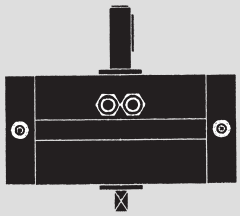
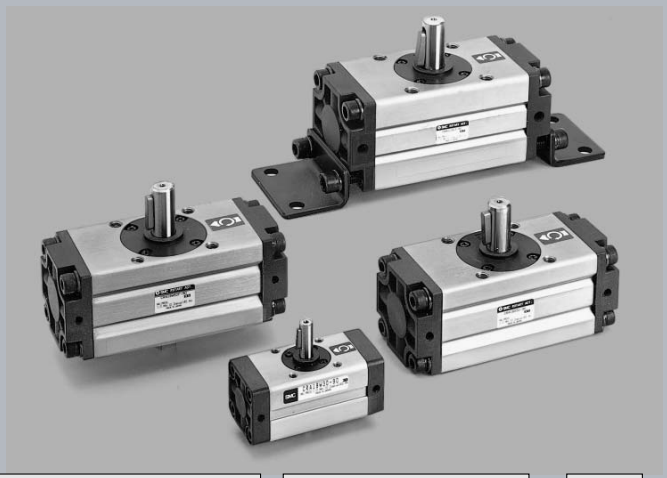


Rotary Actuator
Rack & Pinion Style
Series CRA1
Size: 30, 50, 63, 80, 100

Models with cushion or with solenoid valve available.
(Only sizes 50 or larger are available.)

Angle adjustment is possible.
Size 30·····Fine angle adjuster is standard equipment.
Size 50 or larger···Angle adjustable type

Auto switch is mountable.
Adjustment of switch location is easy with rail mounting.



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

Series Variations

				Fluid		Air		Hydraulic oil		Page
				Size		30	50 63 80 100		50 63 80 100	
Standard	Rotating angle			90°		●	●	●	●	11-7-2 to 11-7-31
				100°		●	●	●	●	
				180°		●	●	●	●	
				190°		●	●	●	●	
	Shaft type			Single shaft	S	●	●	●	●	
				Double shaft	W	●	●	●	●	
				Single shaft with four chamfers	X	●	●	●	●	
				Double shaft key	Y	●	●	●	●	
				Double shaft with four chamfers	Z	●	●	●	●	
	Cushion			None		●	●	●	●	
				Air cushion		●	●	●	●	
	Variations			With auto switch		●	●	●	●	
				Angle adjustable type		●	●	●	●	
				With solenoid valve		●	●	●	●	
				Clean series	11-	●	●	●	●	
				Copper-free (Standard)	20-	●	●	●	●	
				With One-touch fittings		●	●	●	●	
				Flange	F	●	●	●	●	
Option	Mounting bracket			Foot	L	●	●	●	●	
Made to Order	Shaft type			Single shaft	S	●	●	●	●	11-7-4 to 11-7-6
				Single shaft with four chamfers	X	●	●	●	●	
				Double shaft key	Y	●	●	●	●	
				Double shaft with four chamfers	Z	●	●	●	●	
				Single round shaft	T	●	●	●	●	
				Double shaft (Round, With four chamfers)	J	●	●	●	●	
				Double round shaft	K	●	●	●	●	
	Pattern			Shaft end form		●	●	●	●	11-7-32 to 11-7-51
				End of rotation		●	●	●	●	
				Port location		●	●	●	●	
	Shaft, Bolt, Parallel key stainless spec.				-X6	●	●	●	●	
	Operating temp.	Heat resistance 100°C			-X7	●	●	●	●	
	Both sides angle adjustable				-X10	●	●	●	●	
	One side angle adjustable, One side with cushion				-X11	●	●	●	●	
	Fluoro rubber for seals				-X16	●	●	●	●	

Rotary Actuator
Rack & Pinion Style
Series CRA1
Size: 30, 50, 63, 80, 100

How to Order

Size 30

CRA1 B W 30 — 90

Mounting style

B	Basic style
L	Foot style

Rod end shape
Double shaft

Rotating angle

90	90°
180	180°

Size 50 to 100

CRA1 B S □ 50 — 90 □

Mounting style

B	Basic style
L *	Foot style
F	Flange style

* For part numbers, refer to the tables below.

Shaft type

Standard	**S**	Single shaft
	W	Double shaft
Option	**X**	Single shaft with four chamfers
	Y	Double shaft key
	Z	Double shaft with four chamfers

Type

Nil	Pneumatic
H	Air-hydro

Size

50
63
80
100

Rotating angle

Standard	**90**	90°
	180	180°
Option	**100**	100°
	190	190°

Air cushion

Nil	None
C	With air cushion

Foot Bracket Part No.

Size	Foot bracket	Mounting screws included in foot bracket
30	CRA1L30-Y-1	M5 x 0.8 x 25
50	CRA1L50-Y-1	M8 x 1.25 x 35
63	CRA1L63-Y-1	M10 x 1.5 x 40
80	CRA1L80-Y-1	M12 x 1.75 x 50
100	CRA1L100-Y-1	M12 x 1.75 x 50

Note 1) The part numbers shown above include mounting screw.
Note 2) As ordering foot bracket, write “1 piece” for the bracket for one rotary actuator.

Specifications

Type	Pneumatic					Air-hydro			
Size	30	50	63	80	100	50	63	80	100
Fluid	Air (Non-lube)					Hydraulic oil			
Max. operating pressure	1 MPa								
Min. operating pressure	0.1 MPa								
Ambient and fluid temperature	0 to 60°C (No freezing)								
Cushion	None	Not attached, Air cushion				None			
Output (N·m) (1)	1.9	9.3	17	32	74	9.3	17	32	74
Allowable surge pressure	—					1.5 MPa			
Backlash	(2)	Within 1°							
Tolerance in rotating angle	—	+ 4° 0							

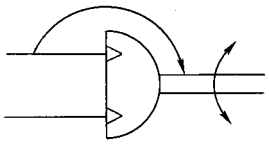
Note 1) Output under the operating pressure of 0.5 MPa. Refer to page 11-1-29 for further information.
Note 2) Since CRA1□30 has a stopper installed, there is no backlash produced under pressure.

Allowable Kinetic Energy/Safe Range of Rotation Time

Model	Allowable kinetic energy			Adjustable range of rotation time safe in operation
	Allowable kinetic energy (mJ)		Cushion angle	
	Without cushion	With cushion Note)		Rotation time (s/90°)
CRA1□W30	10	—	—	0.2 to 1
CRA1□□50	50	980	35°	0.2 to 2
CRA1□□63	120	1500	35°	0.2 to 3
CRA1□□80	160	2000	35°	0.2 to 4
CRA1□□100	540	2900	35°	0.2 to 5

Note) Allowable kinetic energy of the bumpers equipped model
The maximum absorbed energy under proper adjustment of the cushion needle.

JIS Symbol



Made to Order P. 11-7-32 to 11-7-51

Weight/Standard

(kg)

Model	Standard weight		Additional weight	
	90°	180°	Foot bracket	Flange bracket
CRA1BW30	0.3	0.4	0.1	—
CRA1BW50	1.5	1.7	0.3	0.5
CRA1BW63	2.5	3	0.5	0.9
CRA1BW80	4.3	5	0.9	1.5
CRA1BW100	8.5	9.5	1.2	2

⚠ Caution

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

Weight/With Auto Switches and Solenoid Valves

(kg)

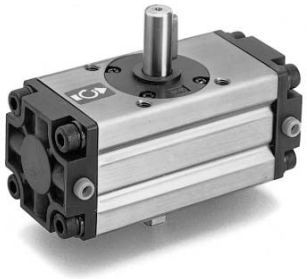
Size	Additional weight	
	With 2 auto switches	With solenoid valve *
30	0.1	—
50	0.2	0.2
63	0.4	0.2
80	0.6	0.2
100	0.9	0.2

* Weight of the solenoid valve is not included. Refer to page 11-7-19 concerning weight of the solenoid valve.

With One-touch Fittings

CRA1 | Mounting | Shaft type | Size | F | Rotating angle | Suffix symbol

F: With One-touch fittings



Piping steps and installation space are saved by One-touch fittings built in the connection ports.

Specifications

Applicable size	**30, 50, 63**
Type	Pneumatic
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Auto switch	Mountable

Refer to pages 11-7-10 to 11-7-12 for dimensions.

Applicable Tubing Specifications

Size	30	50	63
Applicable tubing O.D.	ø4	ø6	
Applicable tubing material	Nylon, Soft nylon, Polyurethane		

Clean Series

11–CRA1 | Mounting | Shaft type | Size | Rotating angle | Suffix symbol

11: Clean Series

Vacuum ports are equipped to prevent dust from being produced from the rod part of the rotary actuators.

Specifications

Type	Pneumatic
Applicable size	**30, 50**
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Auto switch	Mountable

For further specifications, refer to “Pneumatic Clean Series” catalog.

Copper-free

No influence on cathode ray tubes by copper ion and fluorine resin. As standard models are already made applicable to copper free styles, they can be applied as they are.

Specifications

Type	Pneumatic
Applicable size	**30, 50, 63, 80, 100**
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Auto switch	Mountable

Shaft Type Variations/Without Key Grooves (Size 30)

Shaft Type: T, J, K

Refer to “How to Order” on pages 11-7-2 to 11-7-13.

C□RA1 | Mounting | Shaft type | 30 | Rotating angle

Shaft type

T	Single round shaft
J	Double shaft (Long shaft without key and with four chamfers)
K	Double round shaft

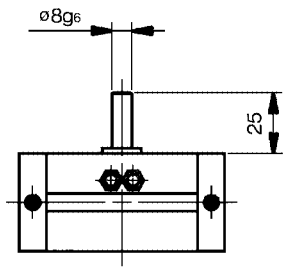
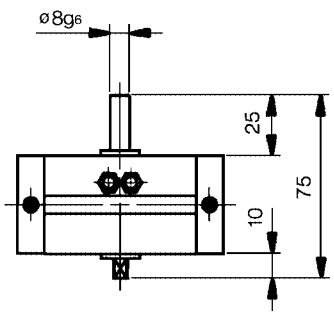
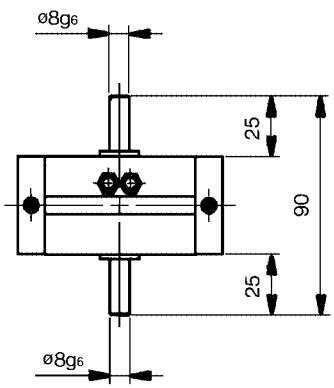
Specifications

Type	Pneumatic
Size	**30**
Shaft type	Single round shaft (T), Double round shaft (K), Double shaft/(Long shaft without key and with four chamfers) (J)
Cushion	None
Auto switch	Mountable
Mounting	Basic style, Foot style

∗ Refer to page 11-7-3 for other specifications.

Dimensions

(mm)

Shaft type	T (Single round shaft)	J (Double shaft/Long shaft without key and with four chamfers)	K (Double round shaft)
Configuration			

Shaft Variations/Without Key Groove (Size 50 to 100)

Shaft Type: T, J, K

C□RA1 | Mounting | Shaft type | Size | Rotating angle | |

Air cushion

Nil	None
C	With air cushion

Refer to "How to Order" on pages 11-7-2, 13, 18 and 24.

Shaft type

T	Single round shaft
J	Double shaft (Long shaft without key and with our chamfers)
K	Double round shaft

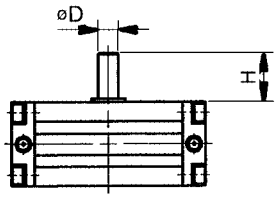
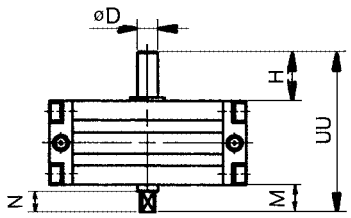
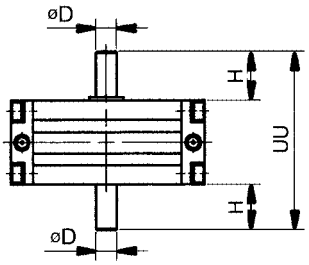
Specifications

Type	Pneumatic	Air-hydro
Size	**50, 63, 80, 100**	
Fluid	Air (Non-lube)	Hydraulic oil
Shaft type	Single round shaft (T), Double round shaft (K), Double shaft/Long shaft without key and with four chamfers (J)	
Cushion	Not attached, Air cushion	None
Auto switch	Mountable	
Mounting	Basic style, Foot style	

Note) Except flange style.
∗ Refer to page 11-7-3 for other specifications.

Dimensions

(mm)

Shaft type	**T (Single round shaft)**		**J (Double shaft/Long shaft without key & with four chamfers)**					**K (Double round shaft)**		
Configuration										
Size	**D (g6)**	**H**	**D (g6)**	**H**	**M**	**N**	**UU**	**D (g6)**	**H**	**UU**
50	15	36	15	36	20	15	118	15	36	134
63	17	41	17	41	22	17	139	17	41	158
80	20	50	20	50	25	20	167	20	50	192
100	25	60	25	60	30	25	202	25	60	232

∗ Refer to pages 11-7-11 to 11-7-12 for other specifications.

Shaft Variations (Size 30)

Shaft Type: S, X, Y, Z

C□RA1 **Mounting** **Shaft type** 30 **Rotating angle**

Refer to "How to Order" on pages 11-7-2 to 11-7-13.

Shaft type

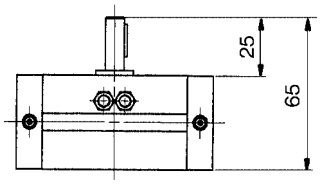
S	Single shaft key
X	Single shaft with four chamfers
Y	Double shaft key
Z	Double shaft with four chamfers

Specifications

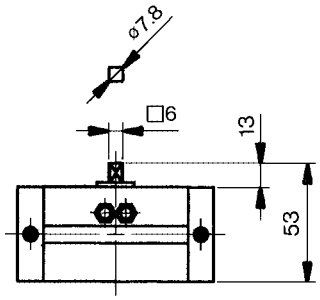
Type	Pneumatic
Size	**30**
Max. operating pressure (MPa)	1 MPa
Min. operating pressure (MPa)	0.1 MPa
Shaft type	Single shaft key (S), Double shaft with four chamfers (X), Double shaft key (Y), Double shaft with four chamfers (Z)
Mounting	Basic style, Foot style
Auto switch	Mountable

∗ Refer to page 11-7-3 for other specifications.

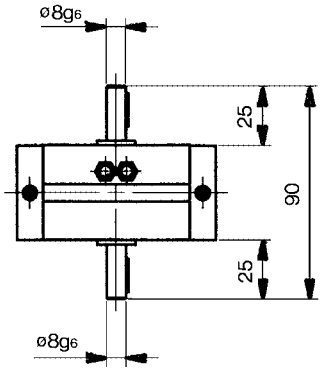
S (Single shaft key)



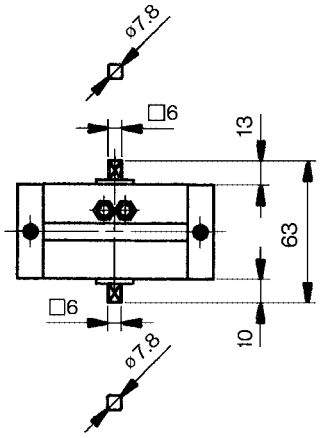
X (Single shaft with four chamfers)



Y (Double shaft key)



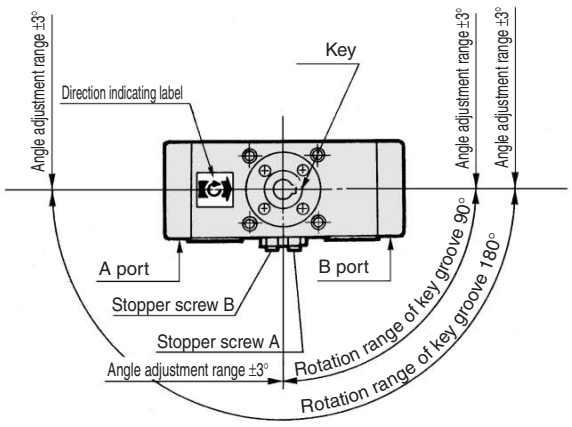
Z (Double shaft with four chamfers)



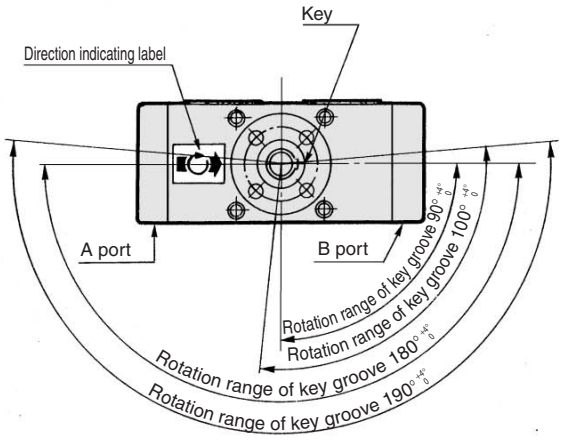
Rotation Range of Key Groove

If air pressure is applied from the A side of the direction indication label, the shaft rotates clockwise. If air pressure is applied from the B side, the shaft rotates counterclockwise.

Size: 30



Size: 50 to 100



· Stopper screw A: For end adjustment in clockwise direction
· Stopper screw B: For end adjustment in counter clockwise direction

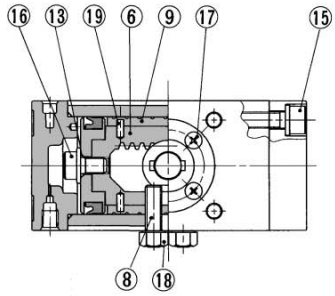
How to Set Rotation Time

Even if the torque that is generated by the rotary actuator is small, the parts could become damaged depending on the inertia of the load. Therefore, the rotation time should be determined by calculating the load's inertial moment and kinetic energy. Refer to pages 11-1-34 to 35 for details on how to set the rotation time.

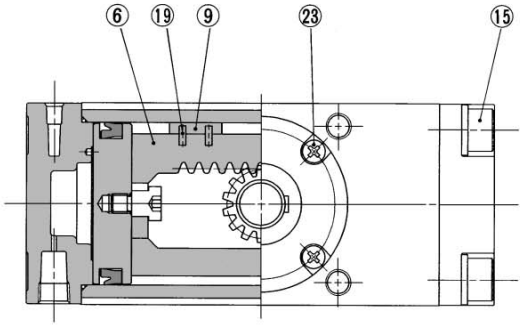
Allowable load on the shaft
Refer to the model selecting order step 3 for rotary actuators on page 11-1-20 concerning allowable loads on the shafts of Series CRA1.

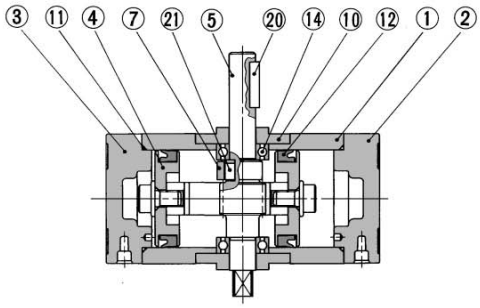
Construction

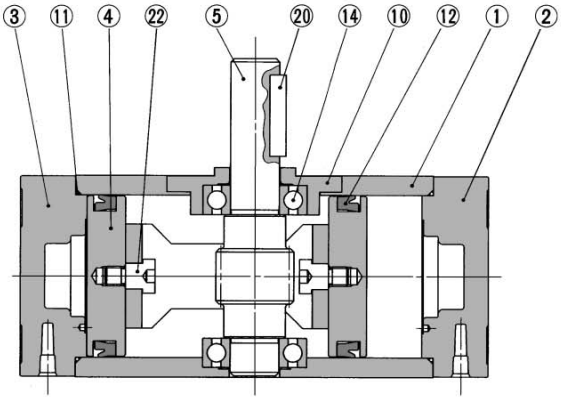
Without air cushion
Size: 30



Without air cushion
Size: 50 to 100







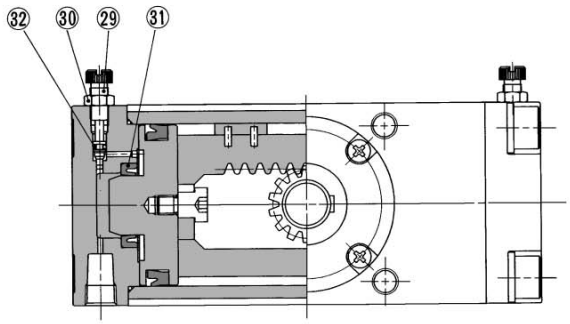
Component Parts

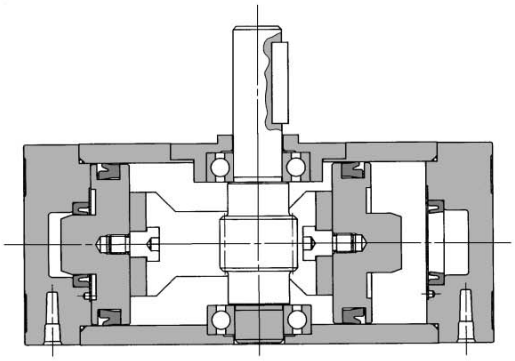
No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Right cover	Aluminum alloy	Black anodized
③	Left cover	Aluminum alloy	Black anodized
④	Piston	Aluminum alloy	Chromated
⑤	Shaft	Chrome molybdenum steel	
⑥	Rack	Carbon steel	Nitrided
⑦	Stopper	Chrome molybdenum steel	
⑧	Stopper screw	Chrome molybdenum steel	Black dyed
⑨	Slider	Resin	
⑩	Bearing retainer	Zinc alloy Note)	Black painted
⑪	Tube gasket	NBR	

Note) Size 50 to 100: Aluminum alloy (Black anodized)

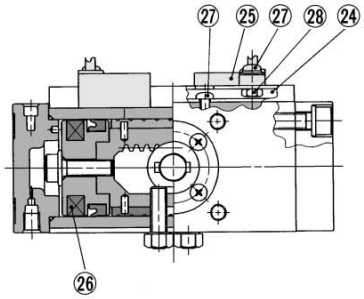
No.	Description	Material	Note
⑫	Piston seal	NBR	
⑬	O-ring	NBR	
⑭	Bearing	Bearing steel	
⑮	Hexagon socket head cap screw with spring washer	Chrome molybdenum steel	Black zinc chromated
⑯	Hexagon socket head cap flange screw	Chrome molybdenum steel	Zinc chromated
⑰	Cross-recessed countersunk head screw	Steel wire	Black dyed
⑱	Hexagon nut	Steel wire	Black dyed
⑲	Spring pin	Steel wire	
⑳	Parallel keyway	Carbon steel	
㉑	Parallel keyway	Carbon steel	
㉒	Connecting screw	Carbon steel	Zinc chromated
㉓	Round head Phillips screw	Steel wire	Black zinc chromated

With air cushion

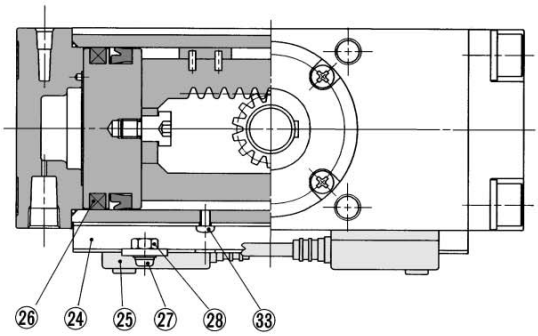




With auto switch
Size: 30



Size: 50 to 100



Component Parts

No.	Description	Material	Note
㉔	Auto switch mounting rail	Aluminum alloy	
㉕	Auto switch	—	
㉖	Plastic magnet	Magnetic material	
㉗	Round head Phillips screw	Steel wire	Nickel plated
㉘	Hexagon nut	Steel wire	Nickel plated
㉙	Needle valve	Steel wire	Nickel plated
㉚	Lock nut	Steel wire	Nickel plated
㉛	Cushion seal	NBR	
㉜	O-ring	NBR	
㉝	Round head Phillips screw	Steel wire	Nickel plated

Replacement Parts (Corresponding parts shown below are set.)

