

CRA1 Series Gear-rack pendular cylinder:

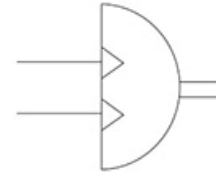


1. Ordering Code :

	C	<input type="checkbox"/>	RA1	B	S	U	50	-	90	<input type="checkbox"/>	
With or without magnet											
Blank: Without magnet inside											
D: With Magnet inside											
Mounting type:											
B: Standard type											
L: Foot mounting type											
F: Flange type (for $\Phi 30$ without flange)											
Shaft type											
S: Single shaft			Y: Double shaft with key								
W: Double shaft			X: Single shaft with four chamfers								
T: Single round shaft			Z: Double shaft with four chamfers								
Angle adjustable type											
Blank: Without angle adjustable											
U: with angle adjustable unit (Max. angle adjustable range: 90degree)											
*Note: Without angle adjustable unit for $\Phi 30$											
Bore of rotary actuator											
30: $\Phi 30$ mm			50: $\Phi 50$ mm			63: $\Phi 63$ mm					
80: $\Phi 80$ mm			100: $\Phi 100$ mm								
Rotating angle range											
90: 90 degree			100: 100 degree								
180: 180 degree			190: 190 degree								
Cushion											
Blank: With air cushion											
C: With air cushion											
*Note: without air cushion for Angle adjustable type and $\Phi 30$ actuator											

2.Characteristics:

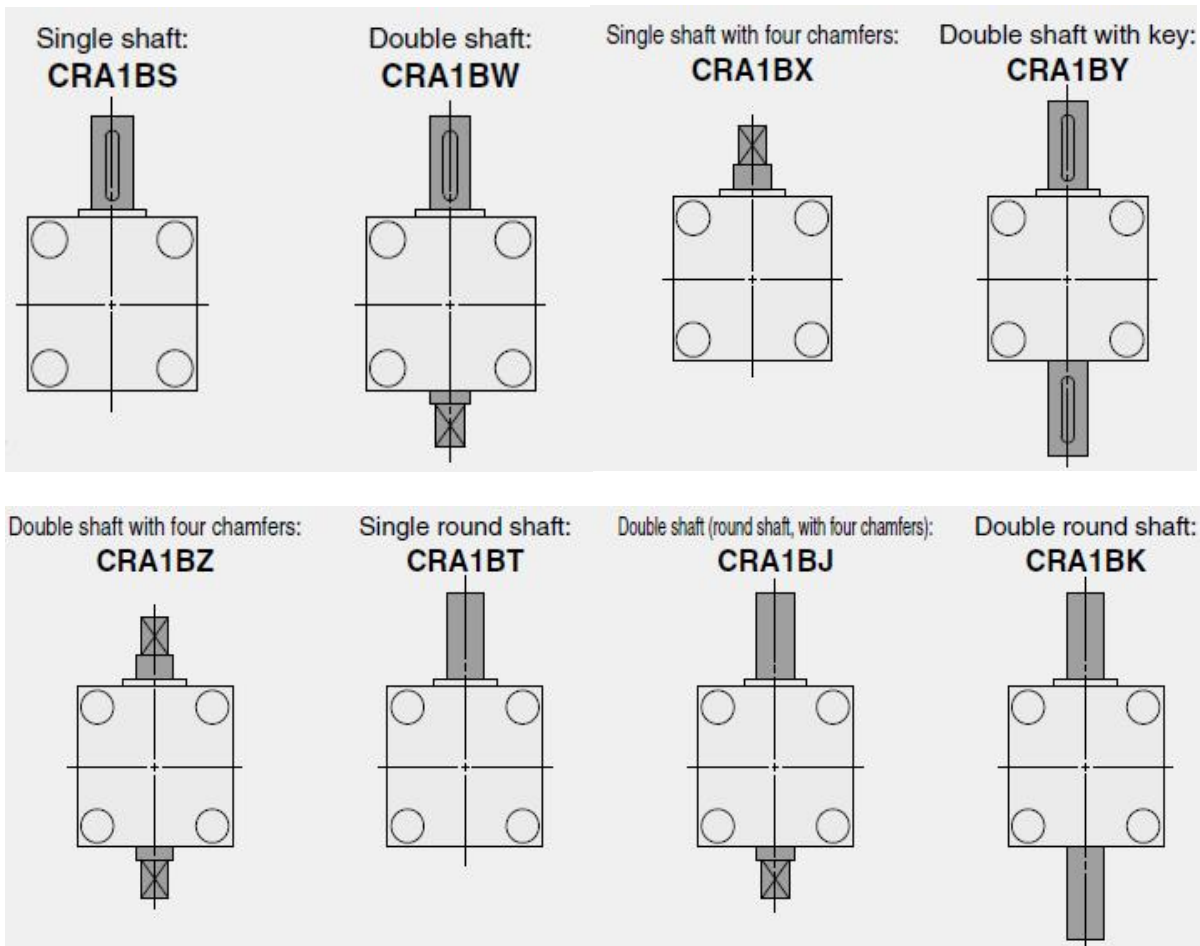
- 1) Compact, lightweight
- 2) Flexible mounting: Top, bottom, or side mounting is possible.
- 3) Front or side ported is selectable.
- 4) With air cushion, Easy adjustment of cushion valve
- 5) With auto switch (CRA1 series: M9N, M9P,M9B etc.)



