

Rotary Actuator

ø50, ø63, ø80, ø100

New

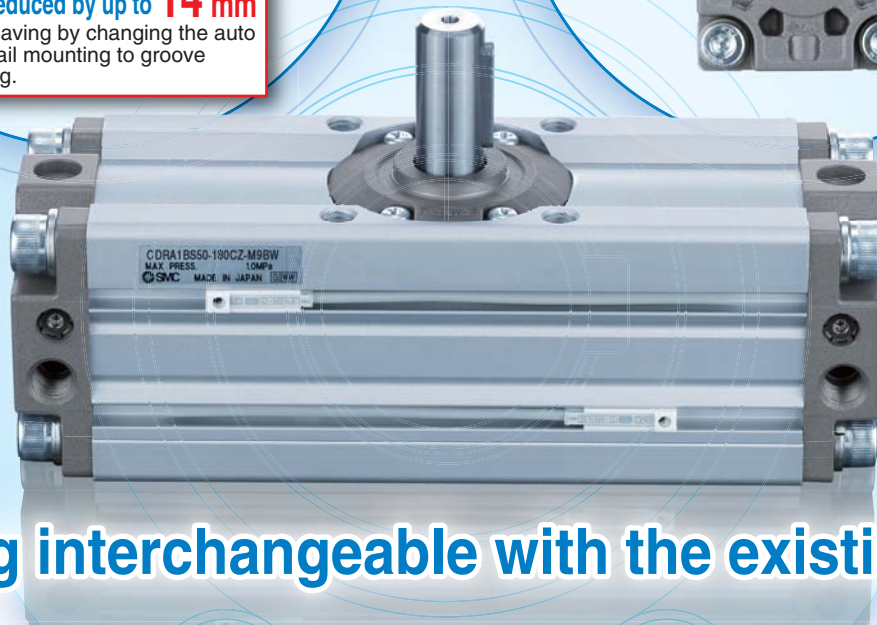
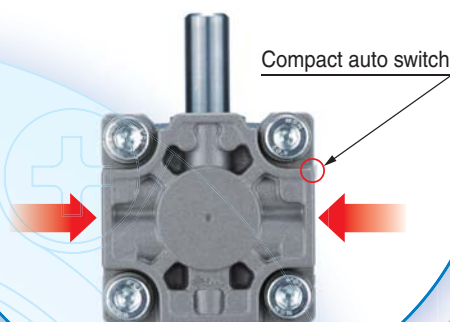
RoHS

Compact auto switches are mountable. (D-M9□)



Width reduced by up to **14 mm**
Space saving by changing the auto switch rail mounting to groove mounting.

Compact auto switches are mountable on 2 surfaces.



Mounting interchangeable with the existing model

Weight is reduced by up to 14%.

- Lightweight body by changing the body and the cover shape

Size	New CRA1 [kg]	Existing model [kg]	Reduction rate [%]
50	1.3	1.5	13
63	2.2	2.5	12
80	3.9	4.3	10
100	7.3	8.5	14

Auto switch can be mounted from the front.

- Auto switch can be mounted from the front at any position on the mounting groove.
- Auto switch can be mounted after installation or when installation condition is changed.



Series **CRA1**



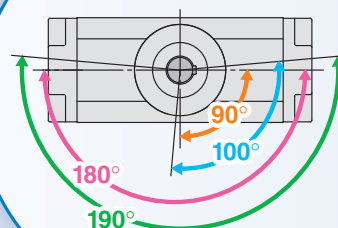
CAT.EUS20-232A-UK

Easy adjustment of cushion valve

- Cushion valve shape is changed so it can be adjusted using a hexagon wrench only.
- No protrusion from the body.
- Retaining ring is used to prevent drop-out.

Port, cushion and auto switch are on the same surface.
Easy to handle.

Rotating angle



Retaining ring
Port

Cushion seal is replaceable.

Cushion seal has been made replaceable.
(Not possible for existing model. Cushion seal only)

- | Replacement parts | |
|----------------------|---------------|
| • Slider | • Tube gasket |
| • Piston seal | • Spring pin |
| • Cushion seal (New) | |

Interchangeable with existing model.

Exterior dimension, shaft diameter, and mounting dimension are interchangeable with existing model.

Compact auto switches are mountable.

Solid state auto switch

- D-M9□
- D-M9□W

Reed auto switch

- D-A9□

Many variations of shaft type

New Series CRA1

Standard: 8 types

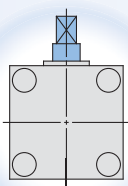
Existing model

Standard: 2 types

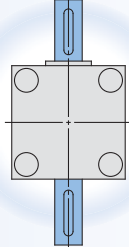
Semi-standard: 6 types

- Shaft type can be selected to suit the specification.
- Part number is assigned for shaft types (single round shaft, double shaft (round shaft, with four chamfers), double round shaft).

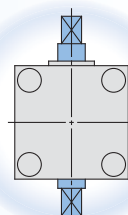
Single shaft with four chamfers: **CRA1BX**



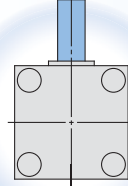
Double shaft with key: **CRA1BY**



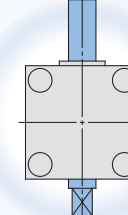
Double shaft with four chamfers: **CRA1BZ**



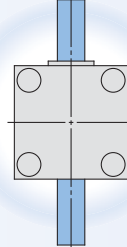
Single round shaft: **CRA1BT**



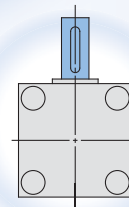
Double shaft (round shaft, with four chamfers): **CRA1BJ**



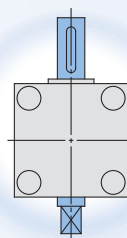
Double round shaft: **CRA1BK**



Single shaft: **CRA1BS**

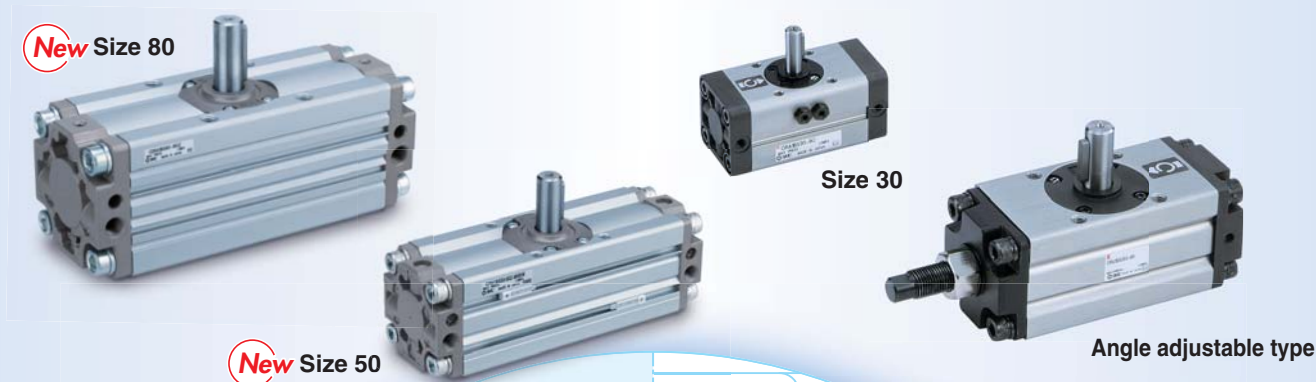


Double shaft: **CRA1BW**



* Single round shaft, double shaft (round shaft, with four chamfers), double round shaft are made to order.

Rotary Actuator



Series Variations

★: New Series CRA1

Fluid		Air					Hydraulic oil			
Size		30	50	63	80	100	50	63	80	100
Standard	Rotating angle	90°		★	★	★	★	★	★	★
		100°		★	★	★	★	★	★	★
		180°		★	★	★	★	★	★	★
		190°		★	★	★	★	★	★	★
	Shaft type	Single shaft	S	★	★	★	★	★	★	★
		Double shaft	W	★	★	★	★	★	★	★
		Single shaft with four chamfers	X	★	★	★	★	★	★	★
		Double shaft with 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	★	★	★	★	★	★	★	★
		Air cushion	★	★	★	★	★	★	★	★
	Variations	With auto switch	★	★	★	★	★	★	★	★
		Angle adjustable type	★	★	★	★	★	★	★	★
		Clean series	11-★	★	★	★	★	★	★	★
		With one-touch fittings	★	★	★	★	★	★	★	★
	Mounting bracket	Flange	F	★	★	★	★	★	★	★
		Foot	L	★	★	★	★	★	★	★
Made to Order	Shaft type	Single shaft	S	★	★	★	★	★	★	★
		Single shaft with four chamfers	X	★	★	★	★	★	★	★
		Double shaft with key	Y	★	★	★	★	★	★	★
		Double shaft with four chamfers	Z	★	★	★	★	★	★	★
	Pattern	Shaft-end shape	★	★	★	★	★	★	★	★
		Rotation range	★	★	★	★	★	★	★	★
		Port location	★	★	★	★	★	★	★	★
	Stainless steel shaft/bolt/parallel key		-X6	★	★	★	★	★	★	★
	Operating temperature		Heat resistant 100°C	-X7	★	★	★	★	★	★
	Both sides angle adjustable type		-X10	★	★	★	★	★	★	★
	One side angle adjustable, one side with cushion type		-X11	★	★	★	★	★	★	★
	Fluororubber seal		-X16	★	★	★	★	★	★	★

Refer to digital catalogue in www.smc.eu for details on .

Rotary Actuator

Series CRA1

RoHS

Rack & Pinion Type/Size: 50, 63, 80, 100



How to Order

CRA1 B S 50 - 90 Z -

With auto switch CDRA1 B S 50 - 90 Z - M9BW -

Built-in magnet

Mounting

B	Basic type
L	Foot type*
F	Flange type

* For foot bracket and part number, refer to page 2.
* Foot bracket is included in the same package, (but not assembled).

Rotating angle

90	90°
180	180°
100	100°
190	190°

Air cushion

—	None
C	With air cushion

Port type

Port type		50, 63	80	100
Size	Rc			
TF	G	1/8	1/4	3/8
TN	NPT			
TT	NPTF			

Shaft type

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

* Flange type is not available for T, J, K.
* T, J, K are made to order.

Size

50
63
80
100

Number of auto switches

—	2 pcs.
S	1 pc.

