

Rotary Actuator/Vane Style

Series CRB1

Size: 50, 63, 80, 100

Basic style
Series CRB1



With solenoid valve
Series CVRB1



Standard	Fluid		Air																	
	Size		50				63				80				100					
	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		
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Single 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		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

MRQ

D-□

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.

Mounting style

B	Basic style
L	Flange style

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

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

Shaft type

W	Double shaft (Long shaft key & Four chamfers)
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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°	—

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.

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

Auto switch

Nil	Without auto switch (built-in magnet)
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* 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

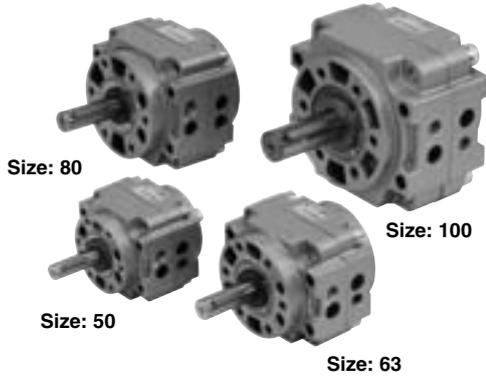
Applicable Auto Switches

Refer to pages 761 to 809 for further information on auto switches.

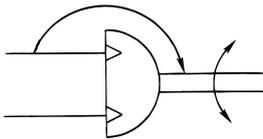
Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Applicable load	
				DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)		
Solid state switch	Grommet	Yes	2-wire	24 V	12 V	—	T79	●	●	—	—	Relay, PLC
	Connector						T79C	●	●	●	●	
	Grommet		3-wire (NPN)	5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

* 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 ^{o+4} ₀ , 180 ^{o+4} ₀ , 270 ^{o+4} ₀			90 ^{o+4} ₀				
	Option	100 ^{o+4} ₀ , 190 ^{o+4} ₀ , 280 ^{o+4} ₀			100 ^{o+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	1/8	1/4	1/4	
	Axial ported	1/8	1/4	1/8	1/4	1/8	1/4	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	—	—	—	—

Mass

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

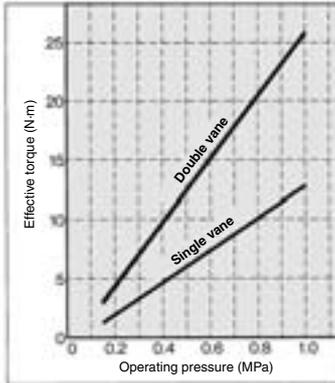
MRQ

D-□

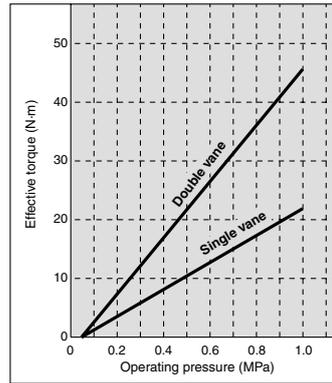
Series CRB1

Effective Output

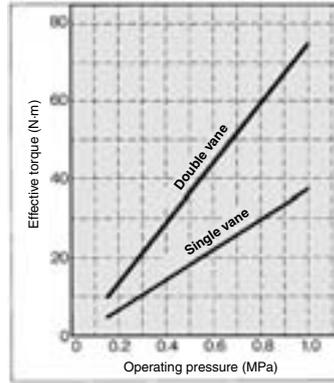
CRB1BW50



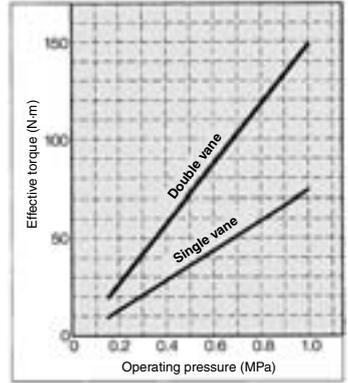
CRB1BW63



CRB1BW80



CRB1BW100

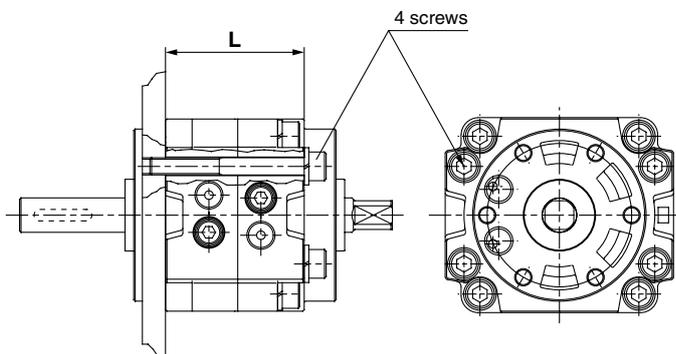


Key Position and Rotation Range (Top View from Long Shaft Side)

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

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

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

With One-touch Fittings

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

● With One-touch fittings

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

Specifications

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

Applicable Tubing and Size

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



Refer to page 126 for external dimensions.

Clean Series

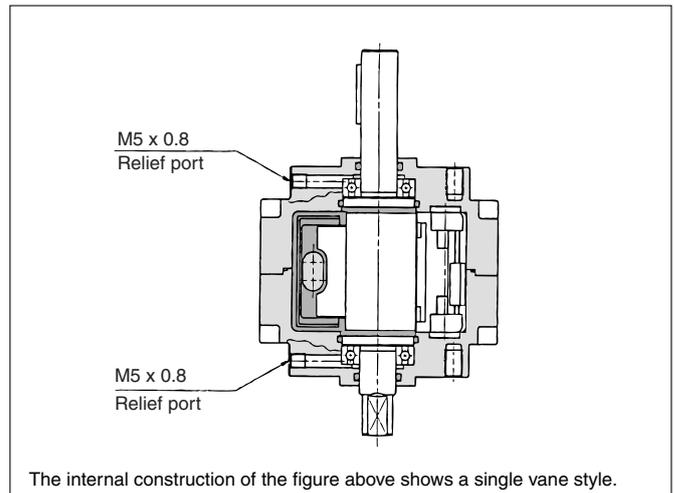
10 — CRB1BW **Size** **Rotating angle** **Vane type** **Port location**

● 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/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



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X
MSQX

MRQ

D-□

Series CRB1

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**

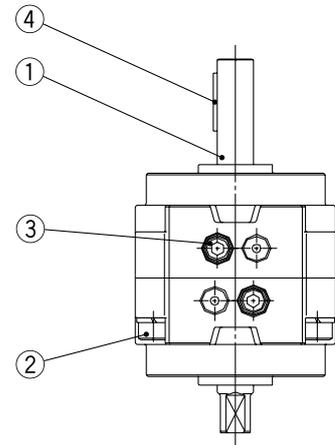
● **Auto switch**

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

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

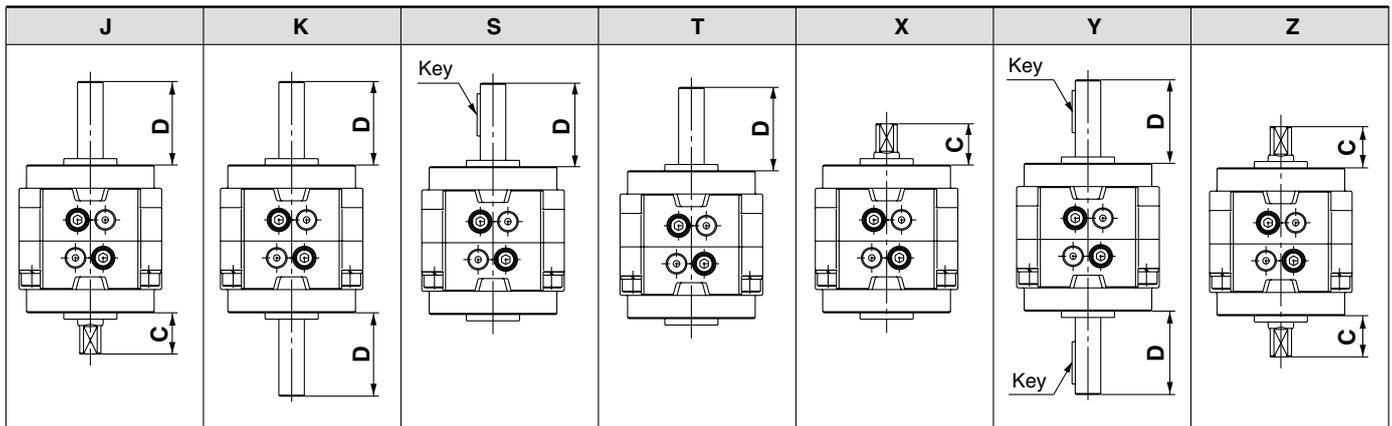
Pattern

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

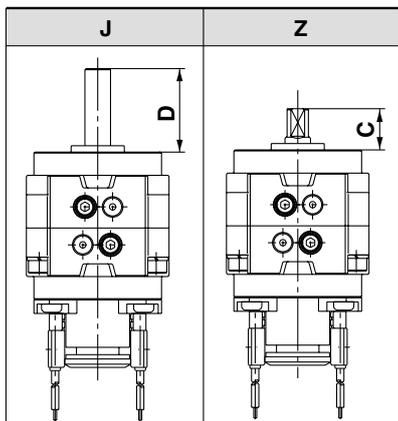
Pattern

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.