3. Reed switches type:

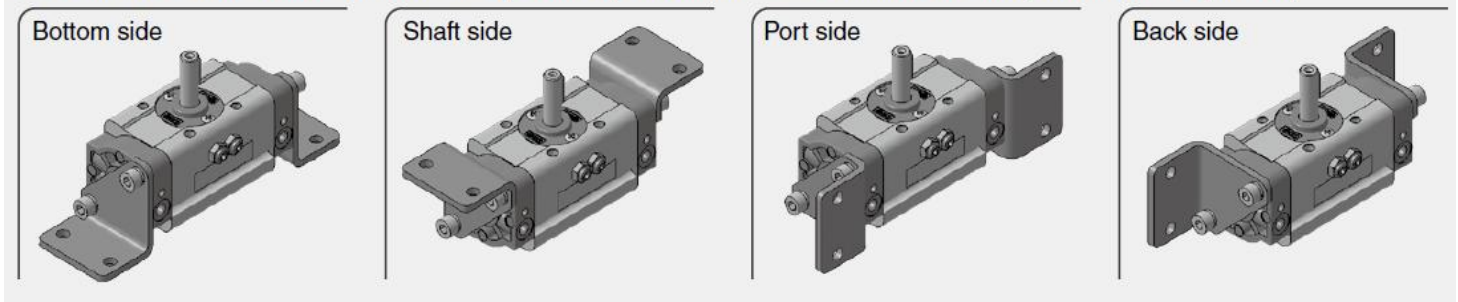
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length [m]				Pre-wired connector	Applicable load	
					DC	AC		Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○		
				2-wire				M9BV	M9B	●	●	●	○	○		
				3-wire (NPN)				M9NWV	M9NW	●	●	●	○	○		
	Diagnosis indication (2-color indicator)			3-wire (PNP)	M9PWV	M9PW	●	●	●	○	○	IC circuit	Relay, PLC			
				2-wire	M9B WV	M9B W	●	●	●	○	○					
	Water resistant (2-color indicator)			3-wire (NPN)	M9NAV*1	M9NA*1	○	○	●	○	○	IC circuit	Relay, PLC			
				3-wire (PNP)	M9PAV*1	M9PA*1	○	○	●	○	○					
				2-wire	M9BAV*1	M9BA*1	○	○	●	○	○					
				2-wire	M9BAV*1	M9BA*1	○	○	●	○	○					
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V 100 V or less	A93V*2	A93	●	●	●	●	—	—	Relay, PLC
								A90V	A90	●	—	●	—	—	—	IC circuit

4. Many variations of shaft type:



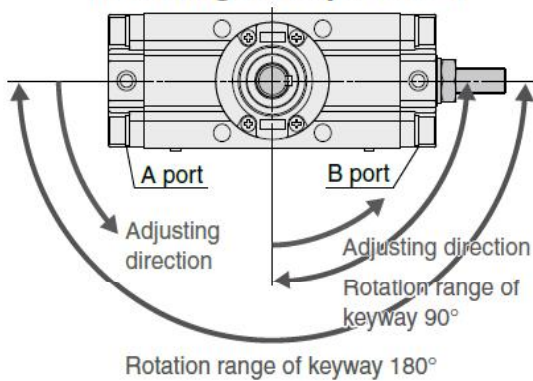
5. Mounting suitable for operating conditions is possible:

Foot bracket can be mounted at a desired position. (Foot bracket is included in the rotary actuator at shipment.)



6. Angle adjustable type:

Angle can be adjusted to a desired level in a range of up to 90°.



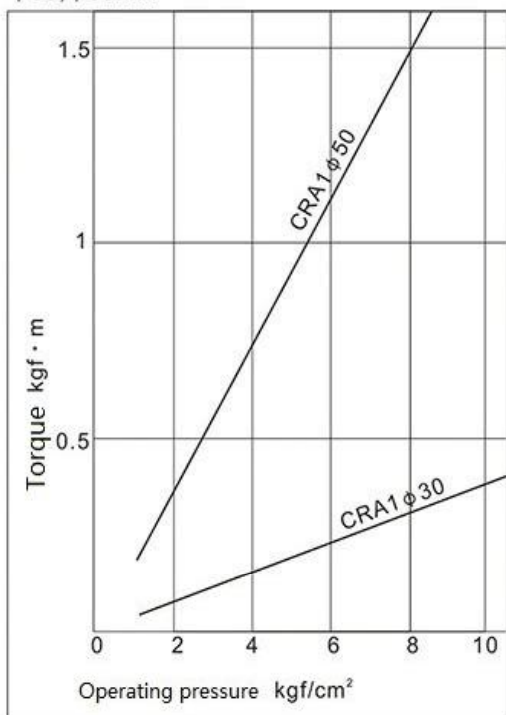
7. Specification:

Bore(mm) of rotary actuator	30	50	63	80	100	
Fluid	Compressed air					
Max.operating pressure	1.0 MPa					
Min. operating pressure	0.1 Mpa					
Ambient and fluid temperature	0°C~60°C (no freezing)					
Cushion	Not attached, Air cushion					
Backlash	None	Within 1 °				
Tolerance in rotating angle	-	0 to + 4 °				
Lubrication	Not need (or ISOVG32)					
Allowable kinetic energy(J)	With	0.01	0.05	0.12	0.16	0.54
	None	-	0.98	1.5	2.0	2.9
Rotating time range (s)	0.2~1	0.2~2	0.2~3	0.2~4	0.2~5	
Port size	M5x0.8	1/8"PT	1/8"PT	1/4"PT	3/8"PT	

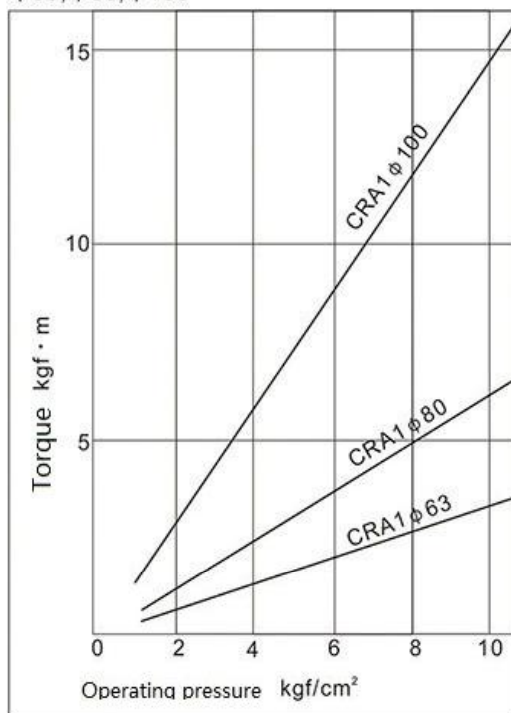
8. Effective Torque(N.m):