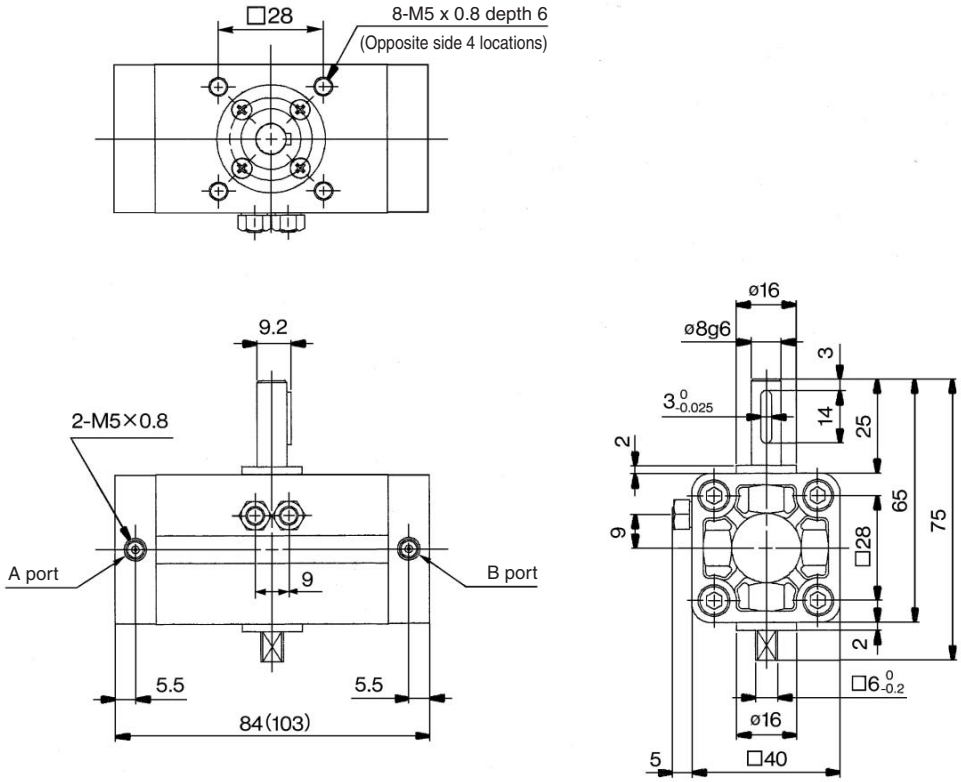
Size	Replacement parts			
	Standard	With air cushion	With auto switch	Air-hydro
CRA1□W30-90	P294010-20	—	P294010-20	—
CRA1□W30-180	P294010-21	—	P294010-21	—
CRA1□□50	P294020-20A	P294020-20A	P294020-20A	P294020-23A
CRA1□□63	P294030-20A	P294030-20A	P294030-20A	P294030-23A
CRA1□□80	P294040-20	P294040-20	P294040-20	P294040-23
CRA1□□100	P294050-20A	P294050-20A	P294050-20A	P294050-23A
Corresponding parts	⑨, ⑪, ⑫, and ⑲ are set.			

Note) When ordering spare parts, write “1 piece” for 1 set of the parts for one actuator.

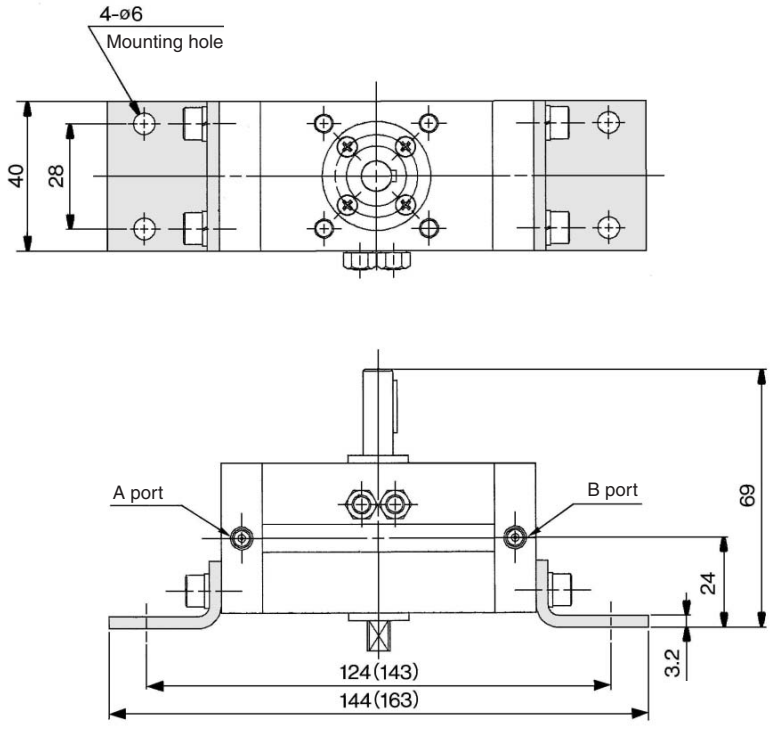
Size 30/Basic Style: CRA1BW, Foot Style: CRA1LW

This drawing is for 90° specifications.

Basic style: CRA1BW30



Foot style: CRA1LW30

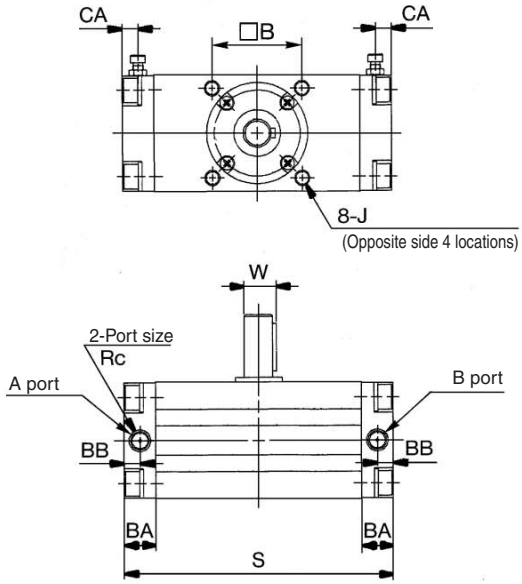


∗ ( ) are the dimensions for rotation of 180°.
★The dimensions below show pressurization to B port.

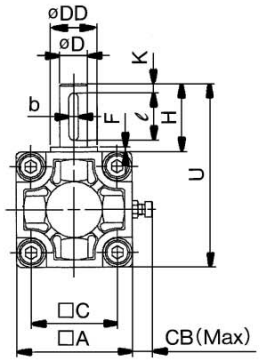
Size 50, 63, 80, 100/Basic Style: CRA1B□

Size: 50 to 100

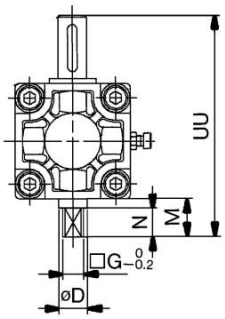
Single shaft type: CRA1BS



Single shaft



Double shaft type: CRA1BW
Double shaft



Note) Other dimensions are the same as the single shaft.

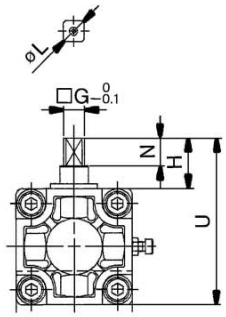
∗ The dimensions above show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.

Model	Port size Rc	A	B	C	D (g6)	DD (h9)	F	H	J	K	S	U	W	BA	BB	⋆ CA	⋆ CB	Keyway dimensions b	Keyway dimensions ℓ
CRA1BS50	1/8	62	48	46	15	25	2.5	36	M8 x 1.25 Depth 8	5	144 (177)	98	17	17	8.5	8.5	13	$5^{0}_{-0.030}$	25
CRA1BS63	1/8	76	60	57	17	30	2.5	41	M10 x 1.5 Depth 12	5	163 (201.5)	117	19.5	20	10	10	14	$6^{0}_{-0.030}$	30
CRA1BS80	1/4	92	72	70	20	35	3	50	M12 x 1.75 Depth 13	5	186 (230)	142	22.5	23.5	12	12	18	$6^{0}_{-0.030}$	40
CRA1BS100	3/8	112	85	85	25	40	4	60	M12 x 1.75 Depth 14	5	245 (311)	172	28	25	12.5	12.5	18	$8^{0}_{-0.036}$	45

⋆ For model with air cushion

Model	D (g6)	G	M	N	UU	L
CRA1BW50	15	11	20	15	118	14
CRA1BW63	17	13	22	17	139	16
CRA1BW80	20	15	25	20	167	19
CRA1BW100	25	19	30	25	202	24

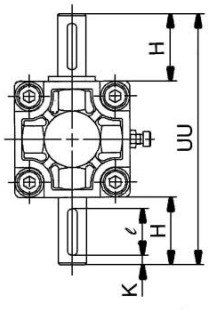
Single shaft with four chamfers: CRA1BX



Note) Other dimensions are the same as the single shaft.

Model	G	H	N	U	L
CRA1BX50	11	27	15	89	14
CRA1BX63	13	29	17	105	16
CRA1BX80	15	38	20	130	19
CRA1BX100	19	44	25	156	24

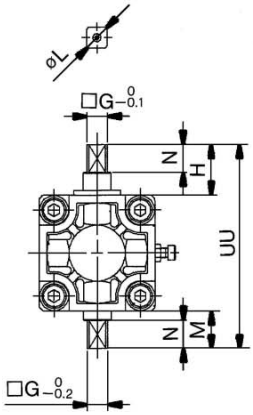
Double shaft key: CRA1BY



Note) Other dimensions are the same as the single shaft.

Model	H	K	UU	ℓ
CRA1BY50	36	5	134	25
CRA1BY63	41	5	158	30
CRA1BY80	50	5	192	40
CRA1BY100	60	5	232	45

Double shaft with four chamfers: CRA1BZ

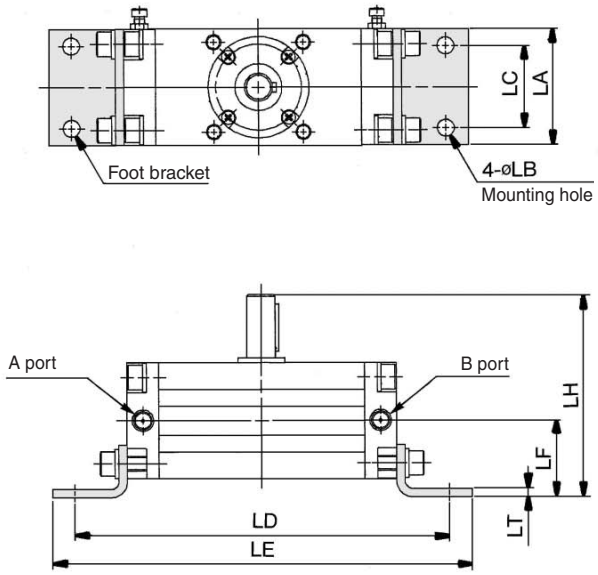


Note) Other dimensions are the same as the single shaft.

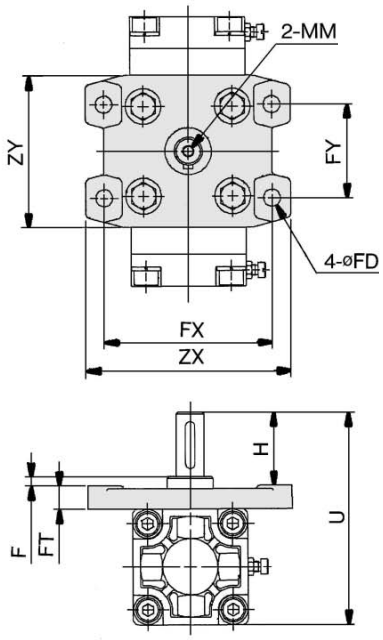
Model	G	H	M	N	UU	L
CRA1BZ50	11	27	20	15	109	14
CRA1BZ63	13	29	22	17	127	16
CRA1BZ80	15	38	25	20	155	19
CRA1BZ100	19	44	30	25	186	24

Size 50, 63, 80, 100/Foot Style: CRA1L□, Flange Style: CRA1F□

Foot style: CRA1L□



Flange style
Single shaft: CRA1FS



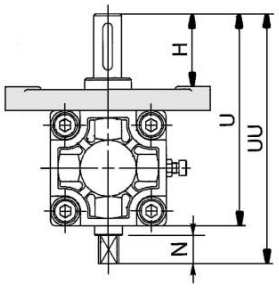
● Dimensions above show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.

Model	LA	LB	LC	LD	LE	LF	LH	LT
CRA1L□□50	62	9	44	200 (233)	224 (257)	41	108	4.5
CRA1L□□63	76	11	55	235 (273.5)	263 (301.5)	48	127	5
CRA1L□□80	92	13	67	274 (318)	316 (360)	58	154	6
CRA1L□□100	112	13	87	333 (399)	375 (441)	73.5	189.5	6

Note) Other dimensions are the same as standard.

Model	F	H	MM	U	FD	FT	FX	FY	ZX	ZY
CRA1F□□50	4	39	M 6 x 1.0 depth 12	114	9	13	90	50	110	81
CRA1F□□63	5	45	M 6 x 1.0 depth 12	136	11.5	15	105	59	130	101
CRA1F□□80	5	55	M8 x 1.25 depth 16	165	13.5	18	130	76	160	119
CRA1F□□100	5	60	M10 x 1.5 depth 20	190	13.5	18	150	92	180	133

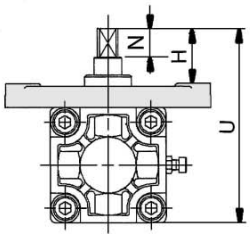
Flange style
Double shaft: CRA1FW



Note) Other dimensions are the same as the single shaft.

Model	H	N	U	UU
CRA1FW□50	39	15	114	134
CRA1FW□63	45	17	136	158
CRA1FW□80	55	20	165	190
CRA1FW□100	60	25	190	220

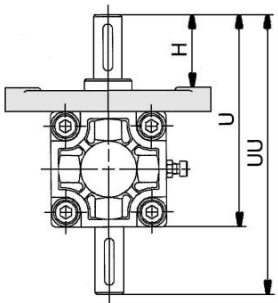
Flange style
Single shaft with four chamfers: CRA1FX



Note) Other dimensions are the same as the single shaft.

Model	H	N	U
CRA1FX□50	30	15	105
CRA1FX□63	33	17	124
CRA1FX□80	43	20	153
CRA1FX□100	44	25	174

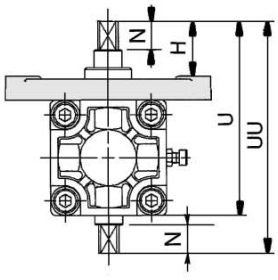
Flange style
Double shaft key: CRA1FY



Note) Other dimensions are the same as the single shaft.

Model	H	U	UU
CRA1FY□50	39	114	150
CRA1FY□63	45	136	177
CRA1FY□80	55	165	215
CRA1FY□100	60	190	250

Flange style
Double shaft with four chamfers: CRA1FZ



Note) Other dimensions are the same as the single shaft.

Model	H	N	U	UU
CRA1FZ□50	30	15	105	125
CRA1FZ□63	33	17	124	146
CRA1FZ□80	43	20	153	178
CRA1FZ□100	44	25	174	204

Rotary Actuator with Auto Switch
Rack & Pinion Style
Series CDRA1
Size: 30, 50, 63, 80, 100

How to Order

Mounting style

B	Basic style
L	Foot style

Rotating angle

90	90°
180	180°

Size 30: C D RA1 B W30 — 90 — J79W S

Size 50 to 100: C D RA1 B W ☐ 50 — 90 ☐ — J59W S

Built-in magnet

Number of auto switches

S	1 pc.
Nil	2 pcs.

Note) Maximum number of auto switches mountable is two.

Mounting style

B	Basic style
L *	Foot style
F	Flange style

* For part numbers of foot bracket, refer to page 11-7-2.

Size

50
63
80
100

Auto switch
* For the applicable auto switch model, refer to the table below.
* Auto switches are shipped together, (but not assembled).

Cushion

Nil	None
C	With cushion

Shaft type

Standard	S	Single shaft
	W	Double shaft
Option	X	Single shaft with four chamfers
	Y	Double shaft key
	Z	Double shaft with four chamfers

Type

Nil	Pneumatic
H	Air-hydro

Rotating angle

Standard	90	90°
	180	180°
Option	100	100°
	190	190°

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

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Size 30 Perpendicular	Auto switch model: Size 30 In-line	Auto switch model: Size 50 to 100 In-line	Lead wire * length (m): 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	—	A76H	A56	●	●	—	—	—	IC circuit	—
				2-wire	—	—	200 V	A72	A72H	—	●	●	—	—	—	—	Relay, PLC
					24 V	12 V	100 V	A73	A73H	—	●	●	●	—	—		
							—	—	—	A53	●	●	●	—	—		
		Connector						A73C	—	—	●	●	●	●	—		
		Grommet				—	100 V, 200 V	—	—	A54	●	●	●	—	—		
	Diagnosis indication (2-color)						—	A79W	—	A59W	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)		5 V, 12 V	—	F7NV	F79	F59	●	●	○	—	○	IC circuit	PLC
				3-wire (PNP)				F7PV	F7P	F5P	●	●	○	—	○		
				2-wire		12 V		F7BV	J79	J59	●	●	○	—	○		
					—	—	100 V, 200 V	—	—	J51	●	●	○	—	—	—	
		Connector			24 V	12 V	—	J79C	—	—	●	●	●	●	—		
	Diagnosis indication (2-color)	Grommet		3-wire (NPN)		5 V, 12 V		F7NWV	F79W	F59W	●	●	○	—	○	IC circuit	
				3-wire (PNP)				—	F7PW	F5PW	●	●	○	—	○		
				2-wire		—	—	F7BWV	J79W	J59W	●	●	○	—	○	—	
	Water resistant (2-color)							—	F7BA **	F5BA **	—	●	○	—	○		
								F7BAV **	—	—	—	●	○	—	—		
	Diagnosis output (2-color)			4-wire (NPN)		5 V, 12 V		—	F79F	F59F	●	●	○	—	○	IC circuit	

** Although it is possible to mount water resistant type auto switches, note that the rotary actuator itself is not of water resistant construction.

* Lead wire length symbols: 0.5 m ····· Nil (Example) A73C
3 m ····· L (Example) A73CL
5 m ····· Z (Example) A73CZ
None ····· N (Example) A73CN

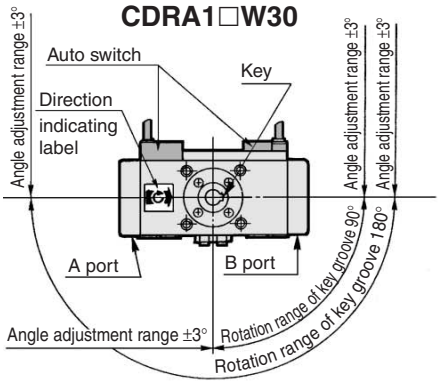
* Auto switches marked with "○" are made to order specifications.

Made to Order Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

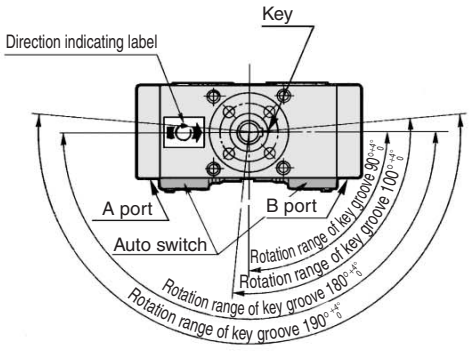
• Refer to page 11-7-14 for applicable switches other than those indicated above.
• For F7NWV, F7BWV switch types, refer to Best Pneumatics Vol. 8.

Rotation Range of Key Groove/Switch Mounting Position

Size: 30
CDRA1□W30

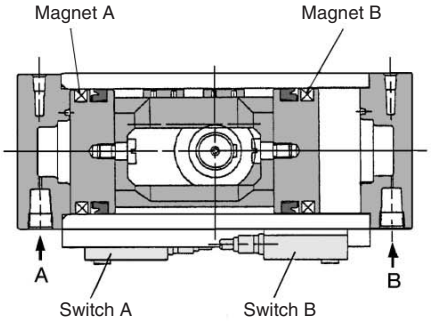


Size: 50 to 100
CDRA1□□50 to 100



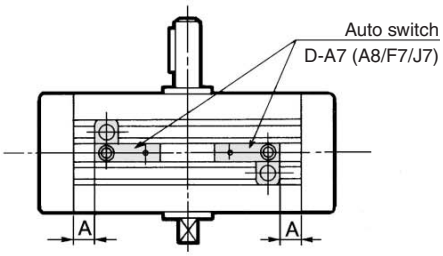
Working Principle

In the diagram below, switch B is ON. When pressure is applied from A, the piston moves to B, causing the shaft to rotate clockwise. At this time, magnet B goes out of the movement range of switch B, causing switch B to turn OFF. Furthermore, the piston moves to the right, causing magnet A to enter the movement range of switch A. As a result, switch A turns ON.

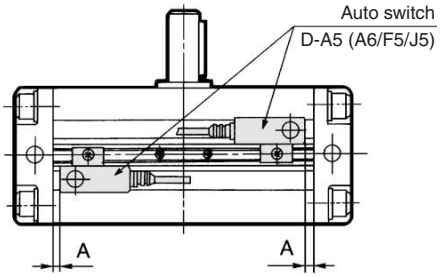


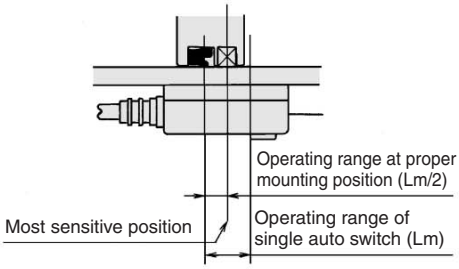
Proper Auto Switch Mounting Position at Rotation End

CDRA1□W30



CDRA1□□50 to 100





Operating angle θ m: Converts the operating range (Lm) of the auto switch into the rotation angle.
Angle of hysteresis: The hysteresis of the auto switch is converted to degrees.