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X
MSQX

MRQ

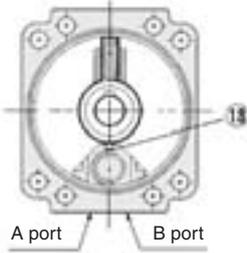
D-□

Series CRB1

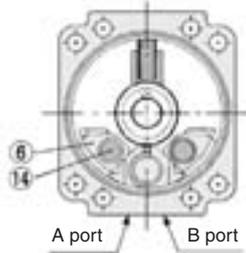
Construction

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

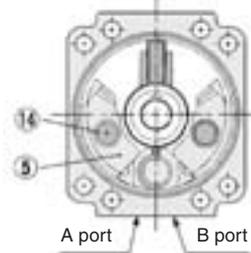
For 270° (Top view
from long shaft side)
Single vane



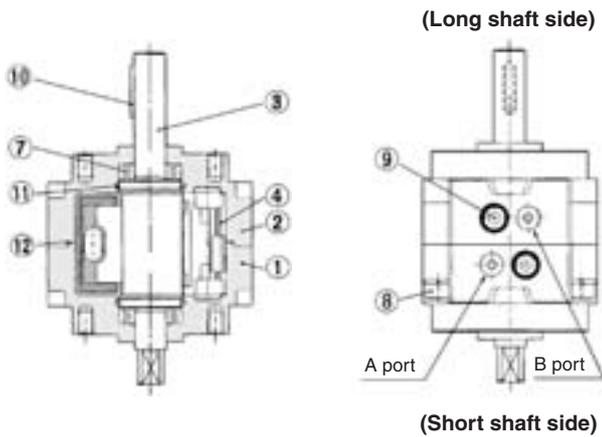
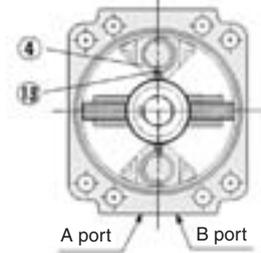
For 180° (Top view
from long shaft side)
Single vane



For 90° (Top view
from long shaft side)
Single vane



For 90° (Top view
from long shaft side)
Double vane

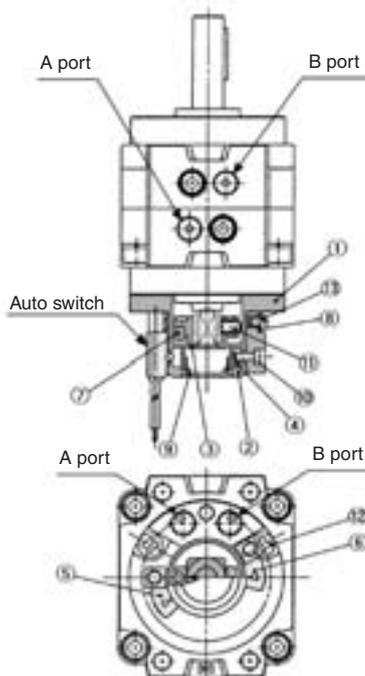


Component Parts

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.)



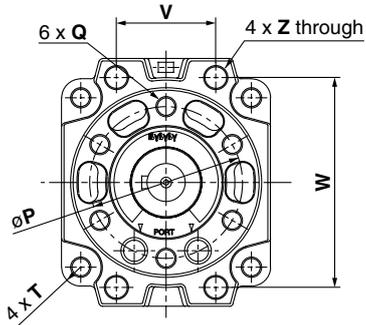
Component Parts

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

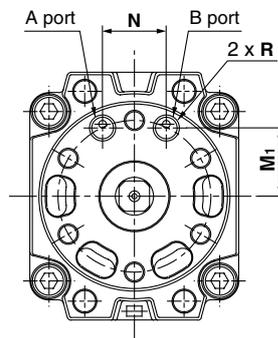
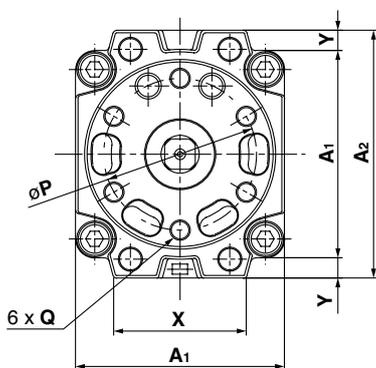
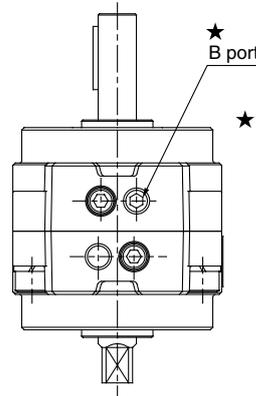
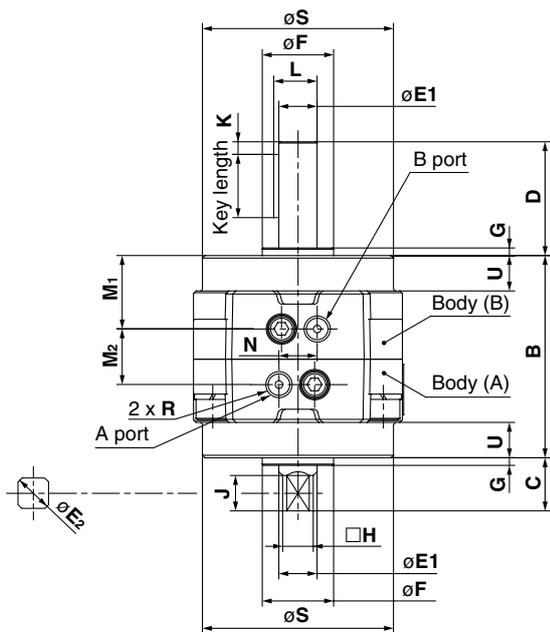
<Port location: Side ported>



Key dimensions

Key dimension	(mm)		
	b (h9)	h (h9)	ℓ
Model			
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>



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 ^{-0.008} _{-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 ^{-0.008} _{-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.

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X
MSQX

MRQ

D-□

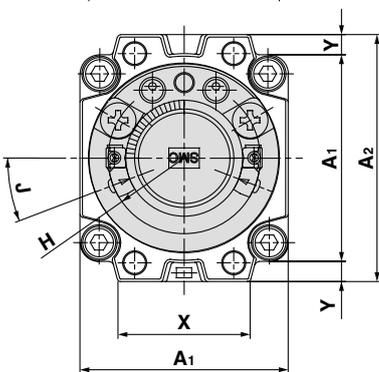
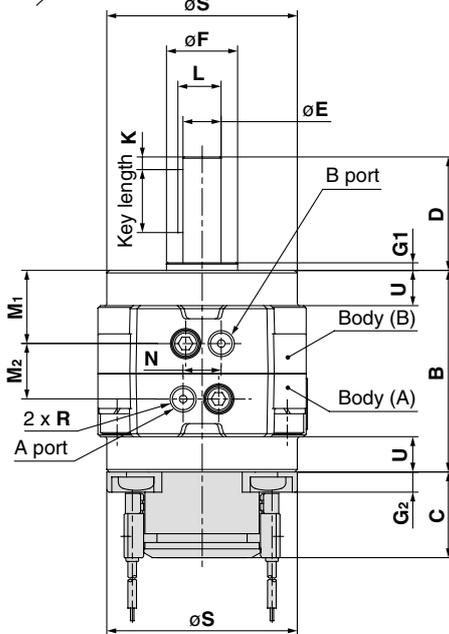
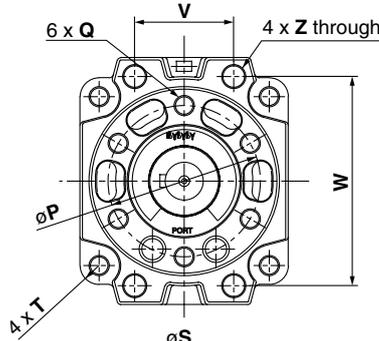
Series CRB1

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

Single vane type/Double vane type

CDRB1BW□-□S/D

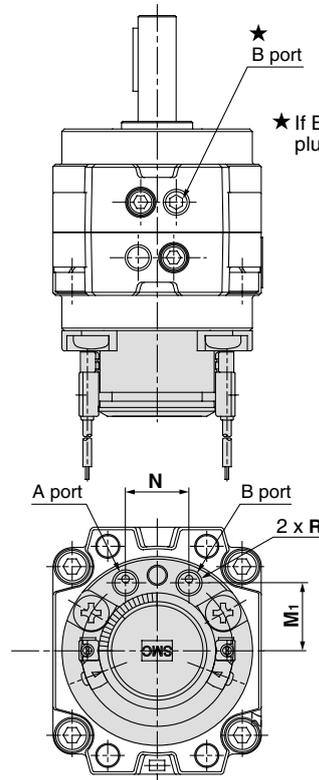
<Port location: Side ported>



Key dimensions

Key dimension	(mm)		
	$b (h_9)$	$h (h_9)$	ℓ
Model			
CDRB1BW 50-□□□	$4_{-0.030}^0$	$4_{-0.030}^0$	20
CDRB1BW 63-□□□	$5_{-0.030}^0$	$5_{-0.030}^0$	25
CDRB1BW 80-□□□	$5_{-0.030}^0$	$5_{-0.030}^0$	36
CDRB1BW100-□□□	$7_{-0.036}^0$	$7_{-0.036}^0$	40

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



Model	A ₁	A ₂	B	C	D	E (g6)	F (h9)	G ₁	G ₂	H (R)	J	K	L	M ₁	M ₂	N	P	Q	R (*)	S	T	U	V	W	X	Y	Z
CDRB1BW 50-□□□	67	78	70	32	39.5	$12_{-0.017}^{-0.006}$	$25_{-0.052}^0$	3	6.5	R22.5	32.5	5	13.5	26	18	14	50	M6 x 1 depth 9	1/8	60	R ₆	11	34	66	46	5.5	6.5
CDRB1BW 50-□□□E														21	—	18											
CDRB1BW 63-□□□	82	98	80	34	45	$15_{-0.017}^{-0.006}$	$28_{-0.052}^0$	3	8	R30	21	5	17	27	22	15	60	M8 x 1.25 depth 10	1/8	75	R _{7.5}	14	39	83	52	8	9
CDRB1BW 63-□□□E														29	—	25											
CDRB1BW 80-□□□	95	110	90	34	53.5	$17_{-0.017}^{-0.006}$	$30_{-0.052}^0$	3	8	R30	21	5	19	30	30	20	70	M8 x 1.25 depth 12	1/4	88	R ₈	15	48	94	63	7.5	9
CDRB1BW 80-□□□E														29	—	30											
CDRB1BW 100-□□□	125	140	103	39	65	$25_{-0.020}^{-0.007}$	$45_{-0.062}^0$	4	13	R30	21	5	28	35.5	32	24	80	M10 x 1.5 depth 13	1/4	108	R ₁₁	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.