Size	Operating pressure [MPa]									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
30	0.38	0.76	1.14	1.53	1.91	2.29	2.67	3.05	3.44	3.82
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

φ 30, φ 50mm



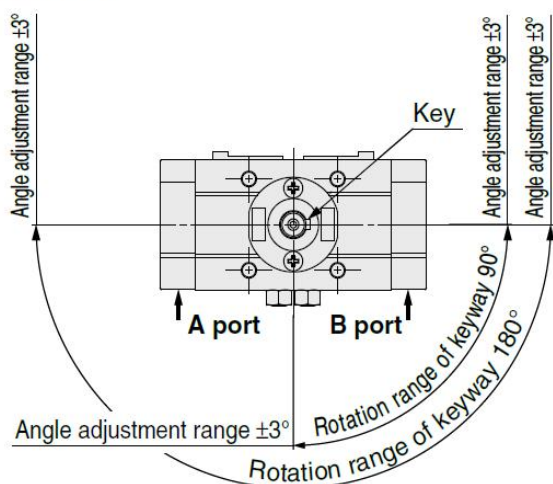
φ 63, φ 80, φ 100



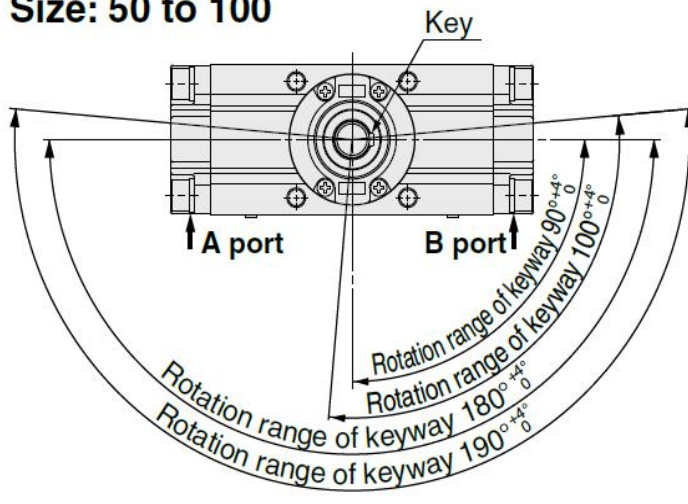
9. Rotating range of keyway:

The shaft rotates clockwise when the pressure is applied from the A port while it rotates counterclockwise when the pressure is applied from the B port

Size: 30

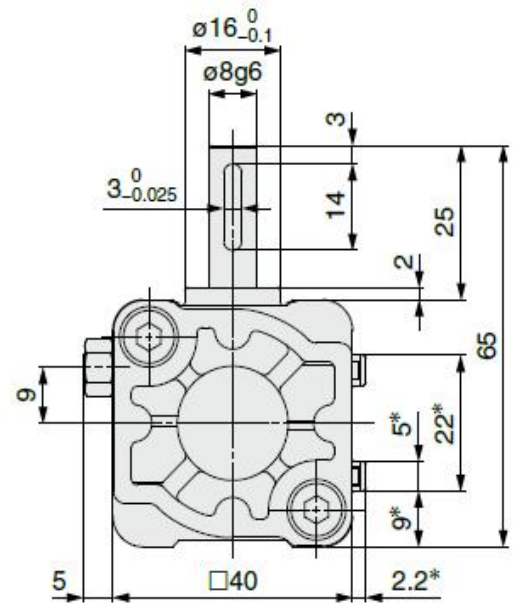
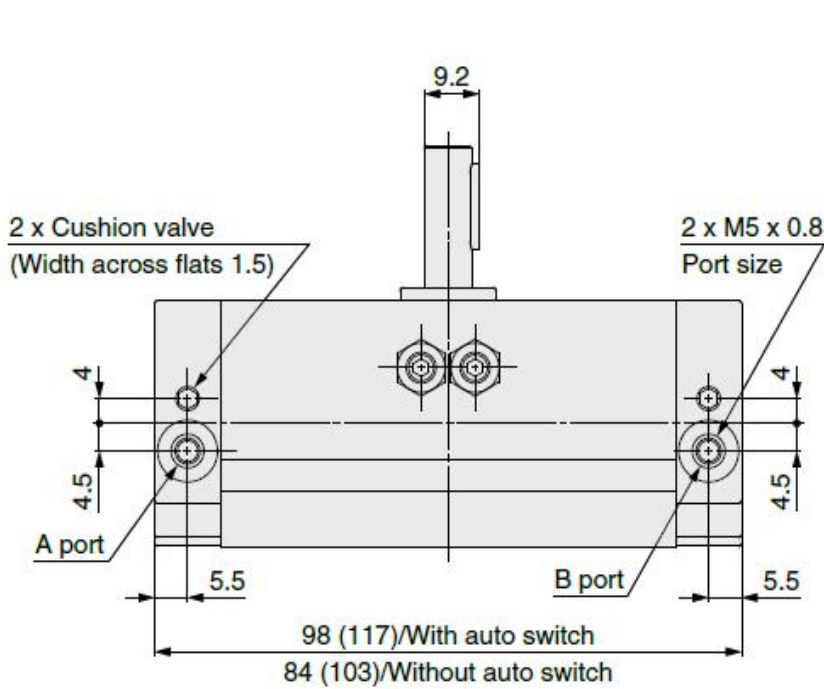


