Rotary Actuator/Vane Style

Series CRB1

Size: 50, 63, 80, 100

Basic style
Series **CRB1**

With solenoid valve
Series **CVRB1**

Standard

			50				63				80				100			
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
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 and fluorine-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	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
Shaft type — Single shaft type	Single shaft key S	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
	Single round shaft T	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
	Single shaft with four chamfers X	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
Pattern	Shaft pattern	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
	Rotation pattern	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●
With solenoid valve		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●

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

How to Order

Without auto switch CRB1 [B] [W] [ ] [80] – [90] [S] [ ] —— [ ]

With auto switch CDRB1 [B] [W] [ ] [80] – [90] [S] [ ] – [T79] [L] [ ] – [ ]

With auto switch
(With auto switch unit and built-in magnet)
* Refer to page 141 when the auto switch unit is needed separately.

Size

50
63
80
100

Made to Order or Port thread type
Refer to pages 129 to 131, 138 and 139 for the details of Made to Order specifications.

Nil	Rc
-XF *	G
-XN *	NPT

* Combination with Made to Order is not available.

Mounting style

B	Basic style
L	Flange style

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

Number of auto switches

S	1 pc. *
Nil	2 pcs. **

* S (1 auto switch) is shipped with a right-hand auto switch.
** Nil (2 auto switches) is shipped with a right-hand and a left-hand switch.

Table (1): Foot Assembly Part No.

Model	Unit part no.
CRB1LW 50	P411020-5
CRB1LW 63	P411030-5
CRB1LW 80	P411040-5
CRB1LW100	P411050-5

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 and 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

Shaft type

W	Double shaft (Long shaft key & Four chamfers)

Pattern

Nil	Option
P	Simple Specials/Made to Order

* For details, refer to pages 129 to 131, 138 and 139.

Rotating angle

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

Auto switch

Nil	Without auto switch (built-in magnet)

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

Connection port location

Nil	Side ported
E	Axial ported

Vane type

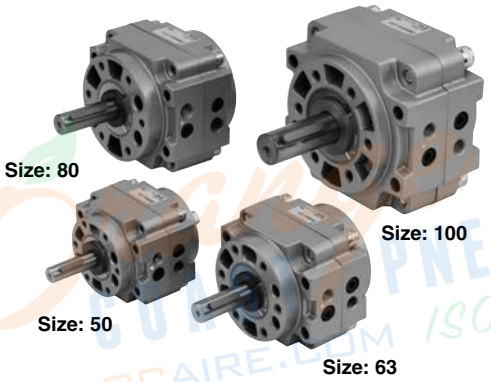
S	Single vane
D	Double vane

Applicable Auto Switches /Refer to pages 761 to 809 for further information on auto switches.

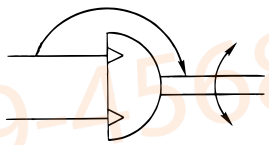
Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m) * 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
Solid state switch	Grommet	Yes	2-wire	24 V	12 V	—	T79	●	●	—	—	—	Relay, PLC
	Connector						T79C	●	●	●	●		
	Grommet		3-wire (NPN)		5 V, 12 V		S79	●	●	—	—	IC circuit	
			3-wire (PNP)				S7P	●	●	—	—		
Reed switch	Grommet	No	2-wire	24 V	—	100 V	R73	●	●	—	—	—	Relay, PLC
	Connector					—	R73C	●	●	●	●		
	Grommet	Yes			48 V, 100 V	100 V or less	R80	●	●	—	—	IC circuit	
	Connector				—	24 V or less	R80C	●	●	●	●	—	

* 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 (side and axial) are available.**



JIS Symbol



Made to Order
(Refer to pages 129 to 131, 138 and 139 for details.)

Symbol	Specifications/Description
XA1 to XA24	Shaft type pattern
XC 1	Add connection port
XC 4	Change of rotation
XC 5	Change of rotation
XC 6	Change of rotation
XC 7	Reversed shaft
XC26	Change of rotation
XC27	Change of rotation range and direction
XC30	Fluorine grease

Specifications

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

Volume

(cm³)

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	—	—	—	—

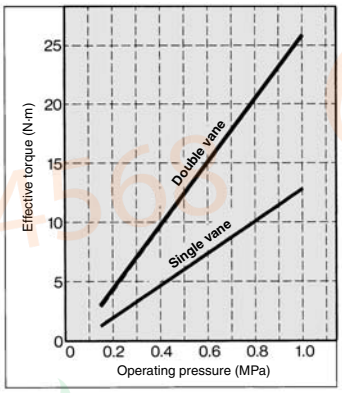
Mass

(g)

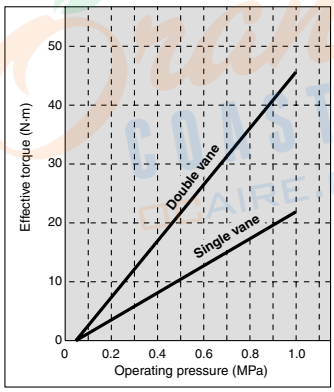
Model	Rotating angle	Single vane (S)				Double vane (D)			
		CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100	CRB1BW50	CRB1BW63	CRB1BW80	CRB1BW100
Main body	90°	810	1365	2070	3990	830	1410	2120	4150
	180°	790	1330	2010	3880	—	—	—	—
	270°	770	1290	1950	3760	—	—	—	—
	100°	808	1360	2065	3980	822	1400	2100	4100
	190°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

Effective Output

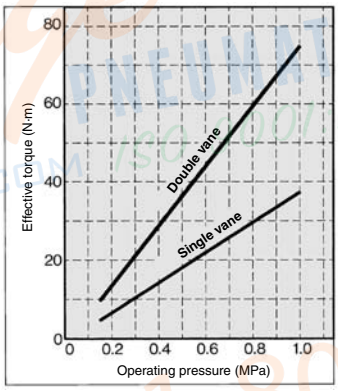
CRB1BW50



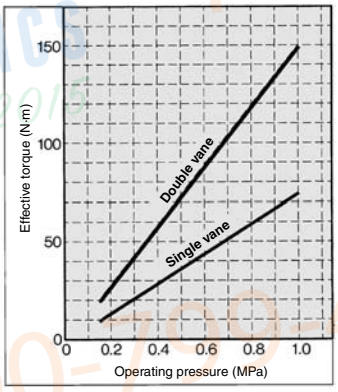
CRB1BW63



CRB1BW80

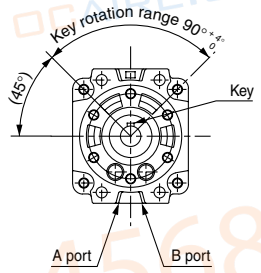
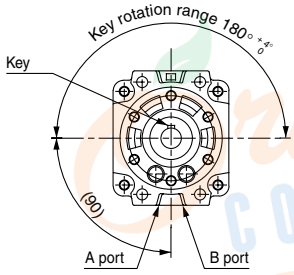
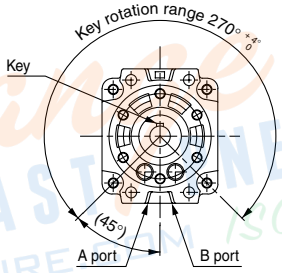
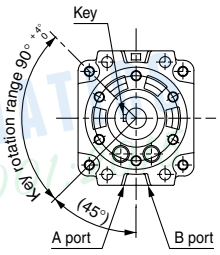
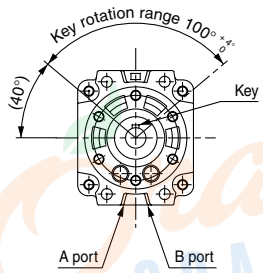
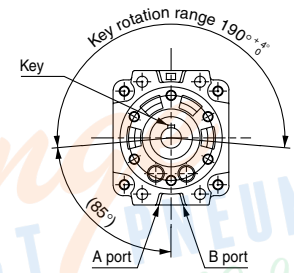
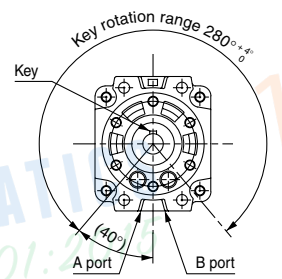
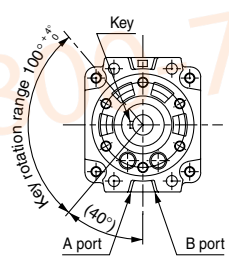


CRB1BW100

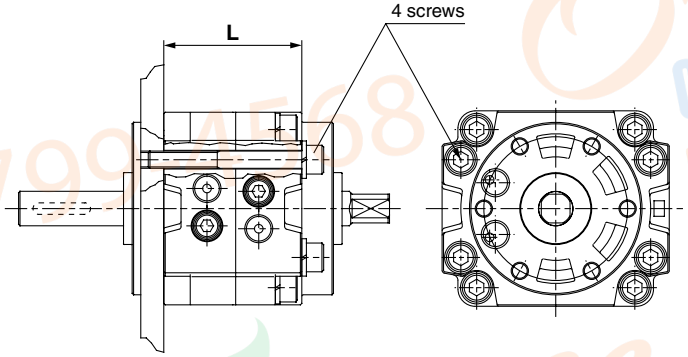


Key Position and Rotation Range

(Top View from Long Shaft Side)
Key positions in the figures below show the intermediate rotation position when A or B port is pressurized.

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

Direct Mounting of Body



Model	L	Screw
CRB1BW 50	48	M 6
CRB1BW 63	52	M 8
CRB1BW 80	60	M 8
CRB1BW100	80	M10

SMC

With One-touch Fittings

CRB1 | Mounting | W50F | Rotating angle | Vane type | Port location

W50F: With One-touch fittings

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

Specifications

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

Applicable Tubing and Size

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

Refer to page 126 for external dimensions.

Clean Series

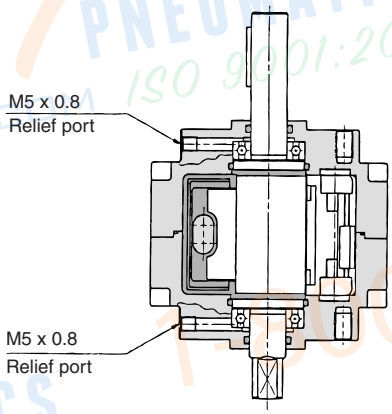
10 — CRB1BW | Size | Rotating angle | Vane type | Port location

10: 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/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	
Allowable kinetic energy	0.029 J	0.042 J



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

Copper-free and Fluorine-free Rotary Actuator

20 – CRB1BW | P | Size | — | Rotating angle | Vane type | Port location | — | Made to order

Pattern

Nil	Without Made to Order
P	Simple Specials/Made to Order

Copper-free and fluorine-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.

Made to order

Symbol	Description
XA1 to XA24	Shaft type pattern
XC 1	Add connection port
XC 4	Change of rotation
XC 5	Change of rotation
XC 6	Change of rotation
XC 7	Reversed shaft
XC26	Change of rotation
XC27	Change of rotation range and direction

* Refer to pages 129 to 131, 138 and 139 for details.

