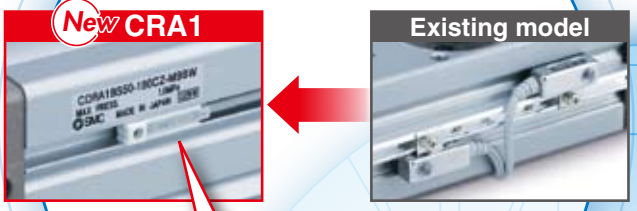
Rotary Actuator

ø50, ø63, ø80, ø100

New

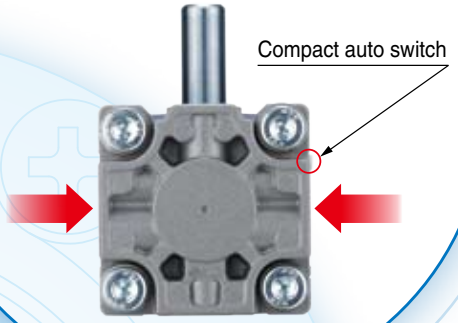
RoHS

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

SMC

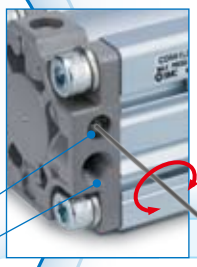
CAT.ES20-232A

Series CRA1 ø50, ø63, ø80, ø100

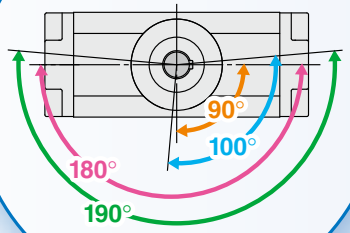
Easy adjustment of cushion valve

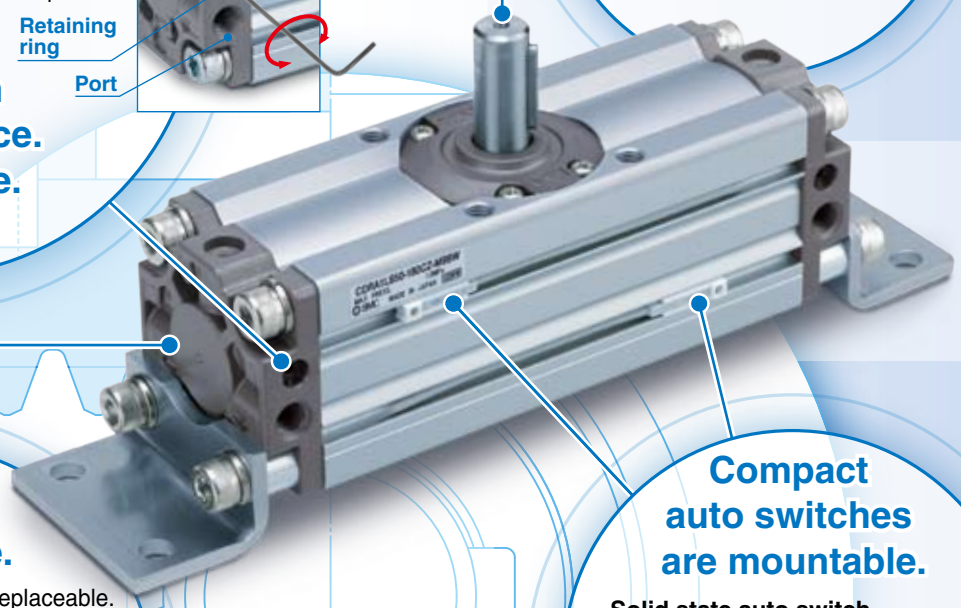
- Cushion valve shape is changed so it can be adjusted using a hexagon wrench only.
- No protrusion from the body.
- Retaining ring is used to prevent drop-out.

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



Rotating angle





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□**

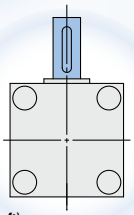
Many variations of shaft type

New Series CRA1
Standard: 8 types

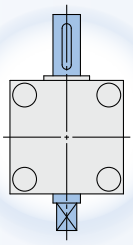
Existing model
Standard: 2 types
Semi-standard: 6 types

- 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).

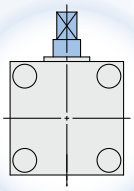
Single shaft: **CRA1BS**



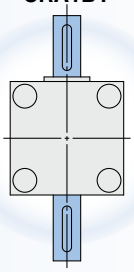
Double shaft: **CRA1BW**



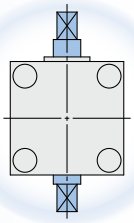
Single shaft with four chamfers: **CRA1BX**



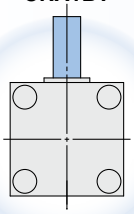
Double shaft with key: **CRA1BY**



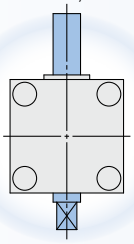
Double shaft with four chamfers: **CRA1BZ**



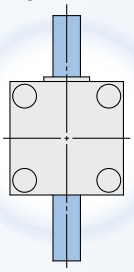
Single round shaft: **CRA1BT**



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



Double round shaft: **CRA1BK**



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

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		●	●	●	●				
		With solenoid valve		●	●	●	●				
		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		●	●	●	●	●				

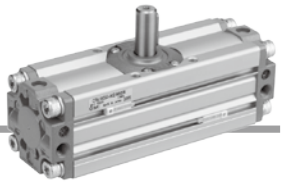
Refer to SMC Best Pneumatics No. 4 for details on ●.

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

Nil	None
C	With air cushion

Number of auto switches

Nil	2 pcs.
S	1 pc.

Note) Up to two auto switches are mountable.

Auto switch

Nil	Without auto switch (Built-in magnet)

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

Made to Order
Refer to page 2.

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.

Port type

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

Size

50
63
80
100

Applicable Auto Switches/Refer to Best Pneumatics No.4 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
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		12 V		**M9BV**	**M9B**	●	●	●	○	○	—	
	Diagnosis indication (2-color indication)			3-wire (NPN)		5 V,12 V		**M9NWV**	**M9NW**	●	●	●	○	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	○	—	
	Water resistant (2-color indication)			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**	●	—	●	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	—	●	—	—	—	Relay, PLC
							100 V or less	**A90V**	**A90**	●	—	●	—	—	IC circuit	

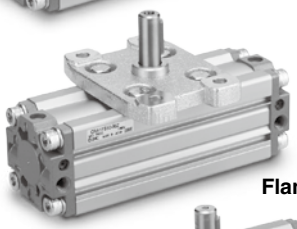
** Although it is possible to mount water resistant type auto switches, note that the rotary actuator itself is not of water resistant construction.