Model	A (mm)	Operating angle θ m	Hysteresis angle (1)
CDRA1□W30-90	9 (19)	95°	20°
CDRA1□□50-90	9 (26)	65°	20°
CDRA1□□63-90	11 (30)	60°	10°
CDRA1□□80-90	15 (37)	45°	7°
CDRA1□□100-90	27 (60)	35°	5°

∗ The dimensions inside ( ) are for 180°.
∗∗ Up to 2 auto switches can be mounted per actuator. The dimensions in the table are the values that represent the most sensitive positions of the auto switches. Thus, they are not the dimensions that represent the mounting position at the time of shipment.
★ Please consult with SMC concerning the angles for the auto switches other than the models D-A73 and D-A53.

Auto Switch Specifications/Refer to page 11-11-1 for further information on auto switch single body.

Type	Model	Electrical entry	Features	Applicable size
Reed switch	D-A80	Grommet (Perpendicular)	Without indicator light	30
	D-A80H	Grommet (In-line)		
	D-A80C	Connector (In-line)		
	D-A64	Grommet (In-line)	Without indicator light, built-in contact protection circuit	50 to 100
	D-A67	Grommet (In-line)	Without indicator light	
Solid state switch	D-F7NTL	Grommet (In-line)	With timer	30
	D-F5NTL	Grommet (In-line)		50 to 100

∗ With pre-wire connector is also available for D-F5NTL, D-F7NTL. For details, refer to pages 11-11-34 to 35.

Sets of Mounting Screws for Auto Switch (Round head Phillips screw, Hexagon nut)

Model	Part no.
CDRA1□W30	P294010-24
CDRA1□□50 to 100	P294020-24

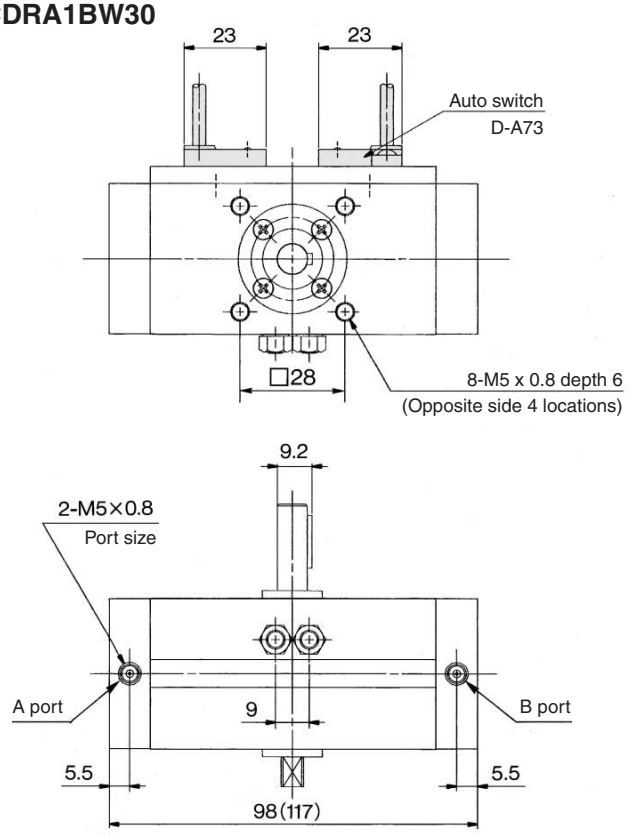
Note 1) The above part numbers include 2 pieces of mounting screws and 2 pieces of nuts.
Note 2) To order a set for 1 unit, the ordering quantity should be "1".

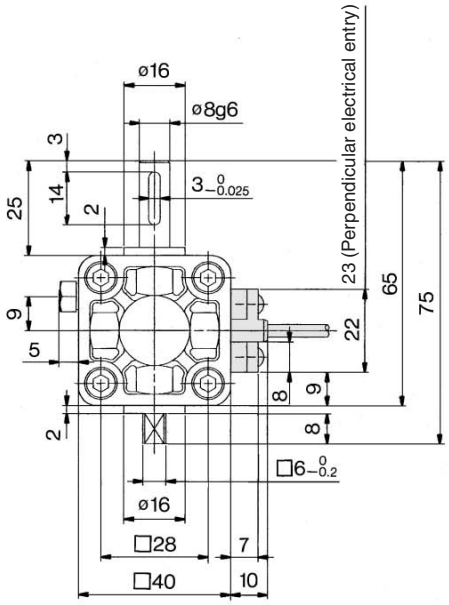
Size 30/Basic Style: CDRA1BW, Foot Style: CDRA1LW

This drawing is for 90° specifications.

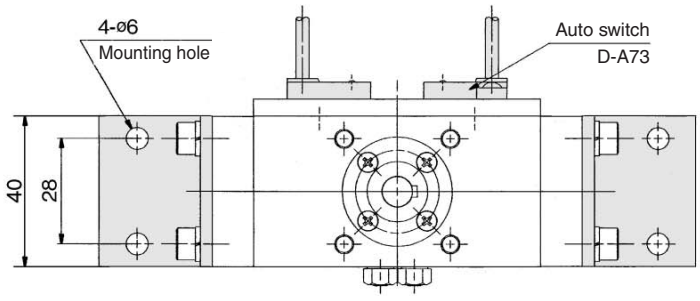
CRB2
CRBU2
CRB1
MSU
CRJ
CRA1
CRQ2
MSQ
MRQ
D-
20-

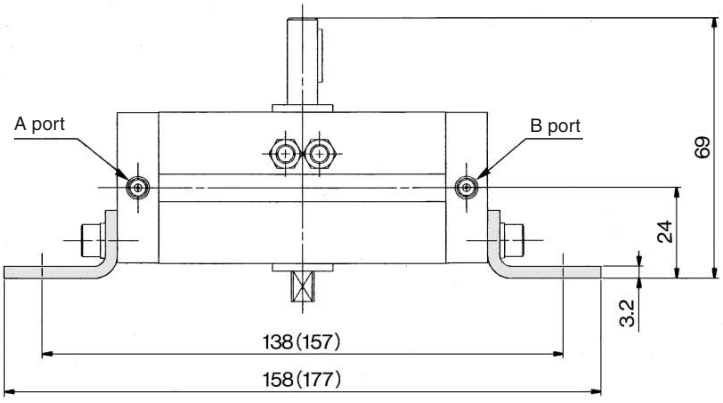
With auto switch
Basic style: CDRA1BW30





Foot style: CDRA1LW30

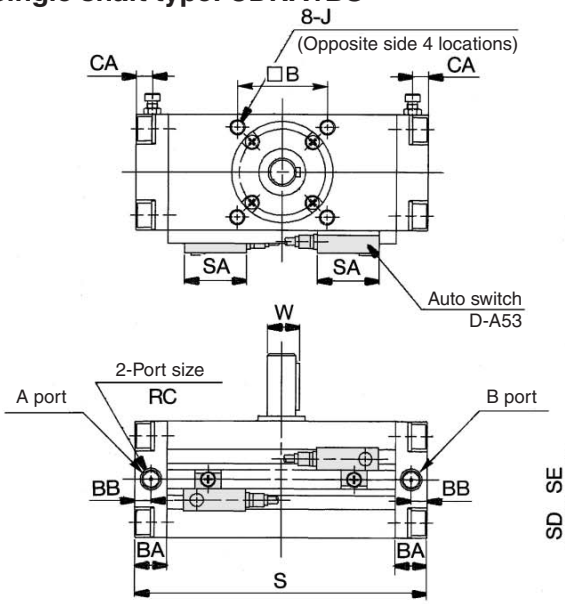




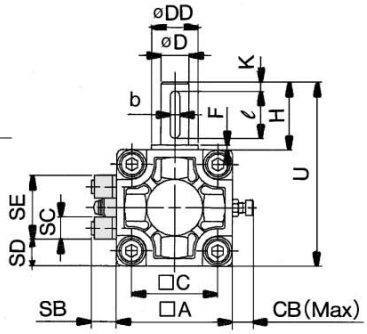
∗ ( ) are the dimensions for rotation of 180°.
⋆ The dimensions below show pressurization to B port.

Size 50, 63, 80, 100/Basic Style: CRA1B□

With auto switch
Single shaft type: CDRA1BS

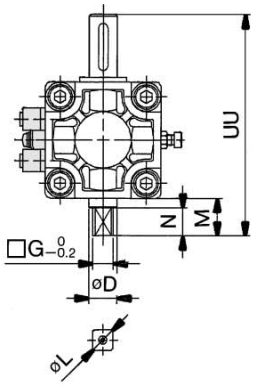


Single shaft



Double shaft type: CDRA1BW

Double shaft



Double Shaft Type

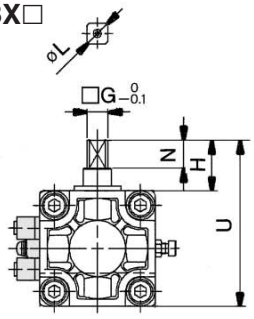
Model	D(g6)	G	M	N	UU	L
CDRA1BW50	15	11	20	15	118	14
CDRA1BW63	17	13	22	17	139	16
CDRA1BW80	20	15	25	20	167	19
CDRA1BW100	25	19	30	25	202	24

Single Shaft Type

⋆ The dimensions below show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.

Model	Port size Rc	A	B	C	D (g6)	DD (h9)	F	H	J	K	S	U	W	BA	BB	CA	CB	SA	SB	SC	SD	SE	Keyway dimensions b	Keyway dimensions ℓ
CDRA1BS50	1/8	62	48	46	15	25	2.5	36	M8 x 1.25 depth 8	5	156 (189)	98	17	17	8.5	8.5	13	33	13.5	12	14	34	5 $^{0}_{-0.030}$	25
CDRA1BS63	1/8	76	60	57	17	30	2.5	41	M10 x 1.5 depth 12	5	175 (213.5)	117	19.5	20	10	10	14	33	14.5	12	21	34	6 $^{0}_{-0.030}$	30
CDRA1BS80	1/4	92	72	70	20	35	3	50	M12 x 1.75 depth 13	5	199 (243)	142	22.5	23.5	12	12	18	33	15.5	12	29	34	6 $^{0}_{-0.030}$	40
CDRA1BS100	3/8	112	85	85	25	40	4	60	M12 x 1.75 depth 14	5	259 (325)	172	28	25	12.5	12.5	18	33	16	12	39	34	8 $^{0}_{-0.036}$	45

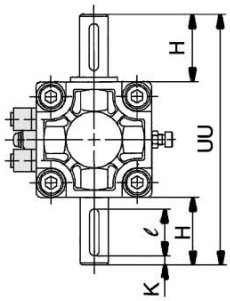
Single shaft with four chamfers: CDRA1BX□



Note) Other dimensions are the same as the single shaft.

Model	G	H	N	U	L
CDRA1BX□50	11	27	15	89	14
CDRA1BX□63	13	29	17	105	16
CDRA1BX□80	15	38	20	130	19
CDRA1BX□100	19	44	25	156	24

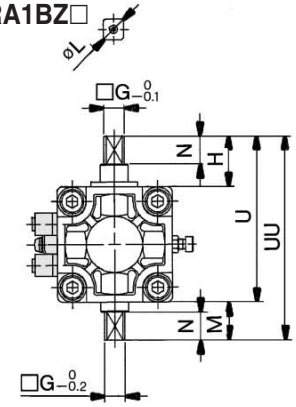
Double shaft key: CDRA1BY□



Note) Other dimensions are the same as the single shaft.

Model	H	K	UU	ℓ
CDRA1BY□50	36	5	134	25
CDRA1BY□63	41	5	158	30
CDRA1BY□80	50	5	192	40
CDRA1BY□100	60	5	232	45

Double shaft with four chamfers: CDRA1BZ□

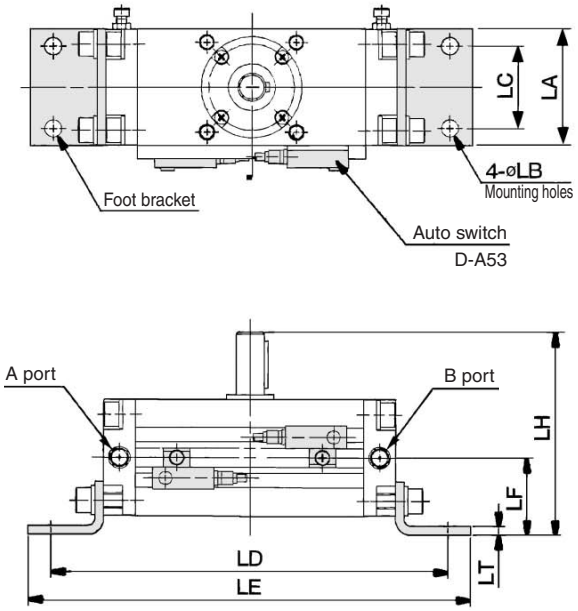


Note) Other dimensions are the same as the single shaft.

Model	G	H	M	N	U	UU	L
CDRA1BZ□50	11	27	20	15	89	109	14
CDRA1BZ□63	13	29	22	17	105	127	16
CDRA1BZ□80	15	38	25	20	130	155	19
CDRA1BZ□100	19	44	30	25	156	186	24

Size 50, 63, 80, 100/Foot Style: CDRA1L, Flange Style: CDRA1F

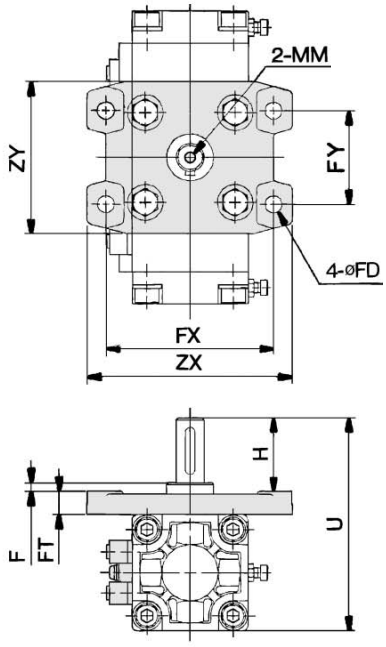
Foot style: CDRA1L□



★Dimensions above show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.

Model	LA	LB	LC	LD	LE	LF	LH	LT
CDRA1L□□50	62	9	44	212 (245)	236 (269)	41	108	4.5
CDRA1L□□63	76	11	55	247 (285.5)	275 (313.5)	48	127	5
CDRA1L□□80	92	13	67	287 (331)	329 (373)	58	154	6
CDRA1L□□100	112	13	87	347 (413)	389 (455)	73.5	189.5	6

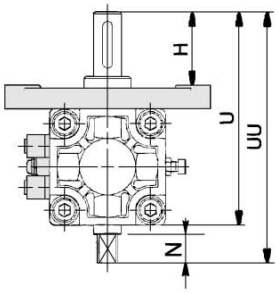
Flange style
Single shaft: CRA1FS



Note) Other dimensions are the same as standard.

Model	F	H	MM	U	FD	FT	FX	FY	ZX	ZY
CDRA1F□□50	4	39	M 6 x 1.0 depth 12	114	9	13	90	50	110	81
CDRA1F□□63	5	45	M 6 x 1.0 depth 12	136	11.5	15	105	59	130	101
CDRA1F□□80	5	55	M8 x 1.25 depth 16	165	13.5	18	130	76	160	119
CDRA1F□□100	5	60	M10 x 1.5 depth 20	190	13.5	18	150	92	180	133

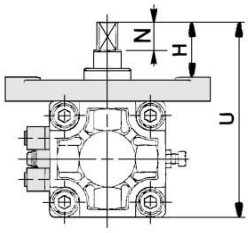
Flange style
Double shaft: CDRA1FW



Note) Other dimensions are the same as the single shaft.

Model	H	N	U	UU
CDRA1FW□50	39	15	114	134
CDRA1FW□63	45	17	136	158
CDRA1FW□80	55	20	165	190
CDRA1FW□100	60	25	190	220

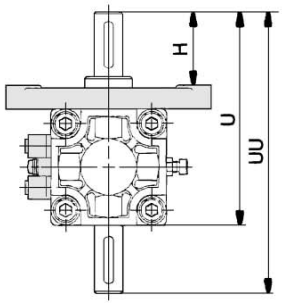
Flange style
Single shaft with four chamfers: CDRA1FX



Note) Other dimensions are the same as the single shaft.

Model	H	N	U
CDRA1FX□50	30	15	105
CDRA1FX□63	33	17	124
CDRA1FX□80	43	20	153
CDRA1FX□100	44	25	174

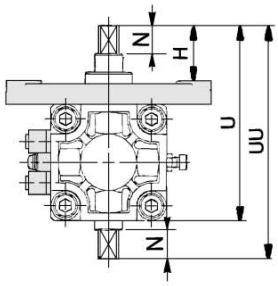
Flange style
Double shaft key: CDRA1FY



Note) Other dimensions are the same as the single shaft.

Model	H	U	UU
CDRA1FY□50	39	114	150
CDRA1FY□63	45	136	177
CDRA1FY□80	55	165	215
CDRA1FY□100	60	190	250

Flange style
Double shaft with four chamfers: CDRA1FZ



Note) Other dimensions are the same as the single shaft.

Model	H	N	U	UU
CDRA1FZ□50	30	15	105	125
CDRA1FZ□63	33	17	124	146
CDRA1FZ□80	43	20	153	178
CDRA1FZ□100	44	25	174	204

Rotary Actuator with Solenoid Valve
Rack & Pinion Style
Series CVRA1
Size: 50, 63, 80, 100

How to Order

Electrical entry

G	Grommet (Lead wire: 300 mm)	
H	Grommet (Lead wire: 600 mm)	
E	Grommet terminal	
T	Conduit terminal	
D	DIN terminal	
L	L plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M plug connector	With lead wire
MN		Without lead wire
MO		Without connector

Light/Surge voltage suppressor

Nil	None
Z *	With light/surge voltage suppressor
S *	With surge voltage suppressor

* Light attached type (Z) is not available for grommet type. Surge voltage suppressor attached type is available only for grommet type.

Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 to 120 VAC, 50/60 Hz
4	220 VAC, 50/60 Hz
5	24 VDC
6	12 VDC
7	240 VAC, 50/60 Hz
9	Other

Solenoid valve configuration

1	Single solenoid
2	Double solenoid
3	Closed center
4	Exhaust center
5	Pressure center

Manual override

Nil	None
B	Locking B type
C	Locking C type

Without auto switch CVRA1 | B | S | | 50 | 90 | | 1 | 1 | G | | |

With auto switch CDVRA1 | B | S | | 50 | 90 | | 1 | 1 | G | | | J59W | S

Built-in magnet

With solenoid valve

Mounting style

B	Basic style
L	Foot style

Note) No flange style "F" is available.

Shaft type

S	Single shaft
W	Double shaft
X	Single shaft with four chamfers
Y	Double shaft key
Z	Double shaft with four chamfers

Type

Nil	Standard
U	Angle adjustable

Size

50
63
80
100

Cushion

Nil	None
C *	With cushion

* Except angle adjustable type "U".

Rotating angle

Standard	90	90°
	180	180°
Option	100	100°
	190	190°

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switches are shipped together, (but not assembled).

Number of auto switches

S	1 pc.
Nil	2 pcs.

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

Type	Special function	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)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	5 V	—	A56	●	●	—	—	IC circuit	—
				2-wire	12 V	—	A53	●	●	●	—	—	Relay, PLC
					24 V	100 V, 200 V	A54	●	●	●	—		
	Diagnosis indication (2-color)				—	—	A59 W	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	F59	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			F5P	●	●	○	○		
				2-wire	12 V		J59	●	●	○	○	—	
					—	100 V, 200 V	J51	●	●	○	—		
	Diagnosis indication (2-color)			3-wire (NPN)	5 V, 12 V	—	F59 W	●	●	○	○	IC circuit	
				3-wire (PNP)			F5PW	●	●	○	○		
				2-wire	24 V		J59 W	●	●	○	○	—	
	Water resistant (2-color)						F5BA **	—	●	○	○		
	Diagnosis output (2-color)			4-wire (NPN)	5 V, 12 V		F59F	●	●	○	○	IC circuit	

** Although it is possible to mount water resistant type auto switches, note that the rotary actuator itself is not of water resistant construction.

* Lead wire length symbols: 0.5 m·····Nil (Example) A53
3 m····· L (Example) A53L
5 m····· Z (Example) A53Z

* Auto switches marked with "○" are made-to-order specifications.

Made to Order Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

⚠ Caution

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

Specifications

Fluid		Air	
Proof pressure		1.35 MPa	
Max. operating pressure		0.9 MPa	
Min. operating pressure		0.15 MPa	
Ambient and fluid temperature		0°C to 50°C (No freezing)	
Lubrication		Non-lube	
Mounting		Basic style, Foot style	
Solenoid valve part no.		VF3□ 20-□□□□-02-X14	
Electrical entry		Grommet, Grommet terminal, Conduit terminal, DIN terminal, L plug connector, M plug connector	
Coil rated voltage	AC	100, 200 V (50/60 Hz)	
	DC	24 V	
Allowable voltage change		–15 to +10% of the rated voltage	
Coil insulation		Equivalent to B class (130°C)	
Power consumption	AC	Inrush	5.6 VA (50 Hz), 5.0 VA (60 Hz)
		Holding	3.4 VA (50 Hz), 2.3 VA (60 Hz)
Apparent current	DC	1.8 W	

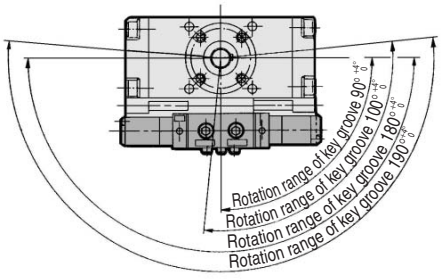
Weight

(kg)

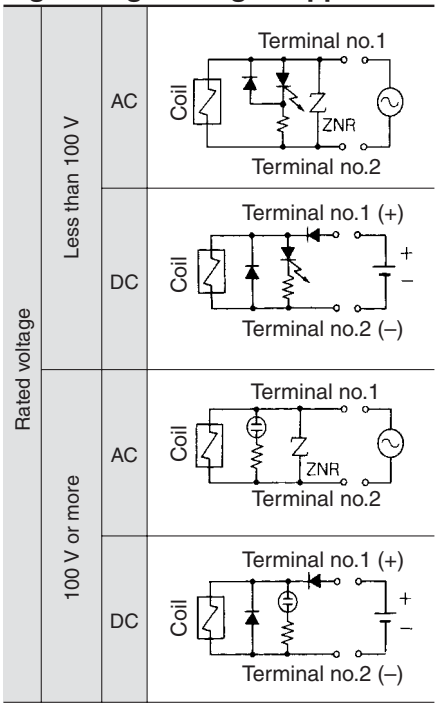
Model	Additional weight	No. of positions/solenoids				
		2 position single	2 position double	3 position closed center	3 position exhaust center	3 position pressure center
CVRA1□□50 to 100	0.2	0.2	0.3	0.4	0.4	0.4

How to calculate weight
Weight = Basic weight * + Add'l weight + No. of positions/solenoids
* Refer to page 11-7-3 for basic weight.