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	

Stainless Steel Specifications for Main Parts

CDRB1 | Mounting style | W | Size | — | Rotating angle | Vane type | Port location | S

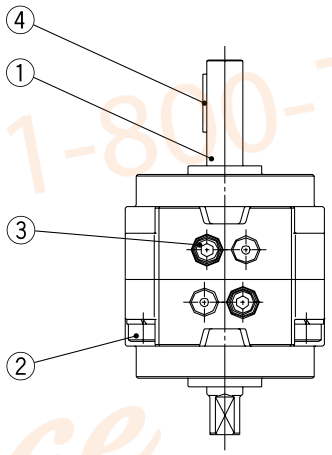
Auto switch

Nil	Basic style
D	With auto switch (With switch unit)

Stainless Steel Specifications for Main Parts

Specifications

Vane type	Single/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			
Allowable kinetic energy	0.029J	0.042J	0.142J	0.212J



Stainless Steel Parts

	Description
1	Vane shaft
2	Hexagon socket head cap screw
3	Fuji lock bolt
4	Parallel keyway

SMC

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** **P** **Size** – **Rotating angle** **Vane type** **Port location** – **Made to order**

Shaft type

J	Double shaft (Long shaft with four chamfers)
K	Double round shaft
S	Single shaft key
T	Single round shaft
X	Single shaft with four chamfers
Z	Double shaft with four chamfers

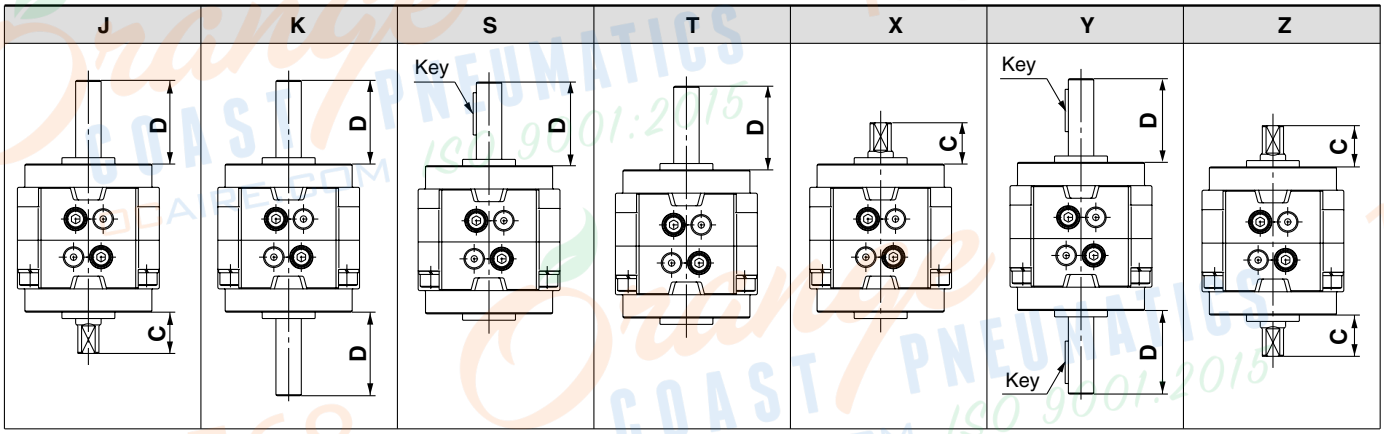
Pattern

Nil	Without Made to Order
P	Simple Specials/Made to Order

Made to Order

Symbol	Description
XA31 to XA60	Shaft type pattern
XC 1	Add connection port
XC 4	Change of rotation
XC 5	Change of rotation
XC 6	Change of rotation
XC 7	Reversed shaft
XC26	Change of rotation
XC27	Change of rotation range and direction
XC30	Fluorine grease

* Refer to pages 132 to 139 for details.



(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.

Without auto switch CDRB1B **J** **P** **Size** – **Rotating angle** **Vane type** **Port location** – **Made to order**

With auto switch

Shaft type

J	Double shaft (Long shaft with four chamfers)
Z	Double shaft with four chamfers

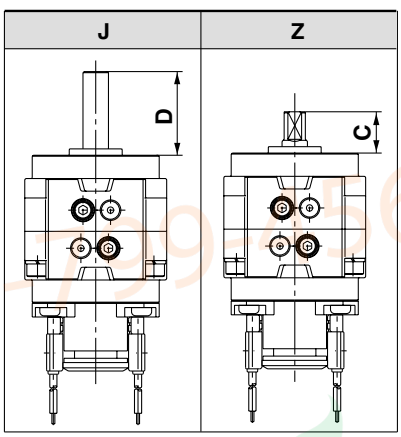
Pattern

Nil	Without Made to Order
P	Simple Specials/Made to Order

Made to Order

Symbol	Description
XA31 to XA60	Shaft type pattern
XC 1	Add connection port
XC 4	Change of rotation
XC 5	Change of rotation
XC 6	Change of rotation
XC 7	Reversed shaft
XC26	Change of rotation
XC27	Change of rotation range and direction
XC30	Fluorine grease

The above may not be selected when the product comes with a auto switch. Refer to pages 132 to 139 for details.



(mm)

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

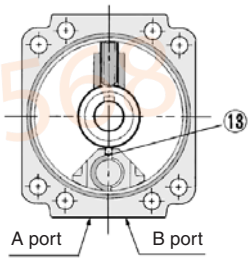
Note) Dimensions and tolerance of the shaft and keyway are the same as the standard.

Construction

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

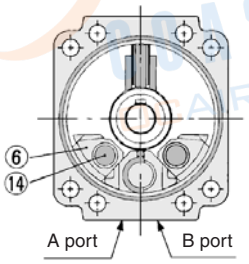
For 270° (Top view from long shaft side)

Single vane



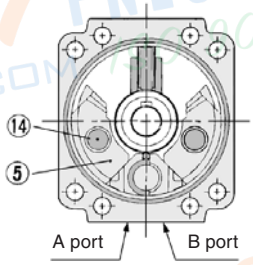
For 180° (Top view from long shaft side)

Single vane



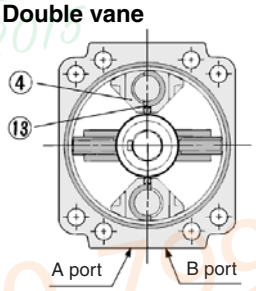
For 90° (Top view from long shaft side)

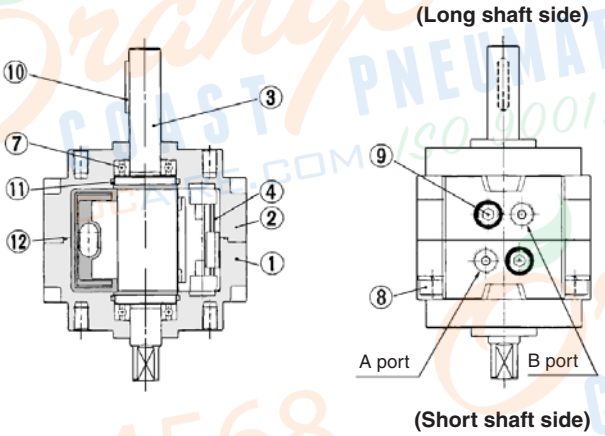
Single vane



For 90° (Top view from long shaft side)

Double vane



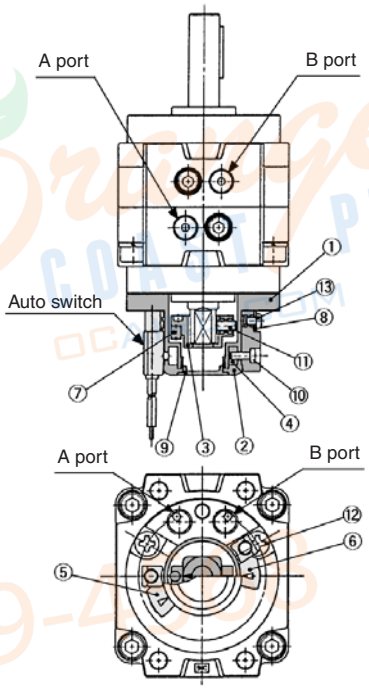


Component Parts

No.	Description	Material	Note
1	**Body (A)**	Aluminum	Painted
2	**Body (B)**	Aluminum	Painted
3	**Vane shaft**	Carbon steel	
4	**Stopper**	Aluminum	
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 key**	Carbon steel	
11	**O-ring**	NBR	
12	**O-ring**	NBR	Special O-ring
13	**Stopper seal**	NBR	Special seal
14	**Holding rubber**	NBR	

With auto switch

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

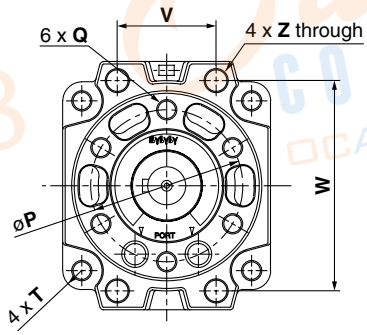


Component Parts

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

Dimensions: 50, 63, 80, 100

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

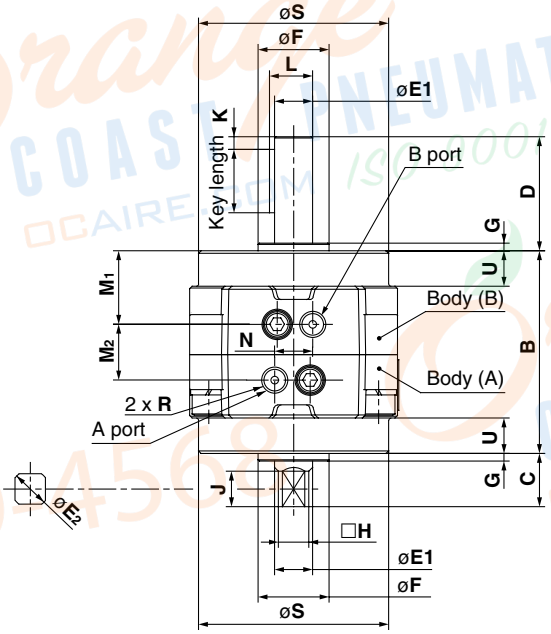


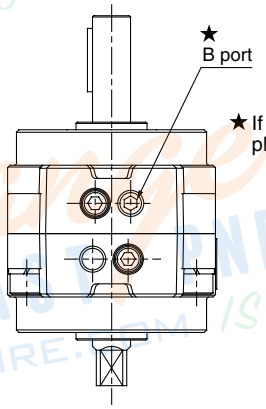
Key dimensions (mm)

Key dimension	ℓ	b	h

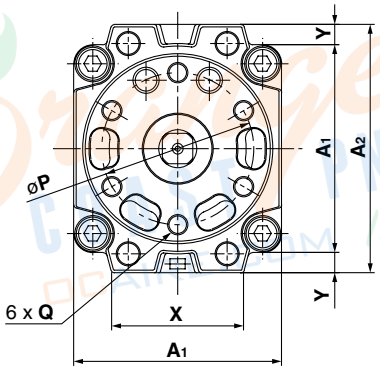
Model	b (h9)	h (h9)	ℓ
CRB1BW 50-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20
CRB1BW 63-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	25
CRB1BW 80-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	36
CRB1BW100-□□□	$7^{0}_{-0.036}$	$7^{0}_{-0.036}$	40

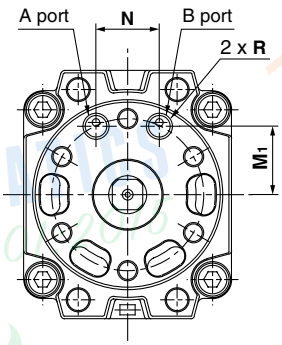
CRB1BW□-□SE, CRB1BW□-□DE <Port location: Axial ported>