* Lead wire length symbols: 0.5 m····· Nil (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).

Made to Order Refer to Best Pneumatics No.4 for detailed solid state auto switches with pre-wired connectors.

Basic type



Flange type

Foot type

Specifications

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

(N·m)

Size	Operating pressure (MPa)									
	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

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	Cushion angle 35°	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 optimized.

Weights

(kg)

Size	Standard weight		Additional weight		
	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.

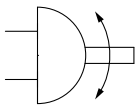
Size	Foot bracket	Contents	Mounting screw size included in foot bracket
50	CRA1L50-Y-1Z	Foot bracket: 2 pcs. Mounting screw: 4 pcs. Collar: 4 pcs.	M8 x 1.25 x 35
63	CRA1L63-Y-1Z		M10 x 1.5 x 40
80	CRA1L80-Y-1Z		M12 x 1.75 x 50
100	CRA1L100-Y-1Z		M12 x 1.75 x 50

Made to Order

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

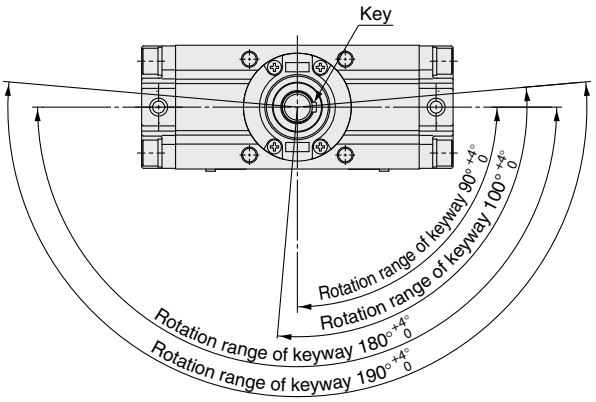
Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft pattern sequencing I	S, W, Y
XA33 to XA59	Shaft pattern sequencing II	X, Z, T, J, K
XC7	Reversed shaft	S, W, X, T, J
XC8 to XC11	Change of rotation range	S, W, Y
XC30	Changed to fluorine grease	S, W, X, Y Z, T, J, K
XC31 to XC36	Change of rotation 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

JIS Symbol



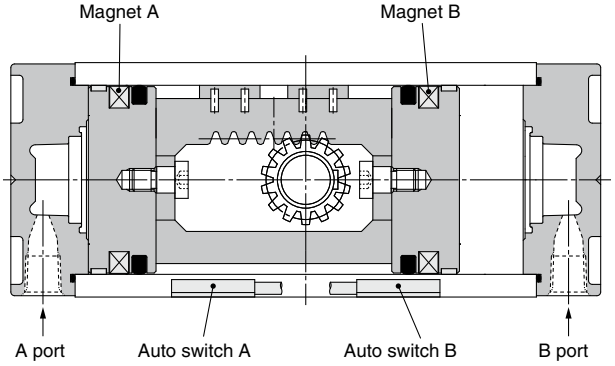
Rotation Range of Keyway/Auto Switch Mounting Position

Size: 50 to 100
CDRA1□□50 to 100



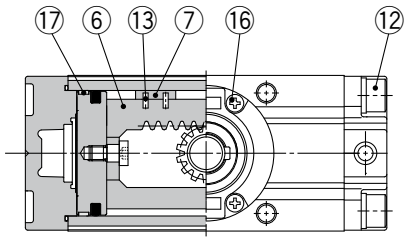
Working Principle

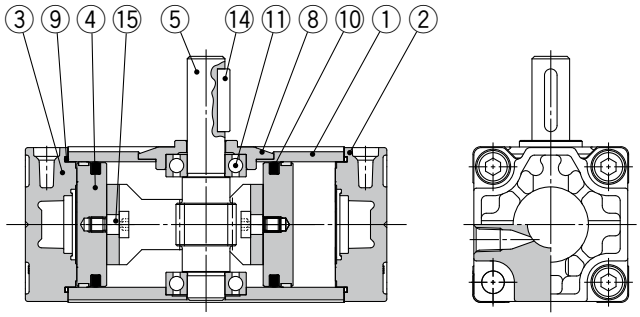
In the diagram below, the auto switch B is ON. When pressure is applied from A, the piston moves to B, causing the shaft to rotate clockwise. At this time, the magnet B goes out of the movement range of the auto switch B, causing the auto switch B to turn OFF. Furthermore, the piston moves to the right,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



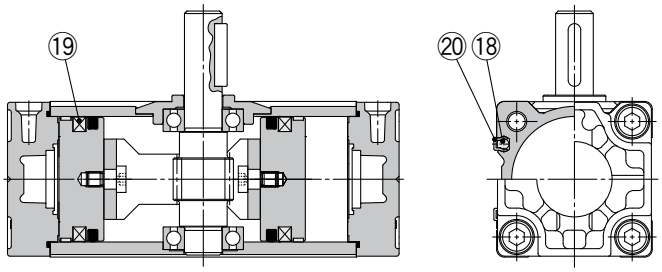
Construction

Without air cushion

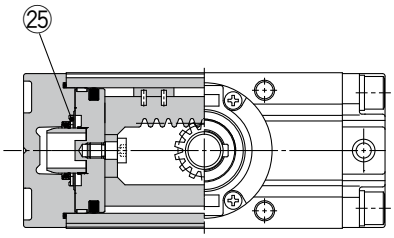


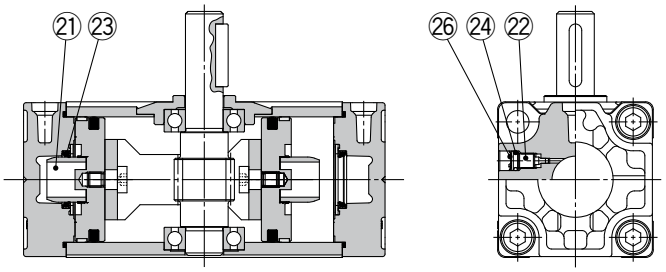


Without air cushion With auto switch



With air cushion





Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Right cover**	Aluminum alloy	Metallic coating
3	**Left cover**	Aluminum alloy	Metallic coating
4	**Piston**	Aluminum alloy	
5	**Shaft**	Alloy steel	
6	**Rack**	Carbon steel	Nitrided
7	**Slider**	Resin	
8	**Bearing retainer**	Aluminum 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**	Aluminum alloy	Anodized
22	**Cushion valve**	Steel	Zinc chromated
23	**Cushion seal**	Urethane	
24	**O-ring**	NBR	
25	**Seal retainer**	Steel	
26	**Retaining ring**	Steel	

