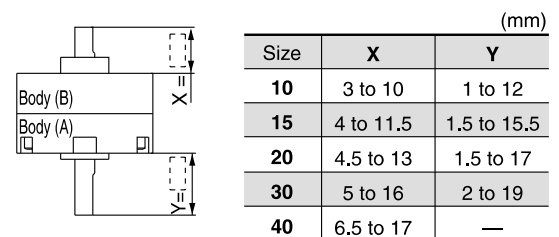
Symbol: A19 Both the long shaft and short shaft are shortened.

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



Symbol: A20 The rotation axis is reversed.

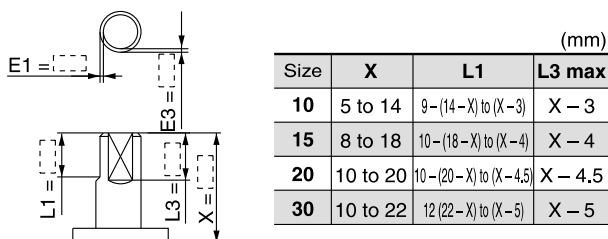
- (The long shaft and short shaft are shortened.)
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft type: W



Symbol: A23 The long shaft can be further shortened by machining right-angle double-sided chamfer onto it.

(If altering the standard chamfer and shortening the shaft are not required, indicate "*" for both the L1 and X dimensions.)

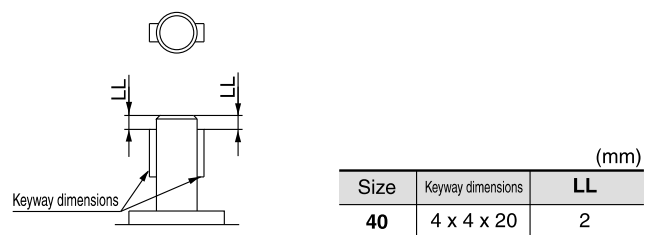
- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore sizes of ø30 or ø40.
- Applicable shaft type: W



Symbol: A24 Double key

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

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



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

Simple Specials:

-XA31 to -XA47: Shaft Pattern Sequencing II

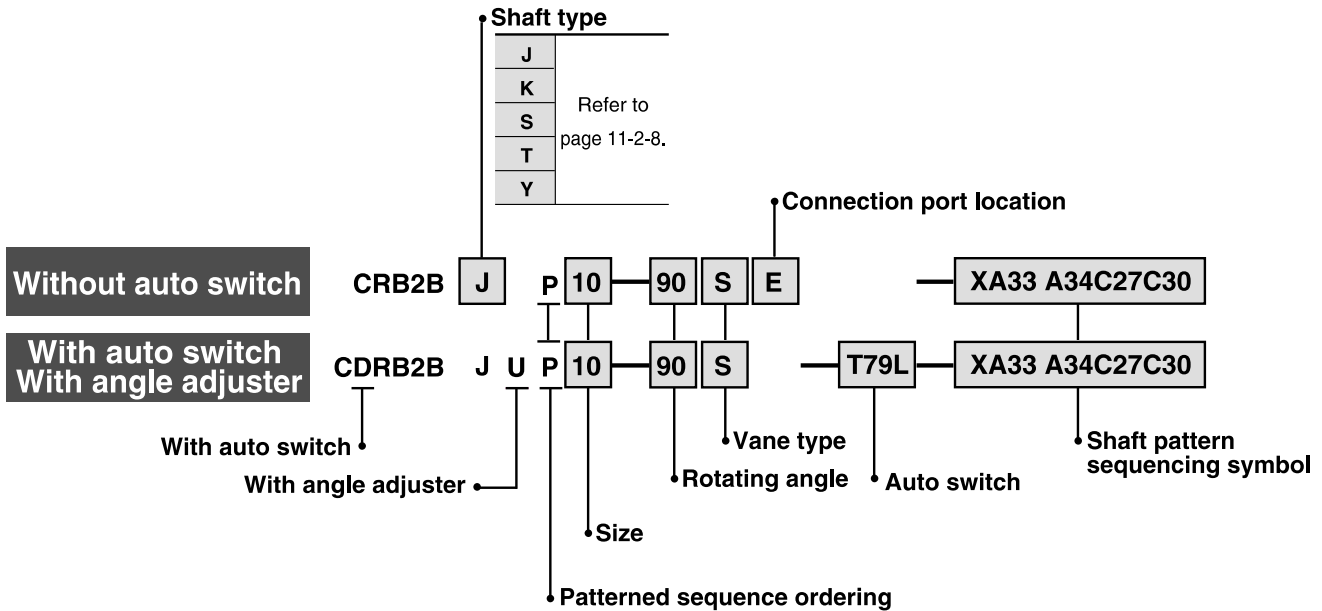
Shaft shape pattern is dealt with simple made-to-order system.

Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing II

-XA31 to XA47

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



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA31	Shaft-end female thread	S, Y	●	●	●	●	●
XA33	Shaft-end female thread	J, K, T	●	●	●	●	●
XA37	Stepped round shaft	J, K, T	●	●	●	●	●
XA45	Middle-cut chamfer	J, K, T	●	●	●	●	●
XA47	Machined keyway	J, K, T			●	●	

● Axial: Bottom (Short shaft side)

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA32 *	Shaft-end female thread	S, Y	●	●	●	●	●
XA34 *	Shaft-end female thread	J, K, T	●	●	●	●	●
XA38 *	Stepped round shaft	K	●	●	●	●	●
XA46 *	Middle-cut chamfer	K	●	●	●	●	●

Combination

XA□ Combination

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

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

● Double Shaft

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA39 *	Shaft through-hole	S, Y	●	●	●	●	●
XA40 *	Shaft through-hole	K, T	●	●	●	●	●
XA41 *	Shaft through-hole	J	●	●	●	●	●
XA42 *	Shaft through-hole + Shaft-end female thread	S, Y	●	●	●	●	●
XA43 *	Shaft through-hole + Shaft-end female thread	K, T	●	●	●	●	●
XA44 *	Shaft through-hole + Shaft-end female thread	J	●	●	●	●	●

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

XA□, XC□ Combination

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

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

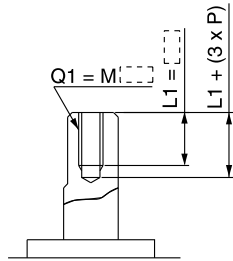
* These specifications are not available for rotary actuators with auto switch unit and angle adjuster.
A total of four XA□ and XC□ combinations is available.
Example: -XA33A34C27C30

Series CRB2

Axial: Top (Long shaft side)

Symbol: A31 Machine female threads into the long shaft.

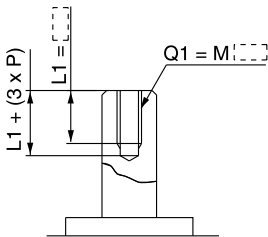
- The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
- Applicable shaft types: S, Y



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

Symbol: A33 Machine female threads into the long shaft.

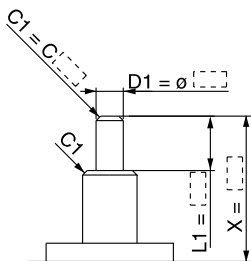
- The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
- Applicable shaft types: J, K, T



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

Symbol: A37 The long shaft can be further shortened by machining it into a stepped round shaft.

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



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

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

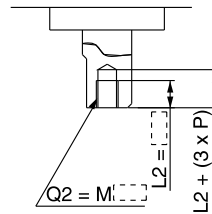
- (If shortening the shaft is not required, indicate "*" for dimension X.)
- Applicable shaft types: J, K, T

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

Axial: Bottom (Short shaft side)

Symbol: A32 Machine female threads into the short shaft.

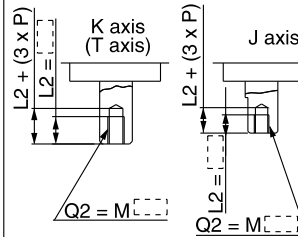
- The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M4: L2 = 8 mm
However, for M5 with S shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: S, Y



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

Symbol: A34 Machine female threads into the short shaft.

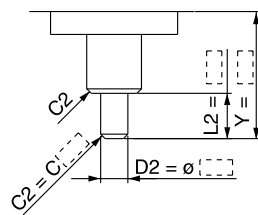
- The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M3: L2 = 6 mm
However, for M5 with T shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: J, K, T



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

Symbol: A38 The short shaft can be further shortened by machining it into a stepped round shaft.

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



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

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

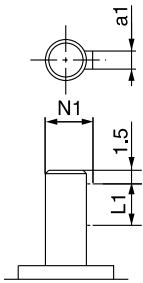
- (If shortening the shaft is not required, indicate "*" for dimension Y.)
- Applicable shaft type: K

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

Axial: Top (Long shaft side)

Symbol: A47 Machine a keyway into the long shaft. (The position of the keyway is the same as the standard one.) The key must be ordered separately.