Note) Up to two auto switches are mountable.

Auto switch

—	Without auto switch (Built-in magnet)
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* For applicable auto switch model, refer to the table below.

Made to Order
Refer to page 2.

Applicable Auto Switches/Refer to Auto Switch Guide for further information on auto switches.

Applicable Load Switch																	
Note: Refer to the Load Switch Guide for further information on auto switches.																	
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length [m]				Pre-wired connector	Applicable load		
					DC		AC	Perpendicular	In-line	0.5 (—)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC	
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○			
				2-wire				M9BV	M9B	●	●	●	○	○			
	Diagnosis indication (2-colour indication)			3-wire (NPN)		5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit		
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○			
	Water resistant (2-colour indication)			2-wire		12 V		M9BWV	M9BW	●	●	●	○	○	—		
				3-wire (NPN)		5 V, 12 V		M9NAV**	M9NA**	○	○	●	○	○	IC circuit		
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	○			
				2-wire				12 V	M9BAV**	M9BA**	○	○	●	○			○
				Reed auto switch	—	Grommet		Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●		—
No	2-wire	24 V	12 V				100 V		A93V	A93	●	—	●	—	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	—	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..... — (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

* Auto switches marked with "○" are produced upon receipt of order.

* Auto switches are shipped together, (but not assembled).



Refer to Auto Switch Guide for detailed solid state auto switches with pre-wired connectors.

Specifications



Basic type



Flange type



Foot type

Type	Pneumatic			
Size	50	63	80	100
Fluid	Air (Non-lube)			
Max. operating pressure	1.0 MPa			
Min. operating pressure	0.1 MPa			
Ambient and fluid temperature	0 to 60°C (No freezing)			
Cushion	Not attached, Air cushion			
Backlash	Within 1°			
Tolerance in rotating angle	+4° 0			

Effective Torque

Size	Operating pressure [MPa]										[N·m]
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
50	1.85	3.71	5.57	7.43	9.27	11.2	13.0	14.9	16.7	18.5	
63	3.44	6.88	10.4	13.8	17.2	20.6	24.0	27.5	31.0	34.4	
80	6.34	12.7	19.0	25.3	31.7	38.0	44.4	50.7	57.0	63.4	
100	14.9	29.7	44.6	59.4	74.3	89.1	104	119	133	149	



Made to Order
(For details, refer to pages 11 to 23.)

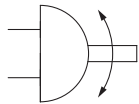
Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft pattern sequencing I	S, W, Y
XA33 to XA59	Shaft pattern sequencing II	X, Z, T, J, K
XC7	Reversed shaft	S, W, X, T, J
XC8 to XC11	Change of rotation range	S, W, Y
XC30	Changed to fluorine grease	S, W, X, Y Z, T, J, K
XC31 to XC36	Change of rotation range and shaft rotation direction	S, W, Y
XC59 to XC61	Change of port location (Mounting location of the cover is changed.)	S, W, X, Y Z, T, J, K

Allowable Kinetic Energy/Adjustable Range of Rotation Time Safe in Operation

Size	Allowable kinetic energy [J]		Adjustable range of rotation time safe in operation [s/90°]
	Without air cushion	With air cushion*	
50	0.05	0.98	0.2 to 2
63	0.12	1.50	0.2 to 3
80	0.16	2.00	0.2 to 4
100	0.54	2.90	0.2 to 5

* Allowable kinetic energy of the product with air cushion is the maximum absorbed energy when the cushion valve adjustment is optimised.

JIS Symbol



Weights

Size	Standard weight		Additional weight			[kg]
	90°	180°	With auto switch*	Foot bracket	Flange bracket	
50	1.3	1.5	0.2	0.3	0.5	
63	2.2	2.6	0.4	0.5	0.9	
80	3.9	4.4	0.6	0.9	1.5	
100	7.3	8.3	0.9	1.2	2.0	

* With 2 auto switches

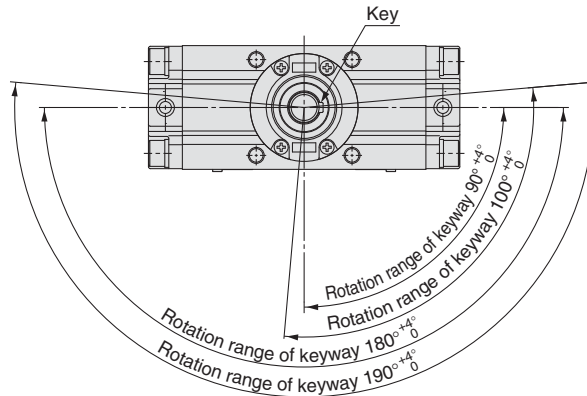
Foot Bracket/Part No.

Size	Foot bracket	Contents	Mounting screw size included in foot bracket
50	CRA1L50-Y-1Z	Foot bracket: 2 pcs. Mounting screw: 4 pcs. Collar: 4 pcs.	M8 x 1.25 x 35
63	CRA1L63-Y-1Z		M10 x 1.5 x 40
80	CRA1L80-Y-1Z		M12 x 1.75 x 50
100	CRA1L100-Y-1Z		M12 x 1.75 x 50

Rotation Range of Keyway/Auto Switch Mounting Position

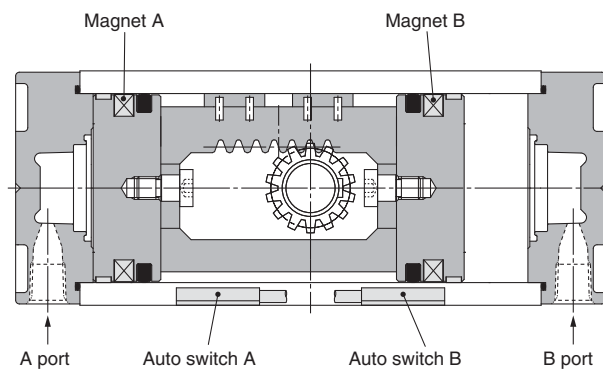
Size: 50 to 100

CDRA1□□50 to 100



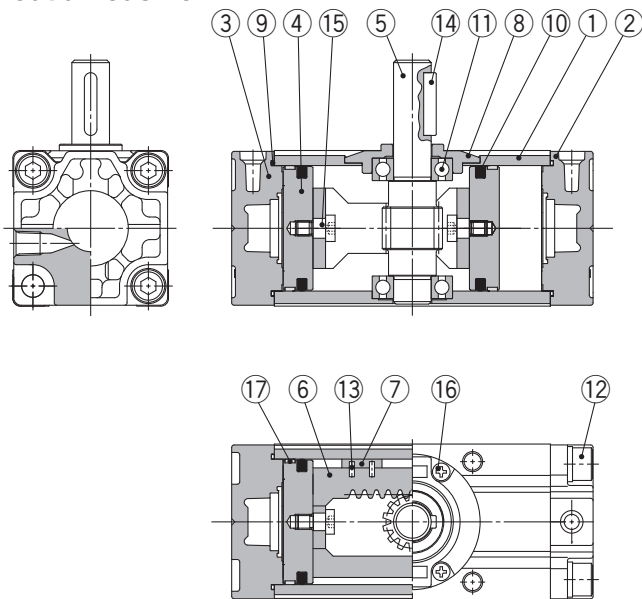
Working Principle

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

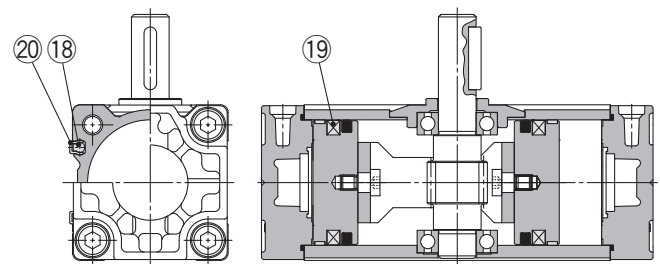


Construction

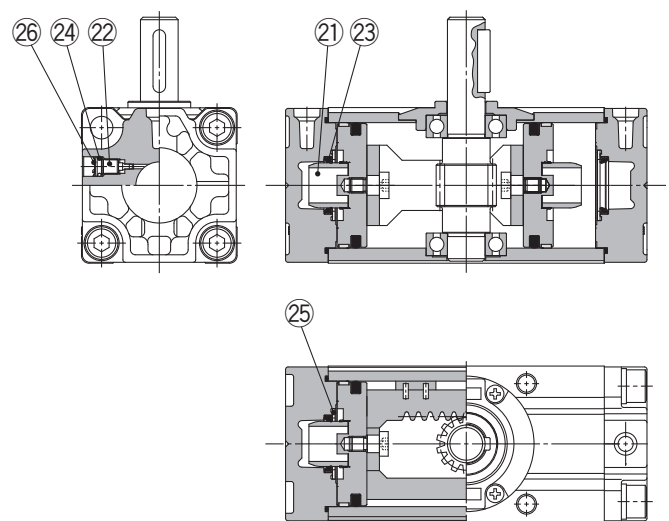
Without air cushion



Without air cushion With auto switch



With air cushion



Component Parts

No.	Description	Material	Note
1	Body	Aluminium alloy	Anodised
2	Right cover	Aluminium alloy	Metallic coating
3	Left cover	Aluminium alloy	Metallic coating
4	Piston	Aluminium alloy	
5	Shaft	Alloy steel	
6	Rack	Carbon steel	Nitrided
7	Slider	Resin	
8	Bearing retainer	Aluminium alloy	Chromated
9	Tube gasket	NBR	
10	Piston seal	NBR	
11	Bearing	High carbon chrome bearing steel	
12	Hexagon socket head cap screw with washer	Alloy steel	Zinc chromated
13	Spring pin	Steel	Zinc chromated
14	Parallel key	Carbon steel	
15	Connecting screw	Carbon steel	Zinc chromated
16	Cross-recessed pan head tapping screw	Steel	Zinc chromated
17	Wear ring	Resin	
18	Auto switch	—	
19	Magnet	—	
20	Switch spacer	Resin	
21	Cushion ring	Aluminium alloy	Anodised
22	Cushion valve	Steel	Zinc chromated
23	Cushion seal	Urethane	
24	O-ring	NBR	
25	Seal retainer	Steel	
26	Retaining ring	Steel	

Replacement Parts/Cushion Seal (Corresponding parts shown below are set.)