Replacement Parts (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

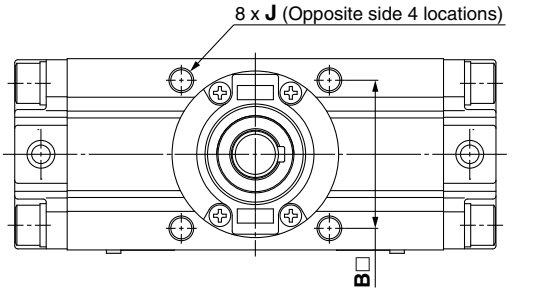
Note) When ordering spare parts, write “1” for one set of the parts per actuator.
∗ For model with air cushion

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)

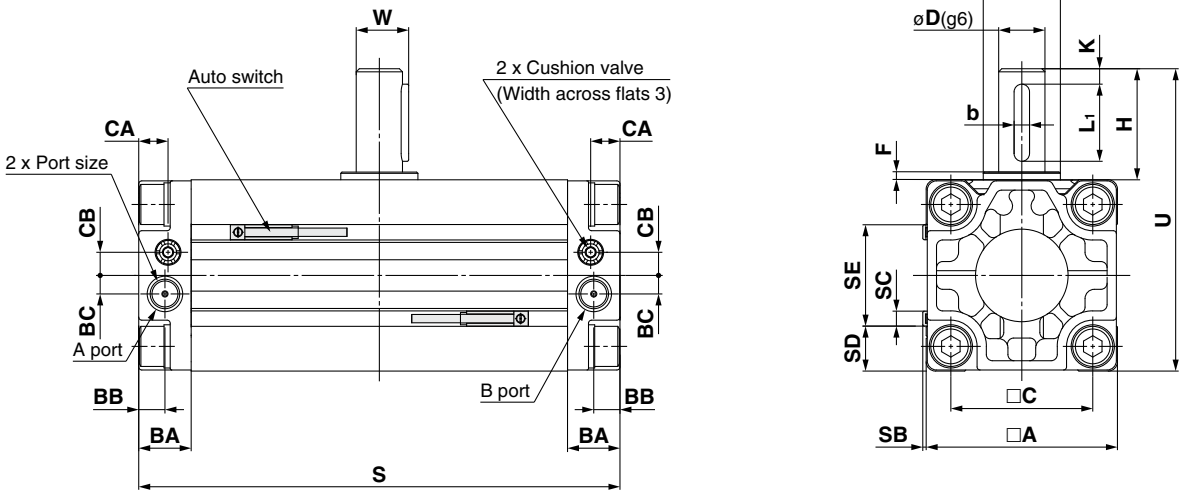
Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

Single shaft: C□RA1BS



Single shaft



• The dimensions above show pressurization 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 Note1)	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 2)	
											S	SB	SC	SD	SE	S								b	L1
C□RA1BS50	Rc1/8	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	Rc1/8	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	Rc1/4	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	Rc3/8	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 1) In addition to Rc, G, NPT and NPTF are also available.
Note 2) A parallel key is included in the same package, (but not assembled).

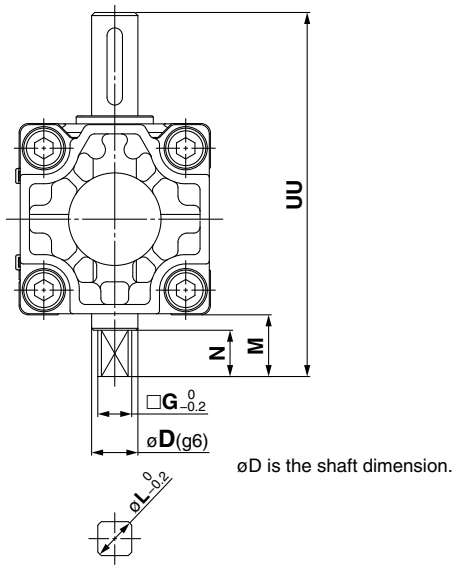
⋆ For model with air cushion

Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

Double shaft: C□RA1BW

Double shaft

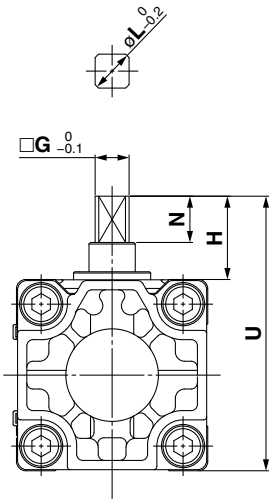


øD is the shaft dimension.

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

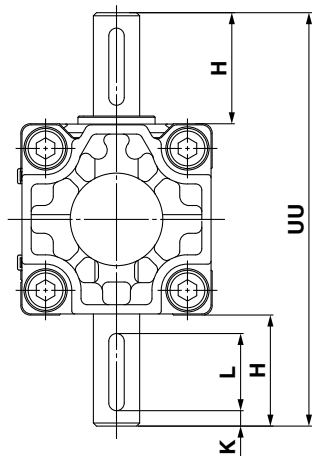
Single shaft with four chamfers: C□RA1BX□



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

Model	G	H	N	U	L
C□RA1BX□50	11	27	15	89	14
C□RA1BX□63	13	29	17	105	16
C□RA1BX□80	15	38	20	130	19
C□RA1BX□100	19	44	25	156	24

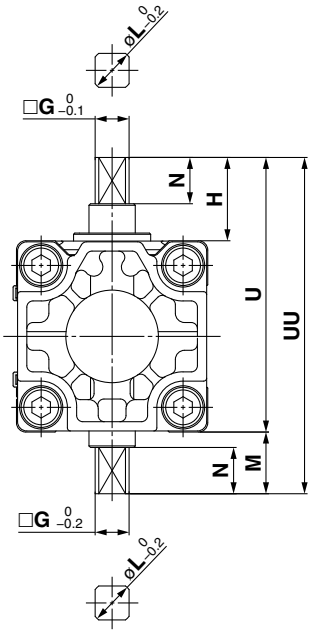
Double shaft with key: C□RA1BY□



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

Model	H	K	UU	L
C□RA1BY□50	36	5	134	25
C□RA1BY□63	41	5	158	30
C□RA1BY□80	50	5	192	40
C□RA1BY□100	60	5	232	45

Double shaft with four chamfers: C□RA1BZ□



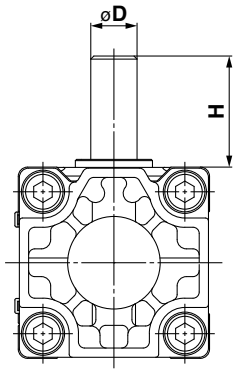
Note) Other dimensions are the same as the single shaft type.