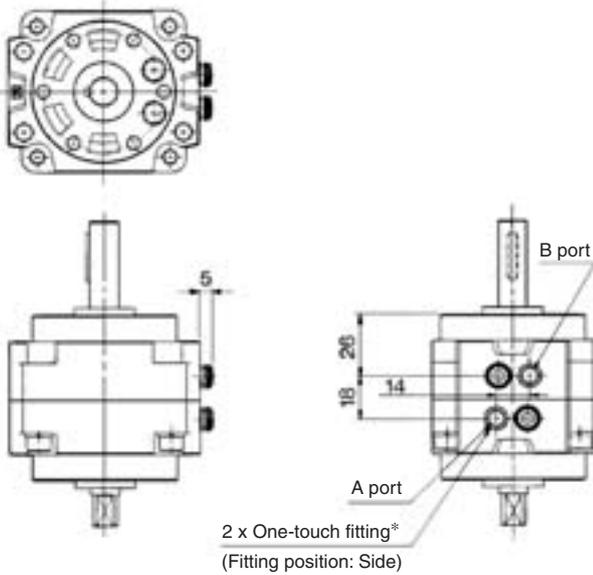
Series CRB1

With One-touch Fittings: 50

Standard

CRB1□W50F-□□

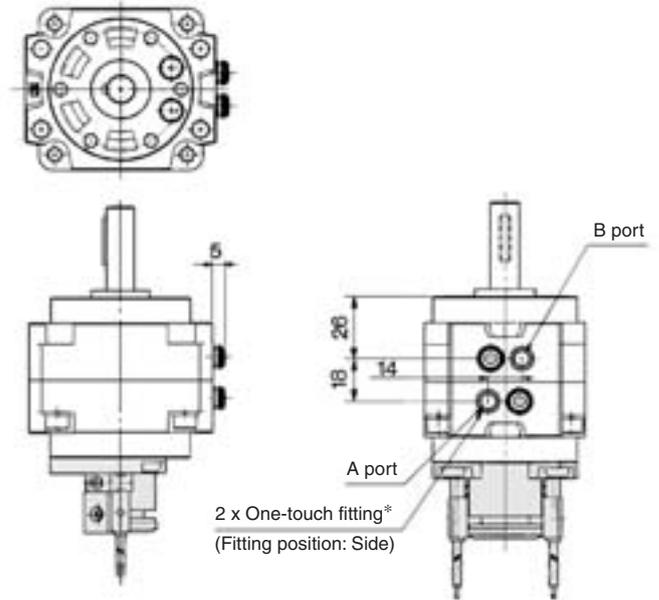
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With auto switch

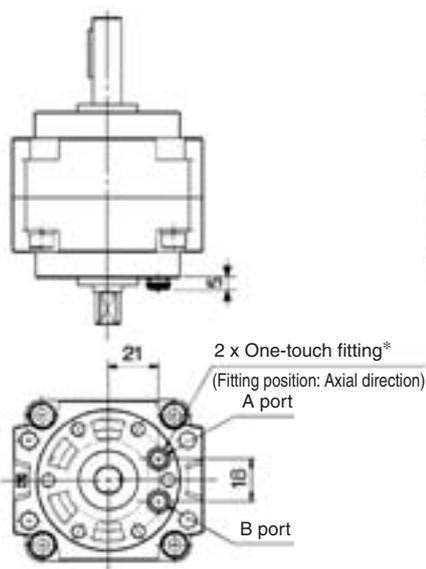
CDRB1□W50F-□□-□

<Port location: Side ported>



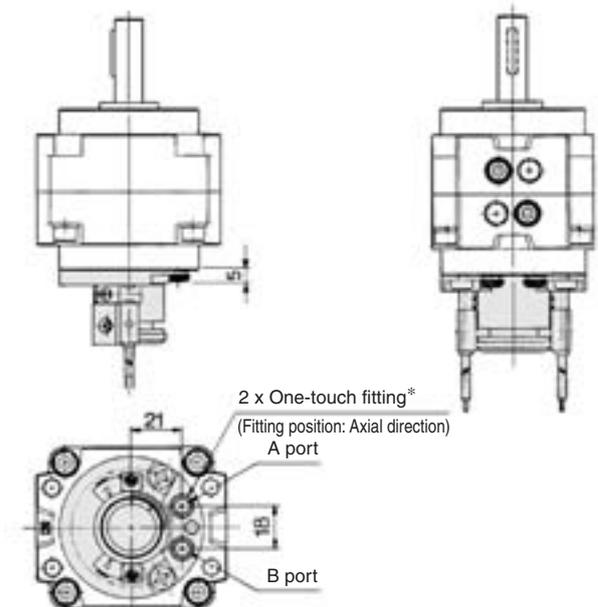
CRB1□W50F-□□E

<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.

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

Size

50
63
80
100

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.

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

Rated voltage

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

Type of actuation

1	2 position single solenoid
2	2 position double solenoid

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

Manual
For Series VZ3000 only

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)

Applicable Auto Switches/Refer to pages 761 to 809 for further information on auto 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)					
Solid state switch	Grommet	Yes	2-wire	24 V	12 V	T79	●	●	—	—	Relay, PLC				
	Connector					T79C	●	●	●	●					
	Grommet					S79	●	●	—	—		IC circuit			
Reed switch	Grommet	Yes	2-wire	24 V	100 V	R73	●	●	—	—	Relay, PLC				
	Connector					R73C	●	●	●	●					
	Grommet					No	48 V, 100 V	100 V or less	R80	●		●	—	—	IC circuit
	Connector								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

Series CVRB1



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	



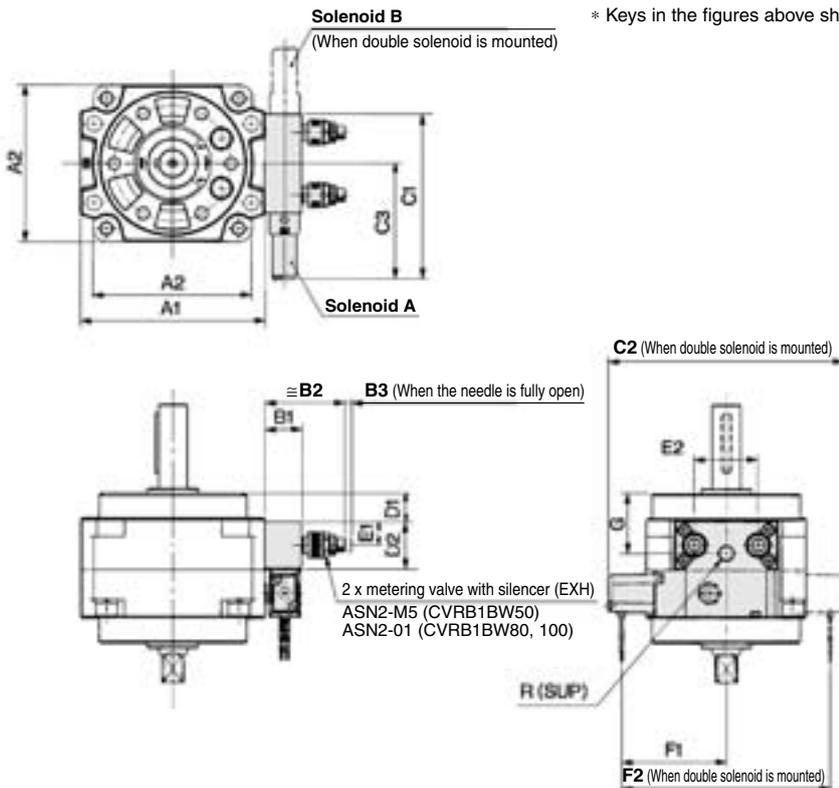
* Option

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 VZ $\frac{3}{4}$ 140-1G.

Note 2) Solenoid valve dimensions: 2 position single solenoid, (): 2 position double solenoid.

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:

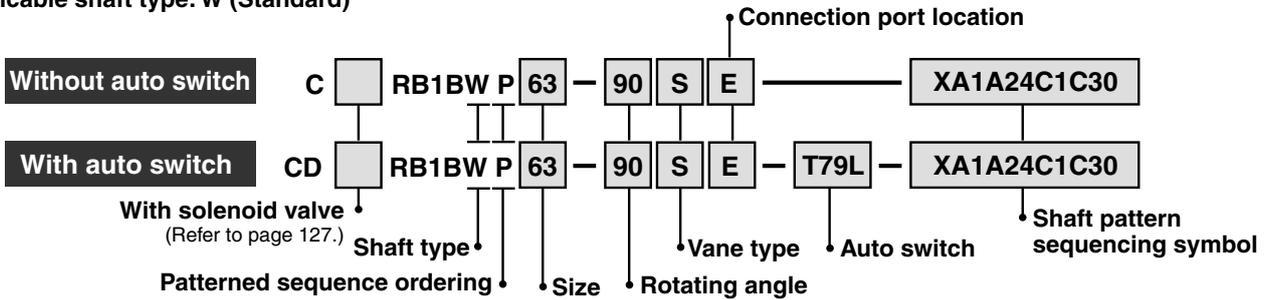
-XA1 to -XA24: Shaft Pattern Sequencing I

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.