- Applicable shaft types: J, K, T



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

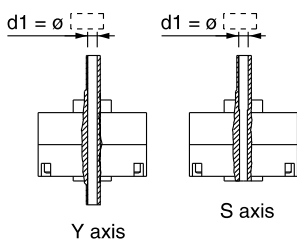
(mm)

Double Shaft

Symbol: A39 Applicable to single vane type only

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

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



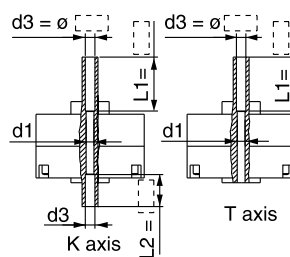
Size	Shaft type	
	S	Y
15	d1	
20	ø2.5 to ø3.5	
30	ø2.5 to ø4	
40	ø2.5 to ø3	

(mm)

Symbol: A40 Applicable to single vane type only

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

- Applicable shaft types: K, T
- Equal dimensions are indicated by the same marker.
- Not available for size 10.
- d1 = ø2.5, L1 = 18 (max.) for size 15; minimum machining diameter for d1 is 0.1 mm.
- d1 = d3 for sizes 20 to 40.



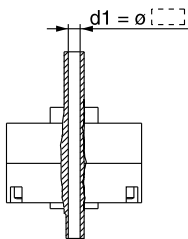
Size	Shaft type	
	K	T
15	d1	d3
20	—	ø2.5 to ø4
30	—	ø2.5 to ø4.5
40	—	ø2.5 to ø5

(mm)

Symbol: A41 Applicable to single vane type only

Shaft with through-hole

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



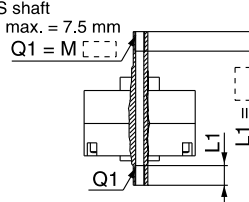
Size	d1
15	ø2.5
20	ø2.5 to ø3.5
30	ø2.5 to ø4
40	ø2.5 to ø4.5

(mm)

Symbol: A42 Applicable to single vane type only

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

- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm. However, for M5 on the short shaft of S shaft: L1 max. = 7.5 mm
- A parallel keyway is used on the long shaft for size 40.
- Applicable shaft types: S, Y
- Equal dimensions are indicated by the same marker.



Size	Shaft type	
	S	Y
15	ø2.5	ø2.5
20	ø2.5	ø2.5
30	ø2.5	ø2.5
40	ø2.5	ø2.5

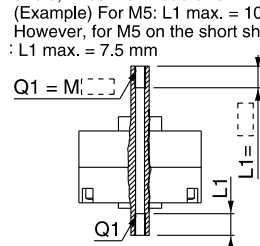
Thread	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

(mm)

Symbol: A43 Applicable to single vane type only

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

- Not available for size 10.
- The maximum dimension L1 is, as a rule, twice the thread size. (Example) For M5: L1 max. = 10 mm. However, for M5 on the short shaft of T shaft: L1 max. = 7.5 mm
- Applicable shaft types: K, T
- Equal dimensions are indicated by the same marker.



Size	Shaft type	
	K	T
15	ø2.5	ø2.5
20	ø2.5	ø2.5
30	ø2.5	ø2.5
40	ø2.5	ø2.5

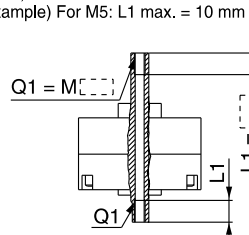
Thread	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	ø3.3
M5 x 0.8	—	—	ø4.2	ø4.2

(mm)

Symbol: A44 Applicable to single vane type only

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

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



Size	Shaft type	
	K	T
15	ø2.5	ø2.5
20	ø2.5	ø2.5
30	ø2.5	ø2.5
40	ø2.5	ø2.5

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

(mm)

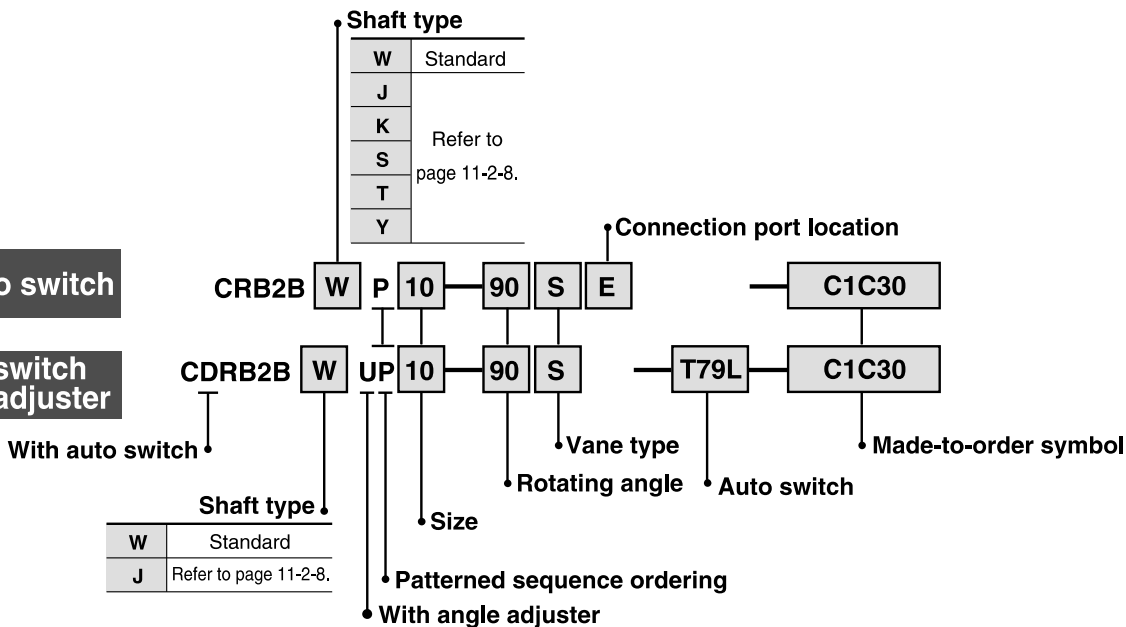
Series **CRB2** (Size: 10, 15, 20, 30, 40)