Model	G	H	M	N	U	UU	L
C□RA1BZ□50	11	27	20	15	89	109	14
C□RA1BZ□63	13	29	22	17	105	127	16
C□RA1BZ□80	15	38	25	20	130	155	19
C□RA1BZ□100	19	44	30	25	156	186	24

Dimensions/Basic Type: C□RA1B□

Size: 50/63/80/100

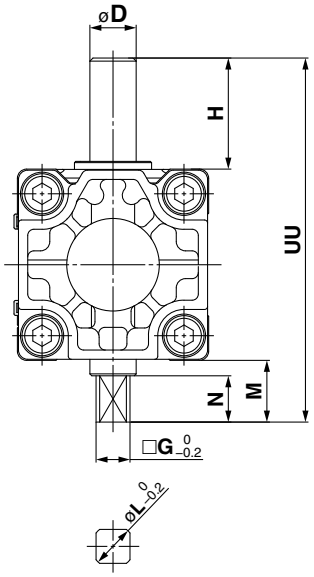
Single round shaft: C□RA1BT



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

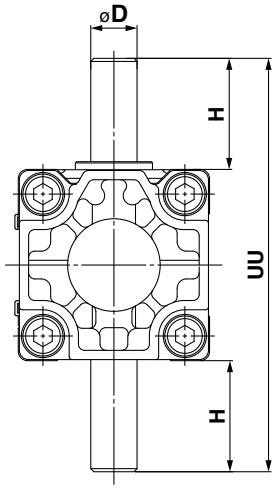
Double shaft (round shaft, with four chamfers): C□RA1BJ



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



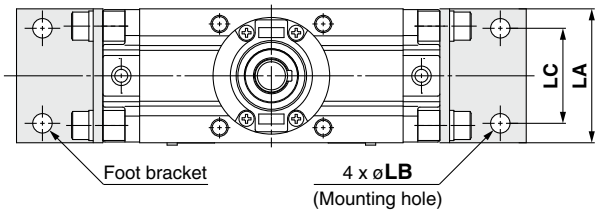
Note) Other dimensions are the same as the single shaft type.

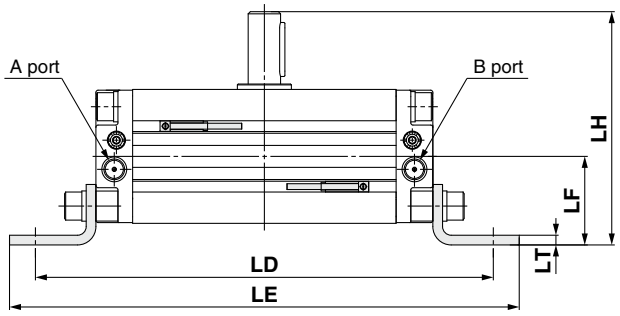
Model	D (g6)	H	UU
C□RA1BK50	15	36	134
C□RA1BK63	17	41	158
C□RA1BK80	20	50	192
C□RA1BK100	25	60	232

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

Size: 50/63/80/100

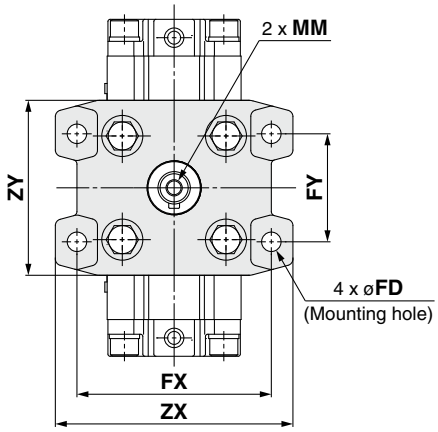
Foot type: C□RA1L□

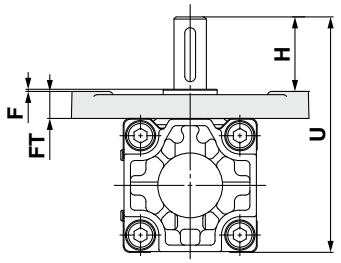




Flange type

Single shaft: C□RA1FS





• Dimensions above show pressurization 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

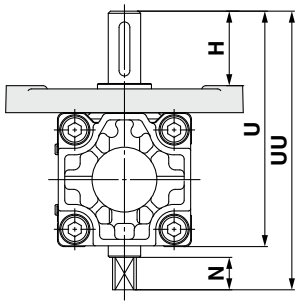
Note) Other dimensions are the same as the basic type.

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

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

Size: 50/63/80/100

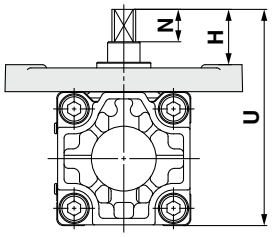
Flange type
Double shaft: C□RA1FW



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

Model	H	N	U	UU
C□RA1FW□50	39	15	114	134
C□RA1FW□63	45	17	136	158
C□RA1FW□80	55	20	165	190
C□RA1FW□100	60	25	190	220

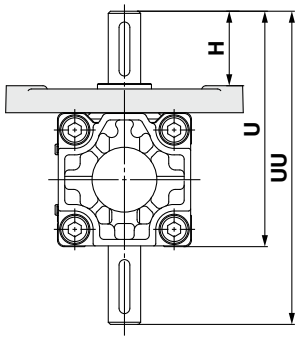
Flange type
Single shaft with four chamfers: C□RA1FX



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

Model	H	N	U
C□RA1FX□50	30	15	105
C□RA1FX□63	33	17	124
C□RA1FX□80	43	20	153
C□RA1FX□100	44	25	174

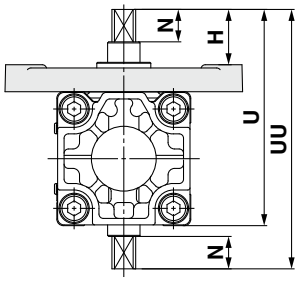
Flange type
Double shaft with key: C□RA1FY