Size	Replacement parts		
	Without air cushion		With air cushion
CRA1□□50	P694020-20		P694020-21
CRA1□□63	P694030-20		P694030-21
CRA1□□80	P694040-20		P694040-21
CRA1□□100	P694050-20		P694050-21
Corresponding parts	No.	Description	Qty.
	7	Slider	2
	9	Tube gasket	2
	10	Piston seal	2
	13	Spring pin	4
	23	Cushion seal*	2

Note) When ordering spare parts, write "1" for one set of the parts per actuator.

* For model with air cushion

A grease pack (10 g) is included. If an additional grease pack is needed, order with the following part number.

Grease pack part number: GR-S-010 (10 g)

Series CDRA1

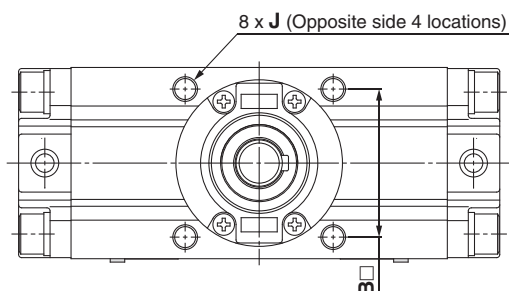
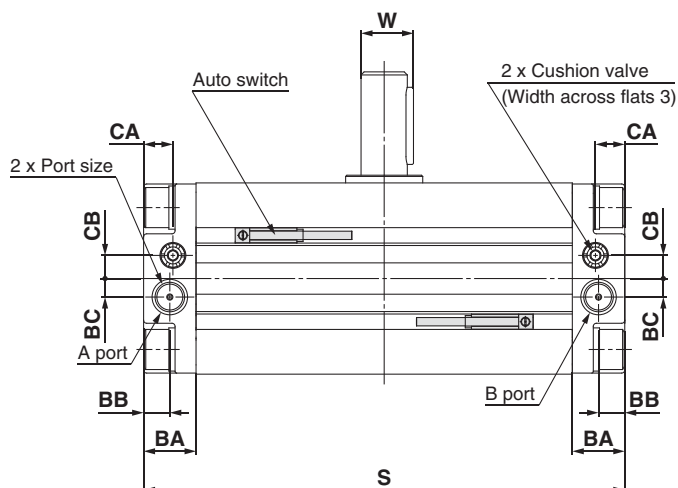
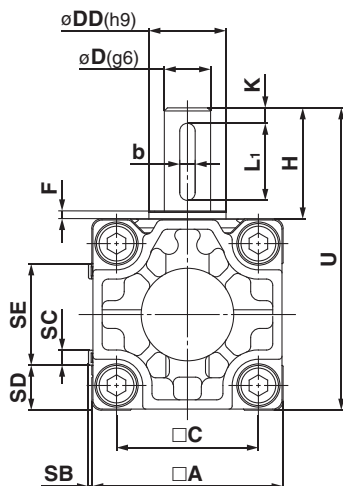
Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

Single shaft: C□RA1BS



Single shaft



- The dimensions above show pressurisation to B port.
- Drawing shows the auto switch mounted on the port side.
- * () are the dimensions for rotation of 180° and 190°.

Model	Port size	A	B	C	D (g6)	DD (h9)	F	H	J	K	With auto switch					Without auto switch	U	W	BA	BB	BC	CA [*]	CB [*]	Key dimensions		(Note)
											S	SB	SC	SD	SE	S								b	L ₁	
C□RA1BS50	1/8	62	48	46	15	25	2.5	36	M8 x 1.25 depth 8	5	156 (189)	1.5	5	14.5	33	144 (177)	98	17	17	8.5	6	9.5	7.5	5 ⁰ _{-0.030}	25	
C□RA1BS63	1/8	76	60	57	17	30	2.5	41	M10 x 1.5 depth 12	5	175 (213.5)	1.5	5	21.5	33	163 (201.5)	117	19.5	20	10	7	11	8	6 ⁰ _{-0.030}	30	
C□RA1BS80	1/4	92	72	70	20	35	3	50	M12 x 1.75 depth 13	5	199 (243)	1.5	5	29.5	33	186 (230)	142	22.5	23.5	12	8	13	9	6 ⁰ _{-0.030}	40	
C□RA1BS100	3/8	112	85	85	25	40	4	60	M12 x 1.75 depth 14	5	259 (325)	1.5	5	39.5	33	245 (311)	172	28	25	12.5	8	14	10	8 ⁰ _{-0.036}	45	

Note) A parallel key is included in the same package, (but not assembled).

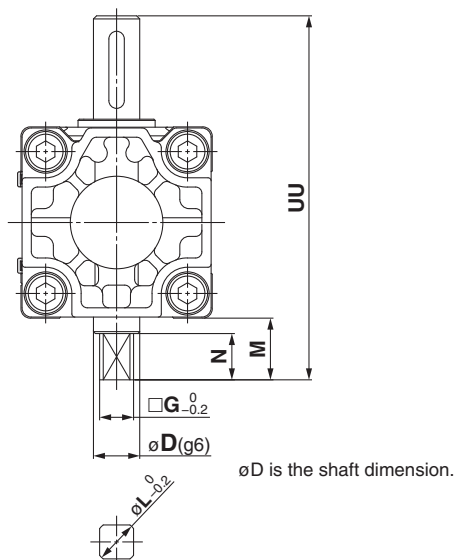
* For model with air cushion

Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

Double shaft: C□RA1BW

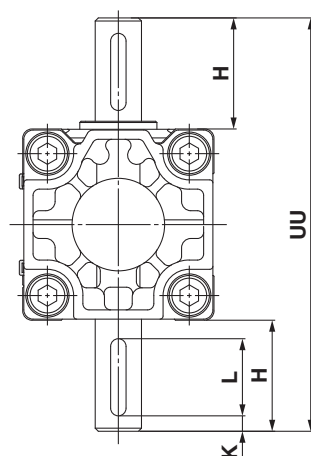
Double shaft



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

Model	D (g6)	G	M	N	UU	L
C□RA1BW50	15	11	20	15	118	14
C□RA1BW63	17	13	22	17	139	16
C□RA1BW80	20	15	25	20	167	19
C□RA1BW100	25	19	30	25	202	24

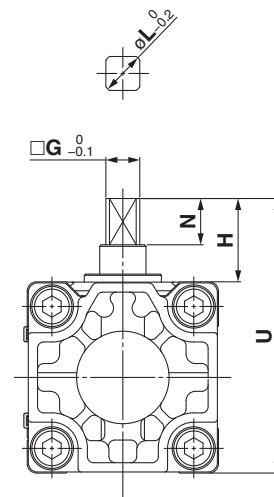
Double shaft with key: C□RA1BY



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

Model	H	K	UU	L
C□RA1BY50	36	5	134	25
C□RA1BY63	41	5	158	30
C□RA1BY80	50	5	192	40
C□RA1BY100	60	5	232	45

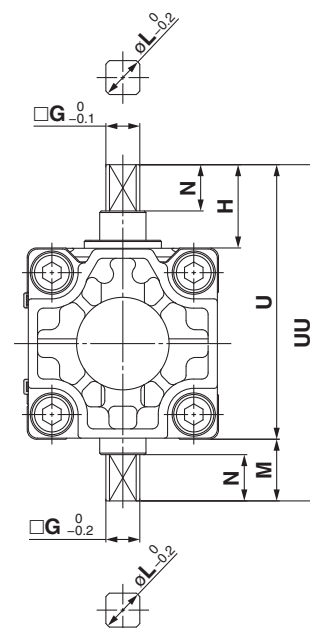
Single shaft with four chamfers: C□RA1BX



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

Model	G	H	N	U	L
C□RA1BX50	11	27	15	89	14
C□RA1BX63	13	29	17	105	16
C□RA1BX80	15	38	20	130	19
C□RA1BX100	19	44	25	156	24

Double shaft with four chamfers: C□RA1BZ



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

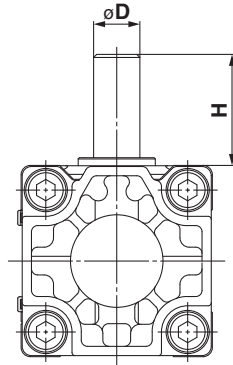
Model	G	H	M	N	U	UU	L
C□RA1BZ50	11	27	20	15	89	109	14
C□RA1BZ63	13	29	22	17	105	127	16
C□RA1BZ80	15	38	25	20	130	155	19
C□RA1BZ100	19	44	30	25	156	186	24

Series CDRA1

Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

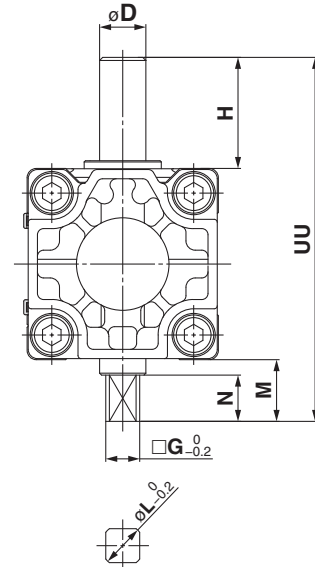
Single round shaft: C□RA1BT



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

Model	D (g6)	H
C□RA1BT50	15	36
C□RA1BT63	17	41
C□RA1BT80	20	50
C□RA1BT100	25	60

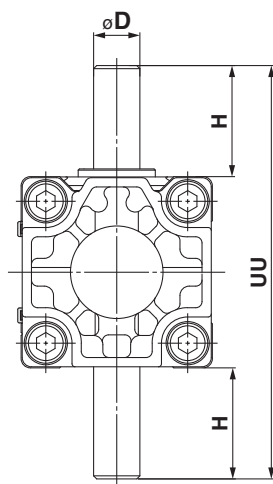
Double shaft (round shaft, with four chamfers): C□RA1BJ



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

Model	D (g6)	G	H	M	N	UU	L
C□RA1BJ50	15	11	36	20	15	118	14
C□RA1BJ63	17	13	41	22	17	139	16
C□RA1BJ80	20	15	50	25	20	167	19
C□RA1BJ100	25	19	60	30	25	202	24