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





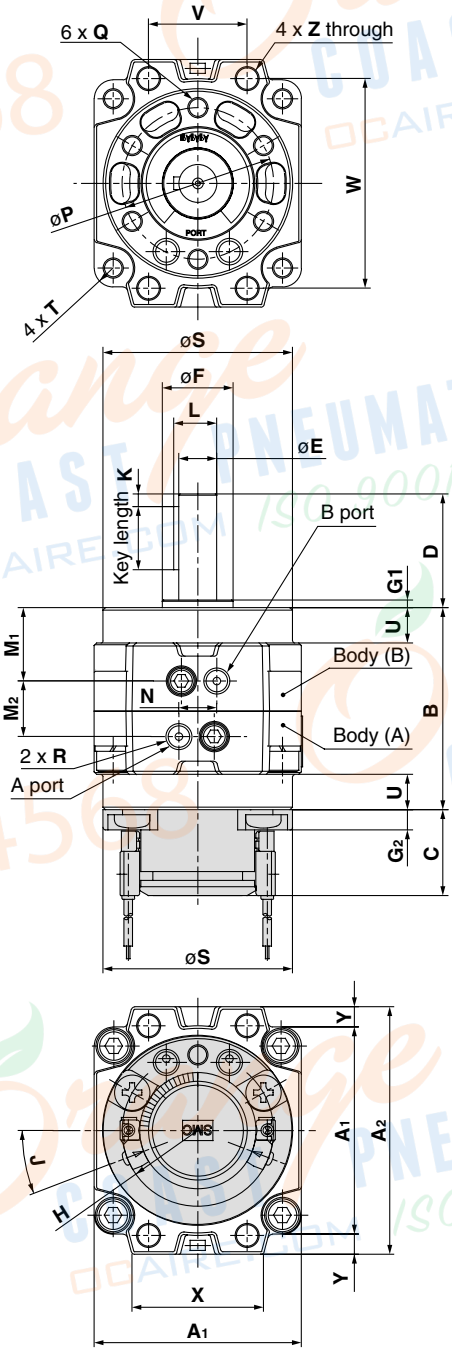
(mm)

Model	A1	A2	B	C	D	E1 (g6)	E2 (h9)	F (h9)	G	H	J	K	L	M1	M2	N	P	Q	R (*)	S	T	U	V	W	X	Y	Z
CRB1BW 50-□□	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
CRB1BW 50-□□E														21	—	18											
CRB1BW 63-□□	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
CRB1BW 63-□□E														27	—	25											
CRB1BW 80-□□	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
CRB1BW 80-□□E														29	—	30											
CRB1BW 100-□□	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
CRB1BW 100-□□E														38	—	38											

∗ For single vane: Above figures show actuators for 180° when B port is pressurized.
∗ For double vane type: Figures above show the intermediate rotation position when the A or B port is pressurized.
∗ In addition to Rc, G and NPT are also available for connection ports.

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

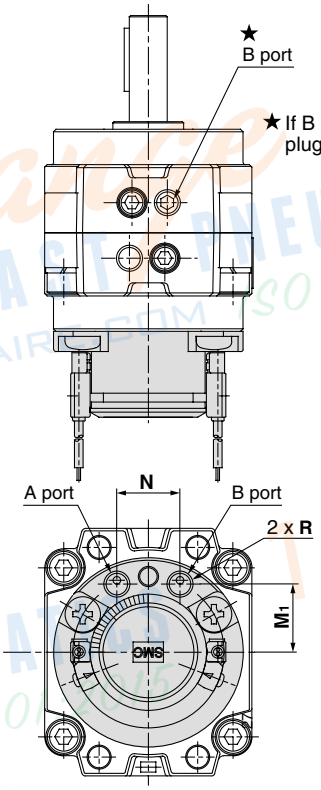
Single vane type/Double vane type
CDRB1BW□-□S/D
<Port location: Side ported>



Key dimensions (mm)

Key dimension	ℓ	b / h
Model	**b** (h9)	**h** (h9)	ℓ
CDRB1BW 50-□□□	$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20
CDRB1BW 63-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	25
CDRB1BW 80-□□□	$5^{0}_{-0.030}$	$5^{0}_{-0.030}$	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.

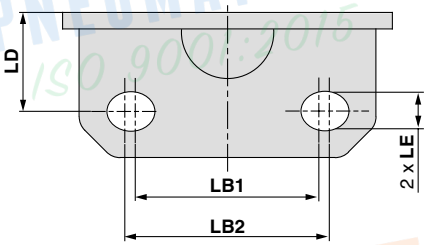
(mm)

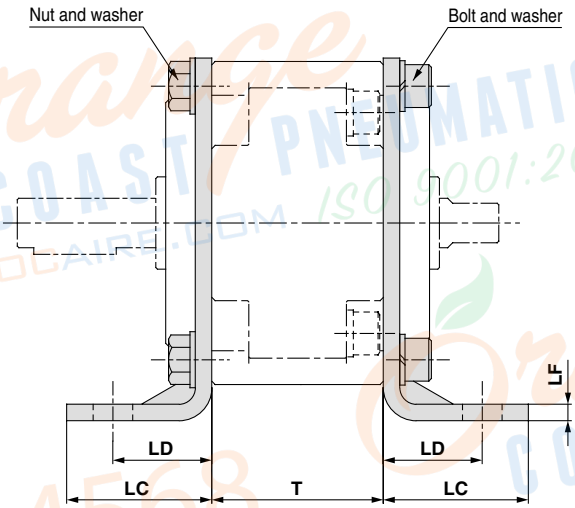
Model	A1	A2	B	C	D	E (g6)	F (h9)	G1	G2	H (R)	J	K	L	M1	M2	N	P	Q	R (*)	S	T	U	V	W	X	Y	Z
CDRB1BW 50-□□	67	78	70	32	39.5	$12^{-0.006}_{-0.017}$	$25^{0}_{-0.052}$	3	6.5	R22.5	32.5	5	13.5	26	18	14	50	M6 x 1 depth 9	1/8	60	R6	11	34	66	46	5.5	6.5
CDRB1BW 50-□□E														21	—	18											
CDRB1BW 63-□□	82	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
CDRB1BW 63-□□E														27		25											
CDRB1BW 80-□□	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
CDRB1BW 80-□□E														29	—	30											
CDRB1BW 100-□□	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
CDRB1BW 100-□□E														38	—	38											

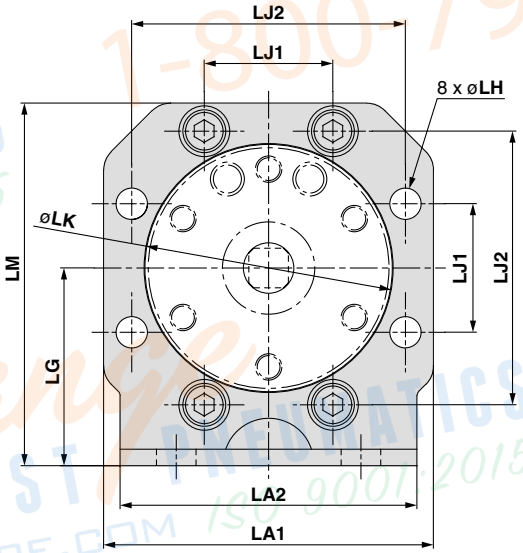
∗ For single vane: Above figures show actuators for 180° when B port is pressurized.
∗ For double vane type: Figures above show the intermediate rotation position when the A or B port is pressurized.
∗ In addition to Rc, G and NPT are also available for connection ports.

Dimensions

Option: Foot bracket







(mm)

Applicable size	Foot bracket assembly no.	LA1	LA2	LB1	LB2	LC	LD	LE	LF	LG	LH	LJ1	LJ2	LK	LM	T
50	P411020-5	78	70	45	50	36	25.5	ø10	4.5	45	7.5	34	66	60.5	84	48
63	P411030-5	100	90	56		44	30	ø12	5	60	9.5	39	83	75.5	110	52
80	P411040-5	111	100	63		46	32	ø12	6	65	9.5	48	94	88.5	120.5	60
100	P411050-5	141	126	80		55	39.5	ø14	6	80	11.5	60	120	108.5	150.5	80

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

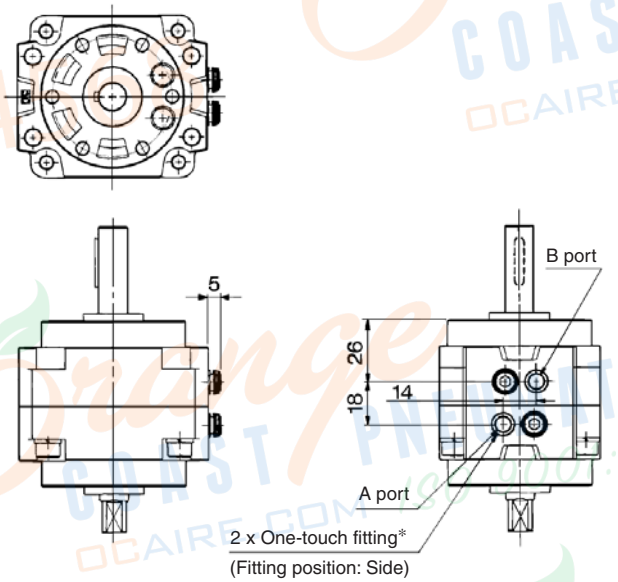
Model		Foot bracket assembly no.
Standard	With auto switch	
CRB1LW 50	**CDRB1LW 50**	P411020-5
CRB1LW 63	**CDRB1LW 63**	P411030-5
CRB1LW 80	**CDRB1LW 80**	P411040-5
CRB1LW100	**CDRB1LW100**	P411050-5

With One-touch Fittings: 50

Standard

CRB1□W50F-□□

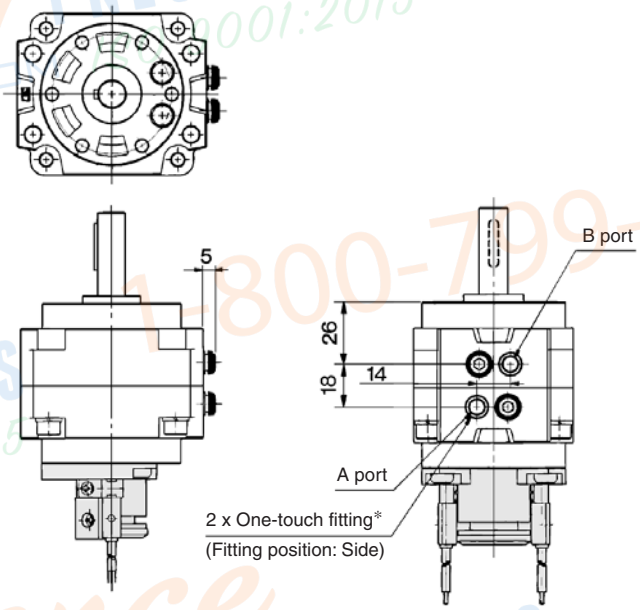
<Port location: Side ported>



With auto switch

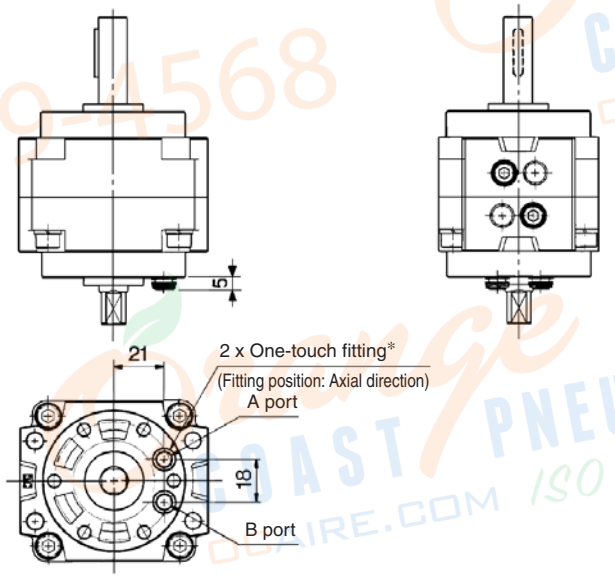
CDRB1□W50F-□□-□

<Port location: Side ported>



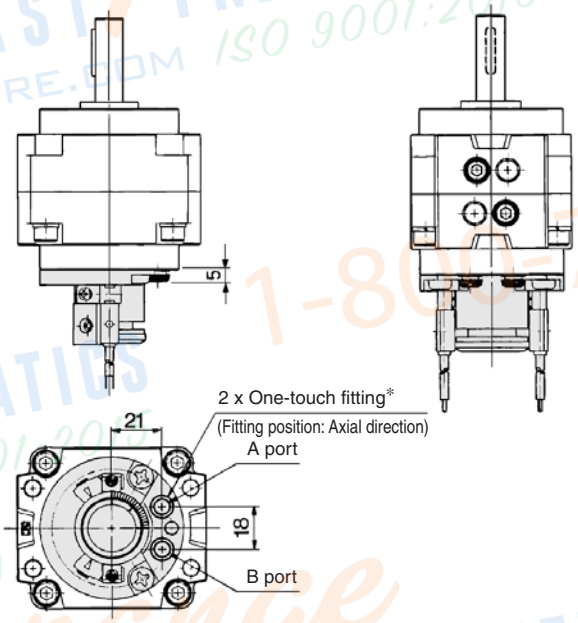
CRB1□W50F-□□E

<Port location: Axial ported>



CDRB1□W50F-□□E-□

<Port location: Axial ported>



Applicable Tubing and O.D/I.D

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

* Dimensions not indicated in the above figures are the same as size 50 actuator.