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

Model	H	U	UU
C□RA1FY□50	39	114	150
C□RA1FY□63	45	136	177
C□RA1FY□80	55	165	215
C□RA1FY□100	60	190	250

Flange type
Double shaft with four chamfers: C□RA1FZ



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

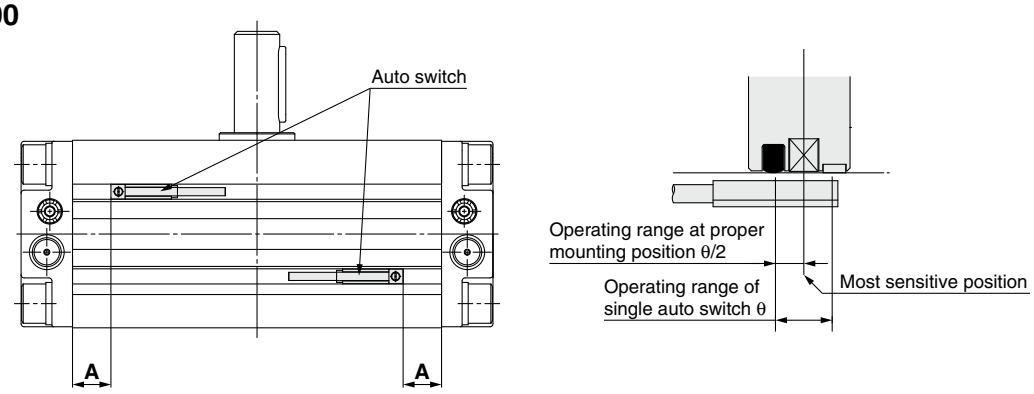
Model	H	N	U	UU
C□RA1FZ□50	30	15	105	125
C□RA1FZ□63	33	17	124	146
C□RA1FZ□80	43	20	153	178
C□RA1FZ□100	44	25	174	204

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

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	
Model	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.

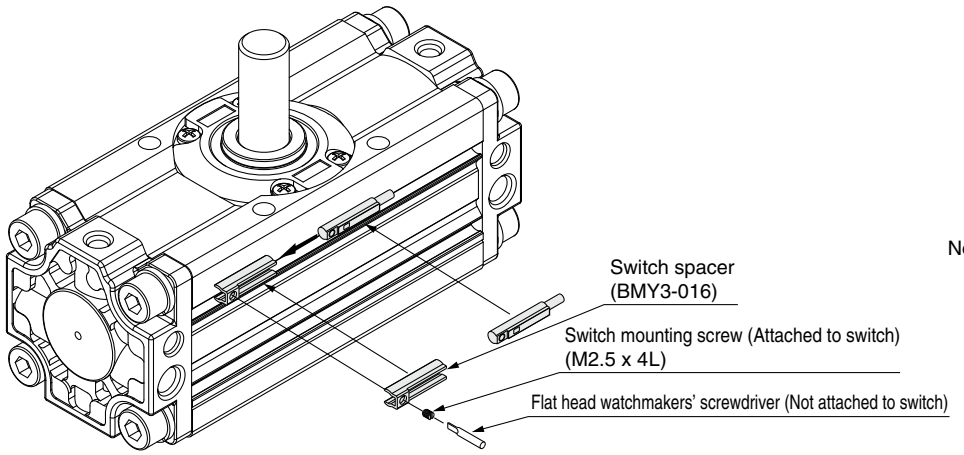
Switch Spacer Part No.

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.

Made to Order

Symbol

Shaft Pattern Sequencing I — -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

Nil	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				
Size		50, 63	80	100
Nil	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

Nil	None
C	With air cushion

Auto switch

Nil	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

Nil	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	→ Chart (1), (2)
A13	C8	C59	→ Chart (2), (5)

• Combination of applicable chart

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

• Combination 4 types

A1	A2	C8	C59	→ Chart (1), (2), (5)
A2	A24	C10	C60	→ Chart (1), (2), (5)

• Combination of applicable chart

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.

Made to Order

Symbol

Shaft Pattern Sequencing I — -XA1 to -XA17

Applicable shaft type: S, W, Y

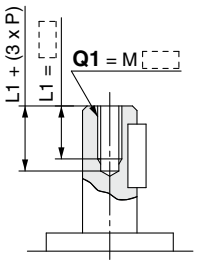
Additional Reminders

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



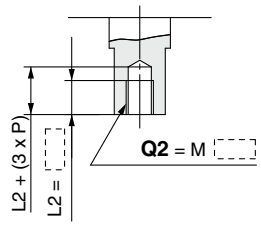
(mm)

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

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



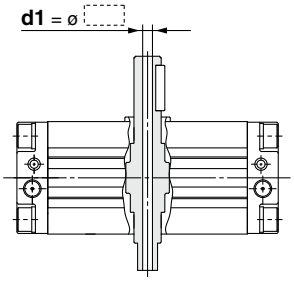
(mm)

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

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



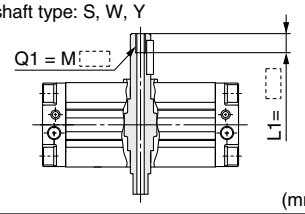
(mm)

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

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



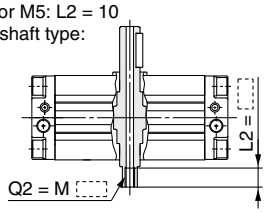
(mm)

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: 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



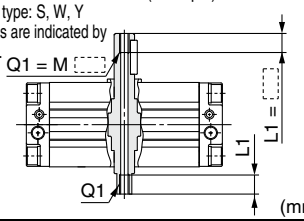
(mm)

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: 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.