Rotation Range of Keygrooves Solenoid Valve Mounting Positions



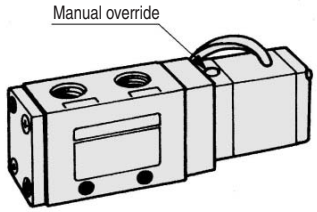
Light/Surge Voltage Suppressor



Note) Light is not available on grommet type.

Manual Override

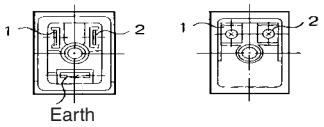
Non-locking push style is standard.



Electrical Wiring

The DIN terminal and the terminal pin (with light/surge voltage suppressor) are connected internally as shown below. Therefore, connect them the respective power supply terminals.

DIN terminal **With terminal block**



Terminal no.	1	2
DIN connector	+	–
Terminal connector	+	–

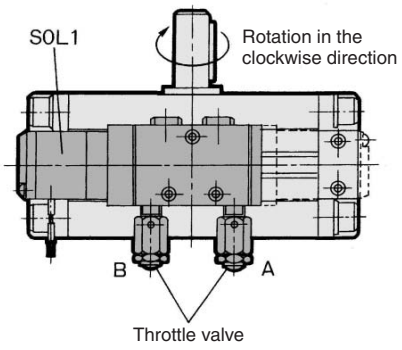
Instant Energizing Time

To operate the double solenoid type by applying an instantaneous current, ensure that the current is applied for at least 0.1 second.

How to Adjust the Rotation Speed

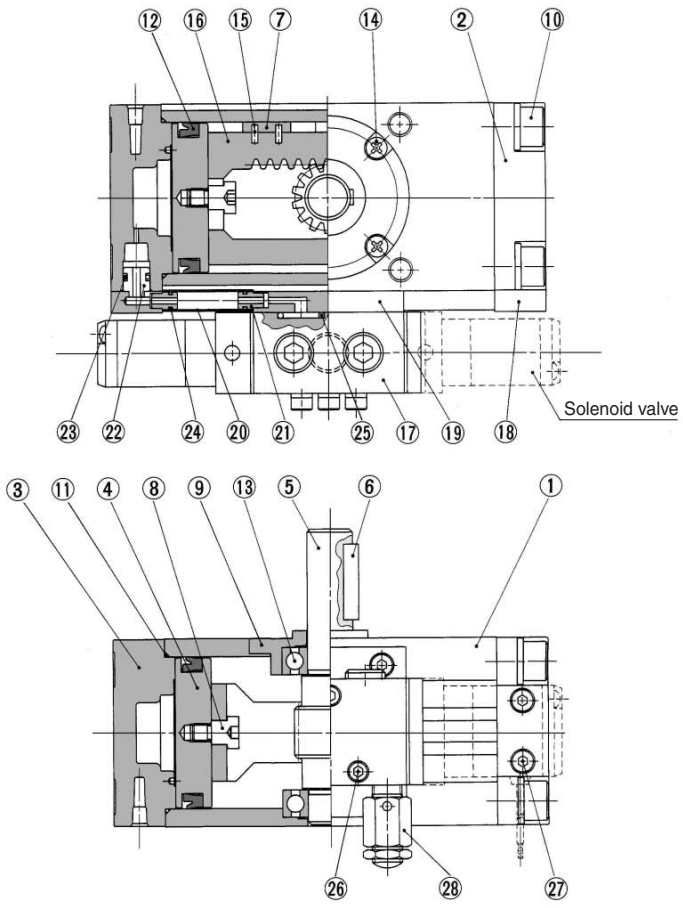
Rotation direction
When current is applied to SOL1, the shaft rotates clockwise.

How to adjust the rotation speed:
Turn the needle valve of the throttle valve clockwise to reduce the exhaust flow volume, thus slowing the rotation speed.
Throttle valve A regulates the clockwise rotation speed of the shaft and throttle valve B regulates the counterclockwise speed to the shaft.

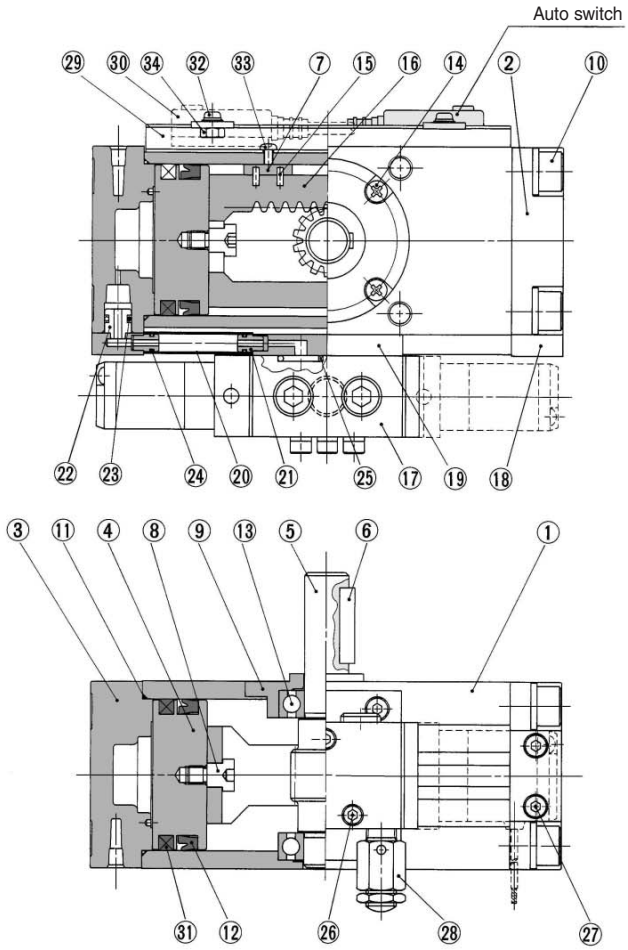


Construction

With solenoid valve



With solenoid valve and auto switch



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Right cover	Aluminum alloy	Black anodized
③	Left cover	Aluminum alloy	Black anodized
④	Piston	Aluminum alloy	Chromated
⑤	Shaft	Chrome molybdenum steel	
⑥	Parallel keyway	Carbon steel	
⑦	Slider	Resin	
⑧	Connecting screw	Carbon steel	Zinc chromated
⑨	Bearing retainer	Aluminum alloy	Black anodized
⑩	Hexagon socket head cap screw with spring washer	Chromium molybdenum steel	Black zinc chromated
⑪	Tube gasket	NBR	
⑫	Piston seal	NBR	
⑬	Bearing	Bearing steel	
⑭	Round head Phillips screw	Steel wire	Black zinc chromated
⑮	Spring pin	Steel wire	
⑯	Rack	Carbon steel	Nitrided
⑰	Solenoid valve		

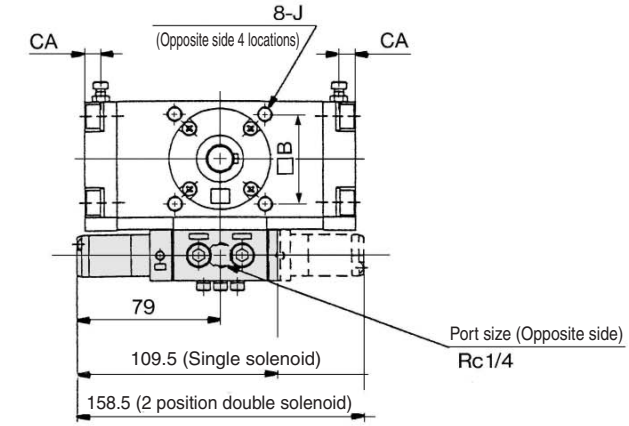
No.	Description	Material	Note
⑱	Sub-plate	Aluminum alloy	Black anodized
⑲	Sub-plate	Aluminum alloy	Black anodized
⑳	Pipe	Stainless steel	
㉑	Fitting	Aluminum alloy	Chromated
㉒	Fitting	Aluminum alloy	Chromated
㉓	O-ring	NBR	
㉔	O-ring	NBR	
㉕	O-ring	NBR	
㉖	Hexagon socket head cap screw	Steel wire	Black dyed
㉗	Hexagon socket head cap screw	Steel wire	Black dyed
㉘	Metal valve	Stainless steel	
㉙	Switch mounting rail	Aluminum alloy	
㉚	Auto switch		
㉛	Plastic magnet	Magnetic material	
㉜	Round head Phillips screw	Steel wire	Nickel plated
㉝	Round head Phillips screw	Steel wire	Nickel plated
㉞	Hexagon nut	Steel wire	Nickel plated

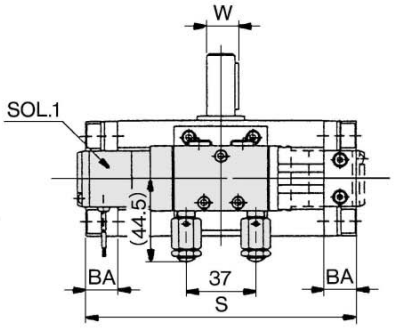
Replacement Parts (The corresponding parts shown below are sets.)

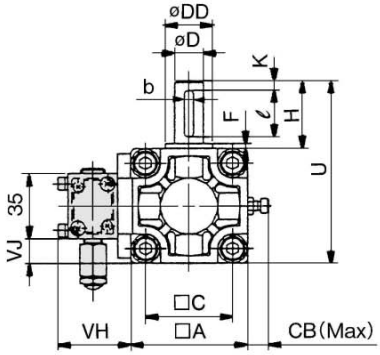
Size (Type)	With solenoid valve, With solenoid valve auto switch
C□VRA1□□50	P294020-49A
C□VRA1□□63	P294030-49A
C□VRA1□□80	P294040-49
C□VRA1□□100	P294050-49A
Corresponding parts no.	⑦, ⑪, ⑫, ⑮, ㉓, ㉔, ㉕ are set.

Size 50, 63, 80, 100/Basic Style: CVRA1BS50 to 100

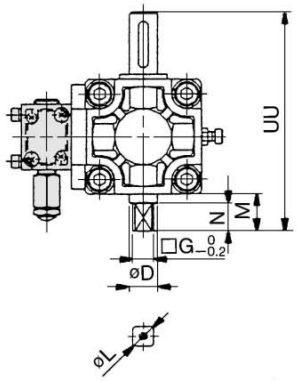
Single shaft type: CVRA1BS□50 to 100







Double shaft type: CVRA1BW□



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

Double Shaft Type

(mm)

Model	D (g6)	G	M	N	UU	L
CVRA1BW□50	15	11	20	15	118	14
CVRA1BW□63	17	13	22	17	139	16
CVRA1BW□80	20	15	25	20	167	19
CVRA1BW□100	25	19	30	25	202	24

Single Shaft Type

(mm)

Model	A	B	BA	C	CA	CB	D (g6)	DD (h9)	F	H	J	K	S *	U	W	Valve dimensions		Keyway dimensions	
																VH	VJ	b	ℓ
CVRA1BS□50	62	48	17	46	8.5	13	15	25	2.5	36	M8 x 1.25 depth 8	5	144 (177)	98	17	39	13.5	$5^{0}_{-0.030}$	25
CVRA1BS□63	76	60	20	57	10	14	17	30	2.5	41	M10 x 1.5 depth 12	5	163 (201.5)	117	19.5	39	20.5	$6^{0}_{-0.030}$	30
CVRA1BS□80	92	72	23.5	70	12	18	20	35	3	50	M12 x 1.75 depth 13	5	186 (230)	142	22.5	43	28.5	$6^{0}_{-0.030}$	40
CVRA1BS□100	112	85	25	85	12.5	18	25	40	4	60	M12 x 1.75 depth 14	5	245 (311)	172	28	43	38.5	$8^{0}_{-0.036}$	45

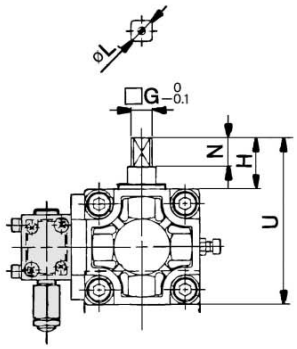
* ( ) are the dimensions for rotation of 180° and 190°.

Port Size

Model	Port size
CVRA1BS□50	Rc 1/4
CVRA1BS□63	Rc 1/4
CVRA1BS□80	Rc 1/4
CVRA1BS□100	Rc 1/4

Size 50, 63, 80, 100/Basic Style: CVRA1B, Foot Style: CVRA1L

Single shaft with four chamfers: CVRA1BX□

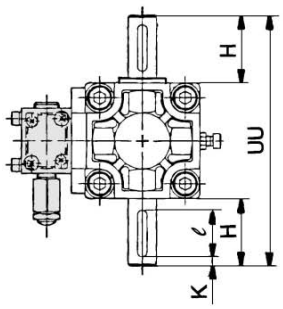


(mm)

Model	G	H	L	N	U
CVRA1BX□50	11	27	14	15	89
CVRA1BX□63	13	29	16	17	105
CVRA1BX□80	15	38	19	20	130
CVRA1BX□100	19	44	24	25	156

Note) Other dimensions are the same as the single shaft.

Double shaft key: CVRA1BY□

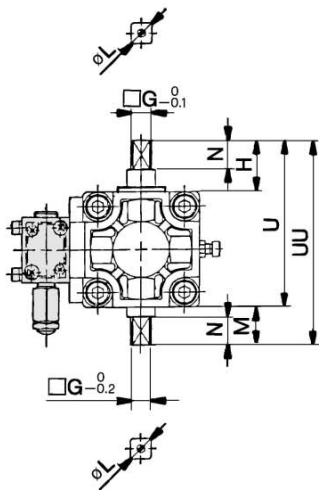


(mm)

Model	ℓ	H	K	UU
CVRA1BY□50	25	36	5	134
CVRA1BY□63	30	41	5	158
CVRA1BY□80	40	50	5	192
CVRA1BY□100	45	60	5	232

Note) Other dimensions are the same as the single shaft.

Double shaft with four chamfers: CVRA1BZ□

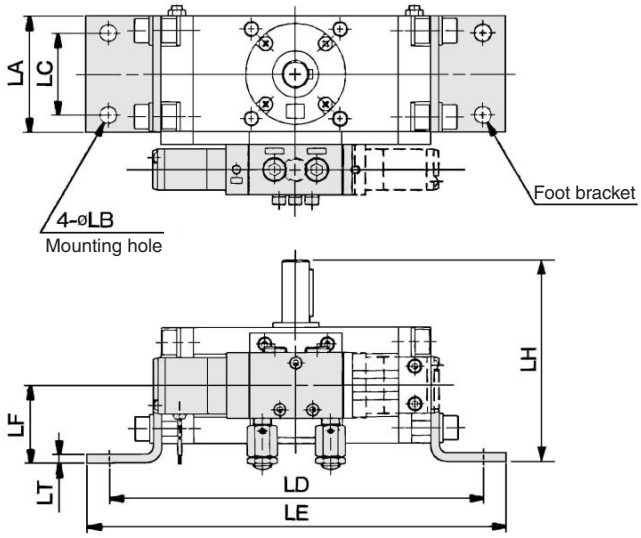


(mm)

Model	G	H	L	M	N	U	UU
CVRA1BZ□50	11	27	14	20	15	89	109
CVRA1BZ□63	13	29	16	22	17	105	127
CVRA1BZ□80	15	38	19	25	20	130	155
CVRA1BZ□100	19	44	24	30	25	156	186

Note) Other dimensions are the same as the single shaft.

Foot style: CVRA1L□□



★The dimensions below show pressurization to B port.

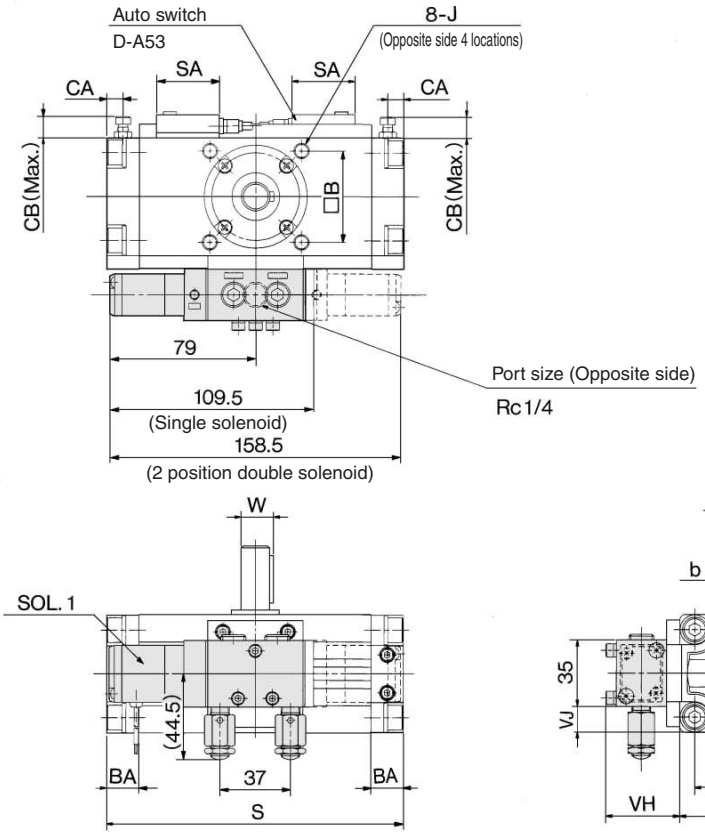
(mm)

Model	LA	LB	LC	LD	LE	LF	LH	LT
CVRA1L□□50	62	9	44	200 (233)	224 (257)	41	108	4.5
CVRA1L□□63	76	11	55	235 (273.5)	263 (301.5)	48	127	5
CVRA1L□□80	92	13	67	274 (318)	316 (360)	58	154	6
CVRA1L□□100	112	13	87	333 (399)	375 (441)	73.5	189.5	6

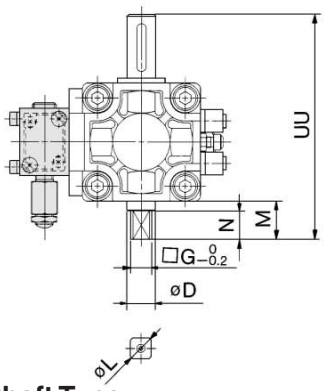
∗ ( ) are the dimensions for rotation of 180° and 190°.
Note) Other dimensions are the same as the single shaft.

Size 50, 63, 80, 100/Basic Style: CDVRA1BS50 to 100

Single shaft type: CDVRA1BS□50 to 100



Double shaft type: CDVRA1BW□



Double Shaft Type

(mm)

Model	D (g6)	G	M	N	UU	øL
CDVRA1BW□50	15	11	20	15	118	14
CDVRA1BW□63	17	13	22	17	139	16
CDVRA1BW□80	20	15	25	20	167	19
CDVRA1BW□100	25	19	30	25	202	24

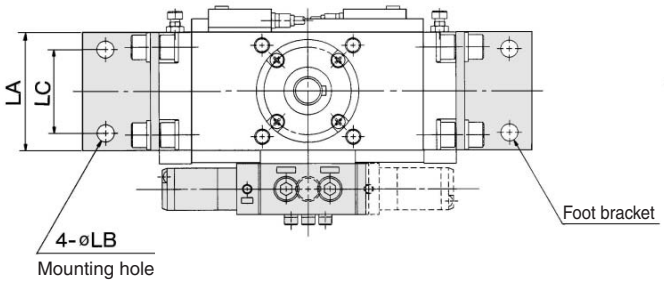
Single Shaft Type

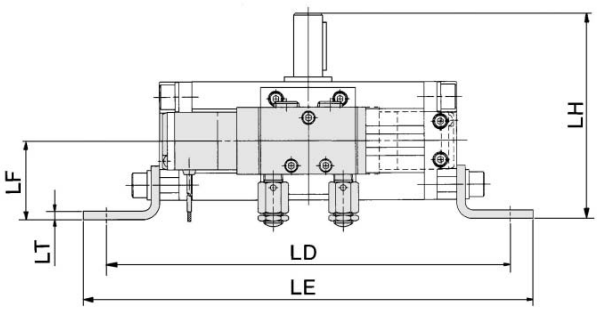
(mm)

Model	A	B	BA	C	CA	CB	øD (g6)	øDD (h9)	F	H	J	K	S	U	W	SA	SB	SC	SD	SE	Valve dimensions VH	Valve dimensions VJ	Keyway dimensions b	Keyway dimensions ℓ
CDVRA1BS□50	62	48	17	46	8.5	13	15	25	2.5	36	M8 x 1.25 depth 8	5	156 (189)	98	17	33	13.5	12	14	34	39	13.5	5 0 −0.030	25
CDVRA1BS□63	76	60	20	57	10	14	17	30	2.5	41	M10 x 1.5 depth 12	5	175 (213.5)	117	19.5	33	14.5	12	21	34	39	20.5	6 0 −0.030	30
CDVRA1BS□80	92	72	23.5	70	12	18	20	35	3	50	M12 x 1.75 depth 13	5	199 (243)	142	22.5	33	15.5	12	29	34	43	28.5	6 0 −0.030	40
CDVRA1BS□100	112	85	25	85	12.5	18	25	40	4	60	M12 x 1.75 depth 14	5	259 (325)	172	28	33	16	12	39	34	43	38.5	8 0 −0.036	45

∗ ( ) are the dimensions for rotation of 180° and 190°.

Foot style: CDVRA1L□□





(mm)

Model	LA	LB	LC	LD	LE	LF	LH	LT
CDVRA1L□□50	62	9	44	212 (245)	236 (269)	41	108	4.5
CDVRA1L□□63	76	11	55	247 (285.5)	275 (313.5)	48	127	5
CDVRA1L□□80	92	13	67	287 (331)	329 (373)	58	154	6
CDVRA1L□□100	112	13	87	347 (413)	389 (455)	73.5	189.5	6

∗ ( ) are the dimensions for rotation of 180° and 190°.

Rotary Actuator: Angle Adjustable Type
Rack & Pinion Style

Series CRA1□□U

Size: 50, 63, 80, 100

∗ Angle adjusting mechanism is provided as standard.

How to Order

Without auto switch

CRA1 **B** **S** **U** **50** — **90**

With auto switch

CDRA1 **B** **S** **U** **50** — **90** — **J59 W** **S**

Built-in magnet

Mounting style

B	Basic style
L∗	Foot style
F	Flange style

∗ For part numbers, refer to the tables below.