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

SMC

Rotary Actuator with Solenoid Valve

Series CVRB1

Size: 50, 63, 80, 100

How to Order

Rotary Actuator

Rotary CDVRB1 [B] [W] [ ] [80] – [90] [S] – [T79] [L] [ ] – [ ]

Auto switch

Nil	Basic style
D	With auto switch (With auto switch unit and built-in magnet)

Mounting style

B	Basic style
L	Foot style

Shaft type

W	Double shaft (Long shaft key & Four chamfers)

Pattern

Nil	Option
P	Simple Specials/Made to Order

* Refer to pages 129 to 130 for details.

Size

50
63
80
100

Rotating angle

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

Vane type

S	Single vane
D	Double vane

Auto switch

Nil	Without auto switch (built-in magnet)

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

Made to Order
Refer to pages 129 to 131, 138 and 139 for details.

Number of auto switches

S	1 pc. *
Nil	2 pcs. **

* S (1 auto switch) is shipped with a right-hand auto switch.
** Nil (2 auto switches) is shipped with a right-hand and a left-hand 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 and 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

How to Order (Example)

When ordering the rotary actuator with solenoid valve, Series CVRB1, specify the models of both the rotary and the valve (solenoid valve).

Note) For the valve, add * in front of the part number when ordering.

Example) CDVRB1BW80-90S-R7·····1 pc.
*VZ5140-5LZ·····1 pc.

Solenoid valve

Valve VZ [3] [1] 4 – [5] [L] [ ] [ ] – [X199]

Valve series

3	Series VZ3000	C□VRB1BW50, 63
5	Series VZ5000	C□VRB1BW80, 100

Type of actuation

1	2 position single solenoid
2	2 position double solenoid

Rated voltage

1	100 VAC 50/60Hz
2	200 VAC 50/60Hz
5	24 VDC

Electrical entry

Grommet	L plug connector	M plug connector	DIN terminal
G: Lead wire length 300mm	L: With lead wire (Wire length: 300 mm)	M: With lead wire (Wire length: 300 mm)	D: With connector
H: Lead wire length 600mm	LO: Without connector	MO: Without connector	DO: Without connector

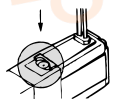
Light/surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z (1)	With light/surge voltage suppressor

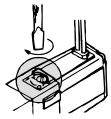
Note 1) GZ, HZ and DOZ are not available.

Manual

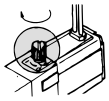
Nil: Non-locking push type



B: Locking B type (Slotted)



C: Locking C type (Manual)

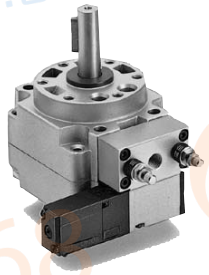


Suffix
For Series VZ3000 only

Applicable Auto Switches/Refer to pages 761 to 809 for further information on auto switches.

Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m) * 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
Solid state switch	Grommet	Yes	2-wire	12 V	—	T79	●	●	—	—	—	Relay, PLC
	Connector					T79C	●	●	●	●		
	Grommet		3-wire (NPN)	5V, 12 V		S79	●	●	—	—	IC circuit	
			3-wire (PNP)			S7P	●	●	—	—		
Reed switch	Grommet	Yes	2-wire	—	100 V	R73	●	●	—	—	—	Relay, PLC
	Connector				—	R73C	●	●	●	●		
	Grommet	No		48 V, 100 V	100 V or less	R80	●	●	—	—	IC circuit	
	Connector			—	24 V or less	R80C	●	●	●	●	—	

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



Made to Order
(Refer to pages 129 to 131, 138 and 139 for details.)

Symbol	Specifications/Description
XA1 to XA24	Shaft type pattern
XC 1	Add connection port
XC 4	Change of rotation
XC 5	Change of rotation
XC 6	Change of rotation
XC 7	Reversed shaft
XC26	Change of rotation
XC27	Change of rotation range and direction
XC30	Fluorine grease

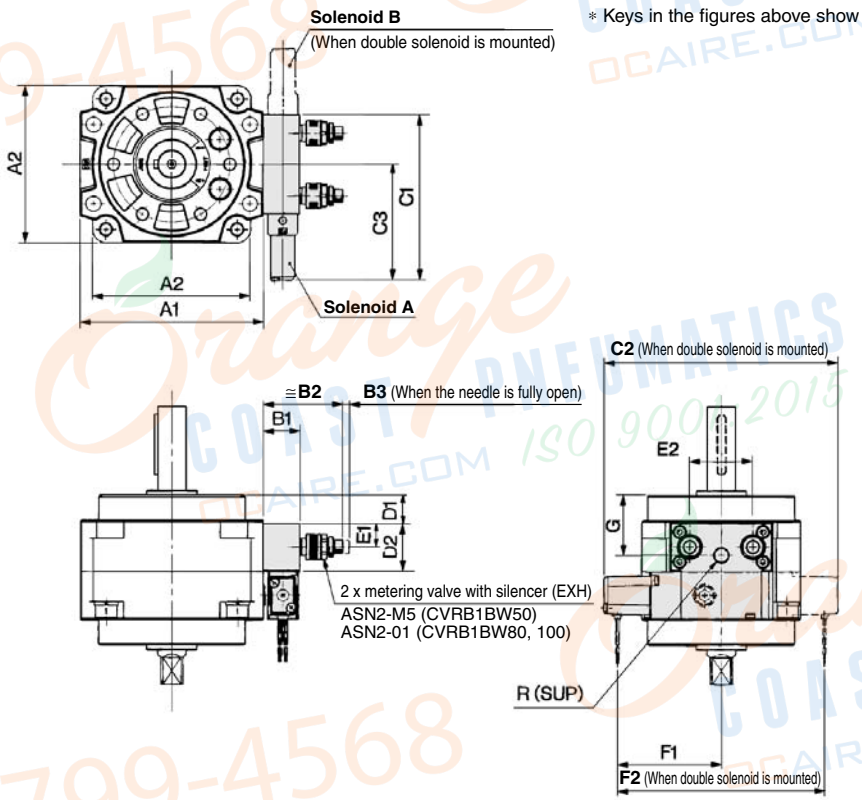
Solenoid Valve Specifications

Model			Series VZ3000, VZ5000
Manual override			Non-locking push type Locking type (Slotted), Locking type (Manual)
Pilot exhaust type			Pilot valve individual exhaust
Mounting position			Free
Impact/Vibration resistance (m/s²) (1)			300/50
Enclosure			Dusttight
Electrical entry			Grommet (G)/(H), L plug connector (L), M plug connector (M), DIN terminal (D)
Coil rated voltage (V)	AC50/60Hz		100, 200
	DC		24
Allowable voltage fluctuation (%)			–15 to +10 of rated voltage
Power consumption (2) (W) [Current mA]	DC		1.8 (With light: 2.1) (24 VDC: 75 [With light: 87.5])
Apparent power (VA) (2) [Current mA]	AC	Inrush	4.5 to 50Hz, 4.2/60Hz [100 VAC: 45/50Hz, 42/60Hz; 200 VAC: 22.5/50Hz, 21/60Hz]
		Holding	3.5 /50Hz, 3 /60Hz [100 VAC: 35/50Hz, 30/60Hz; 200 VAC: 17.5/50Hz, 15/60Hz]
Surge voltage suppressor			DC: Diode, AC: ZNR
Indicator light			DC: LED (Red), AC: Neon bulb

∗ Option
Note 1) Impact resistance: No malfunction occurred in the impact test using a drop impact tester. The test was performed at both energized and de-energized states to the axis and right angle direction of the main valve and armature. Vibration resistance: No malfunction occurred in the one-sweep test between 45 and 2000 Hz. A test was performed at both energized and de-energized states to the axis and right angle direction of the main valve and armature. (Value in the initial stage.)
Note 2) At the rated voltage.

The specifications and construction of rotary actuator is the same as the standard CRB1 series. Refer to page 122.

Dimensions



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

Note 1) Solenoid valve in external appearance is for VZ⁵₇140-1G.
Note 2) Solenoid valve dimensions: 2 position single solenoid, ( ): 2 position double solenoid.

(mm)

Model (Size)	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F1	F2	G	R
CVRB1BW 50	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
CVRB1BW 63	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
CVRB1BW 80	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

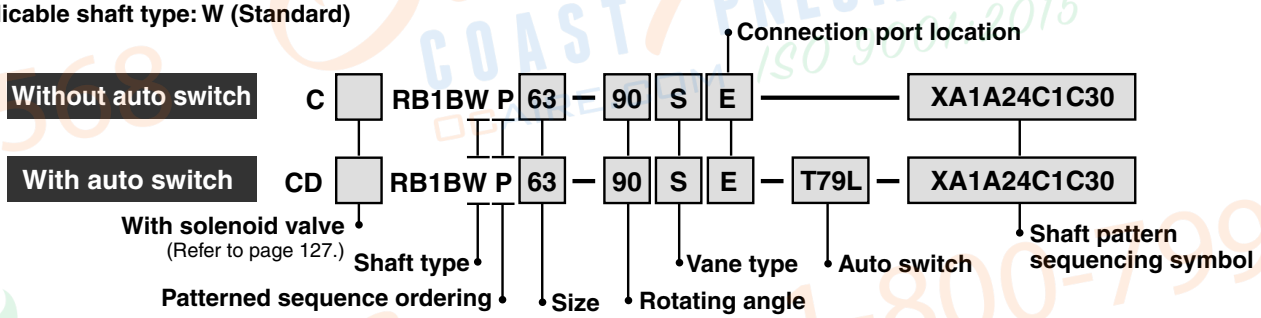
Series CRB1 (Size: 50, 63, 80, 100)

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

Shaft shape pattern is dealt with simple made-to-order system (Refer to front matter 33). 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			
		50	63	80	100
XA 1	Shaft-end female thread	●	●	●	●
XA14 *	Shaft through-hole + Shaft-end female thread	●	●	●	●
XA17 *	Change of long shaft length (Change of key length)	●	●	●	●
XA24 *	Double key	●	●	●	●

* The vane type for the shaft through-hole is compatible with single vanes only.

● Double Shaft

Symbol	Description	Applicable size			
		50	63	80	100
XA13 *	Shaft through-hole	●	●	●	●
XA16 *	Shaft through-hole + Double shaft-end female threads	●	●	●	●
XA19 *	Change of double shaft length	●	●	●	●
XA20 *	Reversed shaft, Change of double shaft length	●	●	●	●

* The vane type for the shaft through-hole is compatible with single vanes only.
* The product with an auto switch is available only for XA1, 14, 17 and 24.

● Axial: Bottom (Short shaft side)

Symbol	Description	Applicable size			
		50	63	80	100
XA 2 *	Shaft-end female thread	●	●	●	●
XA15 *	Shaft through-hole + Shaft-end female thread	●	●	●	●
XA18 *	Change of short shaft length	●	●	●	●

* The vane type for the shaft through-hole is compatible with single vanes only.