● 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.

● 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.

Combination

XA□ Combination

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

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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X
MSQX

MRQ

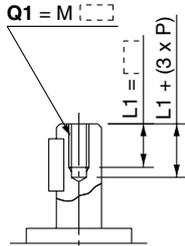
D-□

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



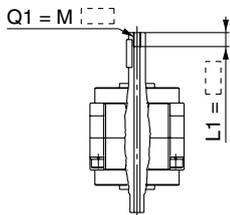
Size	Q1 (mm)
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

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

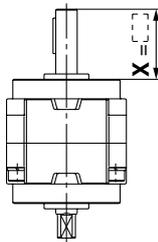


Size	50	63	80	100
Thread				
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Symbol: A17

Shorten the long shaft.

- Applicable shaft type: W



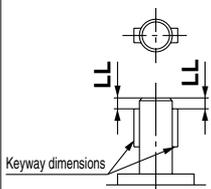
Size	X (mm)
50	24.5 to 39.5
63	28 to 45
80	30.5 to 53.5
100	40 to 65

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.



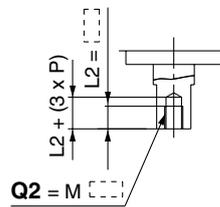
Size	Keyway dimension	LL (mm)
50	4 x 4 x 20	5
63	5 x 5 x 25	
80	5 x 5 x 36	
100	7 x 7 x 40	

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



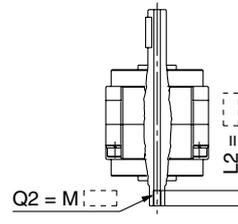
Size	Q2 (mm)
50	M3, M4, M5
63	M4, M5, M6
80	M4, M5, M6
100	M5, M6, M8

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

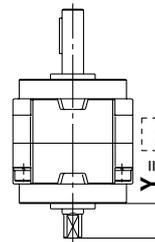


Size	50	63	80	100
Thread				
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Symbol: A18

Shorten the short shaft.

- Applicable shaft type: W



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

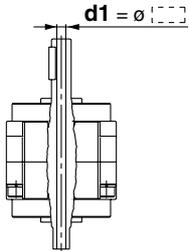
Double Shaft

Symbol: **A13**

Applicable to single vane type only

Shaft with through-hole

- Minimum machining diameter for d1 is 0.1.
- 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

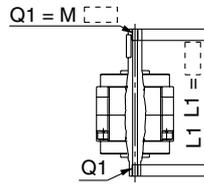
A special end is machined onto both the long and short shafts, and a through hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes.

- The maximum dimension L1 is, as a rule, twice the thread size.

(Example) For M5: L1 = 10

- Applicable shaft type: W

Equal dimensions are indicated by the same marker.

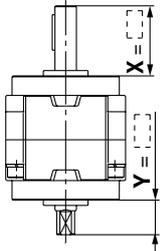


Size	50	63	80	100
Thread				
M5 x 0.8	ø4.2	ø4.2	ø4.2	—
M6 x 1	—	ø5	ø5	ø5
M8 x 1.25	—	—	—	ø6.8

Symbol: **A19**

Shorten both long and short shafts.

- Applicable shaft type: W



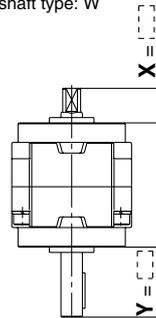
Size	X	Y
50	24.5 to 39.5	4 to 19.5
63	28 to 45	4 to 21
80	30.5 to 53.5	4 to 23.5
100	40 to 65	5 to 30

Symbol: **A20**

The rotation axis is reversed.

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

- Applicable shaft type: W



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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X
MSQX

MRQ

D-□

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

Simple Specials:

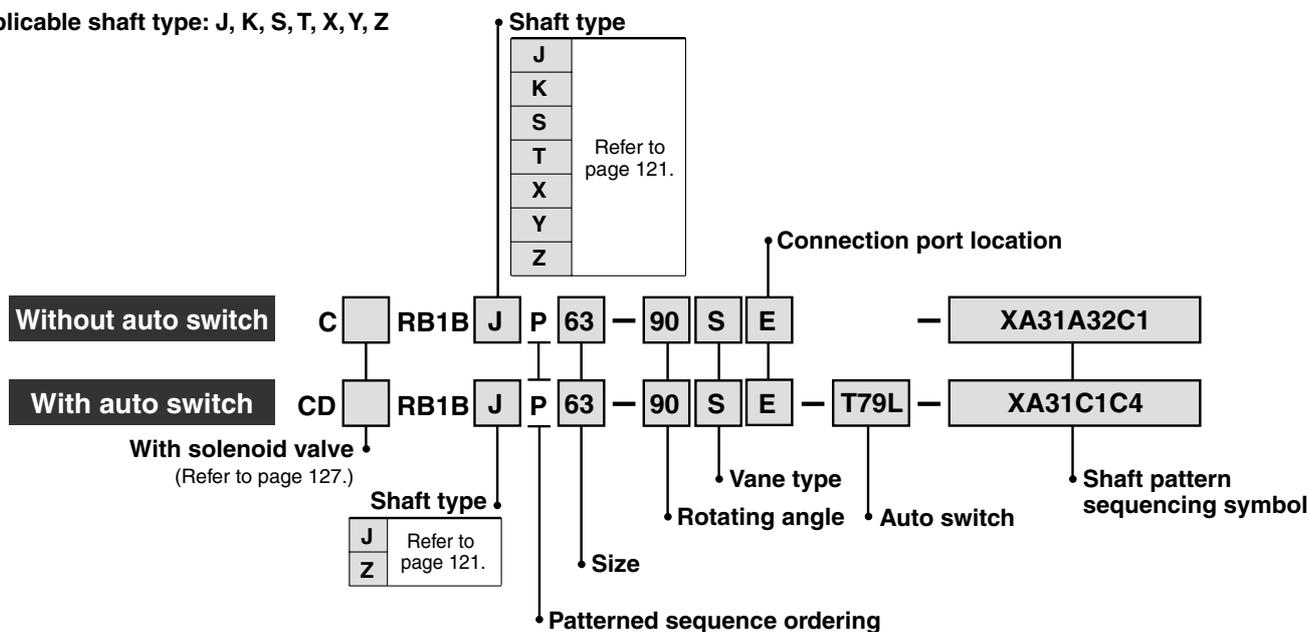
-XA31 to -XA60: Shaft Pattern Sequencing II

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	

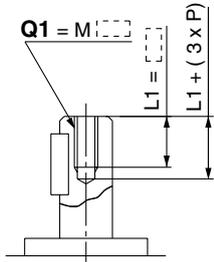
* The vane type for the shaft through-hole is compatible with single vanes only.
* The product with an auto switch is available only for J and Z shafts of XA33, 35, 37 45, 51 and 54.

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

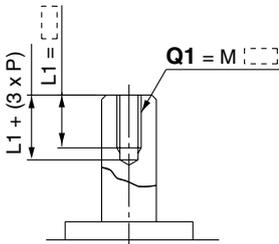


Size	Q1 (mm)	
	S	Y
50	M3, M4, M5	
63	M4, M5, M6	
80	M4, M5, M6	
100	M5, M6, M8	

Symbol: A33

Machine female threads into the long shaft.

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

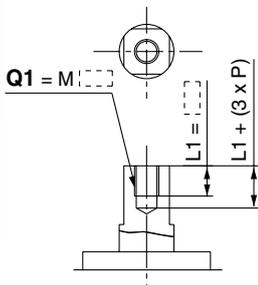


Size	Q1 (mm)		
	J	K	T
50	M3, M4, M5, M6		
63	M4, M5, M6		
80	M4, M5, M6, M8		
100	M5, M6, M8, M10		

Symbol: A35

Machine female threads into the long shaft.

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



Size	Q1 (mm)	
	X	Z
50	M3, M4, M5	
63	M4, M5, M6	
80	M4, M5, M6	
100	M5, M6, M8	

Symbol: A37

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

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

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

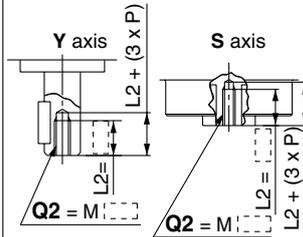
Size	Q1 (mm)								
	X			L1 max			D1		
	J	K	T	J	K	T	J	K	T
50	4 to 39.5			X - 3			3 to 11.9		
63	4 to 45			X - 3			3 to 14.9		
80	4 to 53.5			X - 3			3 to 16.9		
100	5 to 65			X - 4			3 to 24.9		

Axial: Bottom (Short shaft side)

Symbol: A32

Machine female threads into the short shaft.

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

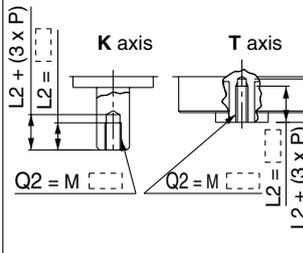


Size	Q2 (mm)	
	S	Y
50	M3, M4, M5, M6	M3, M4, M5
63	M4, M5, M6	M4, M5, M6
80	M4, M5, M6, M8	M4, M5, M6
100	M5, M6, M8, M10	M5, M6, M8

Symbol: A34

Machine female threads into the short shaft.