Shaft type

Standard	**S**	Single shaft
	W	Double shaft
Option	**X**	Single shaft with four chamfers
	Y	Double shaft key
	Z	Double shaft with four chamfers

Size

50
63
80
100

Angle adjustable type

Rotating angle

Standard	**90**	90°
	180	180°
Option	**100**	100°
	190	190°

Auto switch

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

∗ Auto switches are shipped together (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

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

Type	Special function	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)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	**A56**	●	●	—	—	IC circuit	
				2-wire	24 V	12 V	—	**A53**	●	●	●	—	—	Relay, PLC
						—	100 V, 200 V	**A54**	●	●	●	—		
	Diagnosis indication (2-color)						—	**A59 W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**F59**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**F5P**	●	●	○	○		
				2-wire		12 V		**J59**	●	●	○	○	—	
					—	—	100 V, 200 V	**J51**	●	●	○	—		
	Diagnosis indication (2-color)			3-wire (NPN)	24 V	5 V, 12 V	—	**F59 W**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F5PW**	●	●	○	○		
				2-wire		—		**J59 W**	●	●	○	○	—	
	Water resistant (2-color)							**F5BA** ∗∗	—	●	○	○		
	Diagnosis output (2-color)			4-wire (NPN)		5 V, 12 V		**F59F**	●	●	○	○	IC circuit	

∗∗ Although it is possible to mount water resistant type auto switches, note that the rotary actuator itself is not of water resistant construction.

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) A53
3 m ····· L (Example) A53L
5 m ····· Z (Example) A53Z

∗ Auto switches marked with "O" are made to order specifications.

Made to Order

Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

Specifications

Fluid	Air (Non-lube)
Cushion	None
Mounting	Basic style, Foot style, Flange style
Angle adjustable range	0° to 90°
Backlash	Within 1°

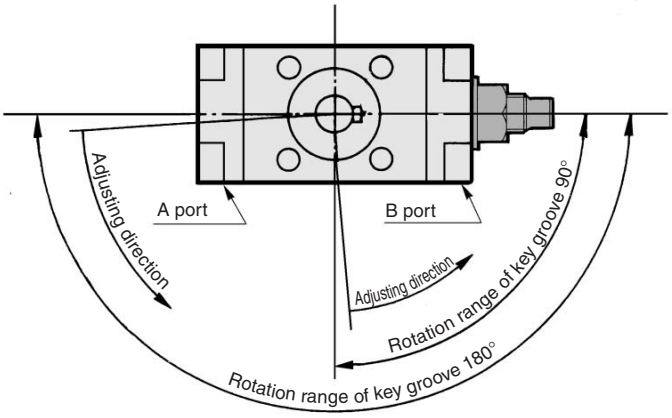
Weight

(kg)

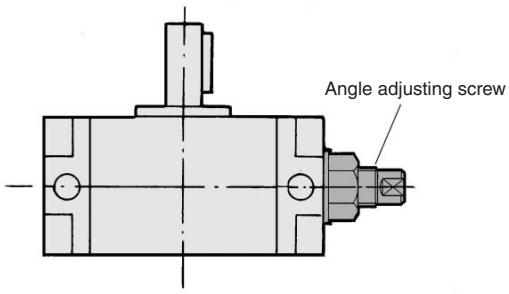
Model	Standard weight		Additional weight
	90°	180°	
CRA1□□U50	1.5	1.7	0.5
CRA1□□U63	2.5	3.0	0.8
CRA1□□U80	4.3	5.0	1.5
CRA1□□U100	8.5	9.5	2.0

Rotation Range of Key Groove

Adjusting direction is in the direction the arrows show.
Adjusting angle at 90° at maximum.
90° type: 90° to 0°, 180° type: 180° to 90°



How to Adjust Angle



Rotation angle becomes smaller by tightening the angle adjusting screw to the right.

Adjusting Angle per One Rotation of Angle Adjusting Screw

Size	**50**	**63**	**80**	**100**
Adjusting angle	8.2°	7.0°	6.1°	4.1°

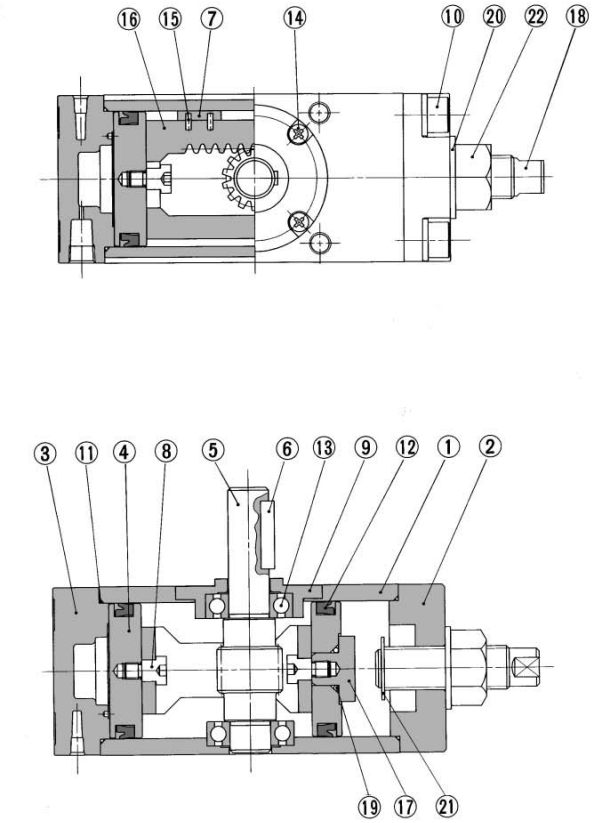
Foot Bracket Part No.

Size	Foot
50	P294020-25
63	P294030-25
80	P294040-25
100	P294050-25

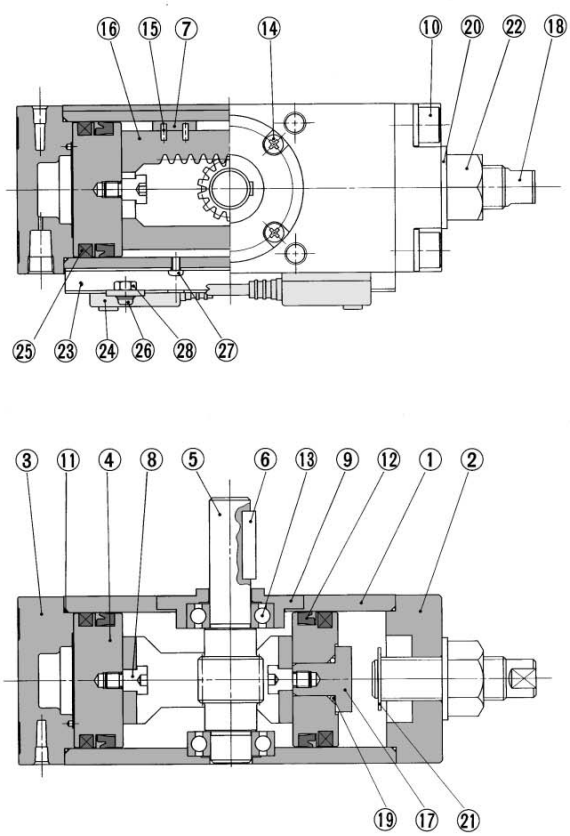
Note) Part no. in the table includes mounting screw.

Construction

Standard: CRA1□□U



With auto switch: CDRA1□□U



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Right cover	Carbon steel	Black zinc chromated
③	Left cover	Aluminum alloy	Black anodized
④	Piston	Aluminum alloy	Chromated
⑤	Shaft	Chrome molybdenum steel	
⑥	Parallel keyway	Carbon steel	
⑦	Slider	Resin	
⑧	Connecting screw	Carbon steel	Zinc chromated
⑨	Bearing retainer	Aluminum alloy	Black anodized
⑩	Hexagon socket head cap screw with spring washer	Chrome molybdenum steel	Black zinc chromated
⑪	Tube gasket	NBR	
⑫	Piston seal	NBR	
⑬	Bearing	Bearing steel	
⑭	Round head Phillips screw	Steel wire	Black zinc chromated

No.	Description	Material	Note
⑮	Spring pin	Steel wire	
⑯	Rack	Carbon steel	Nitrided
⑰	Stopper	Carbon steel	Zinc chromated
⑱	Stopper screw	Carbon steel	Black zinc chromated
⑲	O-ring	NBR	
⑳	Seal washer	NBR	
㉑	E type stopper ring	Steel wire	Chromated
㉒	Hexagon nut	Steel wire	Nickel plated
㉓	Switch mounting rail	Aluminum alloy	
㉔	Auto switch		
㉕	Plastic magnet	Magnetic material	
㉖	Round head Phillips screw	Steel wire	Nickel plated
㉗	Round head Phillips screw	Steel wire	Nickel plated
㉘	Hexagon nut	Steel wire	Nickel plated

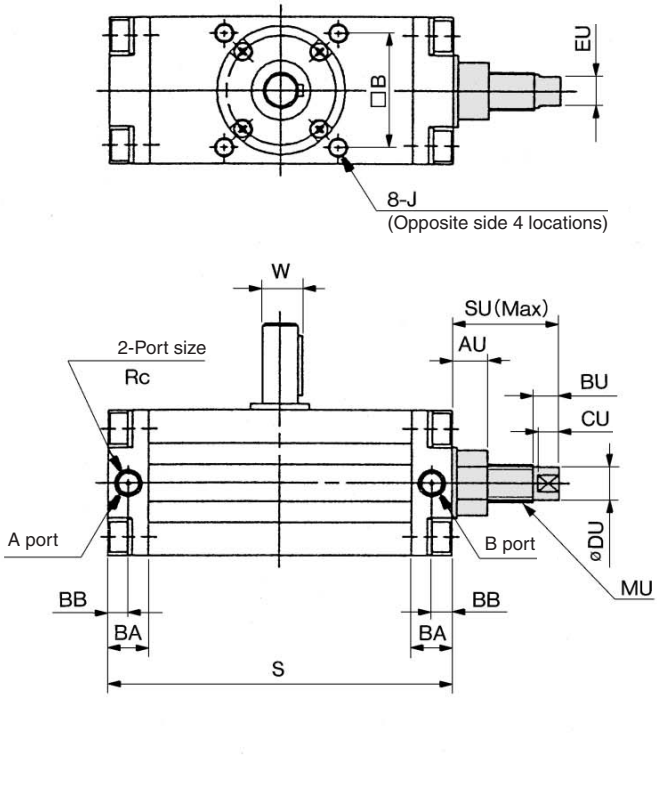
Replacement Parts (The corresponding parts shown below are set.)

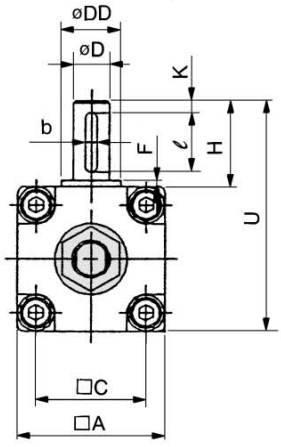
Size (Type)	With angle adjuster, With angle adjuster and auto switch
CRA1□□U50	P294020-22A
CRA1□□U63	P294030-22A
CRA1□□U80	P294040-22
CRA1□□U100	P294050-22A
Corresponding parts no.	⑦, ⑪, ⑫, ⑮, and ⑳ are set.

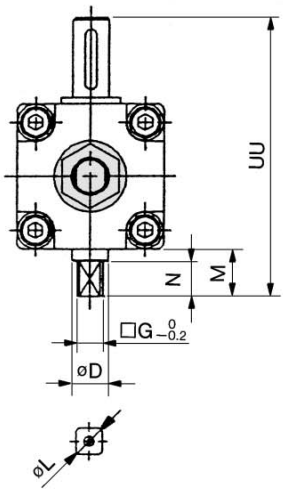
Size 50, 63, 80, 100/Standard: CRA1□□U

★The dimensions below show pressurization to B port.

Single shaft type: CRA1BSU







Double Shaft Type: CRA1BWU (mm)

Model	D (g6)	G	L	M	N	UU
CRA1BWU50	15	11	14	20	15	118
CRA1BWU63	17	13	16	22	17	139
CRA1BWU80	20	15	19	25	20	167
CRA1BWU100	25	19	24	30	25	202

Single Shaft Type

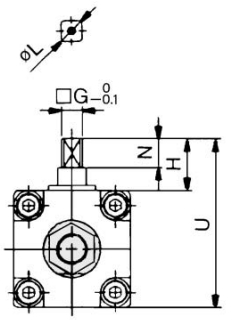
(mm)

Model	Port size Rc	A	AU	B	BA	BB	BU	C	CU	D (g6)	DD (h9)	DU	EU	F	H	J	K	MU	S	SU	U	W	Keyway dimensions b	Keyway dimensions ℓ
CRA1BSU50	1/8	62	15	48	17	8.5	11	46	9	15	25	14	12	2.5	36	M8 x 1.25 depth 8	5	M16 x 1.5	144 (177)	45	98	17	5 0 −0.030	25
CRA1BSU63	1/8	76	19	60	20	10	13	57	11	17	30	18	14	2.5	41	M10 x 1.5 depth 12	5	M20 x 1.5	163 (201.5)	54.5	117	19.5	6 0 −0.030	30
CRA1BSU80	1/4	92	22	72	23.5	12	16	70	13	20	35	22	19	3	50	M12 x 1.75 depth 13	5	M24 x 1.5	186 (230)	62.5	142	22.5	6 0 −0.030	40
CRA1BSU100	3/8	112	22	85	25	12.5	16	85	13	25	40	22	19	4	60	M12 x 1.75 depth 14	5	M24 x 1.5	245 (311)	73.5	172	28	8 0 −0.036	45

∗ ( ) are the dimensions for rotation of 180° and 190°.

Size 50, 63, 80, 100

Single shaft with four chamfers: CRA1BXU□

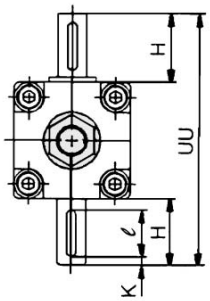


(mm)

Model	G	H	L	N	U
CRA1BXU□50	11	27	14	15	89
CRA1BXU□63	13	29	16	17	105
CRA1BXU□80	15	38	19	20	130
CRA1BXU□100	19	44	24	25	156

Note) Other dimensions are the same as the single shaft.

Double shaft key: CRA1BYU□

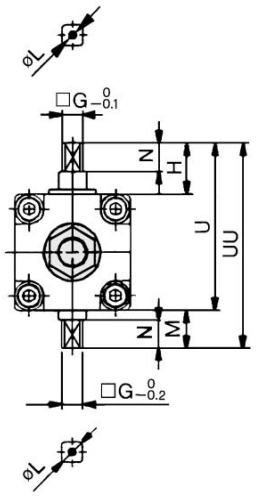


(mm)

Model	ℓ	H	K	UU
CRA1BYU□50	25	36	5	134
CRA1BYU□63	30	41	5	158
CRA1BYU□80	40	50	5	192
CRA1BYU□100	45	60	5	232

Note) Other dimensions are the same as the single shaft.

Double shaft with four chamfers: CRA1BZU□

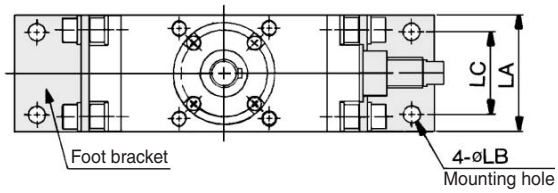


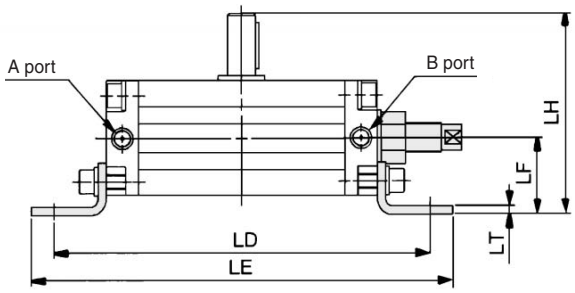
(mm)

Model	G	H	L	M	N	U	UU
CRA1BZU□50	11	27	14	20	15	89	109
CRA1BZU□63	13	29	16	22	17	105	127
CRA1BZU□80	15	38	19	25	20	130	155
CRA1BZU□100	19	44	24	30	25	156	186

Note) Other dimensions are the same as the single shaft.

Foot style: CRA1L□U





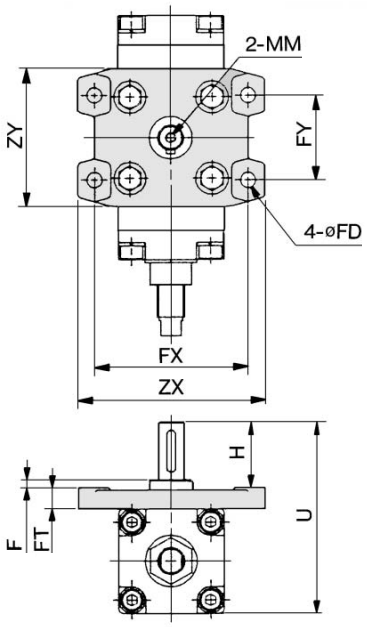
★ The dimensions below show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°. (mm)

Model	LA	LB	LC	LD	LE	LF	LH	LT
CRA1L□U50	62	9	44	200 (233)	224 (257)	41	108	4.5
CRA1L□U63	76	11	55	235 (273.5)	263 (301.5)	48	127	5
CRA1L□U80	92	13	67	274 (318)	316 (360)	58	154	6
CRA1L□U100	112	13	87	333 (399)	375 (441)	73.5	189.5	6

Note) Other dimensions are the same as the single shaft.

Size 50, 63, 80, 100

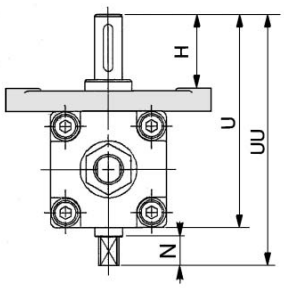
Single shaft flange style: CRA1FSU



Note) Other dimensions are the same as standard. (mm)

Model	F	FD	FT	FX	FY	H	MM	U	ZX	ZY
CRA1F□U50	4	9	13	90	50	39	M6 x 1.0 depth 12	114	110	81
CRA1F□U63	5	11.5	15	105	59	45	M6 x 1.0 depth 12	136	130	101
CRA1F□U80	5	13.5	18	130	76	55	M8 x 1.25 depth 16	165	160	119
CRA1F□U100	5	13.5	18	150	92	60	M 10 x 1.5 depth 20	190	180	133

Flange style Double shaft: CRA1FWU

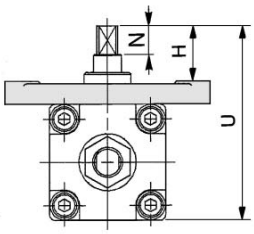


(mm)

Model	H	N	U	UU
CRA1FWU50	39	15	114	134
CRA1FWU63	45	17	136	158
CRA1FWU80	55	20	165	190
CRA1FWU100	60	25	190	220

Note) Other dimensions are the same as the single shaft.

Flange style Single shaft with four chamfers: CRA1FXU

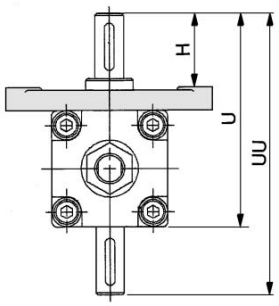


(mm)

Model	H	N	U
CRA1FXU50	30	15	105
CRA1FXU63	33	17	124
CRA1FXU80	43	20	153
CRA1FXU100	44	25	174

Note) Other dimensions are the same as the single shaft.

Flange style Double shaft key: CRA1FYU

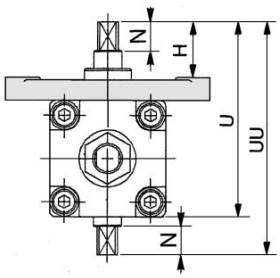


(mm)

Model	H	U	UU
CRA1FYU50	39	114	150
CRA1FYU63	45	136	177
CRA1FYU80	55	165	215
CRA1FYU100	60	190	250

Note) Other dimensions are the same as the single shaft.

Flange style Double shaft with four chamfers: CRA1FZU



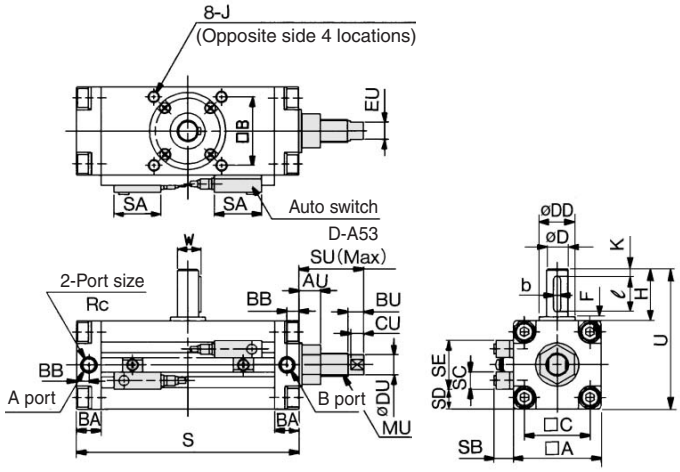
(mm)

Model	H	N	U	UU
CRA1FZU50	30	15	105	125
CRA1FZU63	33	17	124	146
CRA1FZU80	43	20	153	178
CRA1FZU100	44	25	174	204

Note) Other dimensions are the same as the single shaft.

Size 50, 63, 80, 100

Single shaft type: CDRA1BSU

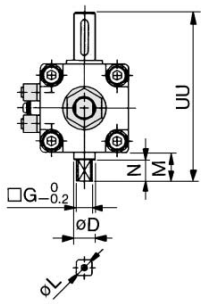


★ The dimensions above show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.

(mm)

Model	Port size Rc	□A	□B	□C	øD (g6)	øDD (h9)	F	H	J	K	S	U	W	BA	BB	SA	SB	SC	SD	SE	Keyway dimensions b	Keyway dimensions ℓ	AU	BU	CU	DU	EU	SU	MU
CDRA1BSU50	1/8	62	48	46	15	25	2.5	36	M8 x 1.25 depth 8	5	156 (189)	98	17	17	8.5	33	13.5	12	14	34	$5^{0}_{-0.030}$	25	15	11	9	14	12	45	M16 x 1.5
CDRA1BSU63	1/8	76	60	57	17	30	2.5	41	M10 x 1.5 depth 12	5	175 (213.5)	117	19.5	20	10	33	14.5	12	21	34	$6^{0}_{-0.030}$	30	19	13	11	18	14	54.5	M20 x 1.5
CDRA1BSU80	1/4	92	72	70	20	35	3	50	M12 x 1.75 depth 13	5	199 (243)	142	22.5	23.5	12	33	15.5	12	29	34	$6^{0}_{-0.030}$	40	22	16	13	22	19	62.5	M24 x 1.5
CDRA1BSU100	3/8	112	85	85	25	40	4	60	M12 x 1.75 depth 14	5	259 (325)	172	28	25	12.5	33	16	12	39	34	$8^{0}_{-0.036}$	45	22	16	13	22	19	73.5	M24 x 1.5

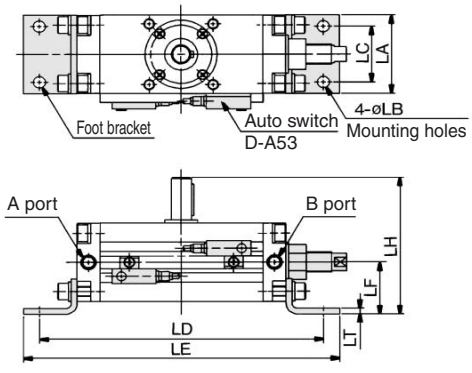
Double shaft type: CDRA1BWU



(mm)

Model	øD (g6)	□G	M	N	UU	øL
CDRA1BWU50	15	11	20	15	118	14
CDRA1BWU63	17	13	22	17	139	16
CDRA1BWU80	20	15	25	20	167	19
CDRA1BWU100	25	19	30	25	202	24

Foot style: CDRA1LSU

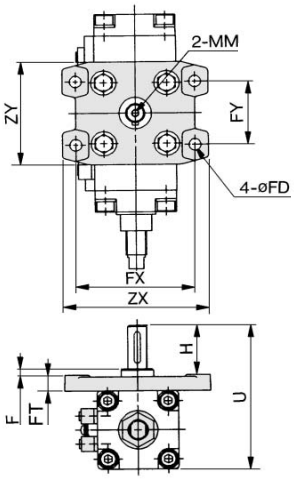


★ The dimensions above show pressurization to B port.
∗ ( ) are the dimensions for rotation of 180° and 190°.
Note) Other dimensions are the same as the single shaft.