Double round shaft: C□RA1BK



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

Model	D (g6)	H	UU
C□RA1BK50	15	36	134
C□RA1BK63	17	41	158
C□RA1BK80	20	50	192
C□RA1BK100	25	60	232

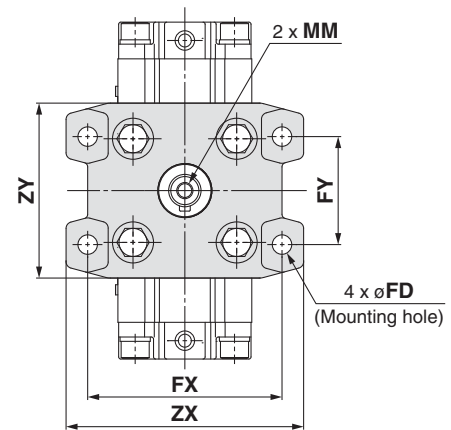
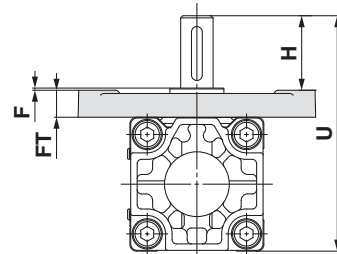
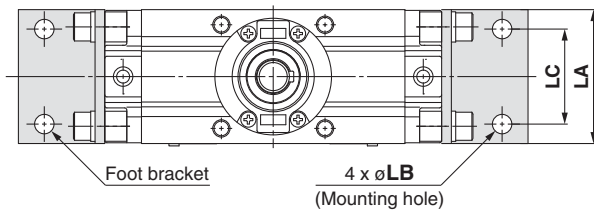
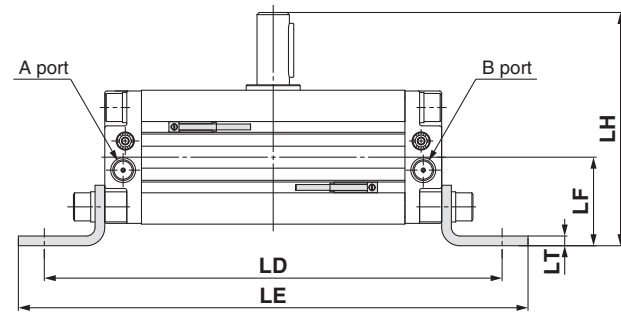
Dimensions/Foot Type: C□RA1L, Flange Type: C□RA1F

Size: 50/63/80/100

Foot type: C□RA1L□

Flange type

Single shaft: C□RA1FS



- Dimensions above show pressurisation to B port.
- Drawing shows the auto switch mounted on the port side.
- * () are the dimensions for rotating angle of 180° and 190°.

Model	LA	LB	LC	With auto switch		Without auto switch	
				LD	LE	LD	LE
C□RA1L□50	62	9	44	212 (245)	236 (269)	200 (233)	224 (257)
C□RA1L□63	76	11	55	247 (285.5)	275 (313.5)	235 (273.5)	263 (301.5)
C□RA1L□80	92	13	67	287 (331)	329 (373)	274 (318)	316 (360)
C□RA1L□100	112	13	87	347 (413)	389 (455)	333 (399)	375 (441)

Model	LF	LH	LT
C□RA1L□50	41	108	4.5
C□RA1L□63	48	127	5
C□RA1L□80	58	154	6
C□RA1L□100	73.5	189.5	6

Note) Other dimensions are the same as the basic type.

Model	F	H	MM	U	FD	FT	FX	FY	ZX	ZY
C□RA1F□50	4	39	M6 x 1.0 depth 12	114	9	13	90	50	110	81
C□RA1F□63	5	45	M6 x 1.0 depth 12	136	11.5	15	105	59	130	101
C□RA1F□80	5	55	M8 x 1.25 depth 16	165	13.5	18	130	76	160	119
C□RA1F□100	5	60	M10 x 1.5 depth 20	190	13.5	18	150	92	180	133

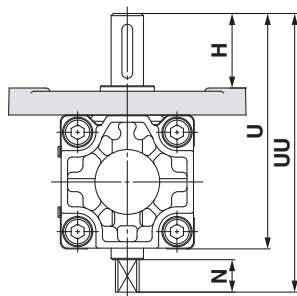
Series CDRA1

Dimensions/Flange Type: C□RA1F

Size: 50/63/80/100

Flange type

Double shaft: C□RA1FW

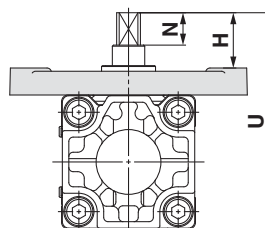


Note) Other dimensions are the same as the single shaft type.

Model	H	N	U	UU
C□RA1FW50	39	15	114	134
C□RA1FW63	45	17	136	158
C□RA1FW80	55	20	165	190
C□RA1FW100	60	25	190	220

Flange type

Single shaft with four chamfers: C□RA1FX

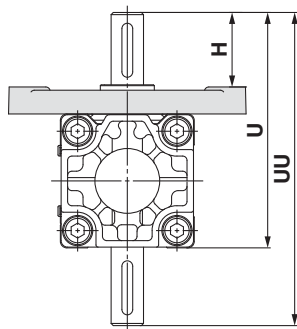


Note) Other dimensions are the same as the single shaft type.

Model	H	N	U
C□RA1FX50	30	15	105
C□RA1FX63	33	17	124
C□RA1FX80	43	20	153
C□RA1FX100	44	25	174

Flange type

Double shaft with key: C□RA1FY

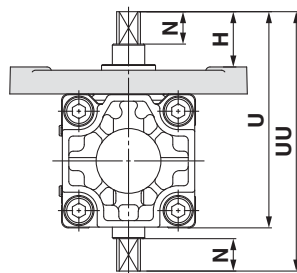


Note) Other dimensions are the same as the single shaft type.

Model	H	U	UU
C□RA1FY50	39	114	150
C□RA1FY63	45	136	177
C□RA1FY80	55	165	215
C□RA1FY100	60	190	250

Flange type

Double shaft with four chamfers: C□RA1FZ



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

Model	H	N	U	UU
C□RA1FZ50	30	15	105	125
C□RA1FZ63	33	17	124	146
C□RA1FZ80	43	20	153	178
C□RA1FZ100	44	25	174	204

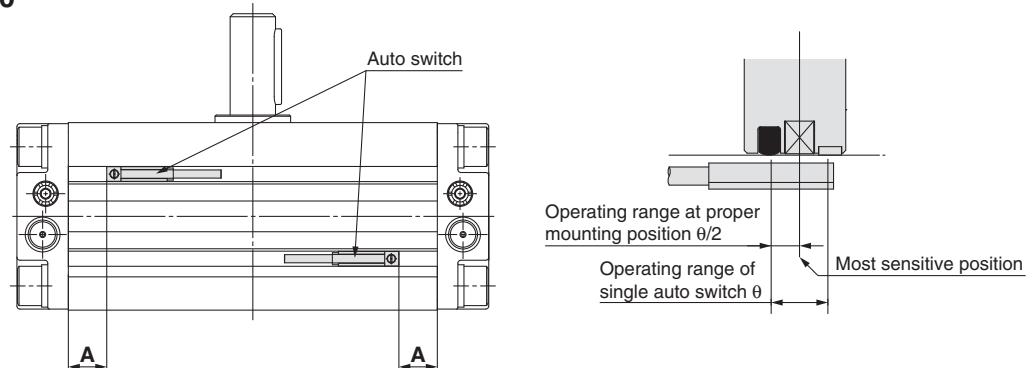
Note) The dimensions of shaft key and four chamfers are the same as the basic type.

Series CRA1

Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at Rotation End)

CDRA1□□50 to 100



Auto switch model	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV		D-A9□/A9□V	
	Proper mounting position A [mm]	Operating range θ [°]	Proper mounting position A [mm]	Operating range θ [°]
CDRA1□50-90	22.5	30°	18.5	44°
CDRA1□50-180	39		35	
CDRA1□63-90	25	28°	21	49°
CDRA1□63-180	44.5		40.5	
CDRA1□80-90	27.5	23°	23.5	41°
CDRA1□80-180	49.5		45.5	
CDRA1□100-90	42.5	15°	38.5	29°
CDRA1□100-180	75.5		71.5	

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion) There may be the case to change substantially depending on an ambient environment.

Adjust the auto switch after confirming the operating conditions in the actual setting.

Switch Spacer Part No.

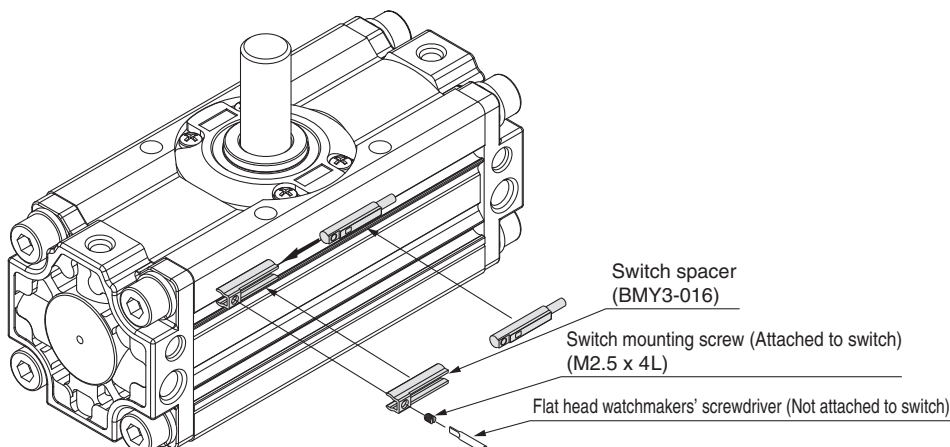
Size	50	63	80	100
Switch spacer part no.	BMY3-016			

* The above part number includes one switch spacer.

* Two switch spacers are included with the product with built-in magnet.

Auto Switch Mounting

To fix the auto switch, hold the switch spacer, and insert into the groove. Make sure that the switch spacer is in the right position or correct the position if necessary, then slide the auto switch in the groove so that it goes into the spacer. Confirm where the mounting position is, and tighten the auto switch mounting screw using a flat head screwdriver.



Note) When tightening an auto switch mounting screw, use a watchmakers' screwdriver with a handle of approximately 5 to 6 mm in diameter. Also, tighten with a torque of about 0.1 to 0.15 N·m. As a guide, turn about 90° past the point at which tightening can first be felt.