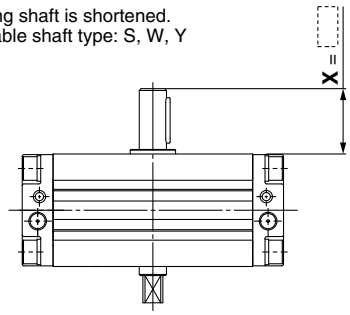


(mm)

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: A17

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



(mm)

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

SMC

Symbol

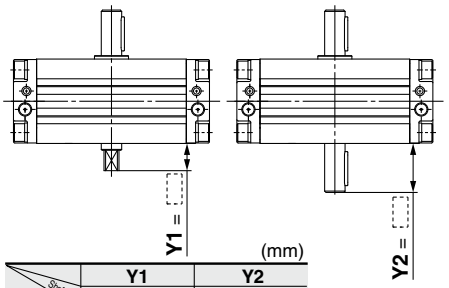
Shaft Pattern Sequencing I

-XA18 to -XA24

Applicable shaft type: S, W, Y

Symbol: A18

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

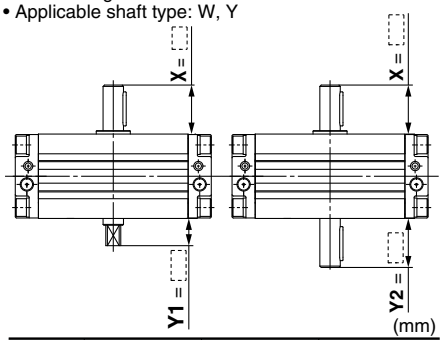


(mm)

Size \ Shaft type	Y1	Y2
	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

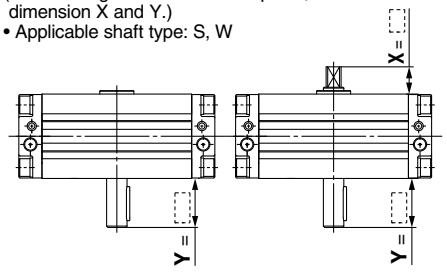


(mm)

Size \ Shaft type	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

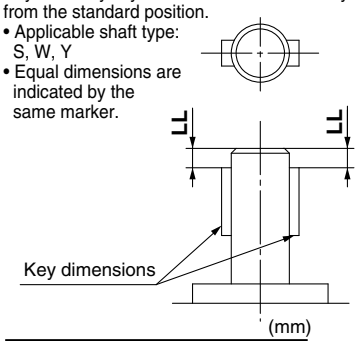


(mm)

Size \ Shaft type	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.



(mm)

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.

Made to Order

Symbol

Shaft Pattern Sequencing II — -XA33 to -XA59

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

Nil	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				
Size		50, 63	80	100
Nil	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

Nil	None
C	With air cushion

Auto switch

Nil	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

Nil	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**	→ Chart (3), (4)
A35	**C30**	**C59**	→ Chart (4), (5)

• Combination of applicable chart

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

• Combination 4 types

A33	**A34**	**C30**	**C59**	→ Chart (3), (4), (5)
A45	**A46**	**C30**	**C61**	→ Chart (3), (4), (5)

• Combination of applicable chart

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 II

-XA33 to -XA59

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	●	●	●	●	—	●	—	—	—	—	—	—	**XA38**				
XA45	Middle-cut chamfer	●	—	—	—	●	●	●	—	T, J, K*	—	—	—	K*	**XA40**	**XA41**	**XA45**	
XA46	Middle-cut chamfer	—	●	—	—	—	—	●	K*	—	—	—	K*	—	—	—	K*	**XA46**
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*	—	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 hour 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.

Made to Order

Symbol

Shaft Pattern Sequencing II — -XA33 to -XA41

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

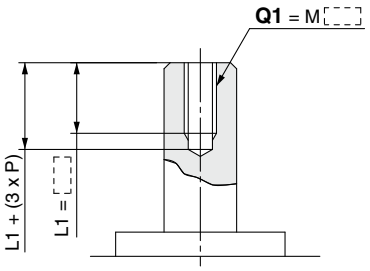
Additional Reminders

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



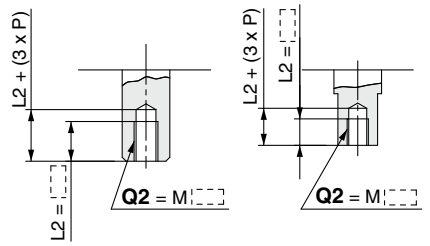
(mm)

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



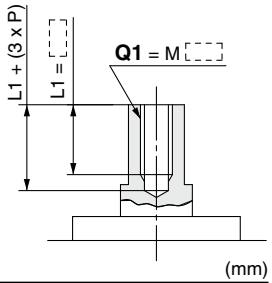
(mm)

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



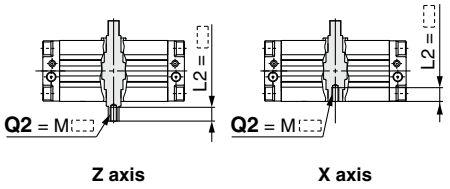
(mm)

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



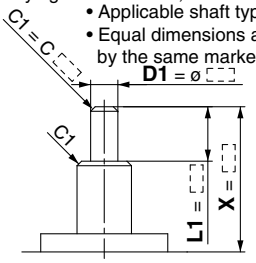
(mm)

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.



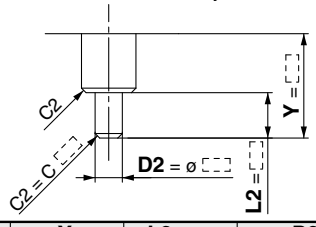
(mm)

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.



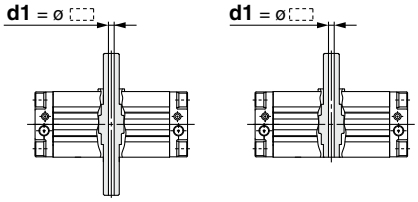
(mm)

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



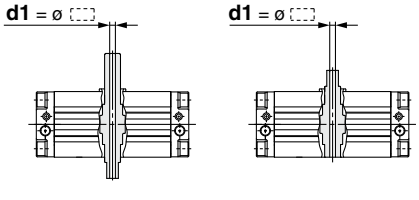
(mm)

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



(mm)

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

SMC

Symbol

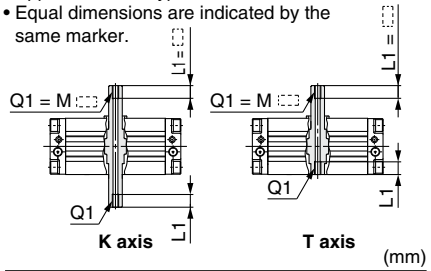
Shaft Pattern Sequencing II

-XA43 to -XA55

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.