(mm)

Model	LA	øLB	LC	LD	LE	LF	LH	LT
CDRA1LSU50	62	9	44	212 (245)	236 (269)	41	108	4.5
CDRA1LSU63	76	11	55	247 (285.5)	275 (313.5)	48	127	5
CDRA1LSU80	92	13	67	287 (331)	329 (373)	58	154	6
CDRA1LSU100	112	13	87	347 (413)	389 (455)	73.5	189.5	6

Single shaft flange style: CDRA1FSU



(mm)

Model	F	H	MM	U	øFD	FT	FX	FY	ZX	ZY
CDRA1FSU50	4	39	M 6 x 1.0 depth 12	114	9	13	90	50	110	81
CDRA1FSU63	5	45	M 6 x 1.0 depth 12	136	11.5	15	105	59	130	101
CDRA1FSU80	5	55	M8 x 1.25 depth 16	165	13.5	18	130	76	160	119
CDRA1FSU100	5	60	M10 x 1.5 depth 20	190	13.5	18	150	92	180	133

Series CRA1 (Size 30, 50, 63, 80, 100)
Simple Specials:
-XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing I

Applicable shaft type: S, W, Y

How to Order

C | D | RA1 | B | S | | P | 50 | 90 | C | F59 | X | A2 | A24 | C10 | -X6

Built-in magnet

Nil	None
D	Built-in magnet

Mounting style

B	Basic style
L	Foot style

Shaft type

S	Single shaft key
W	Double shaft (Long shaft and with four chamfers)
Y	Double shaft key

Type

Nil	Pneumatic
H	Air-hydro

Pattern

Size

30
50
63
80
100

Rotating angle

90°
100°
180°
190°

Auto switch

Refer to page 11-7-13 for the part no. of auto switches.

Air cushion

Nil	None
C	With air cushion

Simple specials, Made-to-order symbol

- **Refer to chart 1, 2 and 3 when the number of combinations is one or two.**

∗ **Combination of XA is possible for up to 2 types.**

- **Combination 3 Types**

			• Combination of Applicable Chart
A1	A24	C30	Chart 1, 2
A2	A24	-X6	Chart 1, 3
A13	C8	C59	Chart 2, 7
A14	C60	-X6	Chart 2, 3, 8
A15	-X10	-X16	Chart 3, 9

Combination is available only when all the conditions are fulfilled in above combination chart.

- **Combination 4 Types**

				• Combination of Applicable Chart
A1	A2	C8	C59	Chart 1, 2, 7
A2	A24	C10	-X6	Chart 1, 2, 3, 8
A13	A24	-X6	-X16	Chart 1, 3, 9
A14	C11	C30	-X16	Chart 2, 3, 7, 8
A15	C60	-X10	-X16	Chart 2, 3, 8, 9
A14	C32	C61	C62	Chart 2, 7

Combination is available only when all the conditions are fulfilled in above combination chart.

∗ **Combination of simple special and made-to-order is available for up to 4 types.**

∗ **Above is the typical example of combination.**

How to order model with auto switches

Refer to page 11-7-13 for "How to Order" products with auto switch.

How to order model with solenoid valve

Refer to page 11-7-18 for "How to order" products with solenoid valve.

How to order angle adjustable type

Refer to page 11-7-24 for "How to Order" angle adjustable type.

Series CRA1 (Size 30, 50, 63, 80, 100)
Simple Specials:
-XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Combination Chart of Simple Specials for Tip End Shape

Chart 1. Combination between -XA□ and -XA□ (S, W, Y shaft)

Symbol	Description	Shaft direction		Combination	
		Upper	Lower	XA1	XA24
XA1	Female thread at the end	●	—	—	●
XA2	Female thread at the end	—	●	●	●
XA13	Shaft through-hole	●	●	—	●
XA14	Shaft through-hole + Rod end female thread	●	—	—	●
XA15	Shaft through-hole + Rod end female thread	—	●	—	●
XA16	Shaft through-hole + Double shaft-end female threads	●	●	—	●
XA24	Double key	●	—	—	—

Combination Chart of Made to Order

Chart 2. Combination between -XA□ and -XC□ (Refer to page 11-7-40 for made-to-order/details on -XC□.)

Symbol	Description	Shaft type			Applicable size	Combination	
		S	W	Y		XA1/2/13 to 16	XA24
XC7	Reversed shaft	●	●	—	50, 63, 80, 100	—	—
XC8 to XC11	Change of rotating range	●	●	●		●	—
XC30	Fluoro grease	●	●	●	30 to 100	●	●
XC31 to XC36	Change of rotation range and shaft rotation direction	●	●	●	50, 63, 80, 100	●	—
XC37 to XC46	Change of rotation range and angle adjusting direction	●	●	●		●	—
XC47 to XC58	Change of rotation range and angle adjusting direction (Angle adjusting screw is equipped on the left.)	●	●	●		●	—
XC59 to XC61	Change of port direction	●	●	●	30 to 100	●	●
XC62	Reverse mounting of auto switch	●	●	●	50, 63, 80, 100	●	●
XC63	One side hydro, One side air	●	●	●		●	●
XC64	One side hydro, One side air	●	●	●		●	●

Chart 3. Combination between -XA□ and -X□ (Refer to page 11-7-49 for made-to-order/details on -X□.)

Symbol	Description	Shaft type			Applicable size	Combination	
		S	W	Y		XA1/2/13 to 16	XA24
X6	Shaft, Bolt, Parallel key stainless specification.	●	●	●	30 to 100	●	●
X7	Heat resistance (100°C)	●	●	●		●	●
X10	Angle adjustment for both sides	●	●	●	50 to 100	●	●
X11	Angle adjustment for single side, Air cushion with single side	●	●	●		●	●
X16	Fluoro rubber for seals	●	●	●	30 to 100	●	●

∗ **Chart 7. For combination between -XC□ and -XC□, refer to page 11-7-40.**
Chart 8. For combination between -X□ and -XC□, refer to page 11-7-40.
Chart 9. For combination between -X□ and -X□, refer to page 11-7-49.

Made to Order

Series ***CRA1*** (Size: 30, 50, 63, 80, 100)
Simple Specials:
-XA1 to -XA24: Shaft Pattern Sequencing I

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

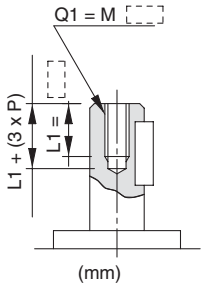
Shaft Pattern Sequencing I — -XA1 to XA24

Additional Reminders

1. Enter the dimensions within a range that allows for additional machining.
2. SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
3. The length of the unthreaded portion is 2 to 3 pitches.
4. Unless specified otherwise, the thread pitch is based on coarse metric threads.
P = Thread pitch
M3 x 0.5, M4 x 0.7, M 5 x 0.8
M6 x 1, M8 x 1.25, M10 x 1.5
5. Enter the desired figures in the portion of the diagram.
6. Chamfer face of the parts machining additionally is C0.5.

Symbol: A1
Machine female threads into the long shaft.
Note) Except flange style

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

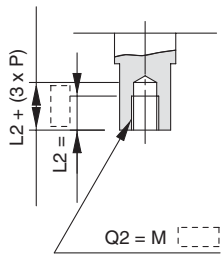


(mm)

Size	Q1
30	M3
50	M4, M5, M6
63	M4, M5, M6
80	M4, M5, M6, M8
100	M5, M6, M8, M10

Symbol: A2
Machine female threads into the short shaft.
Note) Except flange style

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

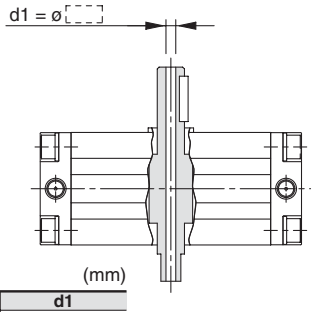


(mm)

Size	Q2
30	M3, M4
50	M4, M5, M6
63	M4, M5, M6
80	M4, M5, M6, M8
100	M5, M6, M8, M10

Symbol: A13
Shaft with through-hole
Note) Except flange style

Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: S, W, Y

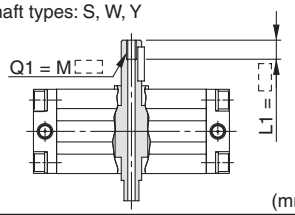


(mm)

Size	d1
30	ø2.5
50	ø4 to ø7
63	ø4.5 to ø18
80	ø6.8 to ø11
100	ø6.8 to ø13

Symbol: A14
Note) Except flange style

A special end is machined onto the long shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.
The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M3: L1 = 6 mm
• Applicable shaft types: S, W, Y

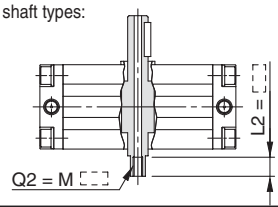


(mm)

Thread \ Size	30	50	63	80	100
M3 x 0.5	ø2.5	—	—	—	—
M5 x 0.8	—	ø4	ø4	—	—
M6 x 1	—	ø5	ø5	—	—
M8 x 1.25	—	—	ø6.8	ø6.8	ø6.8
M10 x 1.5	—	—	—	ø8.5	ø8.5
M12 x 1.75	—	—	—	ø10.3	ø10.3
Rc 1/8	—	—	—	ø8	ø8
Rc 1/4	—	—	—	—	ø11

Symbol: A15
Note) Except flange style

A special end is machined onto the short shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter. The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M4: L2 = 8 mm
• Applicable shaft types: S, W, Y

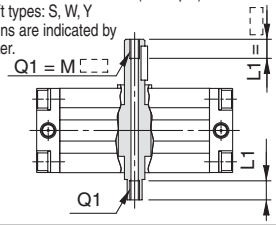


(mm)

Thread \ Size	30	50	63	80	100
M3 x 0.5	ø2.5	—	—	—	—
M5 x 0.8	—	ø4	ø4	—	—
M6 x 1	—	ø5	ø5	—	—
M8 x 1.25	—	—	ø6.8	ø6.8	ø6.8
M10 x 1.5	—	—	—	ø8.5	ø8.5
M12 x 1.75	—	—	—	ø10.3	ø10.3
Rc 1/8	—	—	—	ø8	ø8
Rc 1/4	—	—	—	—	ø11

Symbol: A16
Note) Except flange style

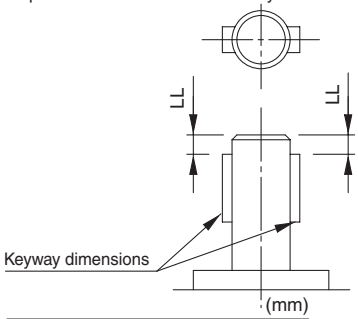
A special end is machined onto both the long and short shafts, and a through-hole is drilled into both shafts. Female threads are machined into the through-holes, whose diameter is equivalent to the diameter of the pilot holes. The maximum dimension L1 is, as a rule, twice the thread size. (Example)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



(mm)

Thread \ Size	30	50	63	80	100
M3 x 0.5	ø2.5	—	—	—	—
M5 x 0.8	—	ø4	ø4	—	—
M6 x 1	—	ø5	ø5	—	—
M8 x 1.25	—	—	ø6.8	ø6.8	ø6.8
M10 x 1.5	—	—	—	ø8.5	ø8.5
M12 x 1.75	—	—	—	ø10.3	ø10.3
Rc 1/8	—	—	—	ø8	ø8
Rc 1/4	—	—	—	—	ø11

Symbol: A24
Double key
Keys and keyways are machined at 180° from the standard position.
• Applicable shaft types: S, W, Y
• Equal dimensions are indicated by the same marker.



(mm)

Size	Key groove dimension	LL
30	3 x 3 x 14	3
50	5 x 5 x 25	5
63	6 x 6 x 30	5
80	6 x 6 x 40	5
100	8 x 7 x 45	5

Made to Order

Series CRA1 (Size: 30, 50, 63, 80, 100)

Simple Specials:
-XA33 to -XA46: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Shaft Pattern Sequencing II

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

How to Order

C | D | RA1 | B | S | | P | 50 | 90 | C | F59 | X | A34 | A37 | C59 | -X6

Built in magnet

Nil	None
D	Built-in magnet

Mounting style

B	Basic style
L	Foot style

Shaft type

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

Type

Nil	Pneumatic
H	Air-hydro

Pattern

Size

30
50
63
80
100

Ratating angle

90°
100°
180°
190°

Auto switch

Refer to page 11-7-13 for the part no. of auto switches.

Suffix symbol

Nil	Without air cushion
C	With air cushion

Simple specials, Made-to-order symbol

- **Refer to chart 4, 5 and 6 when the number of combinations is one or two.**

* **Combination of XA is possible for up to 2 types.**

- **Combination 3 Types**

			• Combination of Applicable Chart
A33	A34	C30	Chart 4, 5
A34	A37	-X6	Chart 4, 6
A35	C30	C59	Chart 5, 7
A40	C60	-X6	Chart 5, 6, 8
A43	-X10	-X16	Chart 6, 9

Combination is available only when all the conditions are fulfilled in above combination chart.

- **Combination 4 Types**

				• Combination of Applicable Chart
A33	A34	C30	C59	Chart 4, 5, 7
A34	A37	C59	-X6	Chart 4, 5, 6, 8
A36	A37	-X6	-X16	Chart 4, 6, 9
A43	C59	C62	-X16	Chart 5, 6, 7, 8
A45	C60	-X10	-X16	Chart 5, 6, 8, 9
A46	C30	C61	C62	Chart 5, 7

Combination is available only when all the conditions are fulfilled in above combination chart.

* **Combination of simple special and made-to-order, it is possible for up to 4 types.**

* **Above is the typical example of combination.**

How to order model with auto switches

Refer to page 11-7-13 for "How to Order" products with auto switch.

How to order model with solenoid valve

Refer to page 11-7-18 for "How to order" products with solenoid valve,

How to order angle adjustable type

Refer to page 11-7-24 for "How to Order" angle adjustable type.

Series CRA1 (Size 30, 50, 63, 80, 100)
Simple Specials:
-XA33 to -XA46: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Combination Chart of Simple Specials for Tip End Shape

Chart 4. Combination between -XA□ and -XA□

Symbol	Description	Shaft direction		Shaft type					Combination				
		Upper	Lower	X	Z	T	J	K	∗ Corresponding shafts type available for combination				
XA33	Female thread at the end	●	—	—	—	●	●	●	**XA33**				
XA34	Female thread at the end	—	●	—	—	●	●	●	T, J, K ∗	**XA34**			
XA35	Female thread at the end	●	—	●	●	—	—	—	—	—	**XA35**		
XA36	Female thread at the end	—	●	●	●	—	—	—	—	—	X, Z ∗		
XA37	Stepped round shaft	●	—	—	—	●	●	●	—	T, J, K ∗	—	**XA37**	
XA38	Stepped round shaft	—	●	—	—	—	—	●	K ∗	—	—	K ∗	
XA40	Shaft through hole	●	●	—	—	●	—	●	—	—	—	—	
XA41	Shaft through hole	●	●	●	●	—	●	—	—	—	—	—	
XA43	Shaft through-hole + Double shaft-end-female threads	●	●	—	—	●	—	●	—	—	—	—	
XA44	Shaft through-hole + Double shaft-end-female threads	●	●	●	●	—	●	—	—	—	—	—	
XA45	Middle-cut chamfer	●	—	—	—	●	●	●	—	T, J, K ∗	—	T, J, K ∗	**XA45**
XA46	Middle-cut chamfer	—	●	—	—	—	—	●	K ∗	—	—	—	K ∗

Combination Chart of Made to Order

Chart 5. Combination between -XA□ and -XC□ (Refer to page 11-7-40 for made-to-order/details on -XC□.)

Symbol	Description	Shaft type					Applicable size	Combination
		X	Z	T	J	K		**XA33 to 38, 40 to 46**
XC7	Reversed shaft	●	—	●	●	—	50, 63, 80, 100	—
XC8 to XC11	Change of rotating range	—	—	—	—	—		—
XC30	Fluoro grease	●	●	●	●	●	30 to 100	●
XC31 to XC36	Change of rotation range and shaft rotation direction	—	—	—	—	—	50, 63, 80, 100	—
XC37 to XC46	Change of rotation range and angle adjusting direction	—	—	—	—	—		—
XC47 to XC58	Change of rotation range and angle adjusting direction (Angle adjusting screw is equipped on the left.)	—	—	—	—	—		—
XC59 to XC61	Change of port direction	●	●	●	●	●	30 to 100	●
XC62	Reverse mounting of auto switch	●	●	●	●	●	50, 63, 80, 100	●
XC63	One side hydro, One side air	●	●	●	●	●		●
XC64	One side hydro, One side air	●	●	●	●	●		●

Chart 6. Combination between -XA□ and -X□ (Refer to page 11-7-49 for made-to-order/details on -X□.)

Symbol	Description	Shaft type					Applicable size	Combination
		X	Z	T	J	K		**XA33 to 38, 40 to 46**
X6	Shaft, Bolt, Parallel key stainless specifications	●	●	●	●	●	30 to 100	●
X7	Heat resistance (100°C)	●	●	●	●	●		●
X10	Angle adjustment for both sides	●	●	●	●	●	50 to 100	●
X11	Angle adjustment for single side, Air cushion with single side	●	●	●	●	●		●
X16	Fluoro rubber for seals	●	●	●	●	●	30 to 100	●

∗ **Chart 7. For combination between -XC□ and -XC□, refer to page 11-7-40.**
Chart 8. For combination between -X□ and -XC□, refer to page 11-7-40.
Chart 9. For combination between -X□ and -X□, refer to page 11-7-49.

Series CRA1 (Size 30, 50, 63, 80, 100)

Simple Specials:
-XA33 to -XA46: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

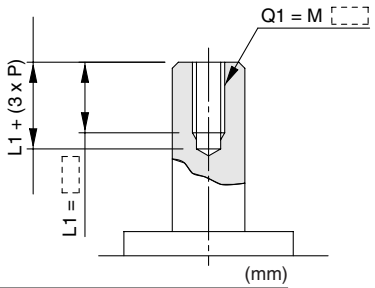
Shaft Pattern Sequencing II

Additional Reminders

1. Enter the dimensions within a range that allows for additional machining.
2. SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
3. The length of the unthreaded portion is 2 to 3 pitches.
4. Unless specified otherwise, the thread pitch is based on coarse metric threads.
   P = Thread pitch
   M3 x 0.5, M4 x 0.7, M 5 x 0.8
   M6 x 1, M8 x 1.25, M10 x 1.5
5. Enter the desired figures in the portion of the diagram.
6. Chamfer face of the parts machining additionally is C0.5.

Symbol: A33
Machine female threads into the long shaft.
Note) Except flange style

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

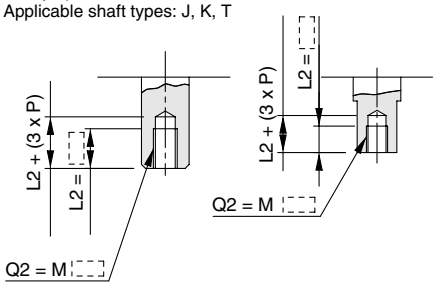


(mm)

Size	Q1
30	M3
50	M4, M5, M6, M8
63	M4, M5, M6, M8, M10
80	M4, M5, M6, M8, M10, M12
100	M5, M6, M8, M10, M12

Symbol: A34
Machine female threads into the short shaft.
Note) Except flange style

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

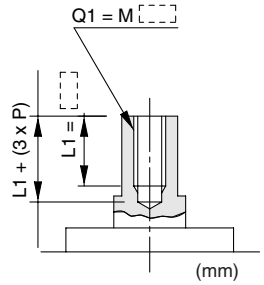


(mm)

Size	Q2
30	M3
50	M4, M5, M6, M8
63	M4, M5, M6, M8, M10
80	M4, M5, M6, M8, M10, M12
100	M5, M6, M8, M10, M12

Symbol: A35
Machine female threads into the shaft.
Note) Except flange style

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

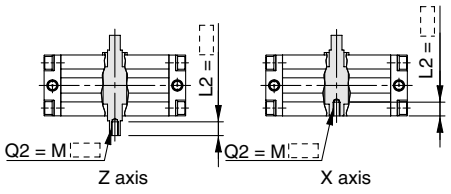


(mm)

Size	Q1
30	M3
50	M4, M5, M6, M8
63	M4, M5, M6, M8, M10
80	M4, M5, M6, M8, M10, M12
100	M5, M6, M8, M10, M12

Symbol: A36
Machine female threads into the short shaft.
Note) Except flange style

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

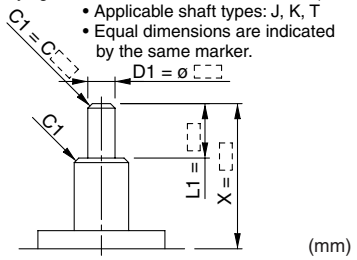


(mm)

Size	Q2
30	M3
50	M4, M5, M6, M8
63	M4, M5, M6, M8, M10
80	M4, M5, M6, M8, M10, M12
100	M5, M6, M8, M10, M12

Symbol: A37
Note) Except flange style

The long shaft can be further shortened by machining it into a stepped round shaft.
• Minimum machining diameter is 0.1 mm.
(If shortening the shaft is not required, indicate "∗" for dimension X.)
(If not specifying dimension C1, indicate "∗" instead.)
• Applicable shaft types: J, K, T
• Equal dimensions are indicated by the same marker.

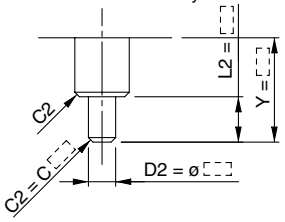


(mm)

Size	X	L1 max	D1
30	3 to 25	X – 2	ø5 to ø7.9
50	3.5 to 36	X – 2.5	ø5 to ø14.9
63	3.5 to 41	X – 2.5	ø5 to ø16.9
80	4 to 50	X – 3	ø8 to ø19.9
100	5 to 60	X – 4	ø8 to ø24.9

Symbol: A38
Note) Except flange style

The short shaft can be further shortened by machining it into a stepped round shaft.
• Minimum machining diameter is 0.1 mm.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)
(If not specifying dimension C2, indicate "∗" instead.)
• Applicable shaft type: K
• Equal dimensions are indicated by the same marker.