Series CRA1 Simple Specials 1

Shaft shape pattern is dealt with simple made-to-order system. A specification sheet is available for ordering. Please access SMC website, or consult your nearest sales branch.



Symbol

Shaft Pattern Sequencing ☐

-XA1 to -XA24

Applicable shaft type: S, W, Y

How to Order

C **D** **RA1** **B** **S** **50** **-** **90** **Z** **-** **M9BW** **-** **X** **A1** **A2** **C8** **C59**

Magnet

—	None
D	Built-in magnet

Mounting

B	Basic type
L	Foot type

Shaft type

S	Single shaft
W	Double shaft
Y	Double shaft with key

Size

50
63
80
100

Port type

Port type		50, 63	80	100
—	Rc	1/8	1/4	3/8
TF	G			
TN	NPT			
TT	NPTF			

Rotating angle

90	90°
180	180°
100	100°
190	190°

Air cushion

—	None
C	With air cushion

Auto switch

—	Without auto switch (Built-in magnet)
---	---------------------------------------

* For auto switch model, refer to page 1.
* Auto switches are shipped together, (but not assembled).

Number of auto switches

—	2 pcs.
S	1 pc.

Simple Specials, Made-to-Order symbol

- Refer to Chart (1), (2) when the number of combinations is one or two.
- Combination of XA is possible for up to 2 types.

Combination 3 types

A1	A24	C59
A13	C8	C59

→ Chart (1), (2)
→ Chart (2), (5)

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

Combination 4 types

A1	A2	C8	C59
A2	A24	C10	C60

→ Chart (1), (2), (5)
→ Chart (1), (2), (5)

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

Simple Specials, Made-to-Order symbol

- Refer to Chart (1), (2) when the number of combinations is one or two.
- Combination of XA is possible for up to 2 types.

Combination 3 types

A1	A24	C59
A13	C8	C59

Combination of applicable chart

Chart (1), (2)
Chart (2), (5)

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

Combination 4 types

A1	A2	C8	C59
A2	A24	C10	C60

Combination of applicable chart

Chart (1), (2), (5)
Chart (1), (2), (5)

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.

Symbol

Shaft Pattern Sequencing I**-XA1 to -XA24**

Applicable shaft type: S, W, Y

Combination Chart of Simple Specials for Shaft-End Shape**Chart (1) Combination between XA□ and XA□ (S, W, Y shaft)**

Symbol	Description	Axial direction		Applicable shaft type			Combination			
		Top	Bottom	S	W	Y	XA1	XA2	XA13	XA24
XA1	Shaft-end female thread	●	—	●	●	●	—	●	—	●
XA2	Shaft-end female thread	—	●	●	●	●	●	—	—	●
XA13	Shaft through-hole	●	●	●	●	●	—	—	—	●
XA14	Shaft through-hole + Shaft-end female thread	●	—	●	●	●	—	—	—	●
XA15	Shaft through-hole + Shaft-end female thread	—	●	●	●	●	—	—	—	●
XA16	Shaft through-hole + Double shaft-end female thread	●	●	●	●	●	—	—	—	●
XA17	Shortened shaft (Long shaft with key)	●	—	●	●	●	—	●	●	—
XA18	Shortened shaft (Short shaft with key and with four chamfers)	—	●	—	●	●	W, Y*	—	W, Y*	—
XA19	Shortened shaft (Double shaft)	●	●	—	●	●	—	—	W, Y*	—
XA20	Reversed shaft, Shortened shaft	●	●	—	●	●	—	—	S, W*	—
XA24	Double key	●	—	●	●	●	—	—	—	—

* Shaft type available for combination.

Combination Chart of Made to Order**Chart (2) Combination between XA□ and XC□**

Symbol	Description	Applicable shaft type			Combination	
		S	W	Y	XA1, 2, 13 to 19	XA20, 24
XC7	Reversed shaft	●	●	—	—	—
XC8 to XC11	Change of rotation range	●	●	●	●	—
XC30	Changed to fluorine grease	●	●	●	●	●
XC31 to XC36	Change of rotation range and shaft rotation direction	●	●	●	●	—
XC59 to XC61	Change of port location	●	●	●	●	●

Series CRA1 Simple Specials 2

Shaft shape pattern is dealt with simple made-to-order system. A specification sheet is available for ordering. Please access SMC website, or consult your nearest sales branch.



Symbol

-XA1 to -XA17

Shaft Pattern Sequencing I

Applicable shaft type: S, W, Y

Additional Reminders

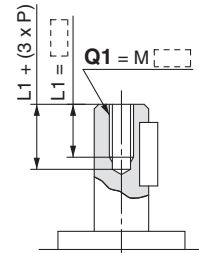
1. Enter the dimensions within a range that allows for additional machining.
2. SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
3. The length of the unthreaded portion is 2 to 3 pitches.
4. Unless specified otherwise, the thread pitch is based on coarse metric threads.
P = Thread pitch
M4 x 0.7, M5 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**

Female threads are machined into the long shaft.
Note) Except flange type

The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M4: L1 = 8

- Applicable shaft type: S, W, Y



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

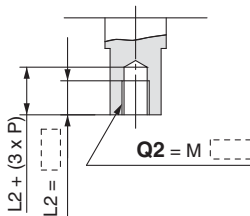
[mm]

Symbol: **A2**

Female threads are machined into the short shaft.
Note) Except flange type

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

- Applicable shaft type: S, W, Y



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

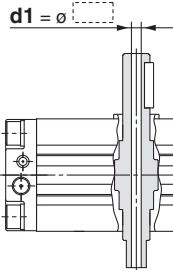
[mm]

Symbol: **A13**

Shaft through-hole
Note) Except flange type

The minimum unit of the dimensions within a range that allows for machining d1 is 0.1.

- Applicable shaft type: S, W, Y



Size	d1
50	ø4 to ø 7
63	ø4 to ø 8
80	ø6.8 to ø11
100	ø6.8 to ø13

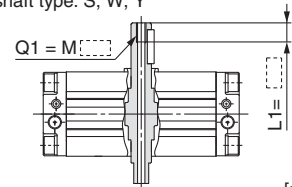
[mm]

Symbol: **A14**

Note) Except flange type

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 M5: L1 = 10

- Applicable shaft type: S, W, Y



Size	50	63	80	100
Thread				
M5 x 0.8	ø4	ø4	—	—
M6 x 1	ø5	ø5	—	—
M8 x 1.25	—	ø6.8	ø 6.8	ø 6.8
M10 x 1.5	—	—	ø 8.5	ø 8.5
M12 x 1.75	—	—	ø10.3	ø10.3
Rc1/8	—	—	ø 8	ø 8
Rc1/4	—	—	—	ø11

[mm]

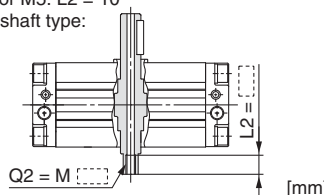
Symbol: **A15**

Note) Except flange type

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 M5: L2 = 10

- Applicable shaft type: S, W, Y



Thread	Size	50	63	80	100
M5 x 0.8		ø4	ø4	—	—
M6 x 1		ø5	ø5	—	—
M8 x 1.25		—	ø6.8	ø 6.8	ø 6.8
M10 x 1.5		—	—	ø 8.5	ø 8.5
M12 x 1.75		—	—	ø10.3	ø10.3
Rc1/8		—	—	ø 8	ø 8
Rc1/4		—	—	—	ø11

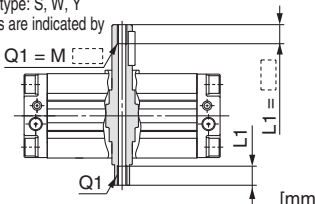
[mm]

Symbol: **A16**

Note) Except flange type

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

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

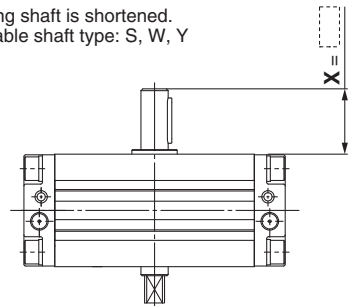


Thread	Size	50	63	80	100
M5 x 0.8		ø4	ø4	—	—
M6 x 1		ø5	ø5	—	—
M8 x 1.25		—	ø6.8	ø 6.8	ø 6.8
M10 x 1.5		—	—	ø 8.5	ø 8.5
M12 x 1.75		—	—	ø10.3	ø10.3
Rc1/8		—	—	ø 8	ø 8
Rc1/4		—	—	—	ø11

[mm]

Symbol: **A17**

- The long shaft is shortened.
- Applicable shaft type: S, W, Y



Size	X
50	18.5 to 36
63	21 to 41
80	25 to 50
100	32.5 to 60

[mm]

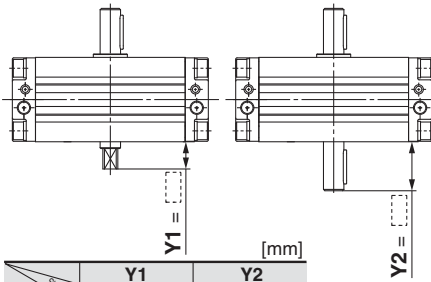
Symbol

-XA18 to -XA24
Shaft Pattern Sequencing I

Applicable shaft type: S, W, Y

Symbol: A18

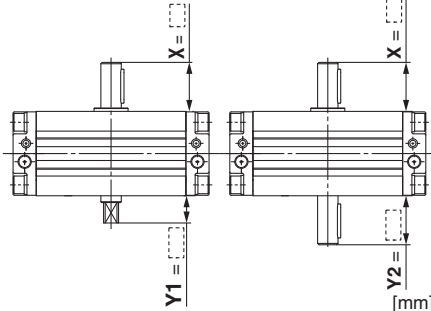
The short shaft is shortened.
• Applicable shaft type: W, Y



Size	Y1	Y2
Shaft type	W	Y
50	1 to 20	18.5 to 36
63	1 to 22	21 to 41
80	1 to 25	25 to 50
100	1 to 30	32.5 to 60

Symbol: A19

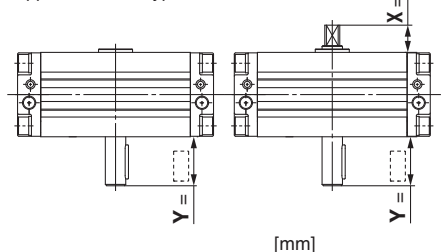
Both the long shaft and short shaft are shortened.
• Applicable shaft type: W, Y




<div>Shaft type</div> <div>Size</div>	X		Y1	Y2
	W	Y	W	Y
50	18.5 to 36		1 to 20	18.5 to 36
63	21 to 41		1 to 22	21 to 41
80	25 to 50		1 to 25	25 to 50
100	32.5 to 60		1 to 30	32.5 to 60

Symbol: A20

The shafts are reversed. Both the long shaft and short shaft can be further shortened.
(If shortening the shaft is not required, indicate "*" for dimension X and Y.)
• Applicable shaft type: S, W

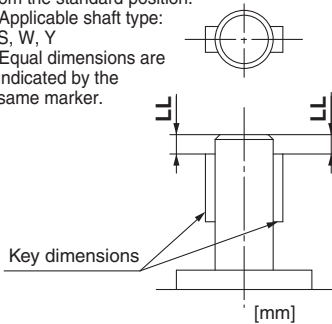


 Size	X	Y	
	W	S	W
50	2 to 11	18.5 to 36	
63	2.5 to 16.5	21 to 41	
80	3 to 20	25 to 50	
100	3 to 22	32.5 to 60	

Symbol: A24

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

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



Size	Keyway dimensions	LL
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

Series CRA1 Simple Specials 3

Shaft shape pattern is dealt with simple made-to-order system. A specification sheet is available for ordering. Please access SMC website, or consult your nearest sales branch.