Combination

XA□ Combination

Symbol	Description	Axial direction		Combination										
		Up	Down											
XA 1	Shaft-end female thread	●	—	XA1										
XA 2	Shaft-end female thread	—	●	●	XA2									
XA13	Shaft through-hole	●	●	—	—	XA13								
XA14	Shaft through-hole + Shaft-end female thread	●	—	—	—	—	XA14							
XA15	Shaft through-hole + Shaft-end female thread	—	●	—	—	—	—	XA15						
XA16	Shaft through-hole + Double shaft-end female threads	●	●	—	—	—	—	—	XA16					
XA17	Change of long shaft length (Change of key length)	●	—	—	●	●	—	●	—	XA17				
XA18	Change of short shaft length	—	●	●	—	●	●	—	—	—	XA18			
XA19	Change of double shaft length	●	●	—	—	●	—	—	—	—	—	XA19		
XA20	Reversed shaft, Change of double shaft length	●	●	—	—	●	—	—	—	—	—	—	XA20	
XA24	Double key	●	—	●	●	●	●	●	●	●	●	●	●	XA24

A combination of up to two XA□s are available.
Example: -XA1A24

XA□, XC□ Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.
Refer to pages 138 to 139 for details of made-to-order specifications.

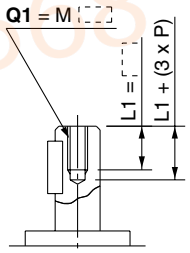
Symbol	Description	Applicable size	XA1, XA2 XA13 to 16, 24
XC 1	Add connection port	50, 63 80,100	●
XC 4	Change of rotation range and direction		●
XC 5	Change of rotation range and direction		●
XC 6	Change of rotation range and direction		●
XC 7	Reversed shaft		—
XC26	Change of rotation range and direction		●
XC27	Change of rotation range and direction		●
XC30	Fluorine grease		●

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

Axial: Top (Long shaft side)

Symbol: A1
Machine female threads into the long shaft.

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



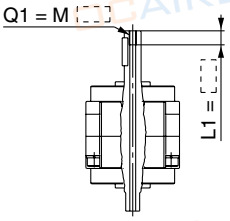
(mm)

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

Symbol: A14
Applicable to single vane type only

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

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

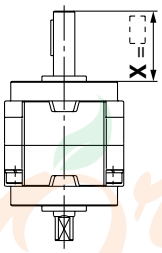


(mm)

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

Symbol: A17
Shorten the long shaft.

- Applicable shaft type: W



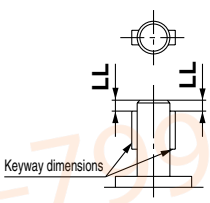
(mm)

Size	X
50	24.5 to 39.5
63	28 to 45
80	30.5 to 53.5
100	40 to 65

Symbol: A24
Double key

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

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



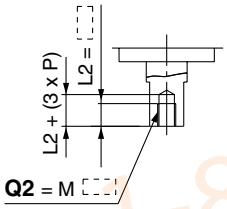
(mm)

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

Axial: Bottom (Short shaft side)

Symbol: A2
Machine female threads into the short shaft.

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



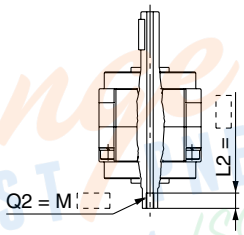
(mm)

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

Symbol: A15
Applicable to single vane type only

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

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

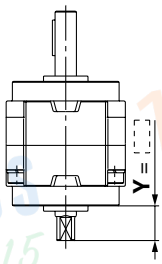


(mm)

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

Symbol: A18
Shorten the short shaft.

- Applicable shaft type: W



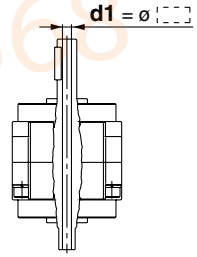
(mm)

Size	Y
50	4 to 19.5
63	4 to 21
80	4 to 23.5
100	5 to 30

Double Shaft

Symbol: A13
Applicable to single vane type only

Shaft with through-hole
- Minimum machining diametor for d1 is 0.1.
- Applicable shaft type: W

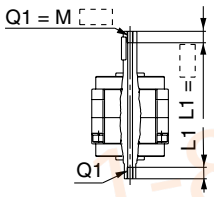


(mm)

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

Symbol: A16
Applicable to single vane type only

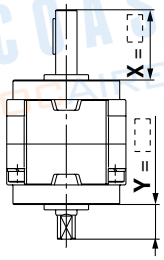
A special end is machined onto both the long and short shafts, and a through hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 = 10
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



(mm)

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

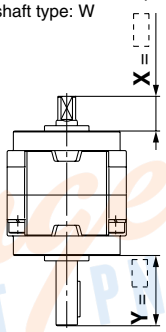
Symbol: A19
Shorten both long and short shafts.
- Applicable shaft type: W



(mm)

Size	X	Y
50	24.5 to 39.5	4 to 19.5
63	28 to 45	4 to 21
80	30.5 to 53.5	4 to 23.5
100	40 to 65	5 to 30

Symbol: A20
The rotation axis is reversed.
(If shortening the shaft is not required, indicate "∗" for dimension X, Y.)
- Applicable shaft type: W



(mm)

Size	X	Y
50	4 to 19.5	24.5 to 39.5
63	4 to 21	28 to 45
80	4 to 23.5	30.5 to 53.5
100	5 to 30	40 to 65

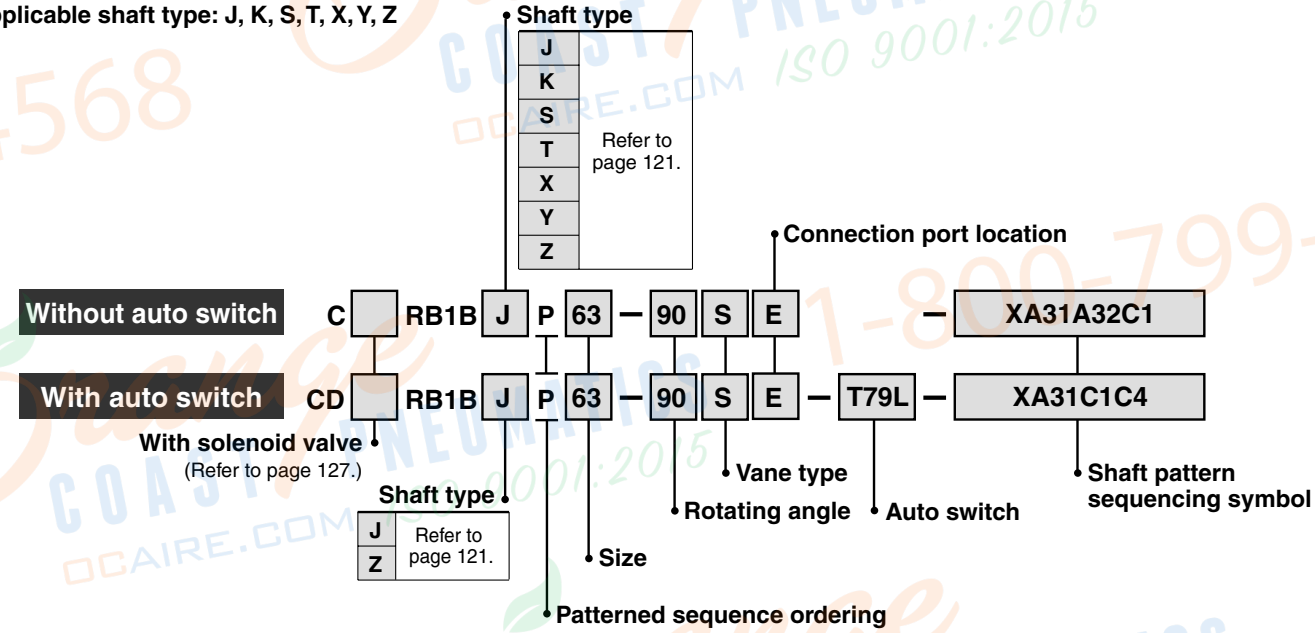
Series CRB1 (Size: 50, 63, 80, 100)

Simple Specials:
-XA31 to -XA60: Shaft Pattern Sequecing II

Shaft shape pattern is dealt with simple made-to-order system (Refer to front matter 33). Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing II -XA31 to XA60

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



Shaft Pattern Sequencing Symbol

● Axial: Top (Long shaft side)

Symbol	Description	Shaft type	Applicable size
XA31	Shaft-end female thread	S, Y	50, 63, 80, 100
XA33	Shaft-end female thread	J, K, T	
XA35	Shaft-end female thread	X, Z	
XA37	Stepped round shaft	J, K, T	
XA45	Middle-cut chamfer	J, K, T	
XA48	Change of long shaft length (With keyway)	S, Y	
XA51	Change of long shaft length (Without keyway)	J, K, T	
XA54	Change of long shaft length (With four chamfers)	X, Z	

● Axial: Bottom (Short shaft side)

Symbol	Description	Shaft type	Applicable size
XA32	Shaft-end female thread	S, Y	50, 63, 80, 100
XA34	Shaft-end female thread	K, T	
XA36	Shaft-end female thread	J, X, Z	
XA38	Stepped round shaft	K	
XA46	Middle-cut chamfer	K	
XA49	Change of short shaft length (With keyway)	Y	
XA52	Change of short shaft length (Without keyway)	K	
XA55	Change of short shaft length (With four chamfers)	J, Z	

● Double Shaft

Symbol	Description	Shaft type	Applicable size
XA39*	Shaft through-hole	S, Y	50, 63, 80, 100
XA40*	Shaft through-hole	K, T	
XA41*	Shaft through-hole	J, X, Z	
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, X, Z	
XA50	Change of double shaft length (Both sides with keyway)	Y	
XA53	Change of double shaft length (Without keyway)	K	
XA56	Change of double shaft length (Both sides with four chamfers)	Z	
XA57	Change of double shaft length (With four chamfers, without keyway)	J	
XA58	Reversed shaft, Change of double shaft length (With four chamfers, without keyway)	J, T	
XA59	Reversed shaft, Change of shaft length (With four chamfers)	X	
XA60	Reversed shaft, Change of shaft length (With keyway)	S	

* The vane type for the shaft through-hole is compatible with single vanes only.
* The product with an auto switch is available only for J and Z shafts of XA33, 35, 37 45, 51 and 54.