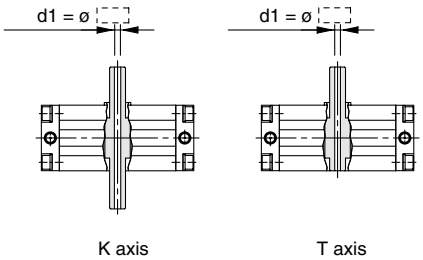


(mm)

Size	Y	L2 max	D2
30	3 to 25	Y – 2	ø5 to ø7.9
50	1 to 36	Y	ø5 to ø14.9
63	1 to 41	Y	ø5 to ø16.9
80	1 to 50	Y	ø8 to ø19.9
100	1 to 60	Y	ø8 to ø24.9

Symbol: A40
Shaft with through-hole
Note) Except flange style

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

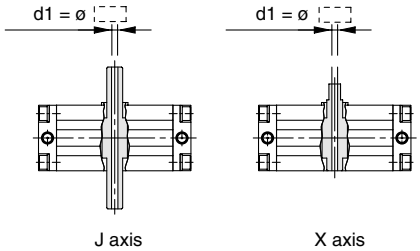


(mm)

Size	d1
30	ø2.5
50	ø4 to ø7.5
63	ø4 to ø8
80	ø6.8 to ø11
100	ø6.8 to ø13

Symbol: A41
Shaft with through-hole
Note) Except flange style

• Minimum machining diameter for d1 is 0.1 mm.
• Applicable shaft types: J, X, Z



(mm)

Size	d1
30	ø2.5
50	ø4 to ø7.5
63	ø4 to ø8
80	ø6.8 to ø11
100	ø6.8 to ø13

Made to Order

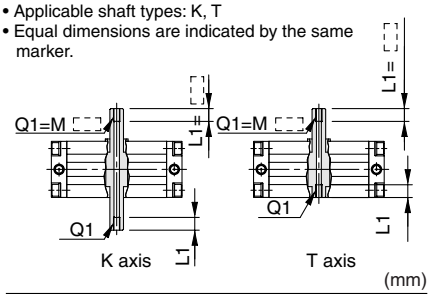
Series CRA1 (Size 30, 50, 63, 80, 100)

Simple Specials:
-XA33 to -XA46: Shaft Pattern Sequencing II

Shaft shape pattern is dealt with simple made-to-order system.
Please contact SMC for a specification sheet when placing an order.

Symbol: A43
Shaft through-hole and female thread
Note) Except flange style

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

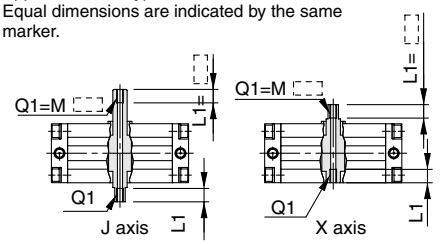


(mm)

Thread \ Size	30	50	63	80	100
M3 x 0.5	ø2.5	—	—	—	—
M5 x 0.8	—	ø4	ø4	—	—
M6 x 1	—	ø5	ø5	—	—
M8 x 1.25	—	—	ø6.8	ø6.8	ø6.8
M10 x 1.5	—	—	—	ø8.5	ø8.5
M12 x 1.75	—	—	—	ø10.3	ø10.3
Rc 1/8	—	—	—	ø8	ø8
Rc 1/4	—	—	—	—	ø 11

Symbol: A44
Note) Except flange style

Shaft through-hole and female thread machining
- Applicable shaft types: J, X, Z
- Equal dimensions are indicated by the same marker.

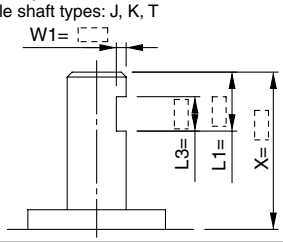


(mm)

Thread \ Size	30	50	63	80	100
M3 x 0.5	ø2.5	—	—	—	—
M5 x 0.8	—	ø4	ø4	—	—
M6 x 1	—	ø5	ø5	—	—
M8 x 1.25	—	—	ø6.8	ø6.8	ø6.8
M10 x 1.5	—	—	—	ø8.5	ø8.5
M12 x 1.75	—	—	—	ø10.3	ø10.3
Rc 1/8	—	—	—	ø8	ø8
Rc 1/4	—	—	—	—	ø 11

Symbol: A45
Note) Except flange style

The long shaft can be further shortened by machining a middle-cut chamfer into it.
- Minimum machining diameter is 0.1 mm.
  (The position is that of the standard flat at the key groove portion.)
  (If shortening the shaft is not required, indicate "∗" for dimension X.)
- Applicable shaft types: J, K, T

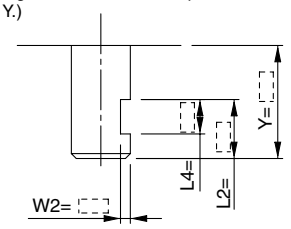


(mm)

Size	X	W1	L1 max	L3 max
30	8.5 to 25	1 to 2	X – 2	L1 – 2
50	12.5 to 36	1 to 5.5	X – 2.5	L1 – 2
63	13.5 to 41	1 to 6.5	X – 2.5	L1 – 2
80	16.5 to 50	1 to 8	X – 3	L1 – 3
100	21 to 60	1.5 to 10.5	X – 4	L1 – 4

Symbol: A46
Note) Except flange style

The short shaft can be further shortened by machining a middle-cut chamfer into it.
- Minimum machining diameter is 0.1 mm.
  (The position is that of the standard flat at the key groove portion.)
- Applicable shaft type: K
  (If shortening the shaft is not required, indicate "∗" for dimension Y.)



(mm)

Size	Y	W2	L2 max	L4 max
30	8.5 to 25	1 to 2	Y – 2	L2 – 2
50	10 to 36	1 to 5.5	Y	L2 – 2
63	11 to 41	1 to 6.5	Y	L2 – 2
80	13.5 to 50	1 to 8	Y	L2 – 3
100	17 to 60	1.5 to 10.5	Y	L2 – 4

Made to Order

Series CRA1
Made to Order Specifications: -XC7 to -XC64

How to Order

C D RA1 B S P 50 90 C F59 X C59 C62 -X10 -X16

Built in magnet

Nil	None
D	Built-in magnet

Mounting style

B	Basic style
L	Foot style
F	Flange style

Shaft type

S	Single shaft key
W	Double shaft (Long shaft and with four chamfers)
Y	Double shaft key
Z	Double shaft with four chamfers
T	Single round shaft
J	Double shaft (Long shaft without key & with four chamfers)
K	Double round shaft

Type

Nil	Pneumatic
H	Air-hydro

Pattern

Size

30
50
63
80
100

Rotating angle

90°
100°
180°
190°

Air cushion

Nil	None
C	With air cushion

Auto switch

Refer to page 11-7-13 for the part no. of auto switches.

Simple specials, Made-to-order symbol

- **When the number of combinations are one or two, please refer to chart 7 and 8.**
- ∗ **Combination of XA is possible for up to 2 types.**

- **Combination 3 Types**

C7	C30	C59	Chart 7
C31	C60	-X6	Chart 7, 8
C59	-X10	-X16	Chart 8, 9

- **Combination of Applicable Chart**

Combination is available only when all the conditions are fulfilled in above combination chart.

- **Combination 4 Types**

C7	C30	C59	C62	Chart 7
C31	C60	C62	-X6	Chart 7, 8
C59	C62	-X10	-X16	Chart 7, 8, 9

- **Combination of Applicable Chart**

Combination is available only when all the conditions are fulfilled in above combination chart.

∗ **Combination of made-to-order is available up to 4 types.**
∗ **Above is the typical example of combination.**
∗ **Chart 9. For combination chart between -X□ and -X□, refer to page 11-7-49.**

How to order model with auto switches

Refer to page 11-7-13 for "How to Order" products with auto switch.

How to order model with solenoid valve

Refer to page 11-7-18 for "How to order" products with solenoid valve,

How to order angle adjustable type

Refer to page 11-7-24 for "How to Order" angle adjustable type.

Combination Chart of Made to Order

Chart 7. Combination between -XC□ and -XC□

Part no.	Description	Shaft type S	W	X	Y	Z	T	J	K	Applicable size	Combination
XC 7	Reversed shaft	●	●	●	—	—	●	●	—	50, 63 80, 100	XC7 — ∗ Corresponding shafts type available for combination
XC 8 to XC11	Change of rotating range	●	●	—	●	—	—	—	—		— XC 8 to XC11
XC30	Fluoro grease	●	●	●	●	●	●	●	●	30 to 100	S, W, X, T, J ∗ S, W, Y ∗ XC30
XC31 to XC36	Changes of rotation range and the revolving direction of shaft	●	●	—	●	—	—	—	—	50, 63 80, 100	— — S, W, Y ∗ XC31 to XC36
XC37 to XC46	Changes of rotation range and the angle adjustment direction	●	●	—	●	—	—	—	—		— — S, W, Y ∗ — XC37 to XC46
XC47 to XC58	Change of rotation range and angle adjusting direction (Angle adjustment screw is set on the left side.)	●	●	—	●	—	—	—	—		— — — — — XC47 to XC58
XC59 to XC61	Change of port direction	●	●	●	●	●	●	●	●	30 to 100	S, W, Y ∗ ● S, W, Y ∗ S, W, Y ∗ S, W, Y ∗ S, W, Y ∗ XC59 to XC61
XC62	Reverse mounting of auto switch	●	●	●	●	●	●	●	●	50, 63 80, 100	● ● ● ● ● ● ● XC62
XC63	One side hydro, One side air	●	●	●	●	●	●	●	●		● ● — ● — — ● ●
XC64	One side hydro, One side air	●	●	●	●	●	●	●	●		● ● — ● — — ● ●

Chart 8. Combination between -X□ and -XC□ (Refer to page 11-7-49 for made-to-order/details on -X□.)

Part no.	Description	Shaft type S	W	X	Y	Z	T	J	K	Applicable size	XC7	XC8 to 11	XC30	XC31 to 36	XC37 to 58	XC59 to 61	XC62
X6	Shaft, Bolt, Parallel key stainless spec.	●	●	●	●	●	●	●	●	30 to 100	●	●	●	●	—	●	●
X7	Heat resistance (100°C)	●	●	●	●	●	●	●	●		●	●	—	●	●	●	—
X10	Angle adjustment for both sides	●	●	●	●	●	●	●	●	50 to 100	●	—	●	—	—	●	●
X11	Angle adjustment for single side, Air cushion with single side	●	●	●	●	●	●	●	●		●	—	—	—	—	●	●
X16	Fluoro rubber for seals	●	●	●	●	●	●	●	●	30 to 100	●	●	●	●	●	●	●

Series CRA1
Made to Order Specifications:
-XC7: Reverse Mounting of Rotation Shaft (Size: 50 to 100)
-XC8 to -XC11: Change of Rotation Range (Size: 50 to 100)
-XC30 Fluoro Grease (Size: 30 to 100)

Please consult with SMC for further information on specifications, dimensions and delivery.

1 Reversed Shaft -XC7

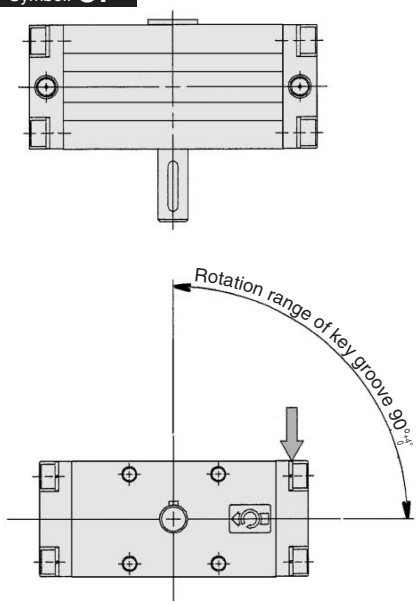
CRA1 → Refer to "How to Order" on page 11-7-40. — XC7

Reverse mounting of rotation shaft (-XC7)

Specifications

Applicable size	50, 63, 80, 100
Applicable shaft type	Shaft S, W, X, T, J

Symbol: **C7**



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

2 Change of Rotating Range -XC8 to XC11

CRA1 → Refer to "How to Order" on page 11-7-40. — XC8

Symbol -XC8 to XC11

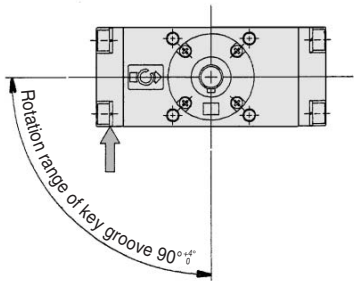
Specifications

Applicable size	50, 63, 80, 100
Applicable shaft type	Shaft S, W, Y

The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: **C8**

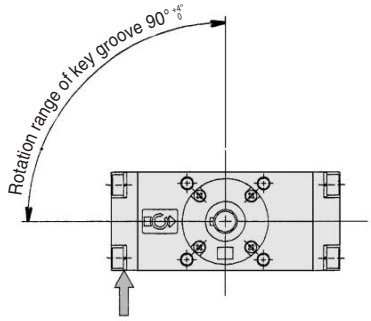
The rotation range is changed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: **C9**

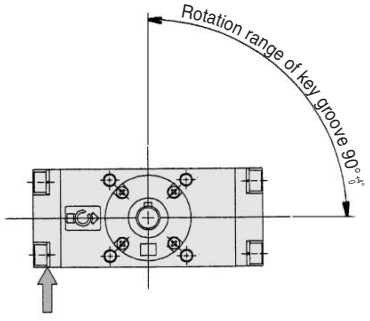
The rotation range is changed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: **C10**

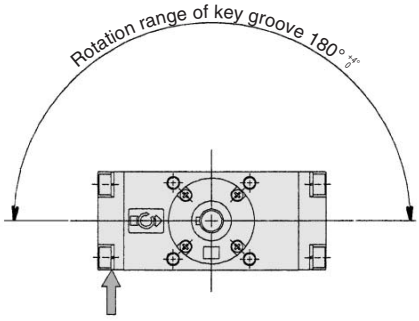
The rotation range is changed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: **C11**

The rotation range is changed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

3 Fluoro Grease -XC30

CRA1 Refer to "How to Order" on page 11-7-40. — XC30

Fluoro grease

Lubricant oil in the seal part of packing and inner wall of the cylinder is changed to fluoro type.
(Not the low speed specifications.)

Specifications

Applicable size	30, 50, 63, 80, 100
Applicable shaft type	S, W, X, Y, Z, T, J, K

∗ Refer to page 11-7-3 for other specifications.
∗∗ Except air-hydro type.

Series CRA1
Made to Order Specifications:
-XC31 to -XC36: Change of Rotation Range and Rotation Direction of Shaft

Please consult with SMC for further information on specifications, dimensions and delivery.

4 Reversed Shaft -XC31 to XC36

CRA1 **→ Refer to "How to Order" on page 11-7-40.** **—XC31**

• Change of the rotation range and the rotation direction of shaft (-XC31 to XC36)

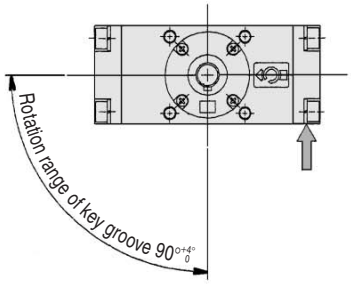
Specifications

Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, Y

The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: C31

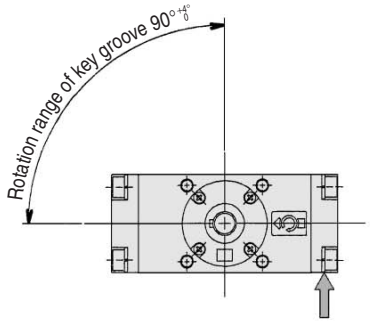
The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C32

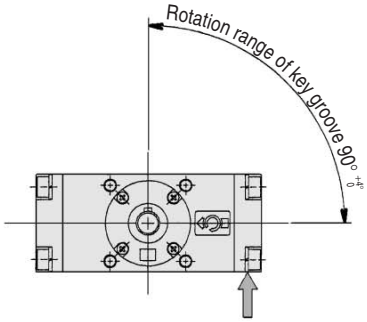
The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C33

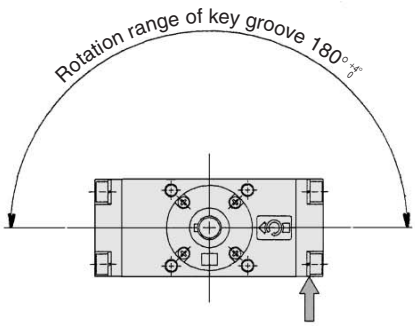
The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C34

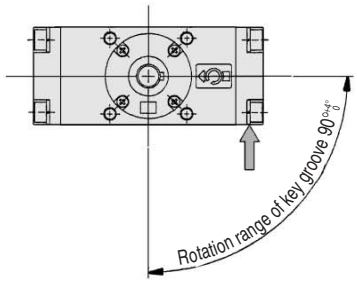
The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C35

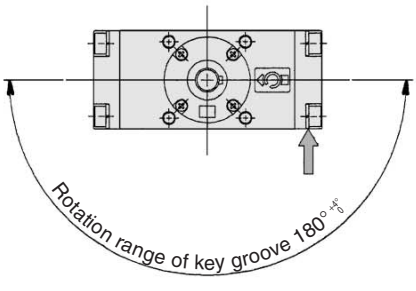
The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C36

The rotation range is changed and the rotating direction is reversed.



Note) If it is pressurized from the port indicated with the arrow, the shaft rotates in the clockwise direction.

Series CRA1
Made to Order Specifications:
-XC37 to -XC42: Change of Rotation Range and Angle Adjusting Direction

Please consult with SMC for further information on specifications, dimensions and delivery.

5 Change of Rotation Range and Angle adjusting -XC37 to XC42

CRA1 → Refer to "How to Order" on page 11-7-40. **—XC37**

• Change of rotation range and angle adjusting direction (-XC37 to XC42)

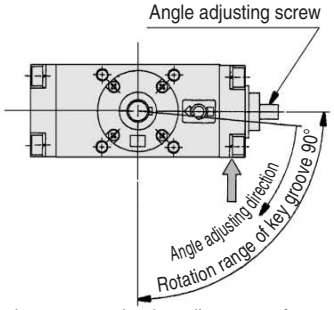
Specifications

Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, Y

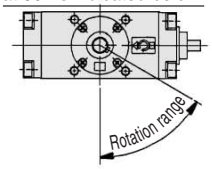
The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: C37

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



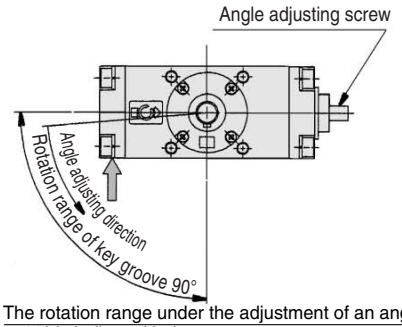
The rotation range under the adjustment of an angle at 60° is indicated below.



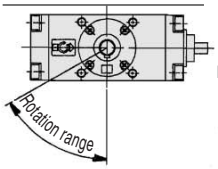
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C38

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



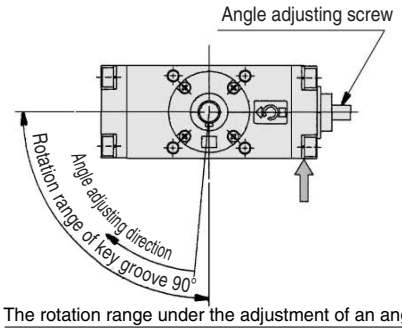
The rotation range under the adjustment of an angle at 60° is indicated below.



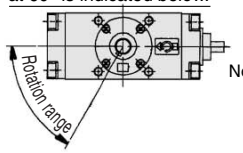
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C39

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



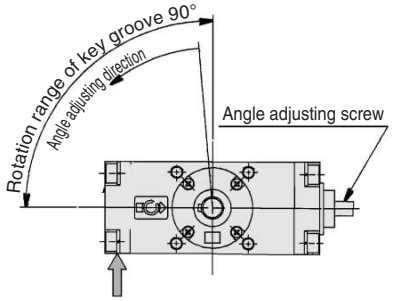
The rotation range under the adjustment of an angle at 60° is indicated below.



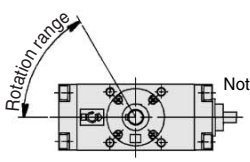
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C40

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



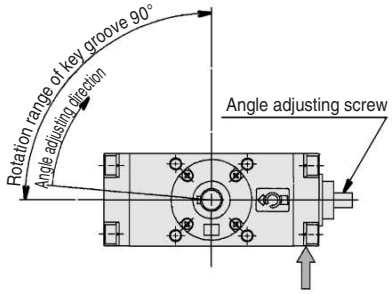
The rotation range under the adjustment of an angle at 60° is indicated below.



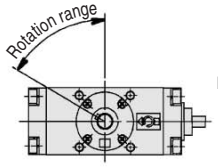
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C41

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



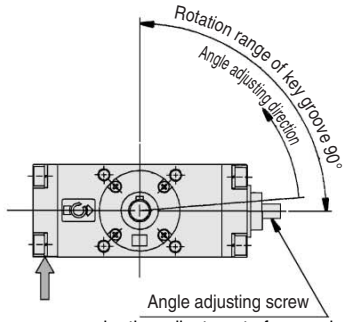
The rotation range under the adjustment of an angle at 60° is indicated below.



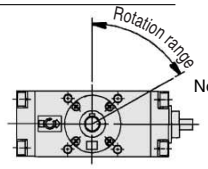
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C42

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



The rotation range under the adjustment of an angle at 60° is indicated below.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Series CRA1
Made to Order Specifications:
-XC43 to -XC46: Change of Rotation Range and Angle Adjusting Direction

Please consult with SMC for further information on specifications, dimensions and delivery.

5 Change of Rotation Range and Angle Adjusting -XC43 to XC46

CRA1 → Refer to "How to Order" on page 11-7-40. **—XC43**

• Change of rotation range and angle adjusting direction (-XC43 to XC46)

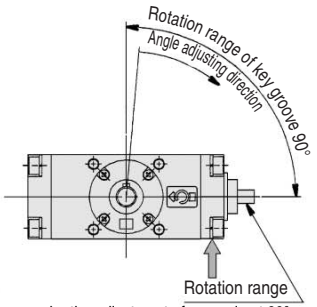
Specifications

Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, Y

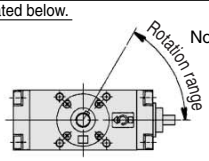
The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the Made to order specifications.

Symbol: C43

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



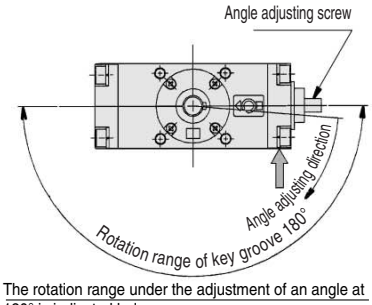
The rotation range under the adjustment of an angle at 60° is indicated below.