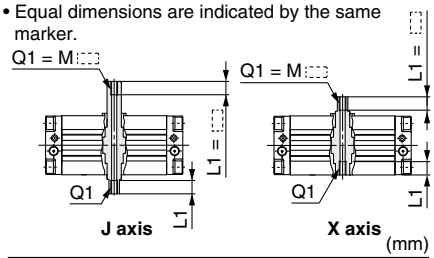
(mm)

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.



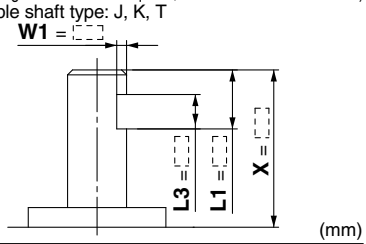
(mm)

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



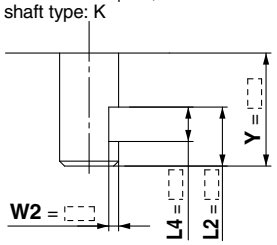
(mm)

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



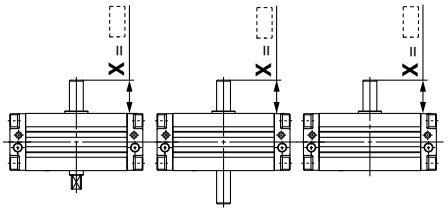
(mm)

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



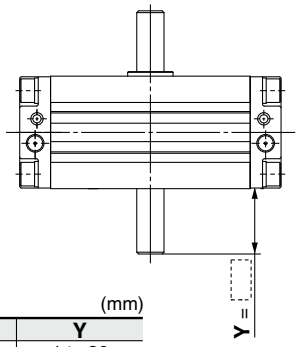
(mm)

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



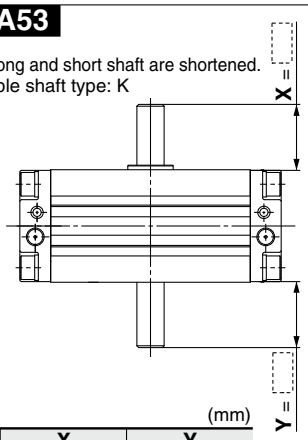
(mm)

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



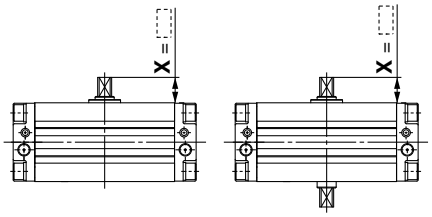
(mm)

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



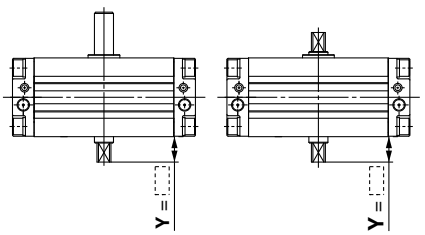
(mm)

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



(mm)

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

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.

Made to Order

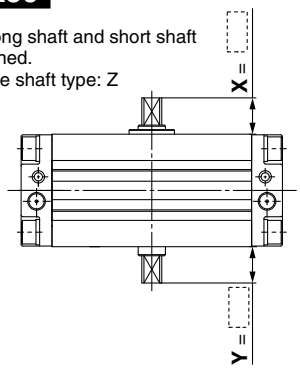
Symbol

Shaft Pattern Sequencing II — -XA56 to -XA59

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

Symbol: A56

Both the long shaft and short shaft are shortened.
• Applicable shaft type: Z

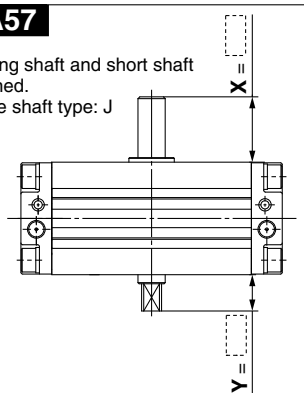


(mm)

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

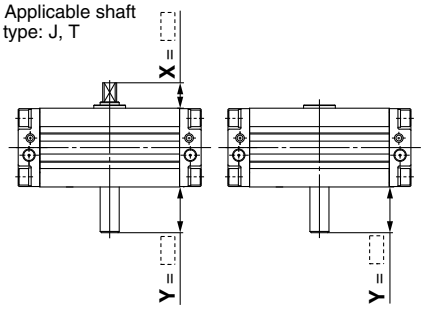


(mm)

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

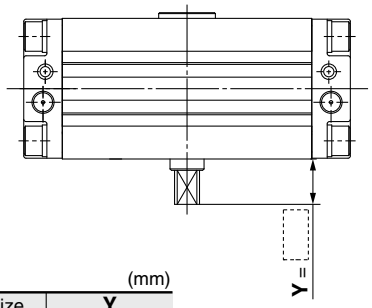


(mm)

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



(mm)

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.

Made to Order

How to Order

C | D | RA1 | B | S | 50 | | – | 90 | | Z – | M9BW | | – X | C8 | C30 | C59

Magnet

Nil	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

Port type

Port type				
Size		50, 63	80	100
Nil	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

Nil	None
C	With air cushion

Auto switch

Nil	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

Nil	2 pcs.
S	1 pc.

∗ Combination of made-to-order is available up to 3 types.
∗ Above is the typical example of combination.

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 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	●	●	—	●	—	—	—	—	—	XC8 to XC11			
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

Made to Order 2

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

Made to Order

1 Reversed Shaft

Symbol: **-XC7**

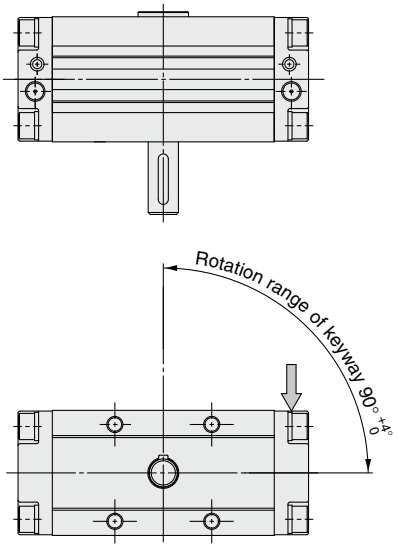
CRA1 [Refer to "How to Order" on page 1.] **– XC7**

Reversed shaft (-XC7)

Specifications

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

Symbol: C7



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

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)

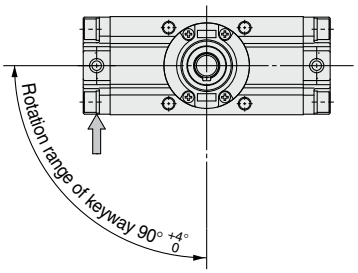
Specifications

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: C8

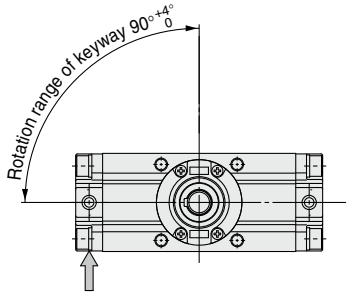
The rotation range is changed.