Symbol

-XA33 to -XA59

Shaft Pattern Sequencing II

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

How to Order

C **D** **RA1** **B** **J** **50** **90** **Z** **M9BW** **X** **A33** **A34** **C8** **C30**

Magnet

—	None
D	Built-in magnet

Mounting

B	Basic type
L	Foot type

Shaft type

X	Single shaft with four chamfers
Z	Double shaft with four chamfers
T	Single round shaft
J	Double shaft (round shaft, with four chamfers)
K	Double round shaft

Size

50
63
80
100

Port type

Port type		50, 63	80	100
—	Rc	1/8	1/4	3/8
TF	G			
TN	NPT			
TT	NPTF			

Rotating angle

90	90°
180	180°
100	100°
190	190°

Air cushion

—	None
C	With air cushion

Auto switch

—	Without auto switch (Built-in magnet)
---	---------------------------------------

* For auto switch model, refer to page 1.
* Auto switches are shipped together, (but not assembled).

Number of auto switches

—	2 pcs.
S	1 pc.

Simple Specials, Made-to-Order symbol

- Refer to Chart (3), (4), (5) when the number of combinations is one or two.
- Combination of XA is possible for up to 2 types.

Combination 3 types

A33	A34	C30
A35	C30	C59

→ Chart (3), (4)
→ Chart (4), (5)

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

Combination 4 types

A33	A34	C30	C59
A45	A46	C30	C61

→ Chart (3), (4), (5)
→ Chart (3), (4), (5)

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.

Symbol

-XA33 to -XA59**Shaft Pattern Sequencing II**

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

Combination Chart of Simple Specials for Shaft-End Shape**Chart (3) Combination between XA□ and XA□**

Symbol	Description	Axial direction		Applicable shaft type					Combination				
		Top	Bottom	X	Z	T	J	K	* Shaft type available for combination.				
XA33	Shaft-end female thread	●	—	—	—	●	●	●	XA33				
XA34	Shaft-end female thread	—	●	—	—	●	●	●	T, J, K*	XA34			
XA35	Shaft-end female thread	●	—	●	●	—	—	—	—	XA35			
XA36	Shaft-end female thread	—	●	●	●	—	—	—	—	X, Z*	XA36		
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 thread	●	●	—	—	●	—	●	—	—	—	—	—
XA44	Shaft through-hole + Double shaft-end female thread	●	●	●	●	—	●	—	—	—	—	—	—
XA45	Middle-cut chamfer	●	—	—	—	●	●	●	T, J, K*	—	—	K*	XA38
XA46	Middle-cut chamfer	—	●	—	—	—	—	●	K*	—	—	K*	XA40 XA41 XA45
XA51	Change of long shaft length (Without keyway)	●	—	—	—	●	●	●	T, J, K*	—	—	K*	T, K* J* K*
XA52	Change of short shaft length (Without keyway)	—	●	—	—	—	—	●	K*	—	—	K*	—
XA53	Change of double shaft length (Both without keyway)	●	●	—	—	—	—	●	—	—	—	K*	—
XA54	Change of long shaft length (With four chamfers)	●	—	●	●	—	—	—	—	—	X, Z*	—	X, Z*
XA55	Change of short shaft length (With four chamfers)	—	●	—	●	—	●	—	J*	—	Z*	J*	J, Z* J*
XA56	Change of double shaft length (Both with four chamfers)	●	●	—	●	—	—	—	—	—	—	Z*	—
XA57	Change of double shaft length (Without keyway, With four chamfers)	●	●	—	—	—	●	—	—	—	—	J*	—
XA58	Reversed shaft, Change of shaft length (With four chamfers, Without keyway)	●	●	—	—	●	●	—	—	—	—	T*	J*
XA59	Reversed shaft, Change of shaft length (With four chamfers)	—	●	●	—	—	—	—	—	—	—	X*	—

Combination Chart of Made to Order**Chart (4) Combination between XA□ and XC□**

Symbol	Description	Applicable shaft type					Combination	
		X	Z	T	J	K	XA33 to 38, 40 to 46, 51 to 59	
XC7	Reversed shaft	●	—	●	●	—	—	
XC8 to XC11	Change of rotation range	—	—	—	—	—	—	
XC30	Changed to fluorine grease	●	●	●	●	●	●	
XC31 to XC36	Change of rotation range and shaft rotation direction	—	—	—	—	—	—	
XC59 to XC61	Change of port location	●	●	●	●	●	●	

Series CRA1 Simple Specials 4

Shaft shape pattern is dealt with simple made-to-order system. A specification sheet is available for ordering. Please access SMC website, or consult your nearest sales branch.



Symbol

-XA33 to -XA41

Shaft Pattern Sequencing II

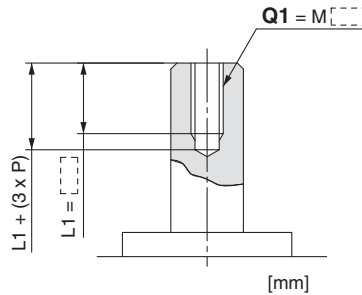
Applicable shaft type: X, Z, T, J, K

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
M4 x 0.7, M5 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 Female threads are machined into the long shaft.
Note) Except flange type

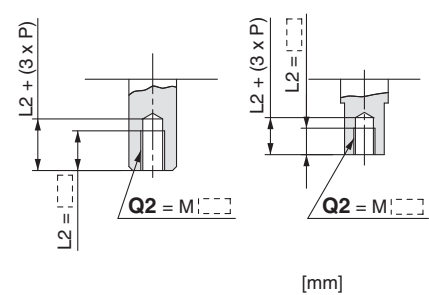
The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M4: L1 = 8
• Applicable shaft type: J, K, T



Size	Q1
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 Female threads are machined into the short shaft.
Note) Except flange type

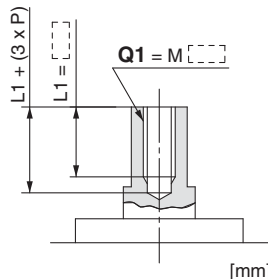
The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M4: L2 = 8
• Applicable shaft type: J, K, T



Size	Q2
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 Female threads are machined into the long shaft.
Note) Except flange type

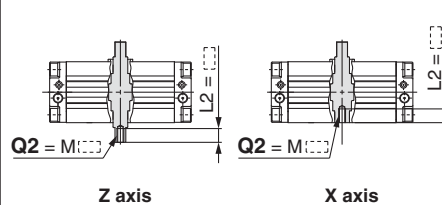
The maximum dimension L1 is, as a rule, twice the thread size.
(Example) For M4: L1 = 8
• Applicable shaft type: X, Z



Size	Q1
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 Female threads are machined into the short shaft.
Note) Except flange type

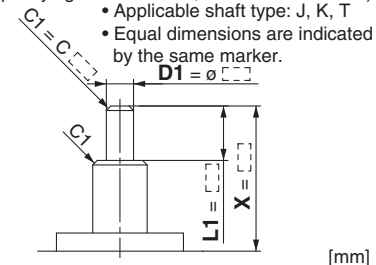
The maximum dimension L2 is, as a rule, twice the thread size.
(Example) For M4: L2 = 8
• Applicable shaft type: X, Z



Size	Q2
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 type

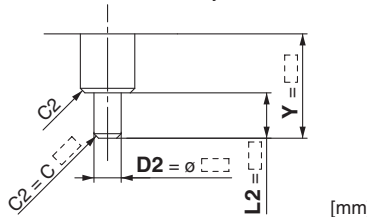
The long shaft can be further shortened by machining it into a stepped round shaft.
• The minimum unit of the dimensions within a range that allows for machining is 0.1.
(If shortening the shaft is not required, indicate "*" for dimension X.)
(If not specifying dimension C1, indicate "*" instead.)
• Applicable shaft type: J, K, T
• Equal dimensions are indicated by the same marker.



Size	X	L1 max	D1
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 type

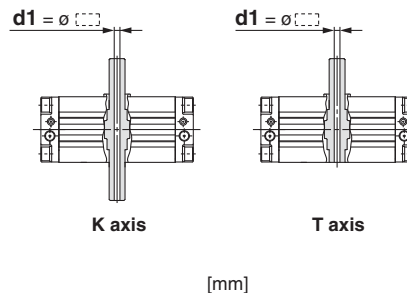
The short shaft can be further shortened by machining it into a stepped round shaft.
• The minimum unit of the dimensions within a range that allows for machining is 0.1.
(If shortening the shaft is not required, indicate "*" for dimension Y.)
(If not specifying dimension C2, indicate "*" instead.)
• Applicable shaft type: K
• Equal dimensions are indicated by the same marker.