Combination

XA□ Combination

Symbol	Description	Axial direction		Applicable shaft type							Combination												
		Up	Down	J	K	S	T	X	Y	Z	∗ These are shaft types that can be combined.												
XA31	Shaft-end female thread	●	—	—	—	●	—	—	●	—	**XA31**												
XA32	Shaft-end female thread	—	●	—	—	●	—	—	●	—	●	**XA32**											
XA33	Shaft-end female thread	●	—	●	●	—	●	—	—	—	—	—	**XA33**										
XA34	Shaft-end female thread	—	●	—	●	—	●	—	—	—	—	—	●	**XA34**									
XA35	Shaft-end female thread	●	—	—	—	—	—	●	—	●	—	—	—	—	**XA35**								
XA36	Shaft-end female thread	—	●	●	—	—	—	●	—	●	—	—	J∗	—	X, Z∗	**XA36**							
XA37	Stepped round shaft	●	—	●	●	—	●	—	—	—	—	—	—	K, T∗	—	J∗	**XA37**						
XA38	Stepped round shaft	—	●	—	●	—	—	—	—	—	—	—	K∗	—	—	—	●						
XA39	Shaft through-hole	●	●	—	—	●	—	—	●	—	—	—	—	—	—	—	—	**XA38**					
XA40	Shaft through-hole	●	●	—	●	—	●	—	—	—	—	—	—	—	—	—	—	K∗	**XA39**				
XA41	Shaft through-hole	●	●	●	—	—	—	●	—	●	—	—	—	—	—	—	—	—	—	**XA40**			
XA42	Shaft through-hole + Double Shaft-end female thread	●	●	—	—	●	—	—	●	—	—	—	—	—	—	—	—	—	—	—	**XA41**		
XA43	Shaft through-hole + Double Shaft-end female thread	●	●	—	●	—	●	—	—	—	—	—	—	—	—	—	—	K∗	—	K, T∗	J∗	**XA45**	
XA44	Shaft through-hole + Double Shaft-end female thread	●	●	●	—	—	—	●	—	●	—	—	—	—	—	—	—	—	—	—	—	K∗	**XA46**
XA45	Middle-cut chamfer	●	—	●	●	—	●	—	—	—	—	—	—	K, T∗	—	J∗	—	K∗	**XA39**	**XA40**	**XA41**	**XA45**	
XA46	Middle-cut chamfer	—	●	—	●	—	—	—	—	—	—	—	K∗	—	—	—	K∗	—	—	—	—	K∗	**XA46**
XA48	Change of long shaft length (With keyway)	●	—	—	—	●	—	—	●	—	—	●	—	—	—	—	—	—	●	—	—	—	—
XA49	Change of short shaft length (With keyway)	—	●	—	—	—	—	—	●	—	Y∗	—	—	—	—	—	—	—	Y∗	—	—	—	—
XA50	Change of double shaft length (Both sides with keyway)	●	●	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	Y∗	—	—	—	—
XA51	Change of long shaft length (Without keyway)	●	—	●	●	—	●	—	—	—	—	—	—	K, T∗	—	J∗	—	K∗	—	K, T∗	J∗	—	K∗
XA52	Change of short shaft length (Without keyway)	—	●	—	●	—	—	—	—	—	—	—	K∗	—	—	—	—	—	—	K∗	—	K∗	—
XA53	Change of double shaft length (Without keyway)	●	●	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	K∗	—	—	—
XA54	Change of long shaft length (With four chamfers)	●	—	—	—	—	—	●	—	●	—	—	—	—	—	X, Z∗	—	—	—	—	X, Z∗	—	—
XA55	Change of short shaft length (With four chamfers)	—	●	●	—	—	—	—	—	●	—	—	J∗	—	Z∗	—	J∗	—	—	—	J, Z∗	J∗	—
XA56	Change of double shaft length (Both sides with four chamfers)	●	●	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	Z∗	—	—
XA57	Change of double shaft length (With four chamfers, without keyway)	●	●	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J∗	—	—
XA58	Reversed shaft, Change of double shaft length (With four chamfers, without keyway)	●	●	●	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	T∗	J∗	—	—
XA59	Reversed shaft, Change of shaft length (With four chamfers)	—	●	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	X∗	—	—
XA60	Reversed shaft, Change of shaft length (With keyway)	—	●	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	S∗	—	—	—	—

Combinations of XA39 to XA44 with others are not available.
The vane type for the shaft through-hole is compatible with single vanes only.
A combination of up to two XA□s are available.
Example: XA31A32

XA□, XC□ Combination

Combination other than XA□, such as Made to Order (XC□), is also available.
Refer to page 138 and 139 for details of made-to-order specifications.

Symbol	Description	Applicable shaft type	XA31 to XA60
		J, K, S, T, X, Y, Z	
XC 1	Add connection port	●	●
XC 4	Change of rotation range and direction	●	●
XC 5	Change of rotation range and direction	●	●
XC 6	Change of rotation range and direction	●	●
XC 7	Reversed shaft	J, S, T, X	—
XC26	Change of rotation range and direction	●	●
XC27	Change of rotation range and direction	●	●
XC30	Fluorine grease	●	●

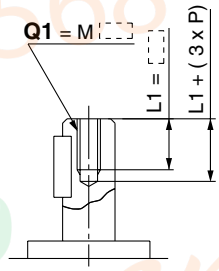
∗ The vane type for the shaft through-hole is compatible with single vanes only.
A total of four XA□ and XC□ combinations is available.
Example: XA31A32C1C30
XA32C1C4C30
∗ The product with an auto switch is available only for J and Z shafts of XA33, 35, 37 45, 51 and 54.

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
- Applicable shaft types: S, Y



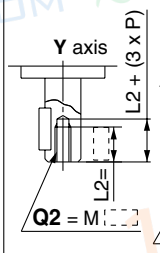
(mm)

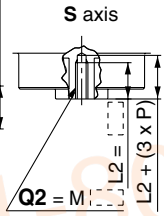
Size \ Shaft type	Q1	
	S	Y
50	M3, M4, M5	
63	M4, M5, M6	
80	M4, M5, M6	
100	M5, M6, M8	

Symbol: 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
- Applicable shaft types: S, Y





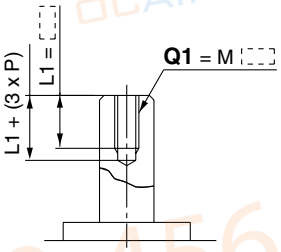
(mm)

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

Symbol: 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
- Applicable shaft types: J, K, T



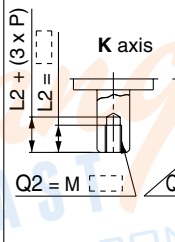
(mm)

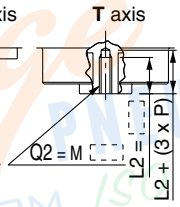
Size \ Shaft type	Q1		
	J	K	T
50	M3, M4, M5, M6		
63	M4, M5, M6		
80	M4, M5, M6, M8		
100	M5, M6, M8, M10		

Symbol: 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
- Applicable shaft types: K, T





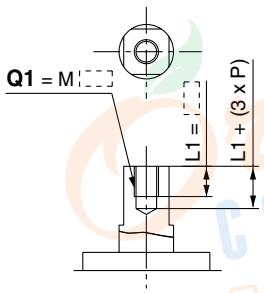
(mm)

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

Symbol: 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
- Applicable shaft types: X, Z



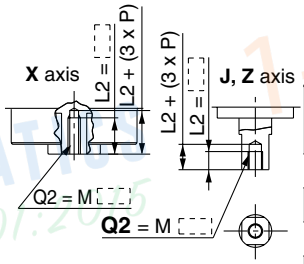
(mm)

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

Symbol: 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
- Applicable shaft types: J, X, Z



(mm)

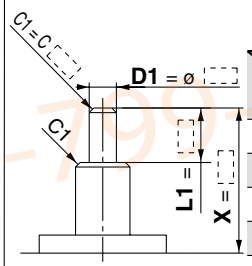
Size \ Shaft type	Q2		
	X	J	Z
50	M3, M4, M5, M6	M3, M4, M5	
63	M4, M5, M6	M4, M5, M6	
80	M4, M5, M6, M8	M4, M5, M6	
100	M5, M6, M8, M10	M5, M6, M8	

Symbol: A37

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

(If shortening the shaft is not required, indicate "*" for dimension X.)
(If not specifying dimension C1, indicate "*" instead.)

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



(mm)

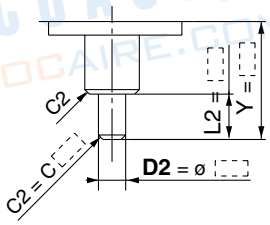
Size \ Shaft type	X			L1 max			D1		
	J	K	T	J	K	T	J	K	T
50	4 to 39.5			X - 3			3 to 11.9		
63	4 to 45			X - 3			3 to 14.9		
80	4 to 53.5			X - 3			3 to 16.9		
100	5 to 65			X - 4			3 to 24.9		

Symbol: A38

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

(If shortening the shaft is not required, indicate "*" for dimension Y.)
(If not specifying dimension C2, indicate "*" instead.)

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



(mm)

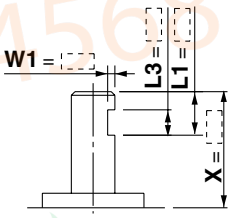
Size	Y	L2 max	D2
50	4 to 39.5	Y - 3	3 to 11.9
63	4 to 45	Y - 3	3 to 14.9
80	4 to 53.5	Y - 3	3 to 16.9
100	5 to 65	Y - 4	3 to 24.9

Axial: Top (Long shaft side)

Symbol: A45

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

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



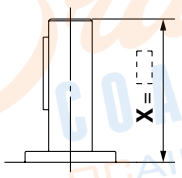
(mm)

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

Symbol: A48

Shorten the long shaft.

• Applicable shaft types: S, Y



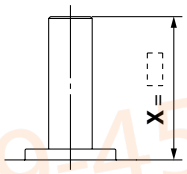
(mm)

Size	X
50	24.5 to 39.5
63	28 to 45
80	30.5 to 53.5
100	40 to 65

Symbol: A51

Shorten the long shaft.

• Applicable shaft types: J, K, T



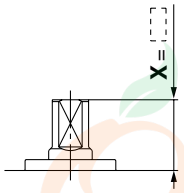
(mm)

Size	X
50	4 to 39.5
63	4 to 45
80	4 to 53.5
100	5 to 65

Symbol: A54

Shorten the long shaft.

• Applicable shaft types: X, Z



(mm)

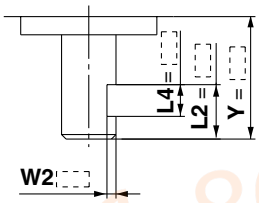
Size	X
50	4 to 19.5
63	4 to 21
80	4 to 23.5
100	5 to 30

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.
• Applicable shaft type: K



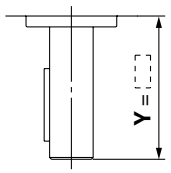
(mm)

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

Symbol: A49

Shorten the short shaft.

• Applicable shaft type: Y



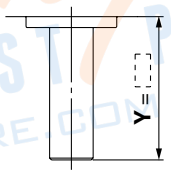
(mm)

Size	Y
50	24.5 to 39.5
63	28 to 45
80	30.5 to 53.5
100	40 to 65

Symbol: A52

Shorten the long shaft.

• Applicable shaft type: K



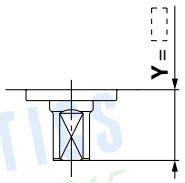
(mm)

Size	Y
50	4 to 39.5
63	4 to 45
80	4 to 53.5
100	5 to 65

Symbol: A55

Shorten the short shaft.

• Applicable shaft types: J, Z



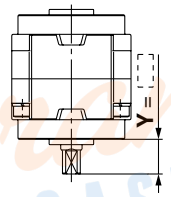
(mm)

Size	Y
50	4 to 19.5
63	4 to 21
80	4 to 23.5
100	5 to 30

Symbol: A59

Reverse the assembly of the shaft, and shorten the long shaft.

• Applicable shaft type: X



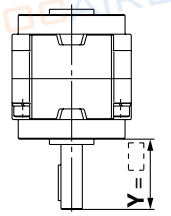
(mm)

Size	Y
50	4 to 19.5
63	4 to 21
80	4 to 23.5
100	5 to 30

Symbol: A60

Reverse the assembly of the shaft, and shorten the long shaft.