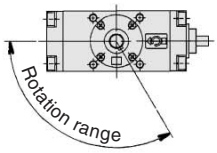
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C44

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



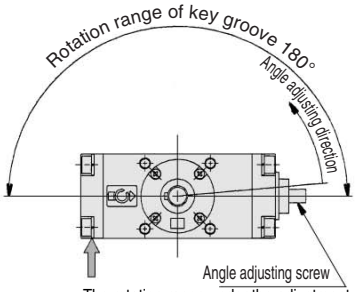
The rotation range under the adjustment of an angle at 120° is indicated below.



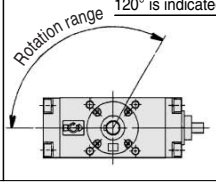
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C45

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



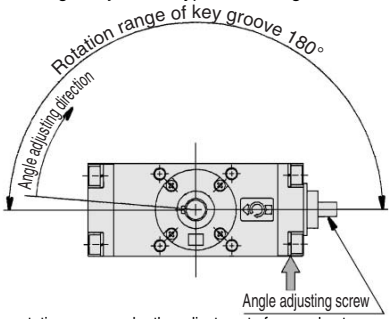
The rotation range under the adjustment of an angle at 120° is indicated below.



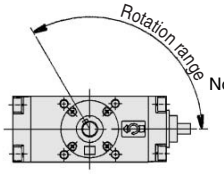
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C46

The rotation range and the angle adjusting direction of the angle adjustable type are changed.



The rotation range under the adjustment of an angle at 120° is indicated below.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Made to Order Specifications:

-XC47 to XC52: Change of Rotation Range and Angle Adjusting Direction (Angle adjusting screw moved to the left)

Please consult with SMC for further information on specifications, dimensions and delivery.

6 Change of Rotation Range and Angle Adjusting Direction (Angle adjusting screw moved to the left) -XC47 to XC52

CRA1 → Refer to "How to Order" on page 11-7-40. **—XC47**

• Change of rotation range and angle adjusting direction (Angle adjusting screw moved to the left) (-XC47 to XC52)

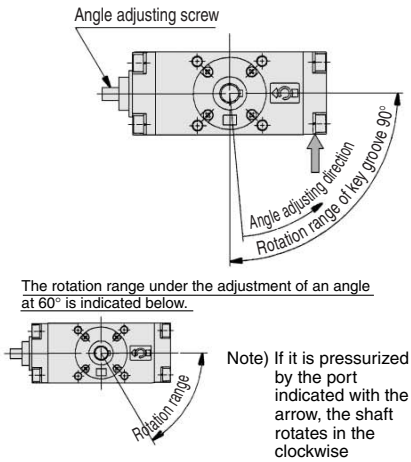
Specifications

Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, Y

The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: C47

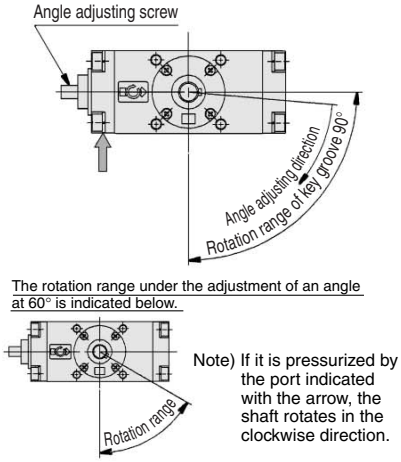
For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C48

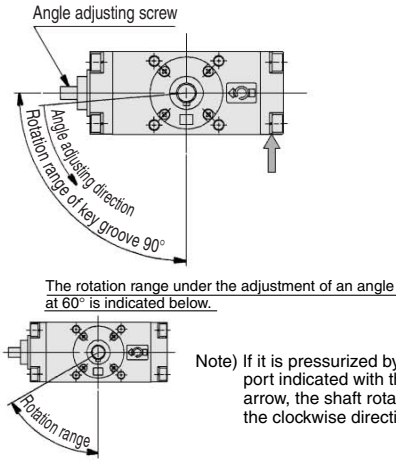
For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C49

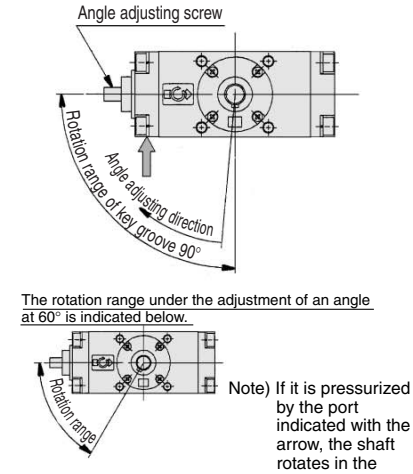
For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C50

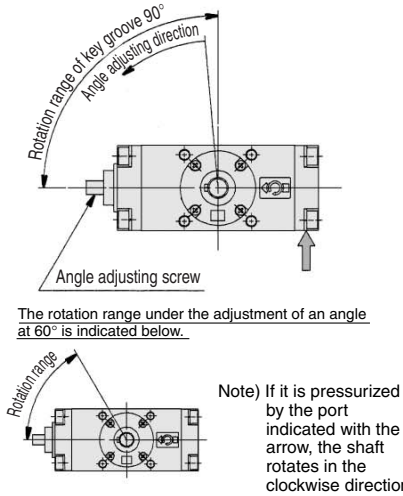
For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C51

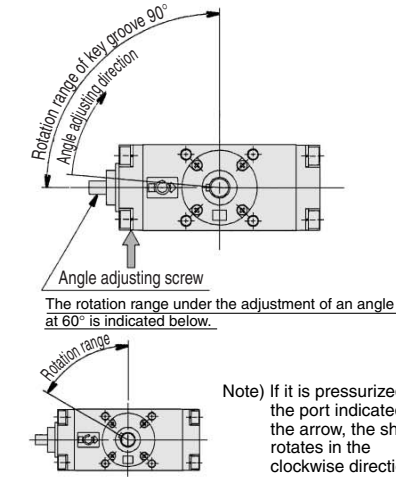
For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C52

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Series CRA1
Made to Order Specifications:
-XC53 to XC58: Change of Rotation Range and Angle Adjusting Direction (Angle adjusting screw moved to the left)

Please consult with SMC for further information on specifications, dimensions and delivery.

6 Change of Rotation Range and Angle Adjusting Direction (Angle adjusting screw moved to the left) -XC53 to XC58

CRA1 → Refer to "How to Order" on page 11-7-40. **—XC53**

Specifications

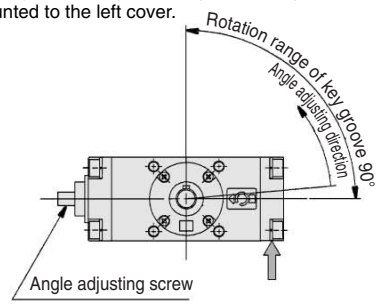
Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, Y

• Change of rotation range and angle adjusting direction (Angle adjusting screw moved to the left) (-XC53 to XC58)

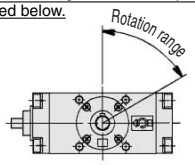
The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: C53

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



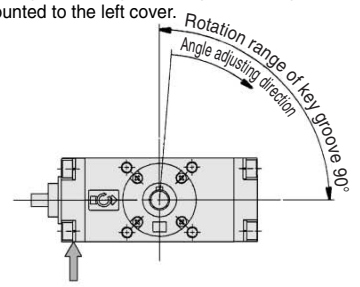
The rotation range under the adjustment of an angle at 60° is indicated below.



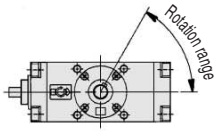
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clock-wise direction.

Symbol: C54

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



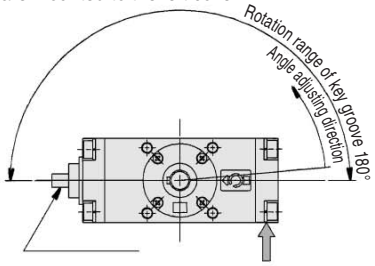
The rotation range under the adjustment of an angle at 60° is indicated below.



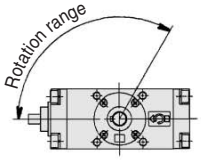
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direc-

Symbol: C55

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



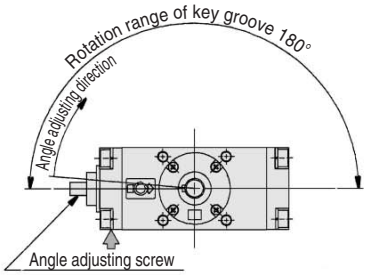
The rotation range under the adjustment of an angle at 120° is indicated below.



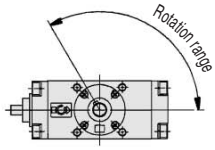
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Symbol: C56

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



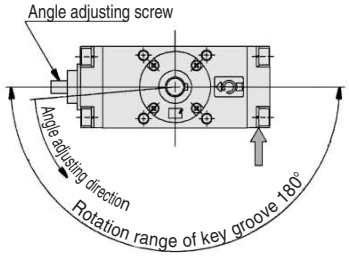
The rotation range under the adjustment of an angle at 120° is indicated below.



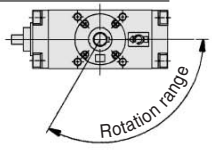
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clock-wise direction.

Symbol: C57

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



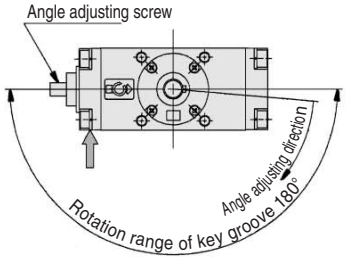
The rotation range under the adjustment of an angle at 120° is indicated below.



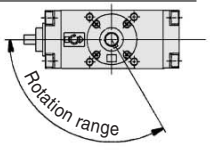
Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clock-wise direction.

Symbol: C58

For the angle adjusting type, angle adjusting screws are mounted to the left cover.



The rotation range under the adjustment of an angle at 120° is indicated below.



Note) If it is pressurized by the port indicated with the arrow, the shaft rotates in the clockwise direction.

Series CRA1
Made to Order Specifications:
-XC59 to -XC61: Change of Port Location (Size 30 to 100)
-XC62: Reverse Auto Switch Mounting (Size 50 to 100)

Please consult with SMC for further information on specifications, dimensions and delivery.

7 Change of Port Location (Mounting location of the cover is changed.) -XC59 to XC61

CRA1 → Refer to "How to Order" on page 11-7-40. **—XC59**

- **Port position is changed. (-XC59 to XC61)**

Specifications

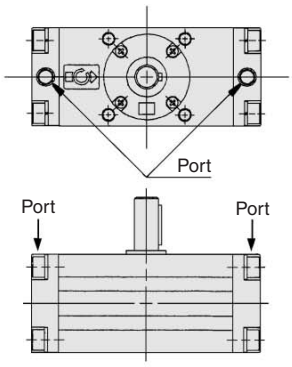
∗ Except for the solenoid valve equipped style.

Applicable size	**30, 50, 63, 80, 100**
Applicable shaft type	Shaft S, W, X, Y Z, T, J, K

The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications. For the bumper equipped type, the needle position is on the opposite side of the port.

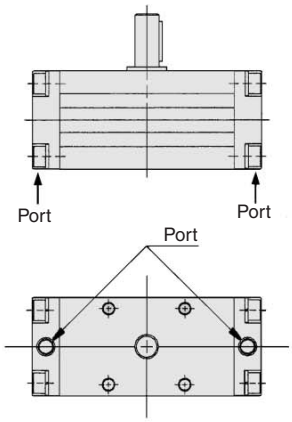
Symbol: C59

Direction of the port is changed. (Upwards)



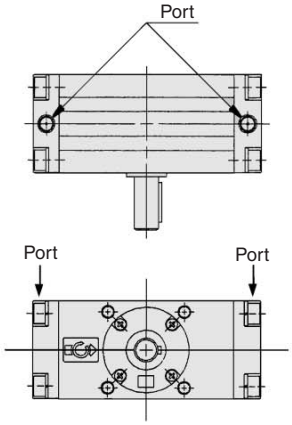
Symbol: C60

Direction of the port is changed. (Downwards)



Symbol: C61

Direction of the port is changed. (Backwards)

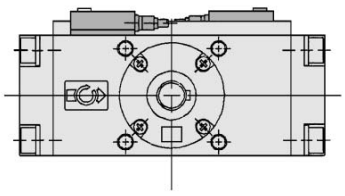


8 Reverse Mounting of the Auto Switch Against the Standard -XC62

CRA1 →Refer to"How to Order" auto switch equipped type on page 11-7-13. **— XC62**

Symbol: C62

The auto switch is reverse mounted to the standard.



Series CRA1
Made to Order Specifications:
-XC63, -XC64: One Side Air-hydro, One Side Air Type

Please consult with SMC for further information on specifications, dimensions and delivery.

9 One Side Air-hydro, One Side Air Type -XC63, -XC64

CRA1 **→ Refer to"How to Order" on page 11-7-40.** **—XC63**

- **One side air-hydro, One side air**
  -XC63: Left side air
  Right side air-hydro
  -XC64: Left side air-hydro
  Right side air

Specifications

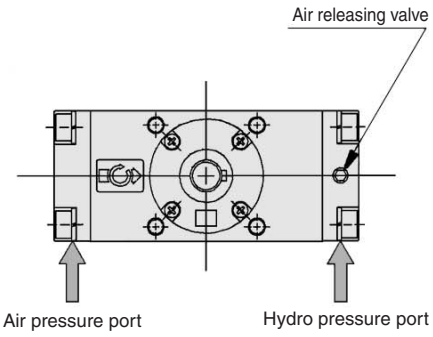
Applicable size	**50, 63, 80, 100**
Applicable shaft type	Shaft S, W, X, Y Z, T, J, K

∗ Except for the solenoid valve equipped type, angle adjustable type and air cushion equipped type.

The patterns with the rotation angle of 90° and 180° are applicable to the respective patterns with the rotation angles of 100° and 190° of the made-to-order specifications.

Symbol: C63

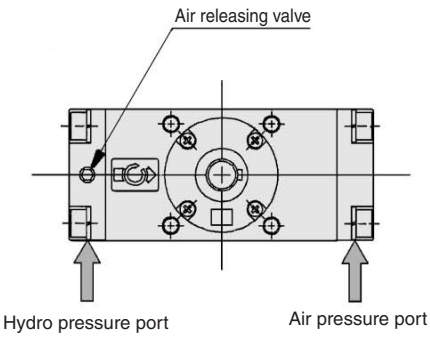
One side air, one side air-hydro specifications (Left side air, Right side hydro)



The figure shows the pressurized situation to the hydro pressure port.

Symbol: C64

One side air, one side air-hydro specifications (Left side hydro, Right side air)



The figure shows the pressurized situation to the air pressure port.

Series CRA1
Made to Order Specifications: -X6 to -X11

Please consult with SMC for further information on specifications, dimensions and delivery.

How to Order

C D RA1 B S P 50 — 90 S — A53 — X6 — X16

- D: Built-in magnet
- P: Pattern
- S: Suffix symbol
- A53: Auto switch
- X6 — X16: Made-to-order symbol
  - Combination is available only when all the conditions are fulfilled in above combination chart 9.

Pattern	
Nil	Made-to-order for 1 kind
P	Made-to-order for 2 kinds

Suffix symbol	
Nil	-X7, -X16
S	-X6
U	-X10
C	-X11

∗ Refer to pages 11-7-50 to 51 for details.

∗ Combination of made-to-order for -X is available up to 2 kinds.
∗ Above is the typical example of combination.

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

Combination Chart of Made to Order

Chart 9. Combination between -X□ and -X□ (S, W, X, Y, Z, T, J, K shaft)

Part no.	Description	Shaft type								Applicable size	Combination		
		S	W	X	Y	Z	T	J	K				
X6	Shaft, Bolt, Parallel key stainless spec.	●	●	●	●	●	●	●	●	30 to 100	X6		
X7	Heat resistance (100°C)	●	●	●	●	●	●	●	●		●	X7	
X10	Angle adjustment for both sides	●	●	●	●	●	●	●	●	50 to 100	—	●	
X11	Angle adjustment for single side, Air cushion with single side	●	●	●	●	●	●	●	●		—	●	X10 to X11
X16	Fluoro rubber for seals	●	●	●	●	●	●	●	●	30 to 100	●	—	●

Series CRA1
Made to Order Specifications:
-X6: Shaft, Bolt, Parallel Key Stainless Spec.
-X7: Heat Resistant Type

Please consult with SMC for further information on specifications, dimensions and delivery.

1 Shaft, Bolt, Parallel key Made of Stainless Steel Spec. -X6

C□RA1 → Refer to "How to Order" on pages 11-7-2, 13 and 18. S — X6

Stainless steel for main part

For applications in areas that pose a risk of rust or corrosion, a portion of the materials used in the standard parts has been changed to stain-less steel.

Specifications

Type	Pneumatic
Size	**30, 50, 63, 80, 100**
Fluid	Air (Non-lube)
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Stainless steel part	Shaft, Bolt, Parallel key
Cushion	30 — Without cushion 50 to 100 — With or without air cushion
Auto switch	Mountable

∗ Refer to page 11-7-3 for other specifications.
∗∗ Except for the angle adjustable type.

2 Heat Resistant Type -X7

CRA1 → Refer to "How to Order" on pages 11-7-2 and 24. — X7

Heat resistant type

In this rotary actuator, the material of the seals has been changed to the heat resistant type (to withstand up to 100°C), for applications in environments that exceed the standard specification temperatures of 0 to 60°C.

Specifications

Type	Pneumatic
Size	**30, 50, 63, 80, 100**
Rotation	90°, 180° (Size 30 to 100) 100°, 190° (Size 50 to 100)
Ambient and fluid temperature	0 to 100°C
Lubrication	ISO VG32
Seal material	FPM
Shaft type	Single shaft, Double shaft, Single shaft with four chamfers, Double shaft key, Double shaft with four chamfers, Double round shaft, Double shaft (Round shaft, with four chamfers), Double round shaft
Cushion	30 — Without cushion 50 to 100 — With or without air cushion
Auto switch	Not mountable

∗ Refer to page 11-7-3 for other specifications.
∗∗ Except for models with solenoid valve.

3 Fluoro Rubber for Seals -X16

CDRA1 → Refer to "How to Order" on pages 11-7-13 and 24. — X16

Fluoro rubber for seals

Seal is now changed to fluoro rubber.

Specifications

Type	Pneumatic
Size	**30, 50, 63, 80, 100**
Fluid	Air (Non-lube)
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Ambient and fluid temperature	0°C to 60°C (No freezing)
Seal material	FPM
Cushion	30 — Without cushion 50 to 100 — With or without air cushion
Auto switch	Mountable

∗ Refer to page 11-7-3 for other specifications.
∗∗ Except for models with solenoid valve.

Series CRA1
Made to Order Specifications:
-X10: Both Sides Angle Adjustable Type
-X11: One Side Angle Adjustable, One Side Cushion Type

Please consult with SMC for further information on specifications, dimensions and delivery.

4 Both Sides Angle Adjustable Type -X10

Refer to "How to Order" on page 11-7-24.

C□RA1 | Mounting | Shaft type | U | Size | Rotation | U-X10

Both sides angle adjustable type

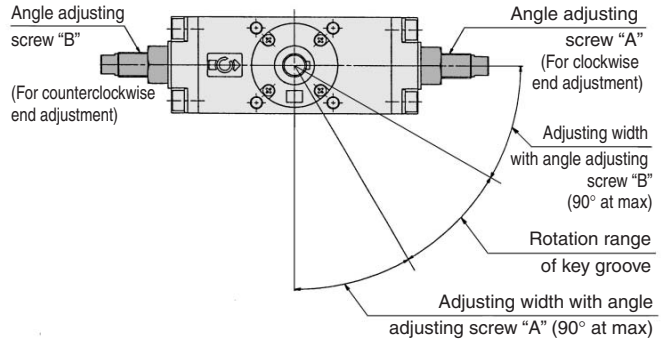
Specifications

Type	Pneumatic
Size	**50, 63, 80, 100**
Rotation	90°, 180°, 100°, 190°
Shaft type	Single shaft (S), Double shaft (W), Single shaft with four chamfers (X), Double shaft key (Y), Double shaft with four chamfers (Z), Single round shaft (T), Double shaft/Round shaft, with four chamfers (J), Double round shaft (K)
Cushion	None
Variation	With auto switch, With solenoid valve

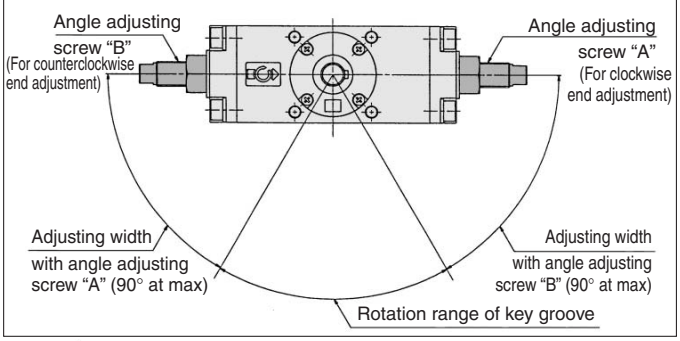
∗ Refer to page 11-7-3 for other specifications.

Adjusting direction: Adjusting direction "A": When angle adjusting screw on "A" side is screwed into the right direction.
Adjusting direction "B": When angle adjusting screw on "B" side is screwed into the right direction.

Rotation at 90°



Rotation at 180°



5 One Side Angle Adjustable, One Side Cushion -X11

Refer to "How to Order" on page 11-7-24.

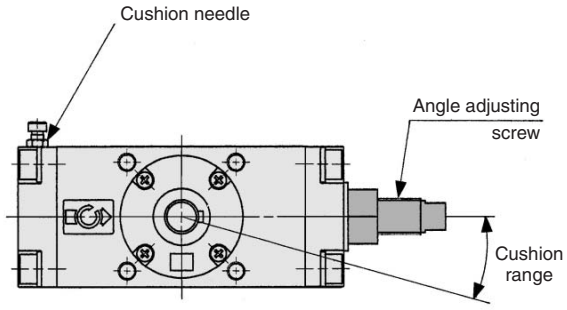
C□RA1 | Mounting | Shaft type | U | Size | Rotation | C-X11

One side angle adjustable, one side cushion

Specifications

Type	Pneumatic
Size	**50, 63, 80, 100**
Rotation	90°, 180°, 100°, 190°
Shaft type	Single shaft (S), Double shaft (W), Single shaft with four chamfers (X), Double shaft key (Y), Double shaft with four chamfers (Z), Single round shaft (T), Double shaft/Round shaft, with four chamfers (J), Double round shaft (K)
Cushion	With cushion on one side
Suffix symbol for auto switch	Mountable
Variation	With auto switch, With solenoid valve

∗ Refer to page 11-7-3 for other specifications.



∗ Refer to pages 11-7-11 to 11-7-12 for dimensions.