Size: 50 to 100

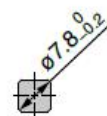
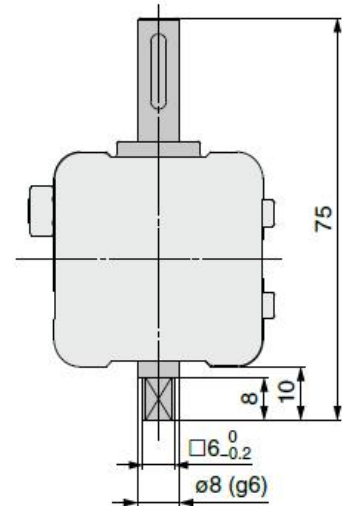
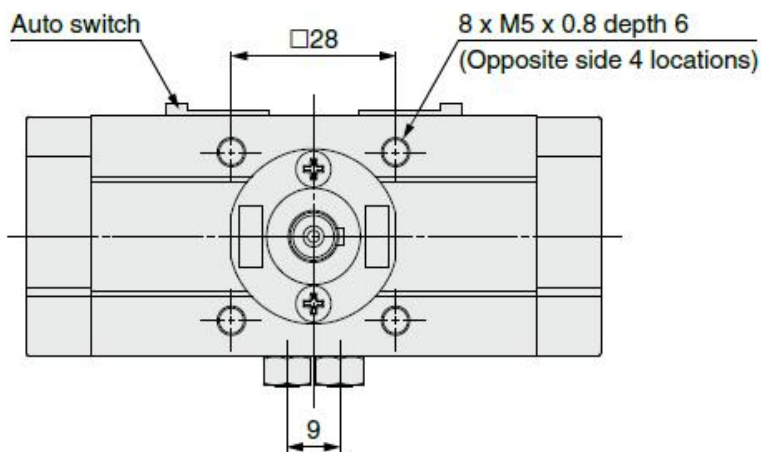


10. Overall and Dimension Sheet (Basic type):

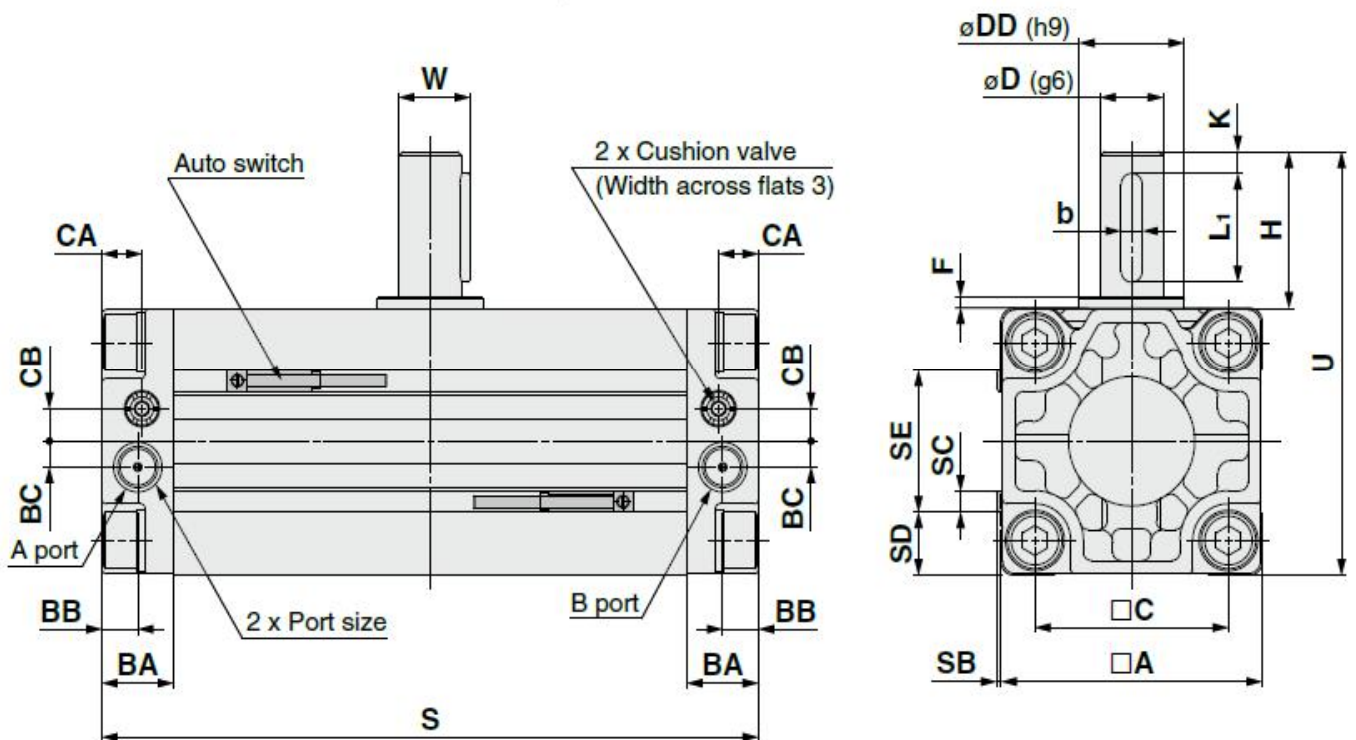
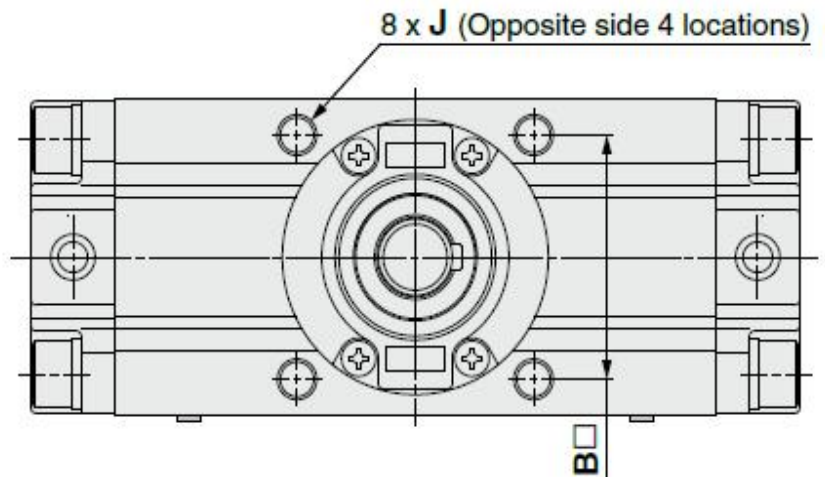
Bore : $\Phi 30$