• Applicable shaft type: S



(mm)

Size	Y
50	24.5 to 39.5
63	28 to 45
80	30.5 to 53.5
100	40 to 65

⚠ Caution

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

(mm)

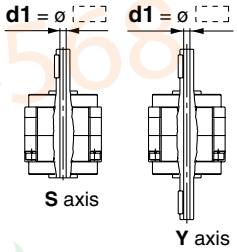
Size	W1 W2	L1-L3 L2-L4
50	4.5 to 6	2 to 5.5
63	6 to 7.5	2 to 3

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

Double Shaft

Symbol: A39
Applicable to single vane type only

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

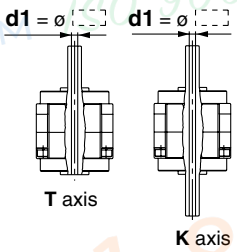


(mm)

Size \ Shaft type	d1 S	d1 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.
- Applicable shaft types: K, T

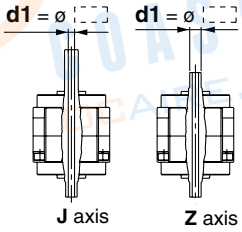


(mm)

Size \ Shaft type	d1 K	d1 T
50	ø4 to ø 5.5	
63	ø4 to ø 6	
80	ø4 to ø 7.5	
100	ø5 to ø10	

Symbol: A41
Applicable to single vane type only

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

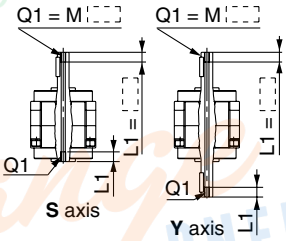


(mm)

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

Symbol: A42
Applicable to single vane type only

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

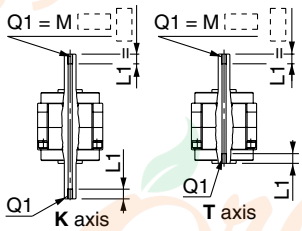


(mm)

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

Symbol: A43
Applicable to single vane type only

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

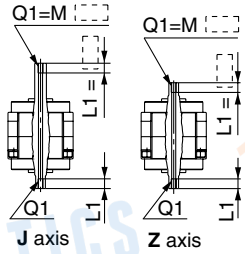


(mm)

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

Symbol: A44
Applicable to single vane type only

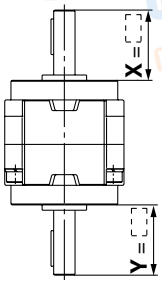
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes
- The maximum dimension L1 is, as a rule, twice the thread size.
- Applicable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



(mm)

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

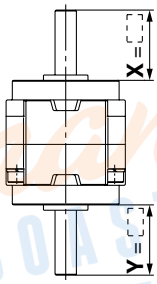
Symbol: A50
Shorten both long and short shafts.
- Applicable shaft type: Y



(mm)

Size	X	Y
50	24.5 to 39.5	24.5 to 39.5
63	28 to 45	28 to 45
80	30.5 to 53.5	30.5 to 53.5
100	40 to 65	40 to 65

Symbol: A53
Shorten both long and short shafts.
- Applicable shaft type: K



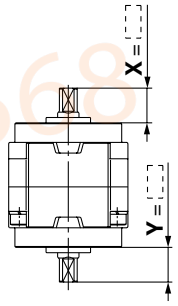
(mm)

Size	X	Y
50	4 to 39.5	4 to 39.5
63	4 to 45	4 to 45
80	4 to 53.5	4 to 53.5
100	5 to 65	5 to 65

Double Shaft

Symbol: A56 Shorten both long and short shafts.

• Applicable shaft type: Z

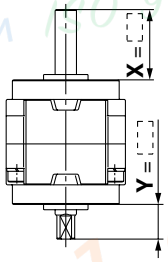


(mm)

Size	X	Y
50	4 to 19.5	4 to 19.5
63	4 to 21	4 to 21
80	4 to 23.5	4 to 23.5
100	5 to 30	5 to 30

Symbol: A57 Shorten both long and short shafts.

• Applicable shaft type: J



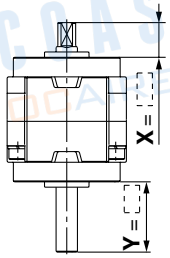
(mm)

Size	X	Y
50	4 to 39.5	4 to 19.5
63	4 to 45	4 to 21
80	4 to 53.5	4 to 23.5
100	5 to 65	5 to 30

Symbol: A58 The rotation axis is reversed.
The long shaft and short shaft are shortened.

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

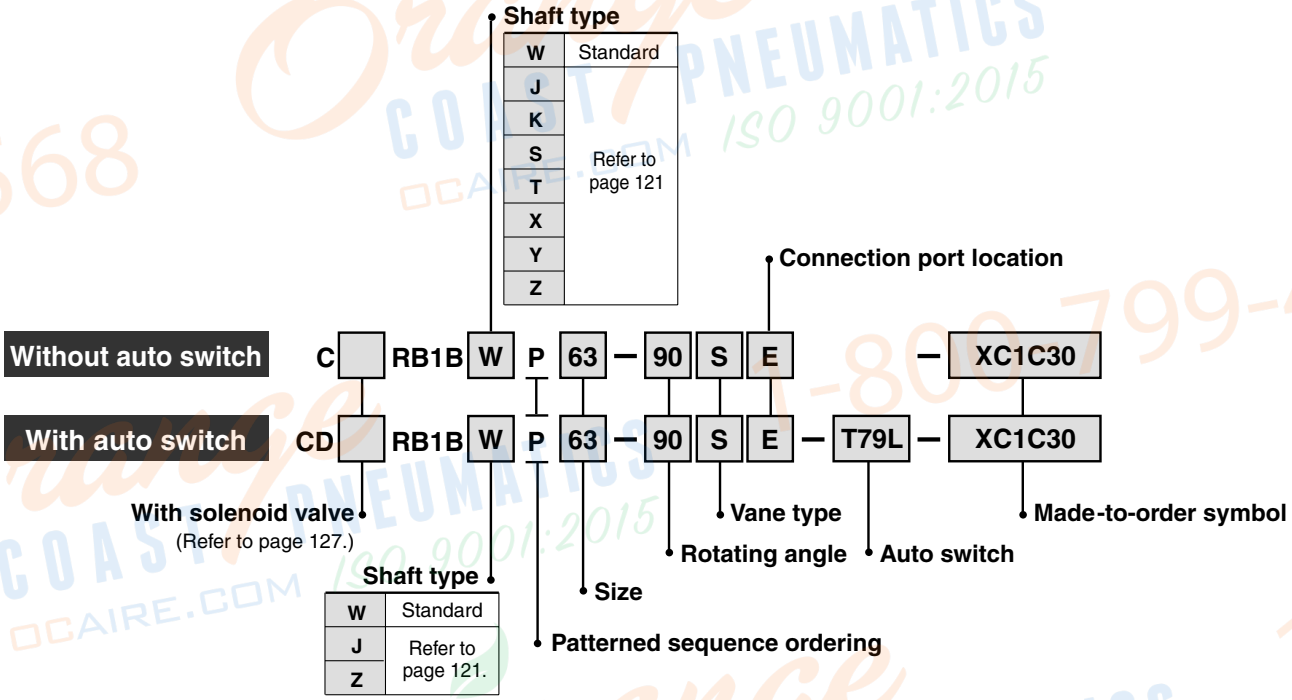
• Applicable shaft types: J, T



(mm)

Size	X	Y
50	4 to 19.5	4 to 39.5
63	4 to 21	4 to 45
80	4 to 23.5	4 to 53.5
100	5 to 30	5 to 65

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
XC 1	Add connection port	●	50, 63, 80, 100
XC 4	Change of rotation	●	
XC 5	Change of rotation	●	
XC 6	Change of rotation	●	
XC 7 *	Reversed shaft	●	
XC26	Change of rotation	●	
XC27	Change of rotation range and direction	●	
XC30	Fluorine grease	●	

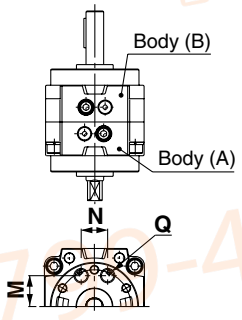
* This specification is not available for rotary actuators with auto switch unit.

Combination

Symbol	Combination XC1	Combination XC30
XC 1	—	●
XC 4	●	●
XC 5	●	●
XC 6	●	●
XC 7	●	●
XC26	●	●
XC27	●	●
XC30	●	—

Symbol: C1

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

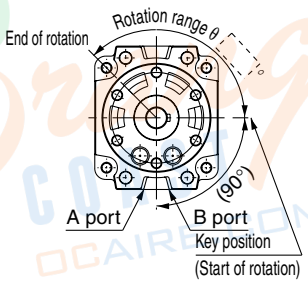


(mm)

Size	Q	M	N
50	Rc1/8	21	18
63	Rc1/8	27	25
80	Rc1/4	29	30
100	Rc1/4	38	38

Symbol: C4

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



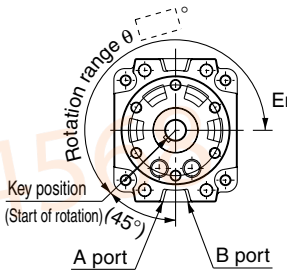
(mm)

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

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

Symbol: C5

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



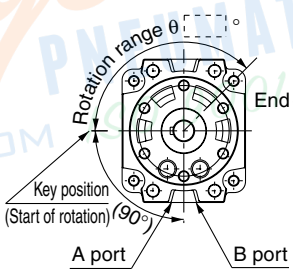
(mm)

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

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

Symbol: C6

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



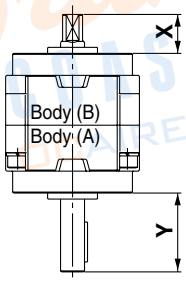
(mm)

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

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

Symbol: C7

The shafts are reversed.

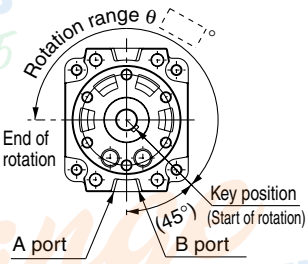


(mm)

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

Symbol: C26

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



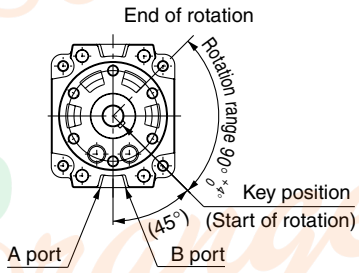
(mm)

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

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

Symbol: C27

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



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

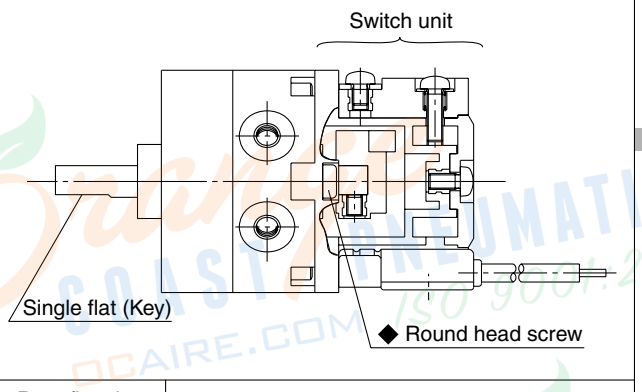
Symbol: C30

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

Auto Switch Unit and Angle Adjuster

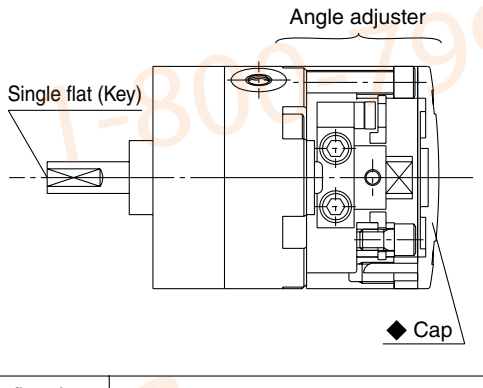
Series CRB2/CRBU2 Auto switch unit and angle adjuster can be mounted on the rotary actuator vane type.

Rotary actuator with switch unit
CDRB2BW□-□□-□
CDRBU2W□-□□-□



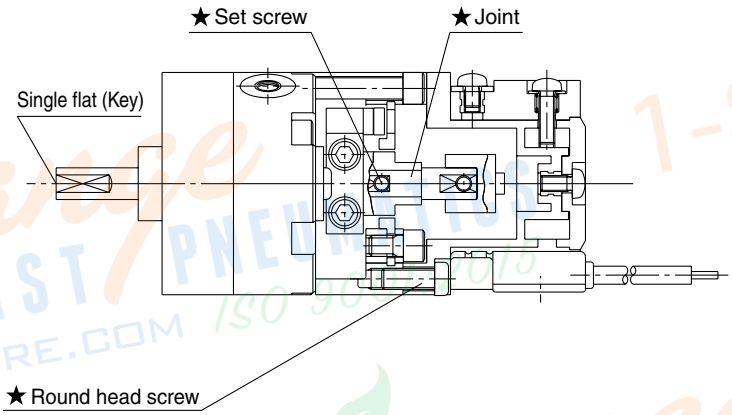
Retrofit unit	Auto switch unit

Rotary actuator with angle adjuster
CRB2BWU□-□□-□
CRBU2WU□-□□-□



Retrofit unit	Angle adjuster

Rotary actuator with switch unit and angle adjuster
CDRB2BWU□-□□-□
CDRBU2WU□-□□-□



Retrofit unit	Auto switch unit /Angle adjustment unit

∗ 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.