Size	Y	L2 max	D2
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 through-hole
Note) Except flange type

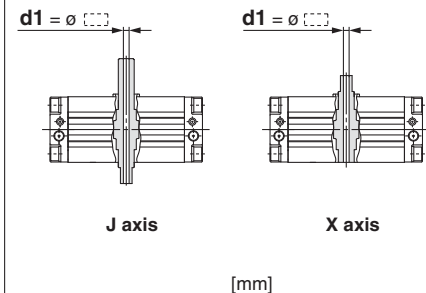
• The minimum unit of the dimensions within a range that allows for machining d1 is 0.1.
• Applicable shaft type: K, T



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

Symbol: A41 Shaft through-hole
Note) Except flange type

• The minimum unit of the dimensions within a range that allows for machining d1 is 0.1.
• Applicable shaft type: J, X, Z



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

Symbol

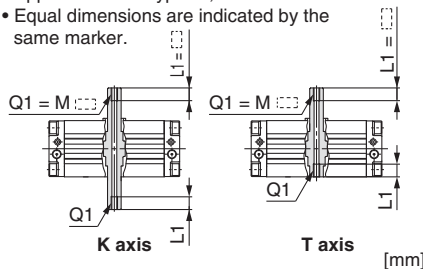
-XA43 to -XA55

Shaft Pattern Sequencing II

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

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

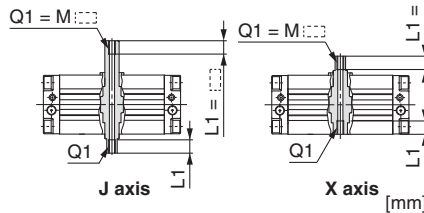
- Applicable shaft type: K, T
- Equal dimensions are indicated by the same marker.



Thread	Size	50	63	80	100
M5 x 0.8	ø4	ø4	—	—	—
M6 x 1	ø5	ø5	—	—	—
M8 x 1.25	—	ø6.8	ø 6.8	ø 6.8	—
M10 x 1.5	—	—	ø 8.5	ø 8.5	—
M12 x 1.75	—	—	ø10.3	ø10.3	—
Rc1/8	—	—	ø 8	ø 8	—
Rc1/4	—	—	—	ø11	—

Symbol: A44 Note) Except flange type

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

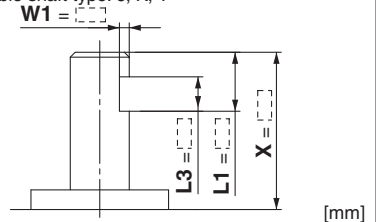


Thread	Size	50	63	80	100
M5 x 0.8	ø4	ø4	—	—	—
M6 x 1	ø5	ø5	—	—	—
M8 x 1.25	—	ø6.8	ø 6.8	ø 6.8	—
M10 x 1.5	—	—	ø 8.5	ø 8.5	—
M12 x 1.75	—	—	ø10.3	ø10.3	—
Rc1/8	—	—	ø 8	ø 8	—
Rc1/4	—	—	—	ø11	—

Symbol: A45 Note) Except flange type

The long shaft can be further shortened by machining a middle-cut chamfer into it.

- The minimum unit of the dimensions within a range that allows for machining is 0.1.
(The position of the middle-cut chamfer is on the standard chamfer at the keyway portion.)
(If shortening the shaft is not required, indicate "*" for dimension X.)
- Applicable shaft type: J, K, T

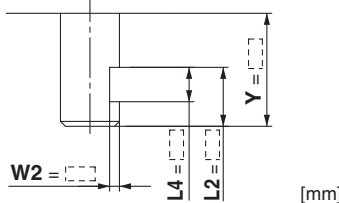


Size	X	W1	L1 max	L3 max
50	12.5 to 36	1 to 5.5	X-2.5	L1-2
63	13.5 to 41	1 to 6.5	X-2.5	L1-2
80	16.5 to 50	1 to 8	X-3	L1-3
100	21 to 60	1.5 to 10.5	X-4	L1-4

Symbol: A46 Note) Except flange type

The short shaft can be further shortened by machining a middle-cut chamfer into it.

- The minimum unit of the dimensions within a range that allows for machining is 0.1.
(The position of the middle-cut chamfer is on the standard chamfer at the keyway portion.)
(If shortening the shaft is not required, indicate "*" for dimension Y.)
- Applicable shaft type: K

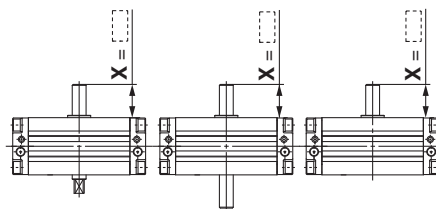


Size	Y	W2	L2 max	L4 max
50	10 to 36	1 to 5.5	Y	L2-2
63	11 to 41	1 to 6.5	Y	L2-2
80	13.5 to 50	1 to 8	Y	L2-3
100	17 to 60	1.5 to 10.5	Y	L2-4

Symbol: A51

The long shaft is shortened.

- Applicable shaft type: J, K, T

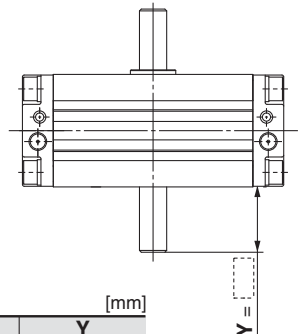


Size	X
50	3.5 to 36
63	3.5 to 41
80	4 to 50
100	5 to 60

Symbol: A52

The short shaft is shortened.

- Applicable shaft type: K

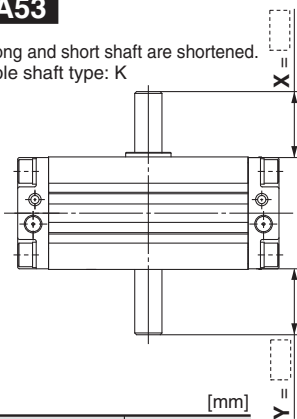


Size	Y
50	1 to 36
63	1 to 41
80	1 to 50
100	1 to 60

Symbol: A53

Both the long and short shaft are shortened.

- Applicable shaft type: K

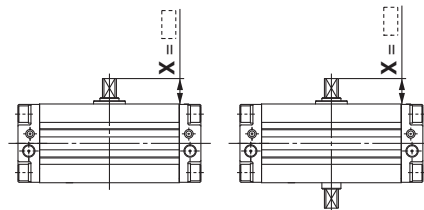


Size	X	Y
50	3.5 to 36	1 to 36
63	3.5 to 41	1 to 41
80	4 to 50	1 to 50
100	5 to 60	1 to 60

Symbol: A54

The long shaft is shortened.

- Applicable shaft type: X, Z

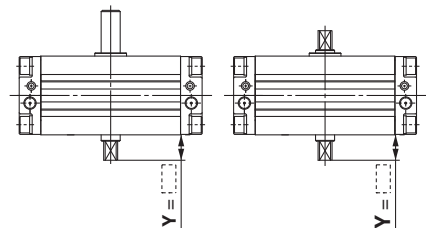


Size	X
50	3.5 to 27
63	3.5 to 29
80	4 to 38
100	5 to 44

Symbol: A55

The short shaft is shortened.

- Applicable shaft type: J, Z



Size	Y
50	1 to 20
63	1 to 22
80	1 to 25
100	1 to 30

Series CRA1 Simple Specials 5

Shaft shape pattern is dealt with simple made-to-order system. A specification sheet is available for ordering. Please access SMC website, or consult your nearest sales branch.



Symbol

-XA56 to -XA59

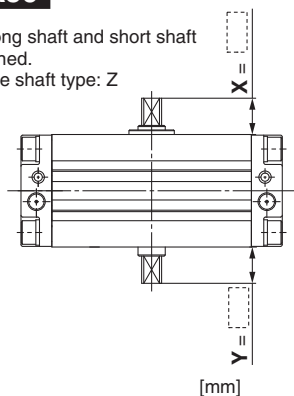
Shaft Pattern Sequencing II

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

Symbol: A56

Both the long shaft and short shaft are shortened.

- Applicable shaft type: Z

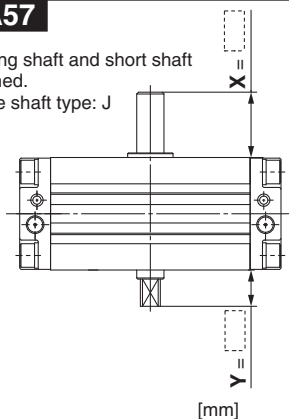


Size	X	Y
50	3.5 to 27	1 to 20
63	3.5 to 29	1 to 22
80	4 to 38	1 to 25
100	5 to 44	1 to 30

Symbol: A57

Both the long shaft and short shaft are shortened.

- Applicable shaft type: J

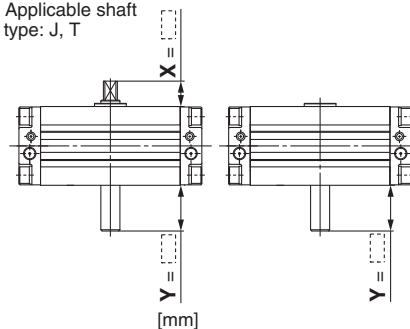


Size	X	Y
50	3.5 to 36	1 to 20
63	3.5 to 41	1 to 22
80	4 to 50	1 to 25
100	5 to 60	1 to 30

Symbol: A58

The shafts are reversed, and both the long shaft and short shaft are shortened.

- Applicable shaft type: J, T

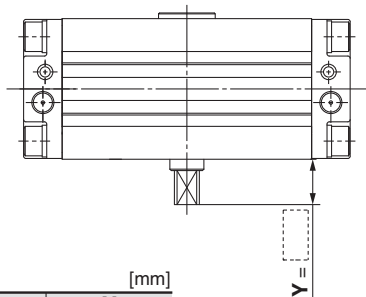


Size	Y
50	1 to 36
63	1 to 41
80	1 to 50
100	1 to 60

Symbol: A59

The shafts are reversed, and both the long shaft and short shaft are shortened.

- Applicable shaft type: X



Size	Y
50	1 to 27
63	1 to 29
80	1 to 38
100	1 to 44

Series CRA1

Made to Order 1

Please contact SMC for further details about dimensions, specifications and delivery.



How to Order

C **D** **RA1** **B** **S** **50** **—** **90** **—** **Z** **—** **M9BW** **—** **X** **C8** **C30** **C59**

Magnet

—	None
D	Built-in magnet

Mounting

B	Basic type
L	Foot type
F	Flange type

Shaft type

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

Size

50
63
80
100

Rotating angle

90	90°
180	180°
100	100°
190	190°

Port type

Port type		50, 63	80	100
—	Rc	1/8	1/4	3/8
TF	G			
TN	NPT			
TT	NPTF			

Simple Specials, Made-to-Order symbol

- When the number of combinations are one or two, refer to Chart (5).
- Combination of XA is possible for up to 2 types.