**Double shaft:
C□RA1BW**



Bore : $\Phi 50, \Phi 63, \Phi 80, \Phi 100$



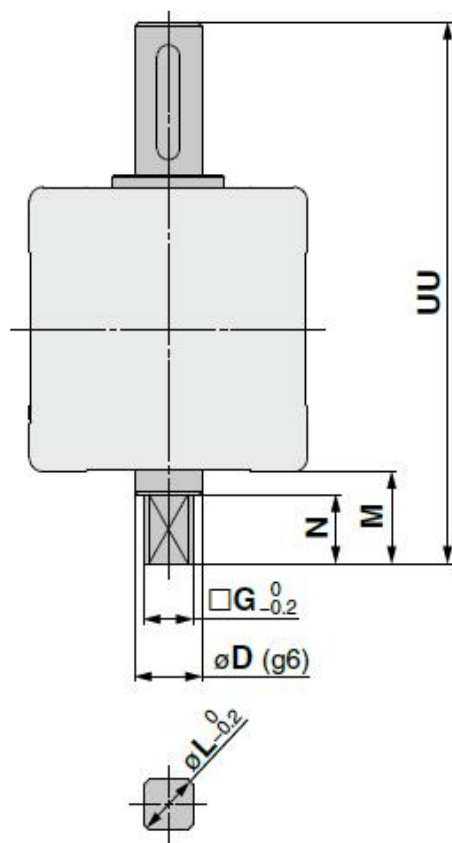
Size	Note 1) Port size	A	B	C	D (g6)	DD (h9)	F	H	J	K	With auto switch					Without auto switch S	U	W	BA	BB	BC	★ CA	★ CB	Note 2) Key dimensions	
											S	SB	SC	SD	SE									b	L1
50	Rc1/8	62	48	46	15	25	2.5	36	M8 x 1.25 depth 8	5	156 (189)	1.5	5	14.5	33	144 (177)	98	17	17	8.5	6	9.5	7.5	5 ⁰ _{-0.030}	25
63	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
80	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
100	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

Double shaft: C□RA1BW



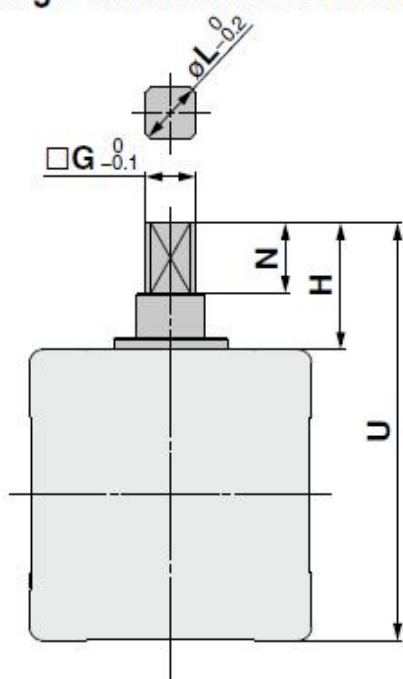
øD is the shaft dimension.

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

[mm]

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

Single shaft with four chamfers: C□RA1BX

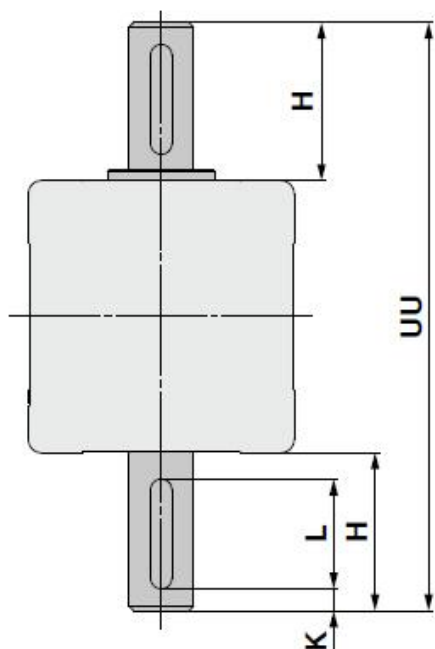


[mm]

Size	G	H	N	U	L
30	6	13	8	53	7.8
50	11	27	15	89	14
63	13	29	17	105	16
80	15	38	20	130	19
100	19	44	25	156	24

Note) Dimension parts different from the standard conform to the general tolerance.

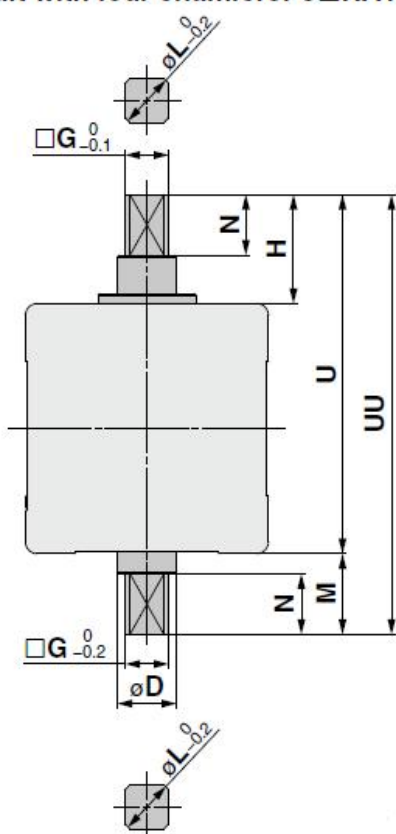
Double shaft with key: C□RA1BY



	[mm]			
Size	H	K	UU	L
30	25	3	90	14
50	36	5	134	25
63	41	5	158	30
80	50	5	192	40
100	60	5	232	45

Note) Dimension parts different from the standard conform to the general tolerance.