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

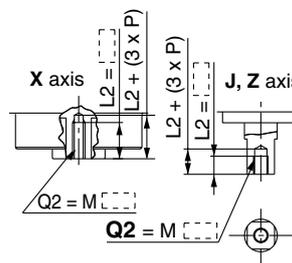


Size	Q2 (mm)	
	K	T
50	M3, M4, M5, M6	
63	M4, M5, M6	
80	M4, M5, M6, M8	
100	M5, M6, M8, M10	

Symbol: A36

Machine female threads into the short shaft.

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



Size	Q2 (mm)		
	X	J	Z
50	M3, M4, M5, M6	M3, M4, M5	
63	M4, M5, M6	M4, M5, M6	
80	M4, M5, M6, M8	M4, M5, M6	
100	M5, M6, M8, M10	M5, M6, M8	

Symbol: A38

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

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

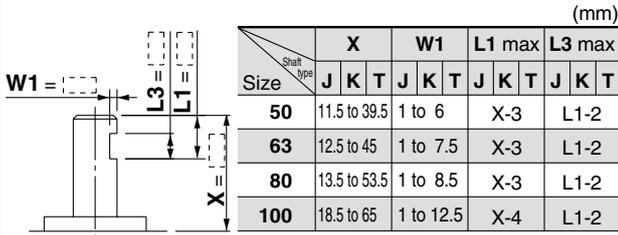
- Equal dimensions are indicated by the same marker.
- Applicable shaft type: K

Size	Q2 (mm)		
	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)

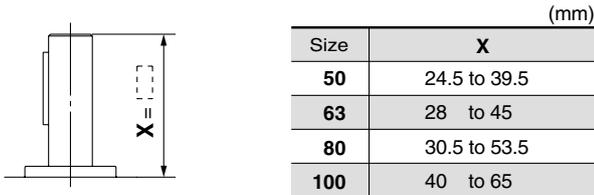
Symbol: A45 The long shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)

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



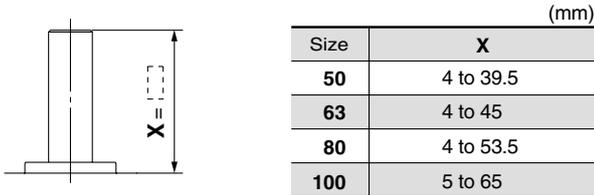
Symbol: A48 Shorten the long shaft.

• Applicable shaft types: S, Y



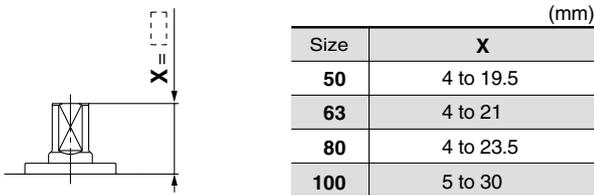
Symbol: A51 Shorten the long shaft.

• Applicable shaft types: J, K, T



Symbol: A54 Shorten the long shaft.

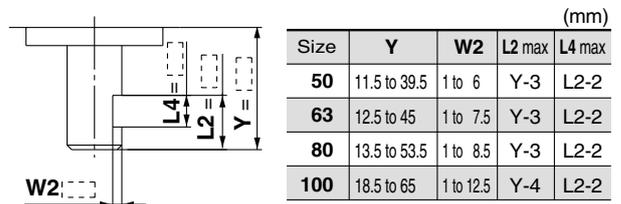
• Applicable shaft types: X, Z



Axial: Bottom (Short shaft side)

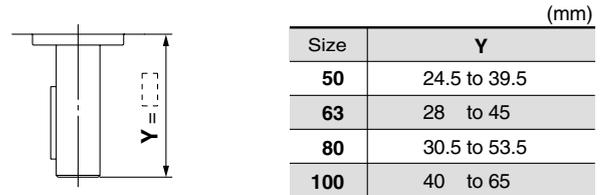
Symbol: A46 The short shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)

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



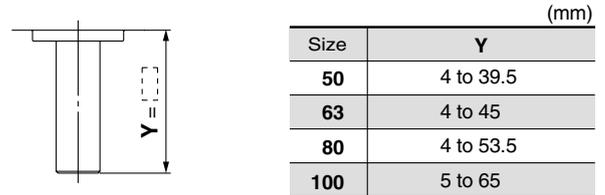
Symbol: A49 Shorten the short shaft.

• Applicable shaft type: Y



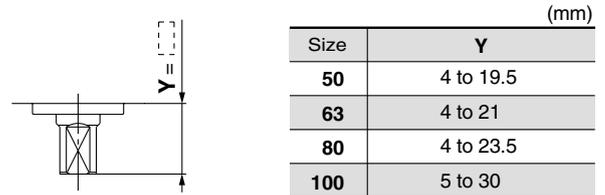
Symbol: A52 Shorten the long shaft.

• Applicable shaft type: K



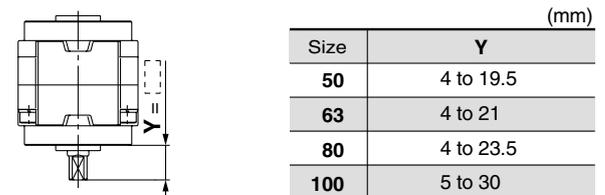
Symbol: A55 Shorten the short shaft.

• Applicable shaft types: J, Z



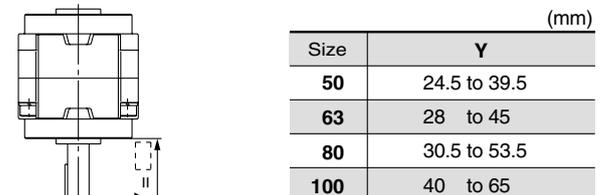
Symbol: A59 Reverse the assembly of the shaft, and shorten the long shaft.

• Applicable shaft type: X



Symbol: A60 Reverse the assembly of the shaft, and shorten the long shaft.

• Applicable shaft type: S



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.

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

- CRB2
- CRBU2
- CRB1
- MSU
- CRJ
- CRA1
- CRQ2
- MSQ
- MSZ
- CRQ2X
- MSQX
- MRQ

D-□

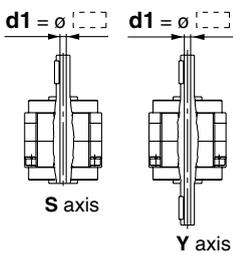
Double Shaft

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



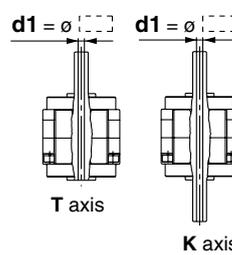
Size	d1	
	S	Y
50	ø4 to ø5	
63	ø4 to ø6	
80	ø4 to ø6.5	
100	ø5 to ø8	

Symbol: A40

Applicable to single vane type only

Shaft with through-hole

- Minimum machining diameter for d1 is 0.1.
- Applicable shaft types: K, T



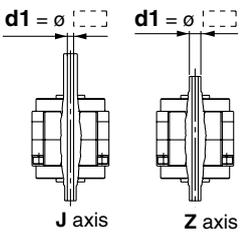
Size	d1	
	K	T
50	ø4 to ø 5.5	
63	ø4 to ø 6	
80	ø4 to ø 7.5	
100	ø5 to ø10	

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



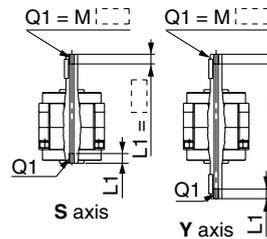
Size	d1		
	J	X	Z
50	ø4 to ø5		
63	ø4 to ø6		
80	ø4 to ø6.5		
100	ø5 to ø8		

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.



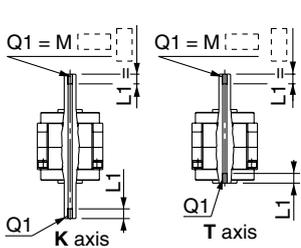
Size	d1							
	S		Y		S		Y	
Thread	S	Y	S	Y	S	Y	S	Y
M5 x 0.8	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2
M6 x 1	—	—	ø5	ø5	ø5	ø5	—	—
M8 x 1.25	—	—	—	—	—	—	ø6.8	—

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.



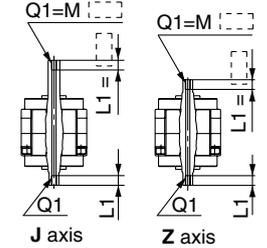
Size	d1							
	K		T		K		T	
Thread	K	T	K	T	K	T	K	T
M5 x 0.8	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2
M6 x 1	ø5	ø5	ø5	ø5	ø5	ø5	—	—
M8 x 1.25	—	—	—	—	ø6.8	ø6.8	—	—
M10 x 1.5	—	—	—	—	—	—	ø8.6	—

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.

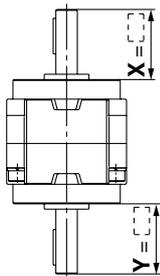


Size	d1																	
	J			X			Z			J			X			Z		
Thread	J	X	Z	J	X	Z	J	X	Z	J	X	Z	J	X	Z	J	X	Z
M5 x 0.8	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2	ø4.2
M6 x 1	—	—	—	ø5	ø5	ø5	ø5	ø5	ø5	—	—	—	—	—	—	—	—	—
M8 x 1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ø6.8

Symbol: A50

Shorten both long and short shafts.