1 Auto Switch Unit Part No.

Each unit can be retrofitted to the rotary actuator.

Series	Model	Vane type	Unit part no.
Series ***CRB2***	**CDRB2BW 10**	Single/Double type	P611070-1
	CDRB2BW 15		P611090-1
	CDRB2BW 20		P611060-1
	CDRB2BW 30		P611080-1
	CDRB2BW 40		P611010-1
Free mount type *Series* ***CRBU2***	**CDRBU2W 10**	Single/Double type	P611070-1
	CDRBU2W 15		P611090-1
	CDRBU2W 20		P611060-1
	CDRBU2W 30		P611080-1
	CDRBU2W 40		P611010-1
Series ***CRB1***	**CDRB1BW 50**	Single/Double type	P411020-1
	CDRB1BW 63		P411030-1
	CDRB1BW 80		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 P211070-13.

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		P611010-3
Free mount type *Series* ***CRBU2***	**CRBU2WU10**	Single/Double type	P611070-3
	CRBU2WU15		P611090-3
	CRBU2WU20		P611060-3
	CRBU2WU30		P611080-3
	CRBU2WU40		P611010-3

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		P611010-4
Free-mount type *Series* ***CRBU2***	**CDRBU2WU10**	Single/Double type	P611070-4
	CDRBU2WU15		P611090-4
	CDRBU2WU20		P611060-4
	CDRBU2WU30		P611080-4
	CDRBU2WU40		P611010-4

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

Series CDRB2/CDRBU2/CRB1
With Auto Switch

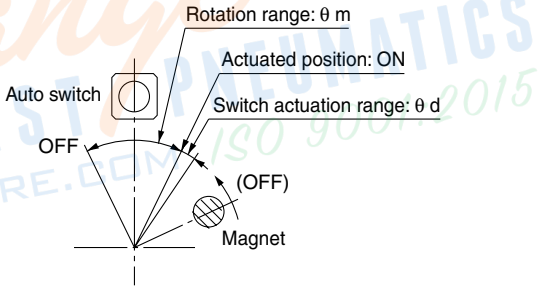
Applicable Auto Switch

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 auto switch turns OFF as the magnet travels the opposite direction.

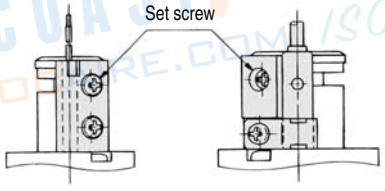


Model	Operating range: θ m	Switch actuation range: θ d
CDRB2BW10/15	110°	10°
CDRBU2W10/15		
CDRB2BW20/30	90°	
CDRBU2W20/30		
CDRB2BW40	52°	8°
CDRBU2W40		
CDRB1BW50		
CDRB1BW63 to 100	38°	7°

Note) Since the figures in the above table are provided as a guideline only, they cannot be guaranteed. Adjust the auto switch after confirming the operating conditions in the actual setting.

How to Change the Detecting Position of Auto Switch

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



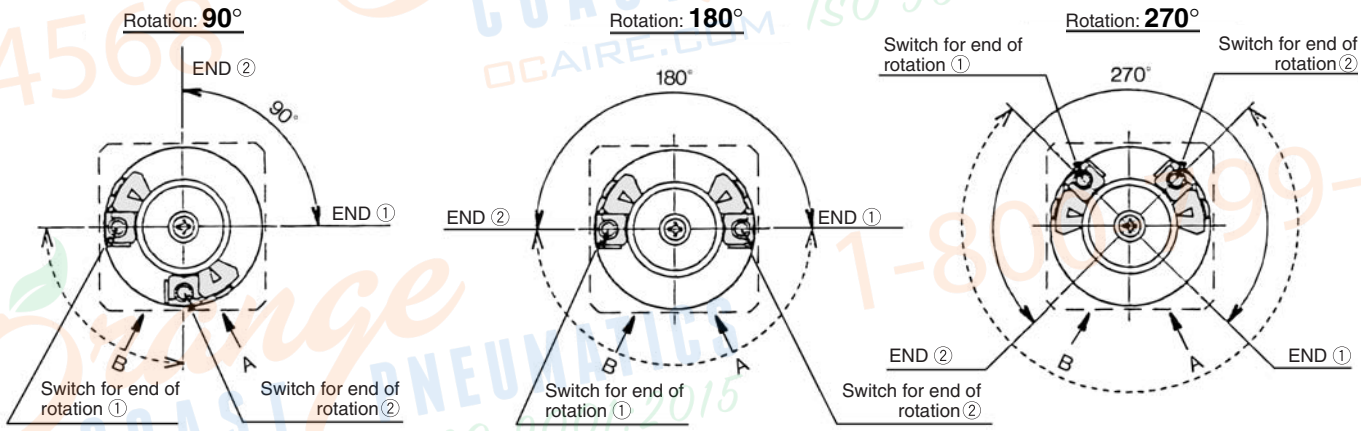
(CDRB2BW10/15
CDRBU2W10/15)

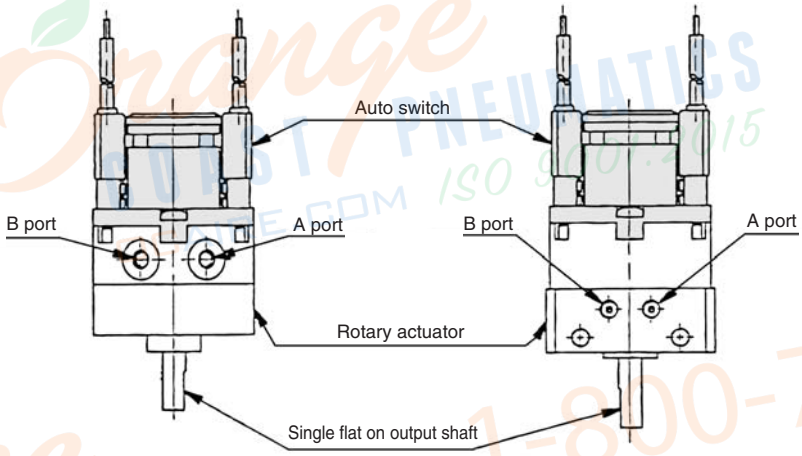
(CDRB2BW20 to 40
CDRBU2W20 to 40
CDRB1BW50 to 100)

Adjustment of Auto Switch

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

<Single vane>





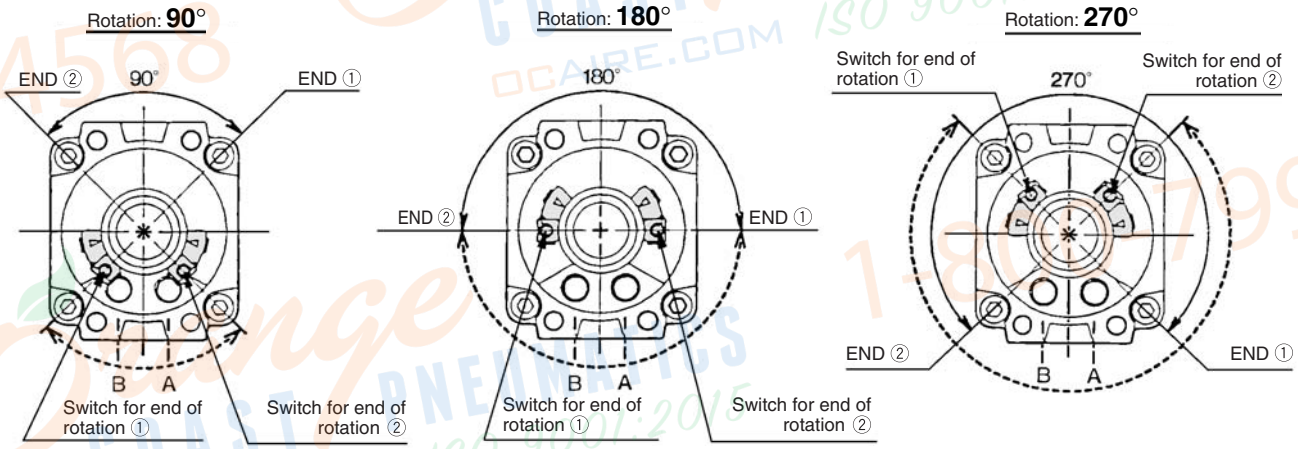
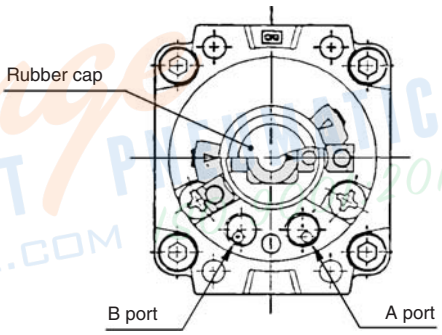
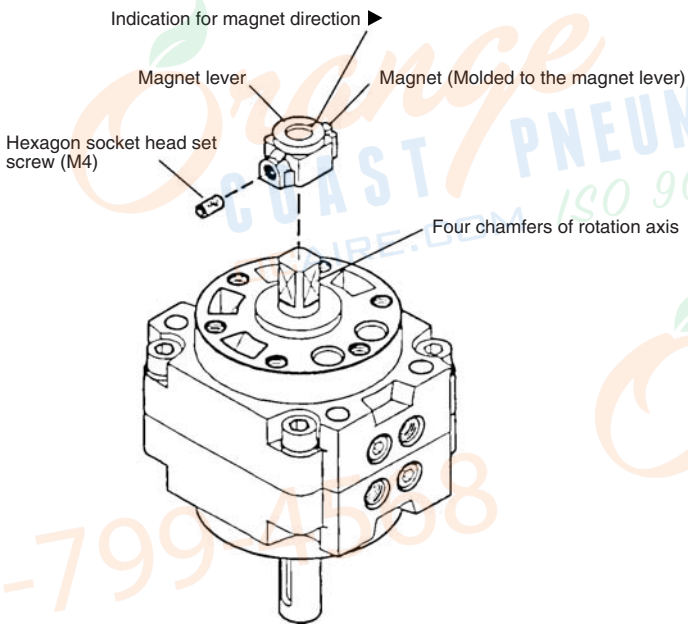
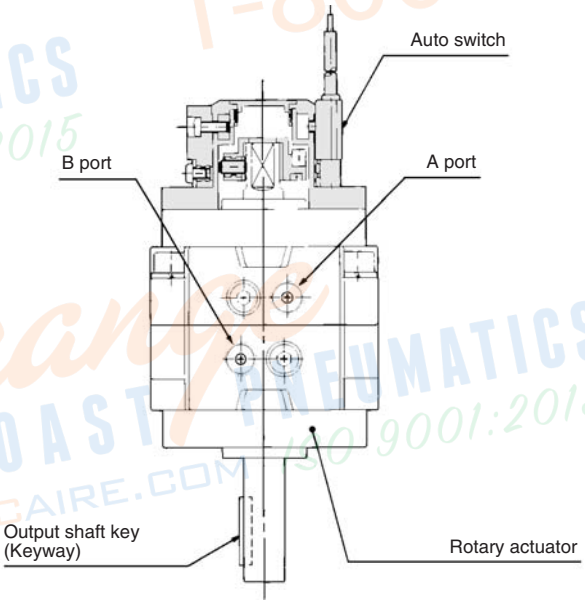
(CDRB2BW10 to 40) **(CDRBU2W10 to 40)**

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

Adjustment of Auto Switch

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

<Single vane>



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