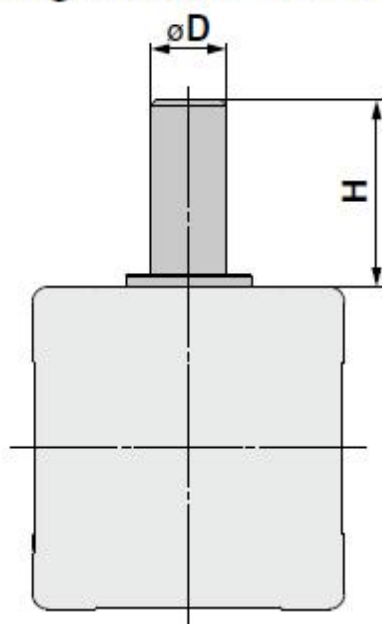
Double shaft with four chamfers: C□RA1BZ



	[mm]							
Size	D (g6)	G	H	M	N	U	UU	L
30	8	6	13	10	8	53	63	7.8
50	15	11	27	20	15	89	109	14
63	17	13	29	22	17	105	127	16
80	20	15	38	25	20	130	155	19
100	25	19	44	30	25	156	186	24

Note) Dimension parts different from the standard conform to the general tolerance.

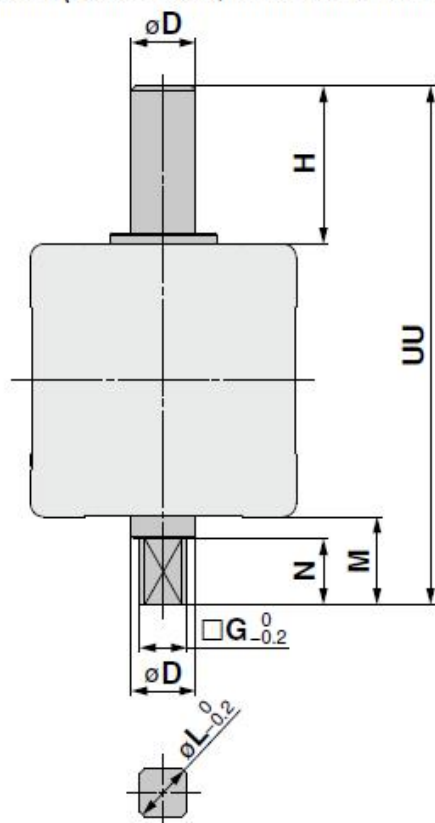
Single round shaft: C□RA1BT



[mm]		
Size	D (g6)	H
30	8	25
50	15	36
63	17	41
80	20	50
100	25	60

Note) Dimension parts different from the standard conform to the general tolerance.

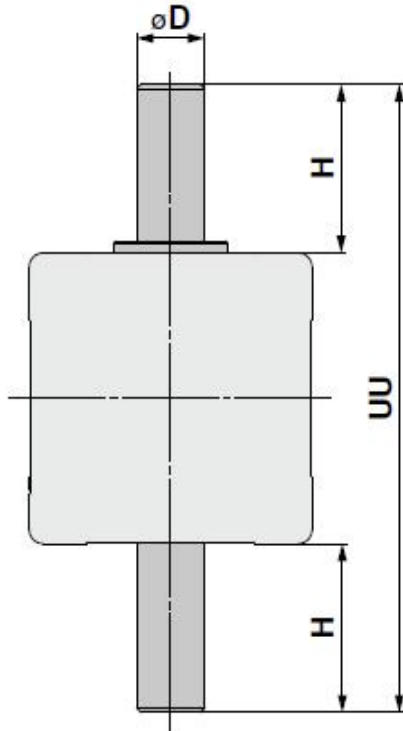
Double shaft (round shaft, with four chamfers): C□RA1BJ



[mm]							
Size	D (g6)	G	H	M	N	UU	L
30	8	6	25	10	8	75	7.8
50	15	11	36	20	15	118	14
63	17	13	41	22	17	139	16
80	20	15	50	25	20	167	19
100	25	19	60	30	25	202	24

Note) Dimension parts different from the standard conform to the general tolerance.