- Applicable shaft type: Y

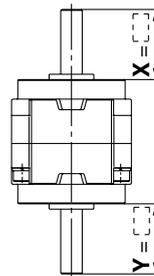


Size	X		Y	
	50	24.5 to 39.5	24.5 to 39.5	
63	28 to 45	28 to 45		
80	30.5 to 53.5	30.5 to 53.5		
100	40 to 65	40 to 65		

Symbol: A53

Shorten both long and short shafts.

- Applicable shaft type: K



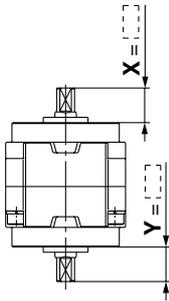
Size	X		Y	
	50	4 to 39.5	4 to 39.5	
63	4 to 45	4 to 45		
80	4 to 53.5	4 to 53.5		
100	5 to 65	5 to 65		

Double Shaft

Symbol: **A56**

Shorten both long and short shafts.

- Applicable shaft type: Z

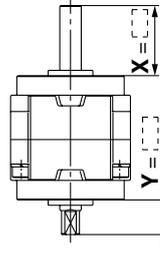


Size	X	Y
50	4 to 19.5	4 to 19.5
63	4 to 21	4 to 21
80	4 to 23.5	4 to 23.5
100	5 to 30	5 to 30

Symbol: **A57**

Shorten both long and short shafts.

- Applicable shaft type: J



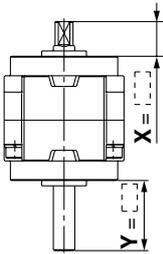
Size	X	Y
50	4 to 39.5	4 to 19.5
63	4 to 45	4 to 21
80	4 to 53.5	4 to 23.5
100	5 to 65	5 to 30

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



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

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

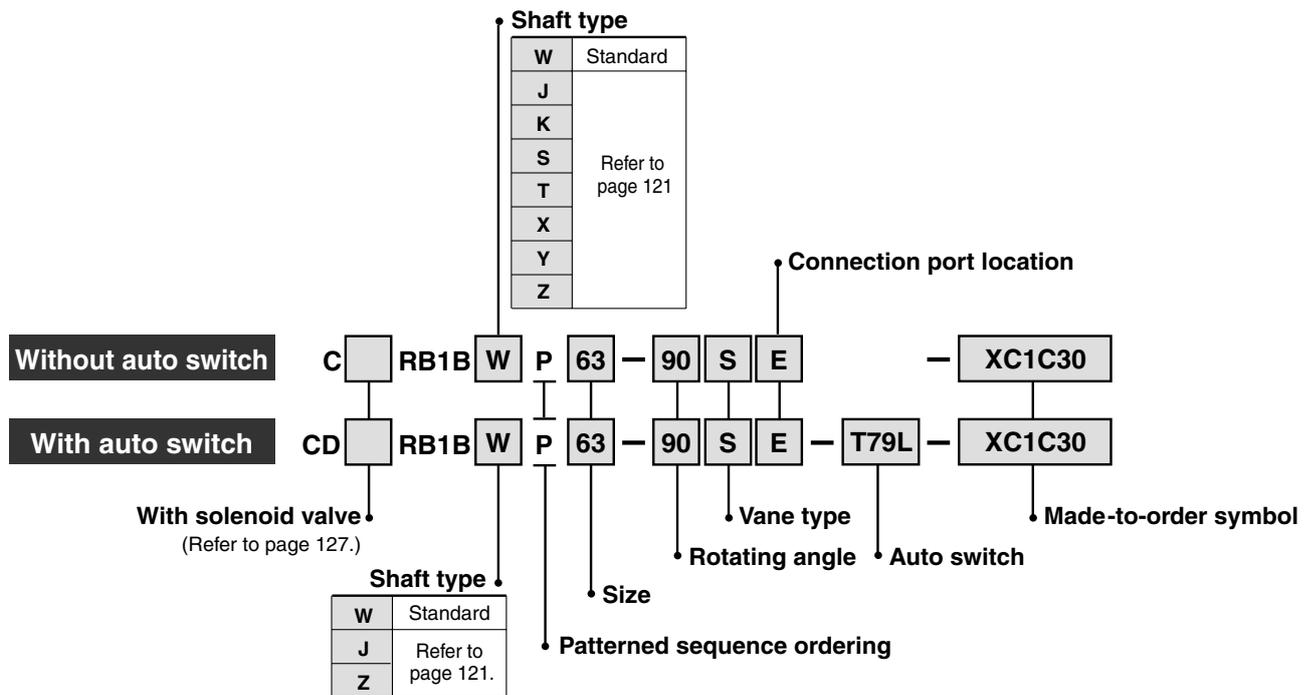
MSZ

CRQ2X
MSQX

MRQ

D-□

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	Applicable size
		W, J, K, S, T, X, Y, Z	
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	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.)

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

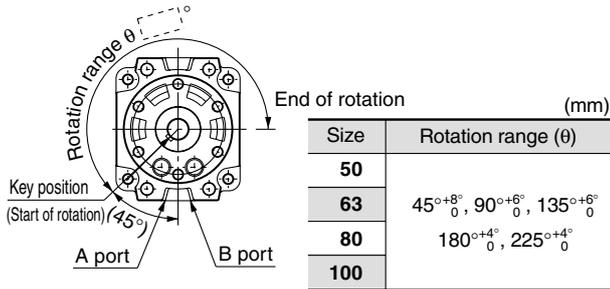
Symbol: C4 Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line (90° down from the top to the right side).

Size	Rotation range θ (mm)
50	
63	45° ^{+8°} ₀ , 90° ^{+8°} ₀ , 135° ^{+6°} ₀
80	
100	

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

Symbol: C5

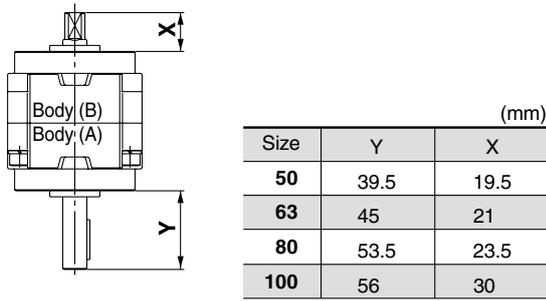
Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line
(45° down from the top to the left side).



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

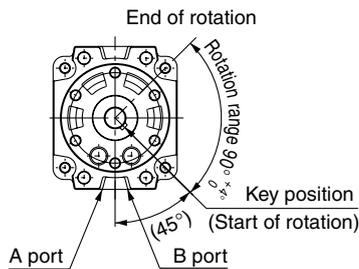
Symbol: C7

The shafts are reversed.



Symbol: C27

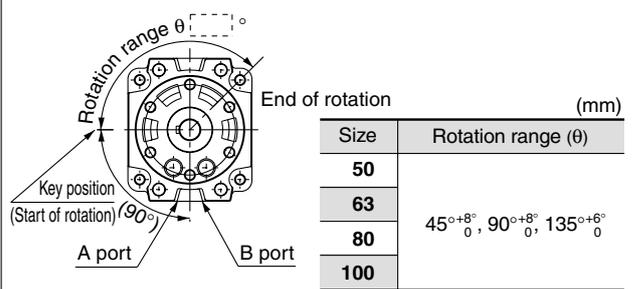
Change of rotation. (Applicable to double vane type only)
Rotation: 90° Rotation starts from the horizontal line
(45° down from the top to the right side).



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

Symbol: C6

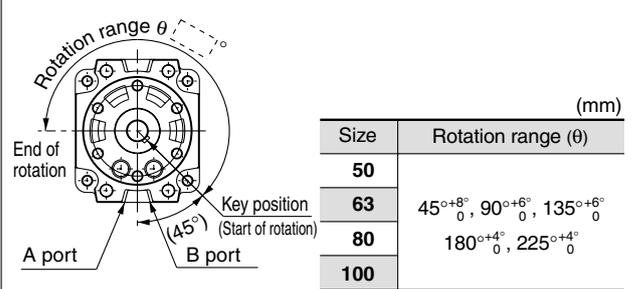
Change of rotation. (Applicable to single vane type only)
Rotation starts from the horizontal line
(90° down from the top to the left side).