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

-XC1 to XC7, -XC30

Without auto switch

With auto switch
With angle adjuster



Made to Order Symbol

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

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

Combination

Symbol	Combination							
	XC1	XC2	XC3	XC4	XC5	XC6	XC7	XC30
XC1	●							
XC2	●	●						
XC3	●	—	●					
XC4	●	●	●	●				
XC5	●	●	●	—	●			
XC6	●	●	●	—	—	●		
XC7	●	●	●	●	●	—	●	
XC30	●	●	●	●	●	●	●	●

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

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

Size	(mm)		
	Q	M	N
10	M3	8,5	9,5
15	M3	11	10
20	M5	14	13
30	M5	15,5	14
40	M5	21	20

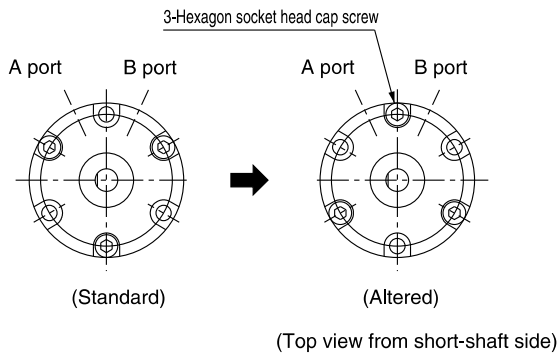
Symbol: C2 Change 3 threaded holes on Body (B) into through holes. (An additionally machined port will have an aluminum surface since it will be left unfinished.)

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

Size	(mm)
	d
15	3.4
20	4.5
30	5.5
40	5.5

(Top view from long shaft side)

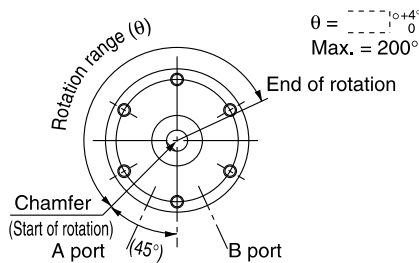
Symbol: C3 Change the position of the screws for tightening the actuator body.



Symbol: C5 Applicable to single vane type only

Start of rotation is 45° up from the bottom of the vertical line to the left side

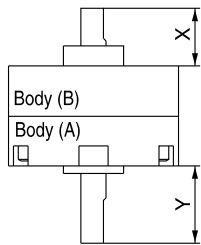
- Rotation tolerance for CRB2BW10 is $^{+5^{\circ}}_0$.
- Port size for CRB2BW10, 15 is M3.
- A parallel keyway is used instead of chamfer for size 40.



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

Symbol: C7 The shafts are reversed.

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



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

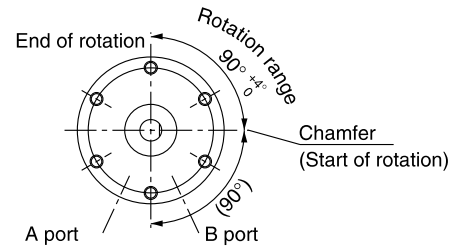
(mm)

Symbol: C4 Applicable to single vane type only

Change rotation range to 90°.

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

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

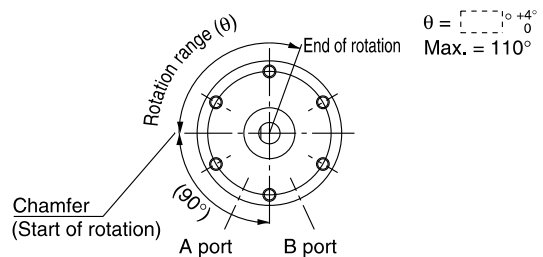


Start of rotation is the position of the chamfer (keyway) when A port is pressurized. (Top view from long shaft side)

Symbol: C6 Applicable to single vane type only

Start of rotation is horizontal line (90° down from the top to the left side).

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



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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