Combination 3 types

C7 **C30** **C59** → Chart (5)

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 3 types.

* Above is the typical example of combination.

Number of auto switches

—	2 pcs.
S	1 pc.

Auto switch

—	Without auto switch (Built-in magnet)
---	---------------------------------------

* For auto switch model refer to page 1.

* Auto switches are shipped together, (but not assembled).

Air cushion

—	None
C	With air cushion

Combination Chart of Made to Order

Chart (5) Combination between XA□ and XC□

Symbol	Description	Applicable shaft type								Combination				
		S	W	X	Y	Z	T	J	K					
XC7	Reversed shaft	●	●	●	—	—	●	●	—	XC7	* Shaft type available for combination.			
XC8 to XC11	Change of rotation range	●	●	—	●	—	—	—	—	—				
XC30	Changed to fluorine grease	●	●	●	●	●	●	●	●	S,W,X,T,J*	S,W,Y*	XC30		
XC31 to XC36	Changes of rotation range and shaft location direction	●	●	—	●	—	—	—	—	—	—	S,W,Y*	XC31 to XC36	
XC59 to XC61	Change of port location	●	●	●	●	●	●	●	●	S,W,X,T,J*	●	●	S,W,Y*	XC59 to XC61

Series CRA1

Made to Order 2

Please contact SMC for further details about dimensions, specifications and delivery.



1 Reversed Shaft Symbol -XC7

CRA1 Refer to "How to Order" on page 1. - XC7

Reversed shaft (-XC7)

Specifications

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

2 Change of Rotation Range Symbol -XC8 to -XC11

CRA1 Refer to "How to Order" on page 1. - XC8

Change of rotation range (-XC8 to -XC11)

Specifications

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

The patterns with the rotation range of 90° and 180° are applicable to the respective patterns with the rotation range of 100° and 190° of the semi-standard specifications.

Symbol: C7

Rotation range of keyway 90°+4°/0°

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

Symbol: C8

The rotation range is changed.

Rotation range of keyway 90°+4°/0°

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

Symbol: C9

The rotation range is changed.

Rotation range of keyway 90°+4°/0°

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

Symbol: C10

The rotation range is changed.

Rotation range of keyway 90°+4°/0°

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

Symbol: C11

The rotation range is changed.

Rotation range of keyway 180°+4°/0°

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

3 Changed to Fluorine Grease Symbol -XC30

CRA1 Refer to "How to Order" on page 1. - XC30

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

Changed to fluorine grease

Specifications

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

* Refer to page 2 for other specifications.

Symbol

-XC31 to -XC36

4 Change of Rotation Range and Shaft Rotation Direction

CRA1 Refer to “How to Order” on page 1. **- XC31**

Specifications

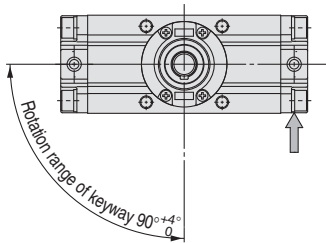
Applicable size	50, 63, 80, 100
Applicable shaft type	S, W, Y

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

The patterns with the rotation range of 90° and 180° are applicable to the respective patterns with the rotation range of 100° and 190° of the semi-standard specifications.

Symbol: C31

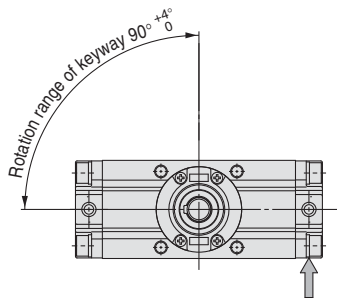
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C32

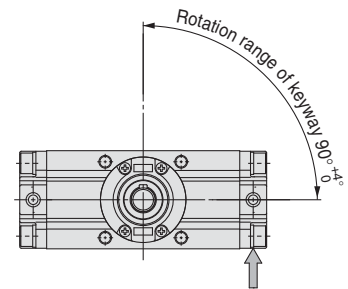
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C33

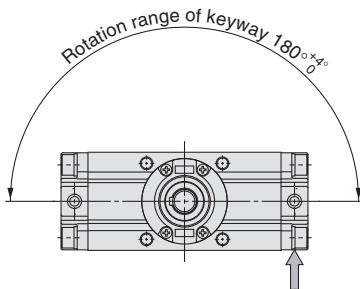
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C34

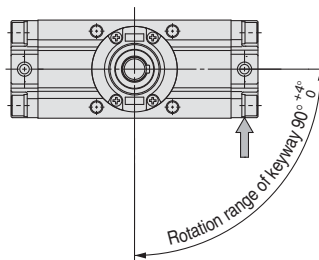
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C35

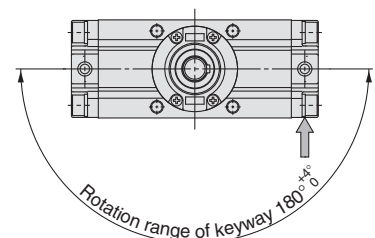
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C36

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



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

Series **CRA1**

Made to Order 3

Please contact SMC for further details about dimensions, specifications and delivery.



Symbol

5 Change of Port Location (Mounting location of the cover is changed.)

-XC59 to -XC61

CRA1 Refer to “How to Order” on page 1. – **XC59**

Specifications

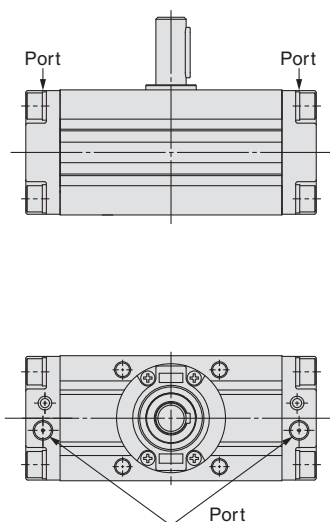
Applicable size	50, 63, 80, 100
Applicable shaft type	S, W, X, Y Z, T, J, K

Change of port location
(-XC59 to -XC61)

The patterns with the rotation range of 90° and 180° are applicable to the respective patterns with the rotation range of 100° and 190° of the semi-standard specifications.

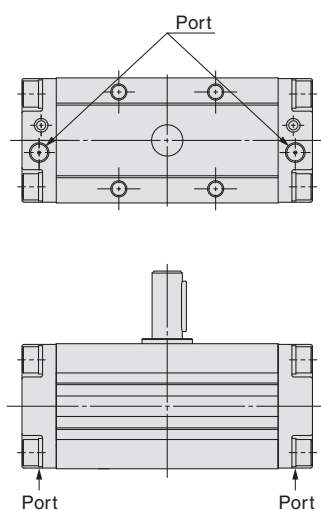
Symbol: C59

The port direction is changed. (Upward)



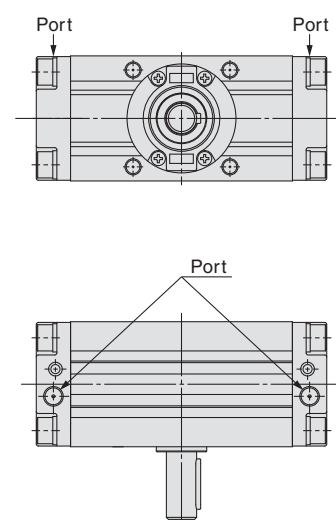
Symbol: C60

The port direction is changed. (Downward)






Symbol: C61

The port direction is changed. (Backward)



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

Warning

- The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 - The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 - When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 - Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
 - An application which could have negative effects on people, property, or animals requiring special safety analysis.
 - Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

- The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation (Europe)

Austria	☎+43 (0)2262622800	www.smc.at	office@smc.at
Belgium	☎+32 (0)33551464	www.smc-pneumatics.be	info@smc-pneumatics.be
Bulgaria	☎+359 (0)2807670	www.smc.bg	office@smc.bg
Croatia	☎+385 (0)13707288	www.smc.hr	office@smc.hr
Czech Republic	☎+420 541424611	www.smc.cz	office@smc.cz
Denmark	☎+45 70252900	www.smc.dk.com	smc@smcdk.com
Estonia	☎+372 6510370	www.smc-pneumatics.ee	smc@smc-pneumatics.ee
Finland	☎+358 207513513	www.smc.fi	smc@smc.fi
France	☎+33 (0)164761000	www.smc-france.fr	promotion@smc-france.fr
Germany	☎+49 (0)61034020	www.smc.de	info@smc.de
Greece	☎+30 210 2717265	www.smc-hellas.gr	sales@smc-hellas.gr
Hungary	☎+36 23511390	www.smc.hu	office@smc.hu
Ireland	☎+353 (0)14039000	www.smc-pneumatics.ie	sales@smc-pneumatics.ie
Italy	☎+39 0292711	www.smc-italia.it	mailbox@smc-italia.it
Latvia	☎+371 67817700	www.smc.lv	info@smc.lv

Lithuania	☎+370 5 2308118	www.smc.lt	info@smc.lt
Netherlands	☎+31 (0)205318888	www.smc-pneumatics.nl	info@smc-pneumatics.nl
Norway	☎+47 67129020	www.smc-norge.no	post@smc-norge.no
Poland	☎+48 (0)222119616	www.smc.pl	office@smc.pl
Portugal	☎+351 226166570	www.smc.eu	post@smc-smc.es
Romania	☎+40 213205111	www.smc-romania.ro	smcromania@smc-romania.ro
Russia	☎+7 8127185445	www.smc-pneumatik.ru	info@smc-pneumatik.ru
Slovakia	☎+421 (0)413213212	www.smc.sk	office@smc.sk
Slovenia	☎+386 (0)73885412	www.smc.si	office@smc.si
Spain	☎+34 902184100	www.smc.eu	post@smc-smc.es
Sweden	☎+46 (0)86031200	www.smc.nu	post@smc.nu
Switzerland	☎+41 (0)523963131	www.smc.ch	info@smc.ch
Turkey	☎+90 212 489 0 440	www.smc-pneumatik.com.tr	info@smc-pneumatik.com.tr
UK	☎+44 (0)845 121 5122	www.smc-pneumatics.co.uk	sales@smc-pneumatics.co.uk