Double round shaft: C□RA1BK

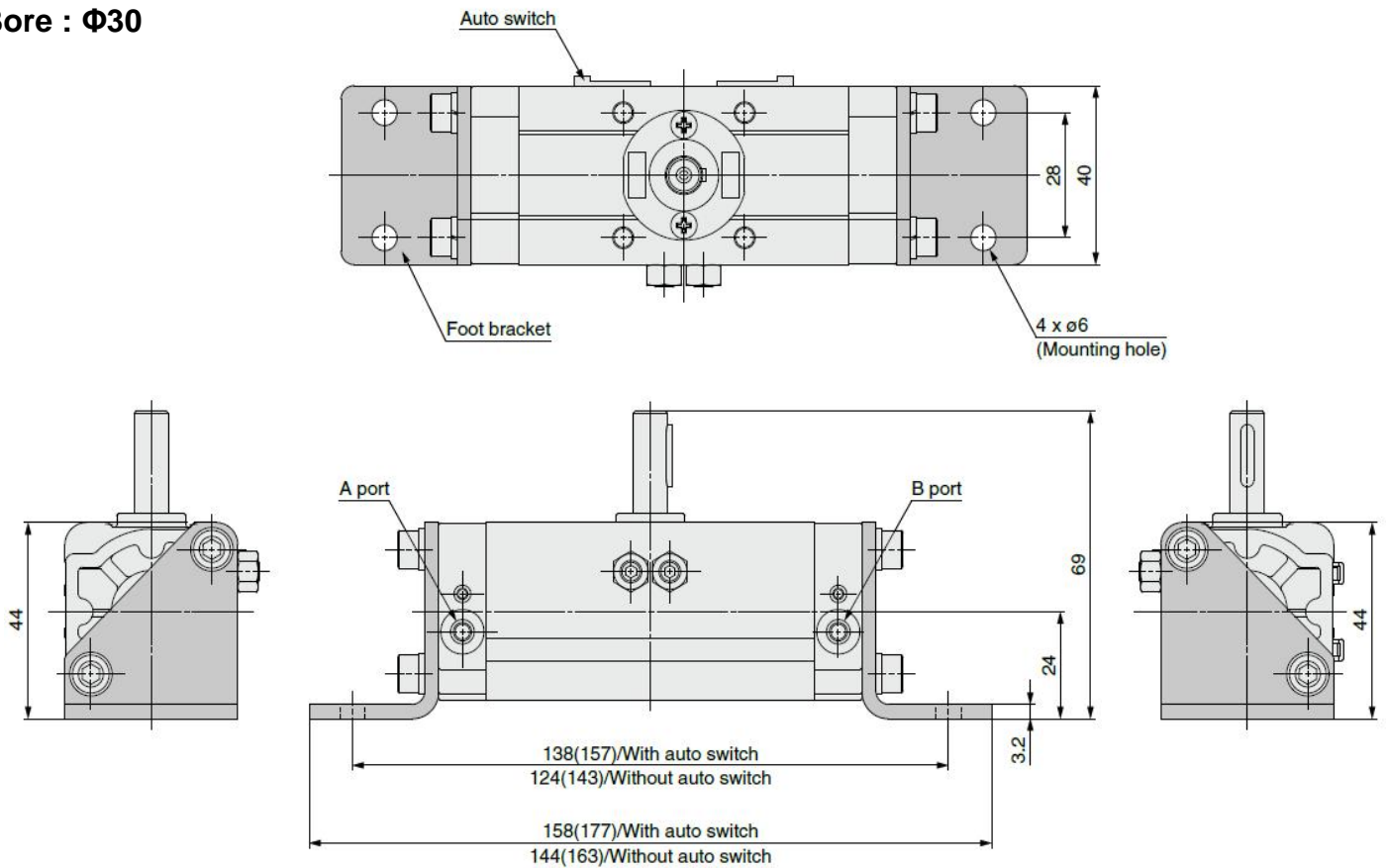


[mm]			
Size	D (g6)	H	UU
30	8	25	90
50	15	36	134
63	17	41	158
80	20	50	192
100	25	60	232

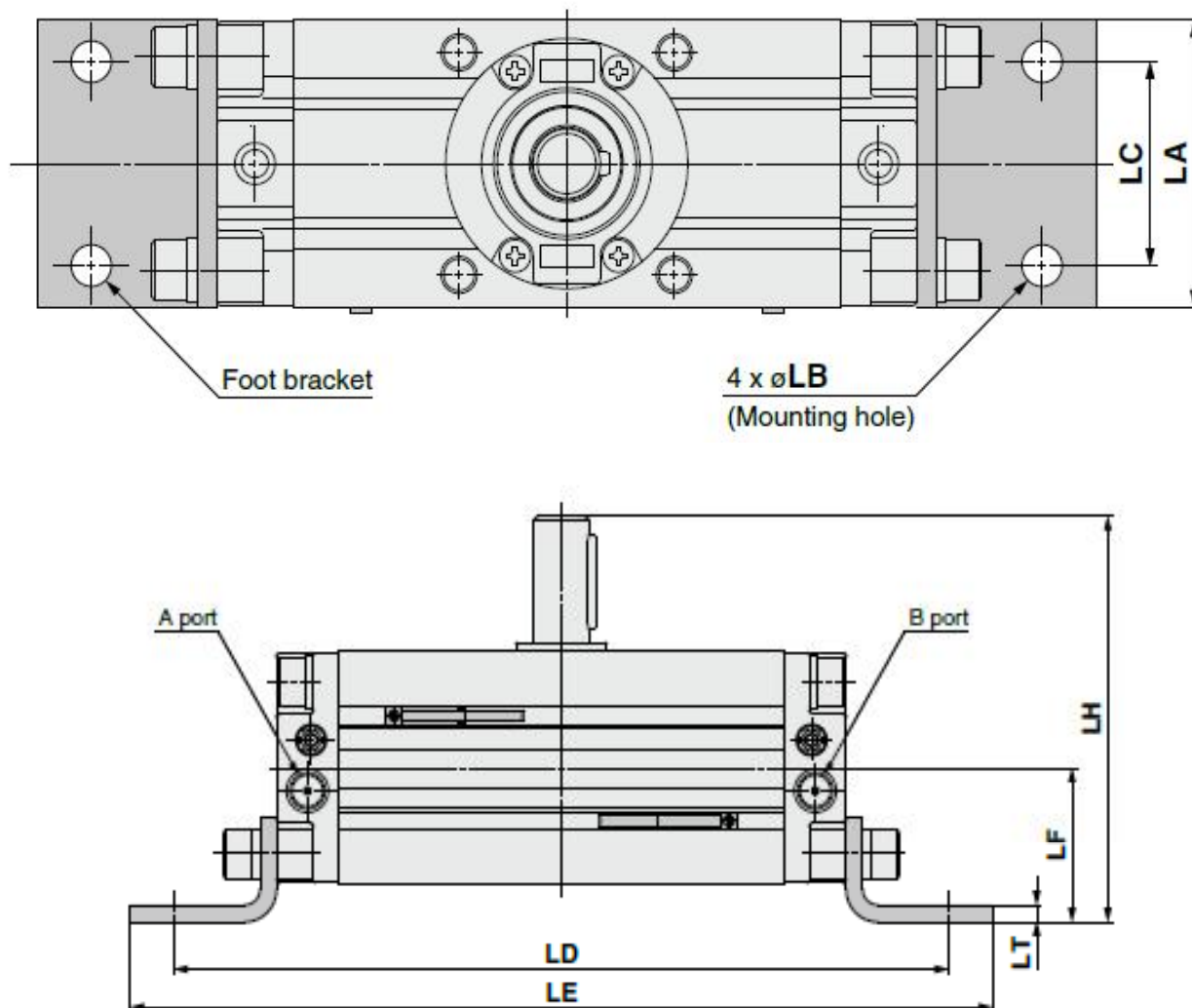
Note) Dimension parts different from the standard conform to the general tolerance.