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

Symbol: C9

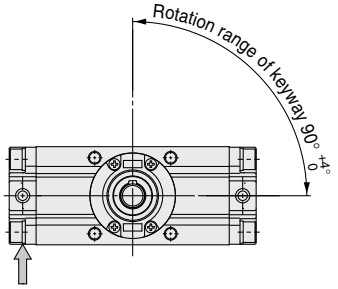
The rotation range is changed.



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

Symbol: C10

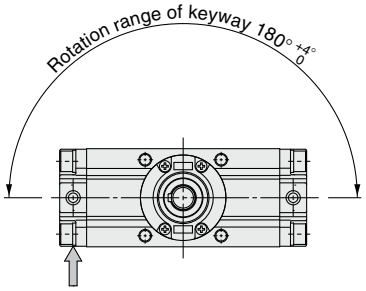
The rotation range is changed.



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 Changed to Fluorine Grease

Symbol: **-XC30**

CRA1 [Refer to "How to Order" on page 1.] **– XC30**

Changed to fluorine 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	**50, 63, 80, 100**
Applicable shaft type	S, W, X, Y, Z, T, J, K

∗ Refer to page 2 for other specifications.

4 Change of Rotation Range and Shaft Rotation Direction

Symbol
-XC31 to -XC36

CRA1 | Refer to "How to Order" on page 1. | **– XC31**

Specifications

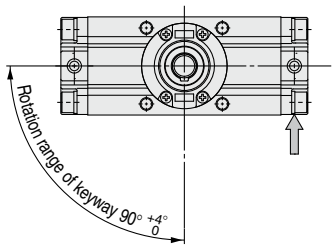
Applicable size	**50, 63, 80, 100**
Applicable shaft type	S, W, Y

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

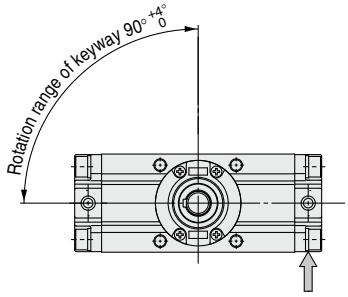
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C32

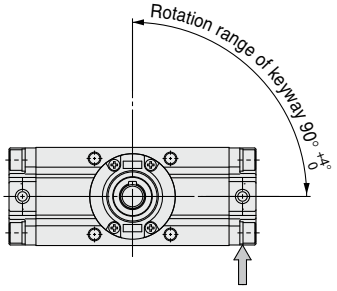
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C33

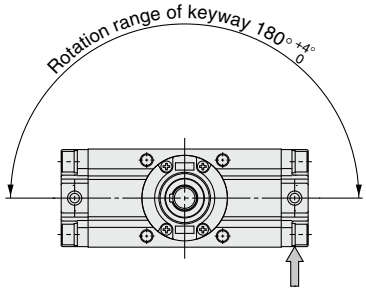
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C34

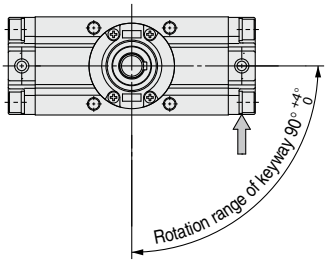
The rotation range is changed and the rotation direction is reversed.



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

Symbol: C35

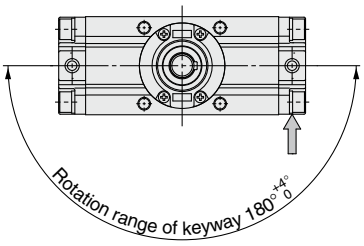
The rotation range is changed and the rotation direction is reversed.



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

Made to Order 3

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

Made to Order

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

Symbol
-XC59 to -XC61

CRA1 | Refer to "How to Order" on page 1. | **– XC59**

Change of port location
(-XC59 to -XC61)

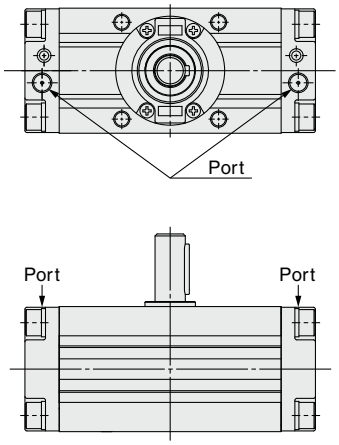
Specifications

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

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.

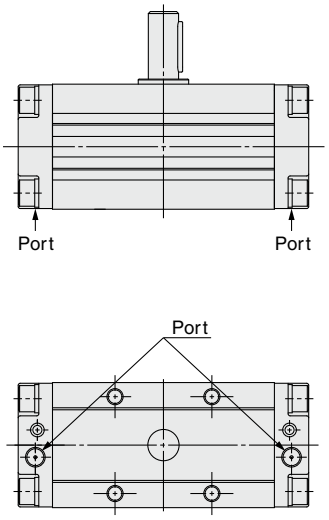
Symbol: C59

The port direction is changed. (Upward)



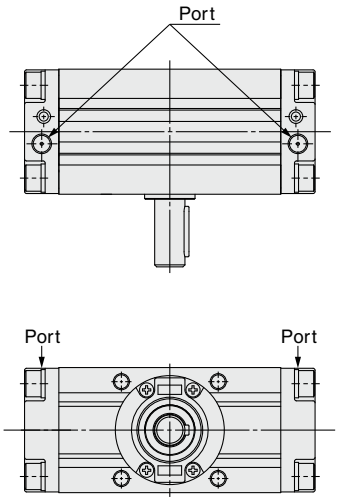
Symbol: C60

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

1. **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 catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **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.
3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. 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.
   2. 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.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. 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 catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. 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

1. **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

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. 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.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog 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

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. 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.

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