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

MSZ

CRQ2X

MSQX

MRQ

D-□

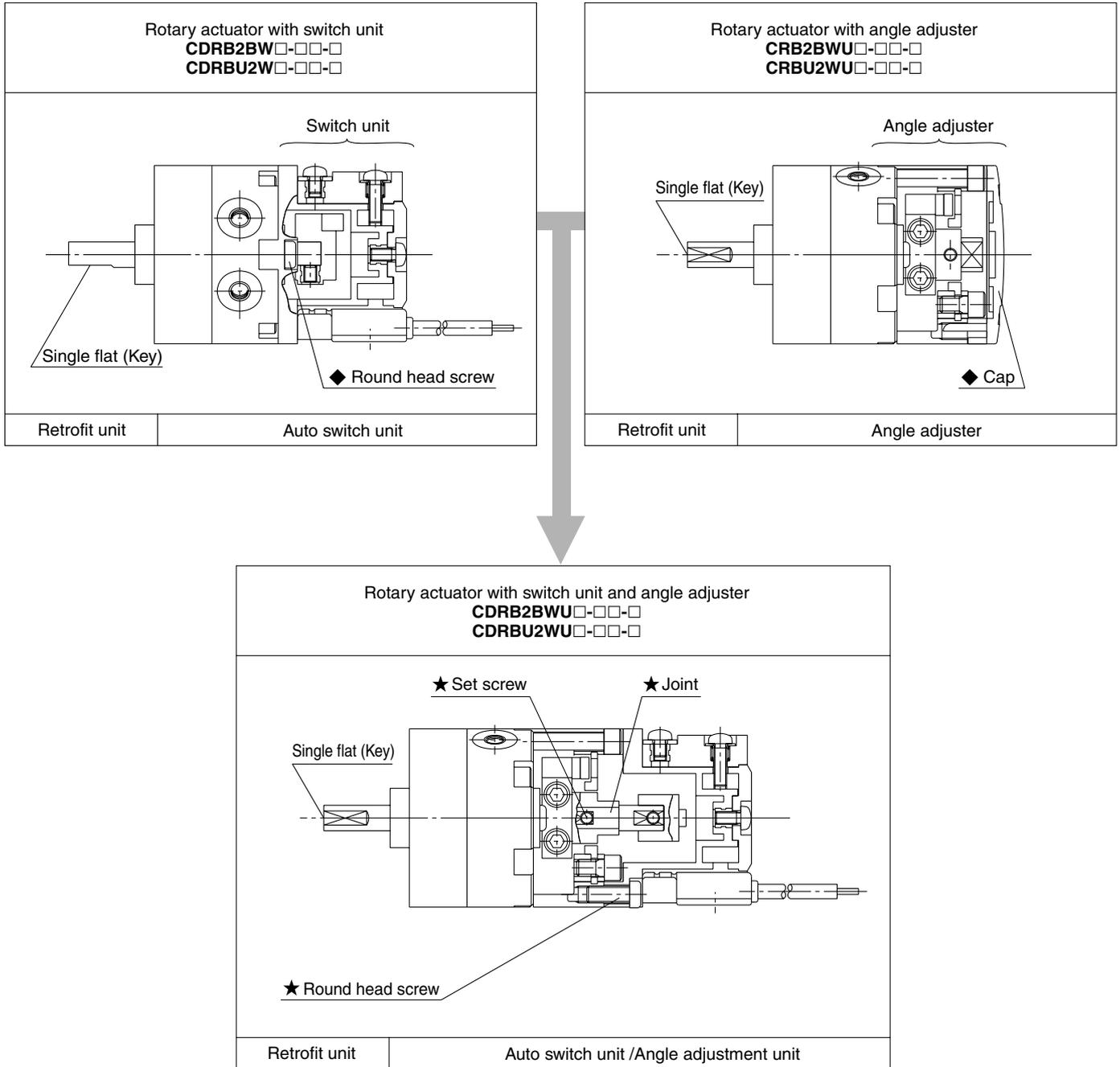
Rotary Actuators

Series *CRB2/CRBU2/CRB1*

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.

1 Auto Switch Unit Part No.

Each unit can be retrofitted to the rotary actuator.

Series	Model	Vane type	Unit part no.
<i>Series CRB2</i>	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 <i>Series CRBU2</i>	CDRBU2W 10	Single/Double type	P611070-1
	CDRBU2W 15		P611090-1
	CDRBU2W 20		P611060-1
	CDRBU2W 30		P611080-1
	CDRBU2W 40		P611010-1
<i>Series CRB1</i>	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.	
<i>Series CRB2</i>	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 <i>Series CRBU2</i>	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
<i>Series CRB1</i>	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.
<i>Series CRB2</i>	CRB2BWU10	Single/Double type	P611070-3
	CRB2BWU15		P611090-3
	CRB2BWU20		P611060-3
	CRB2BWU30		P611080-3
	CRB2BWU40		P611010-3
Free mount type <i>Series CRBU2</i>	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.
<i>Series CRB2</i>	CDRB2BWU10	Single/Double type	P611070-4
	CDRB2BWU15		P611090-4
	CDRB2BWU20		P611060-4
	CDRB2BWU30		P611080-4
	CDRB2BWU40		P611010-4
Free-mount type <i>Series CRBU2</i>	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.
<i>Series CRB2</i>	CDRB2BWU10	Single/Double type	P211070-10
	CDRB2BWU15		P211090-10
	CDRB2BWU20		P211060-10
	CDRB2BWU30		P211080-10
	CDRB2BWU40		P211010-10
Free mount type <i>Series CRBU2</i>	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

MSZ

CRQ2X
MSQX

MRQ

D-□

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		

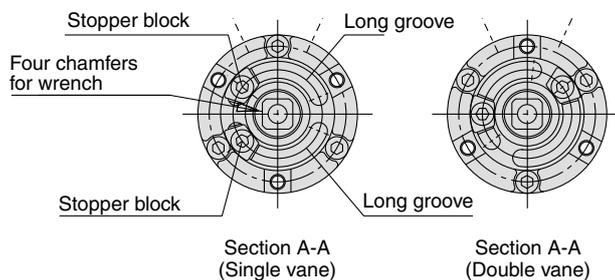
Note 1) Since the maximum angle of the rotation adjustment range will be limited by the rotation when using a rotary actuator for 90°, make sure to take this into consideration when ordering. Rotary actuator for 90° should be used to adjust the angle of 85° or less as a guide.

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.)



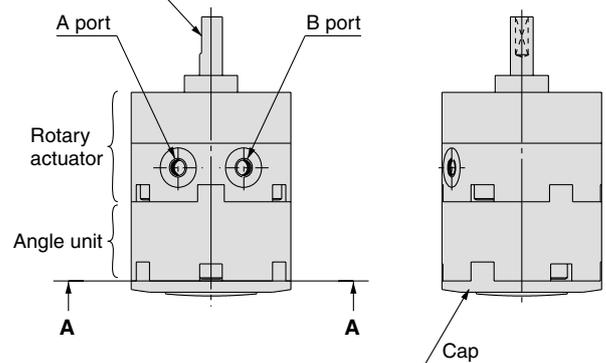
Note) For size 40, each stopper block comes with 2 holding bolts.

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)



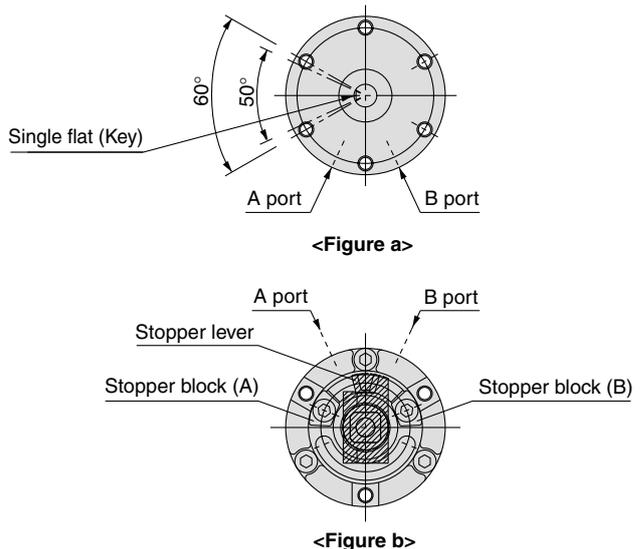
Other Operating Method

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

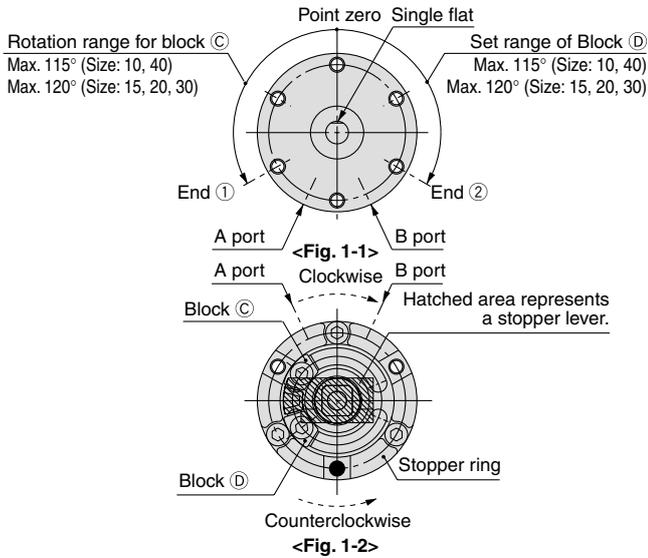
Size: 10, 4050°
Size: 15, 20, 3060°

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.)



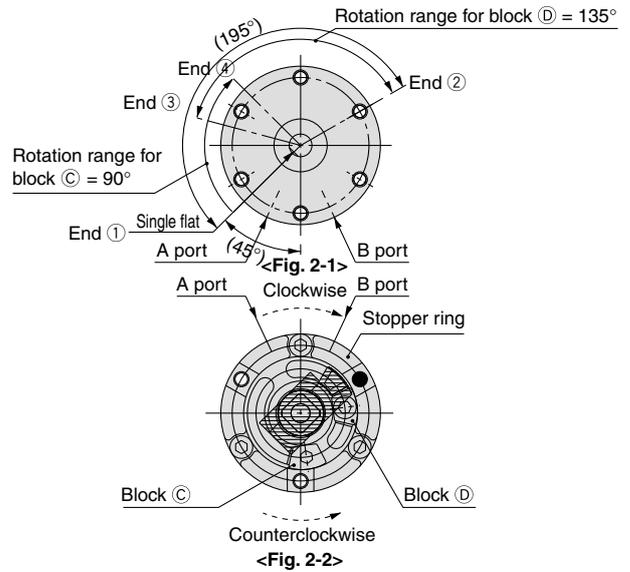
Rotation Setting Example

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



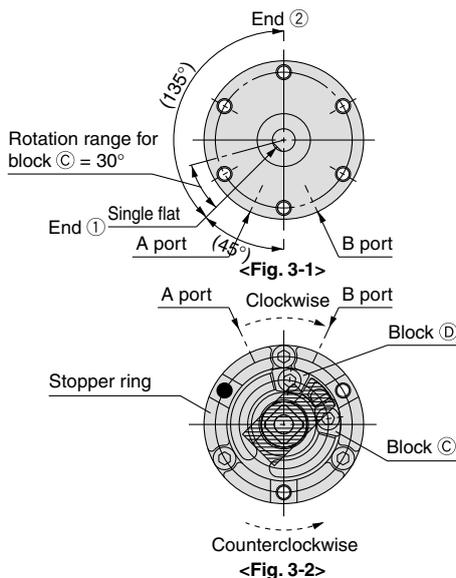
Lock block ④ in Fig. 1-2, and move block ③ clockwise to allow the rotation of the shaft with single flat in Fig. 1-1 from point zero to end of rotation ①. When block ③ is locked and block ④ is moved counterclockwise, the shaft with single flat in Fig. 1-1 rotates from point zero to end of rotation ②. 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 2 The stopper ring is mounted on 120° counterclockwise from the standard position shown in Fig. 1-2 in Example 1.



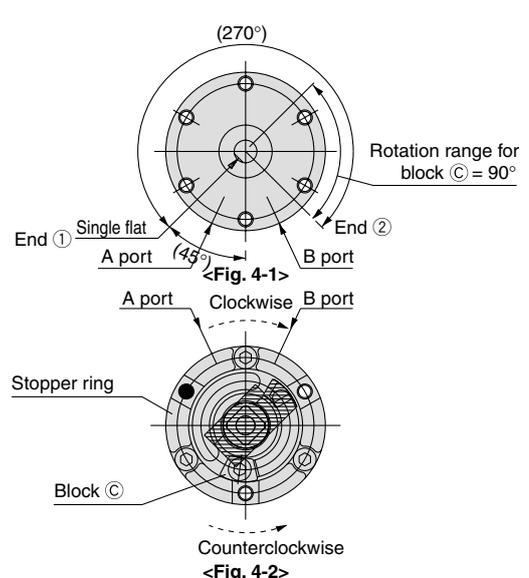
The maximum rotation range of the shaft with single flat in Fig. 2-2 is 195°, from end of rotation ① to end of rotation ②. The rotation range decreases to the range between end of rotation ② and ③ as in 2-1 when moving block ③ in Fig. 2-2 clockwise, and similarly when block ④ is moved counterclockwise, 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 ④ when adjusting.

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 ③ in Fig. 3-2 and move block ④ 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 ③ when adjusting. End of rotation side ① can be adjusted within 30° by turning block ③ counterclockwise.

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 ② side is adjusted using block ③. The rotation can be adjusted within 90° from end of rotation ②. Note that block ③ 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

MSZ

CRQ2X

MSQX

MRQ

D-□

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.

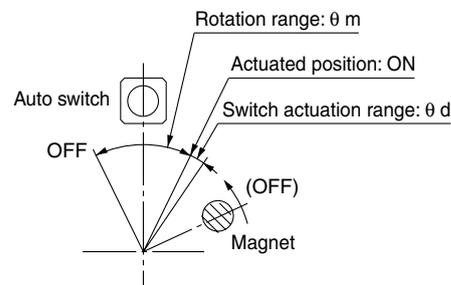
Operating Range and Hysteresis

* 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.

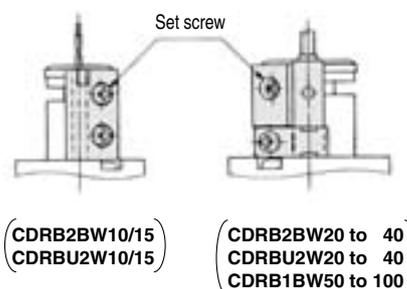


Model	Operating range: θ m	Switch actuation range: θ d
CDRB2BW10/15	110°	10°
CDRBU2W10/15		
CDRB2BW20/30	90°	8°
CDRBU2W20/30		
CDRB2BW40	52°	7°
CDRBU2W40		
CDRB1BW50	38°	7°
CDRB1BW63 to 100		

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

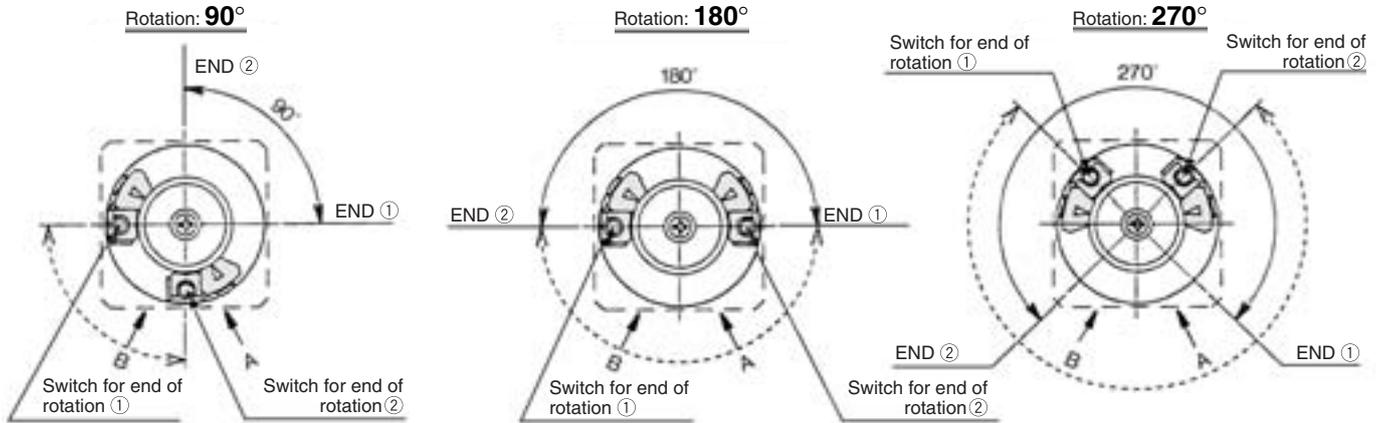
* When setting the detection location, loosen the tightening screw a bit and move the auto switch to the preferred location and then tighten again and fix it. At this time, if tightened too much, screw can become damaged and unable to fix location. Be sure to set the tightening torque around 0.49 N·m.



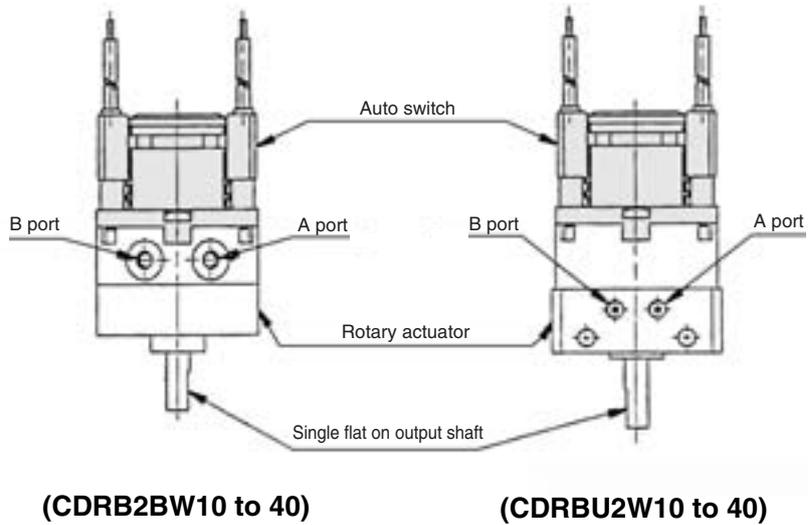
Adjustment of Auto Switch

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 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.



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X

MSQX

MRQ

D-□

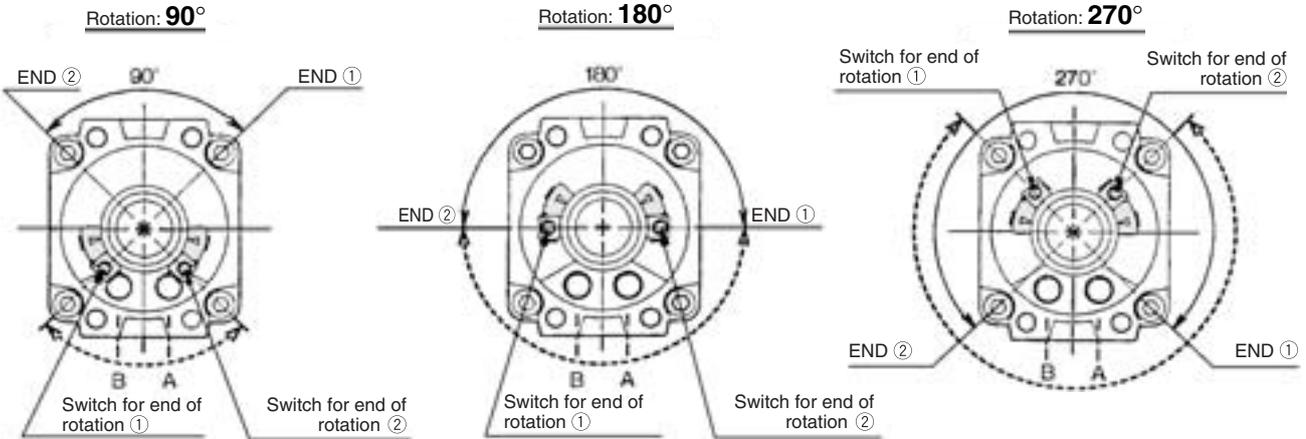
Series CDRB2/CDRBU2/CRB1

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 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.