11. Overall and Dimension Sheet (Foot type):

Bore : $\Phi 30$



Bore : $\Phi 50, \Phi 63, \Phi 80, \Phi 100$



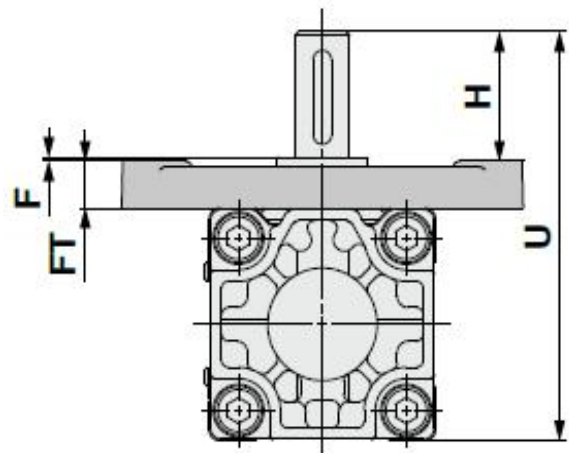
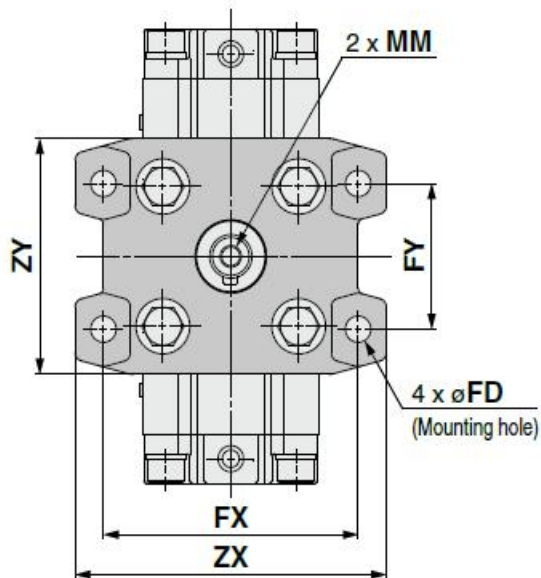
Note) Other dimensions are the same as the basic type.

[mm]

Size	LA	LB	LC	With auto switch		Without auto switch		LF	LH	LT
				LD	LE	LD	LE			
50	62	9	44	212 (245)	236 (269)	200 (233)	224 (257)	41	108	4.5
63	76	11	55	247 (285.5)	275 (313.5)	235 (273.5)	263 (301.5)	48	127	5
80	92	13	67	287 (331)	329 (373)	274 (318)	316 (360)	58	154	6
100	112	13	87	347 (413)	389 (455)	333 (399)	375 (441)	73.5	189.5	6

12. Overall and Dimension Sheet (Flange type):

Single shaft: C□RA1FS

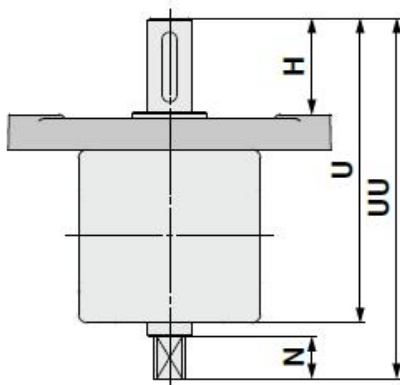


Note) Other dimensions are the same as the basic type
[mm]

Size	F	H	MM	U	FD
50	4	39	M6 x 1.0 depth 12	114	9
63	5	45	M6 x 1.0 depth 12	136	11.5
80	5	55	M8 x 1.25 depth 16	165	13.5
100	5	60	M10 x 1.5 depth 20	190	13.5

Size	FT	FX	FY	ZX	ZY
50	13	90	50	110	81
63	15	105	59	130	101
80	18	130	76	160	119
100	18	150	92	180	133

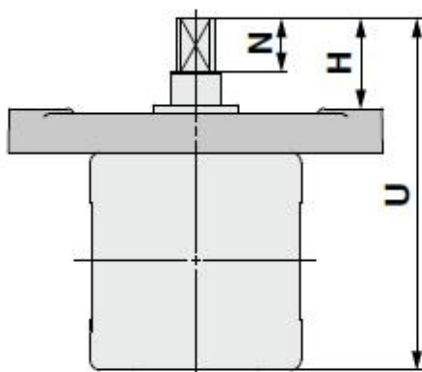
Double shaft: C□RA1FW



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

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

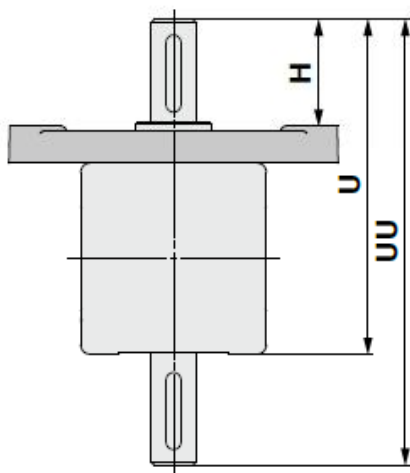
Single shaft with four chamfers: C□RA1FX



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

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

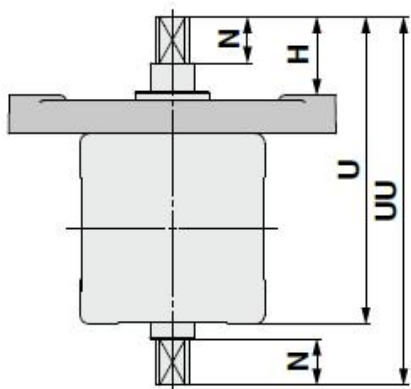
Double shaft with key: C□RA1FY



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

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

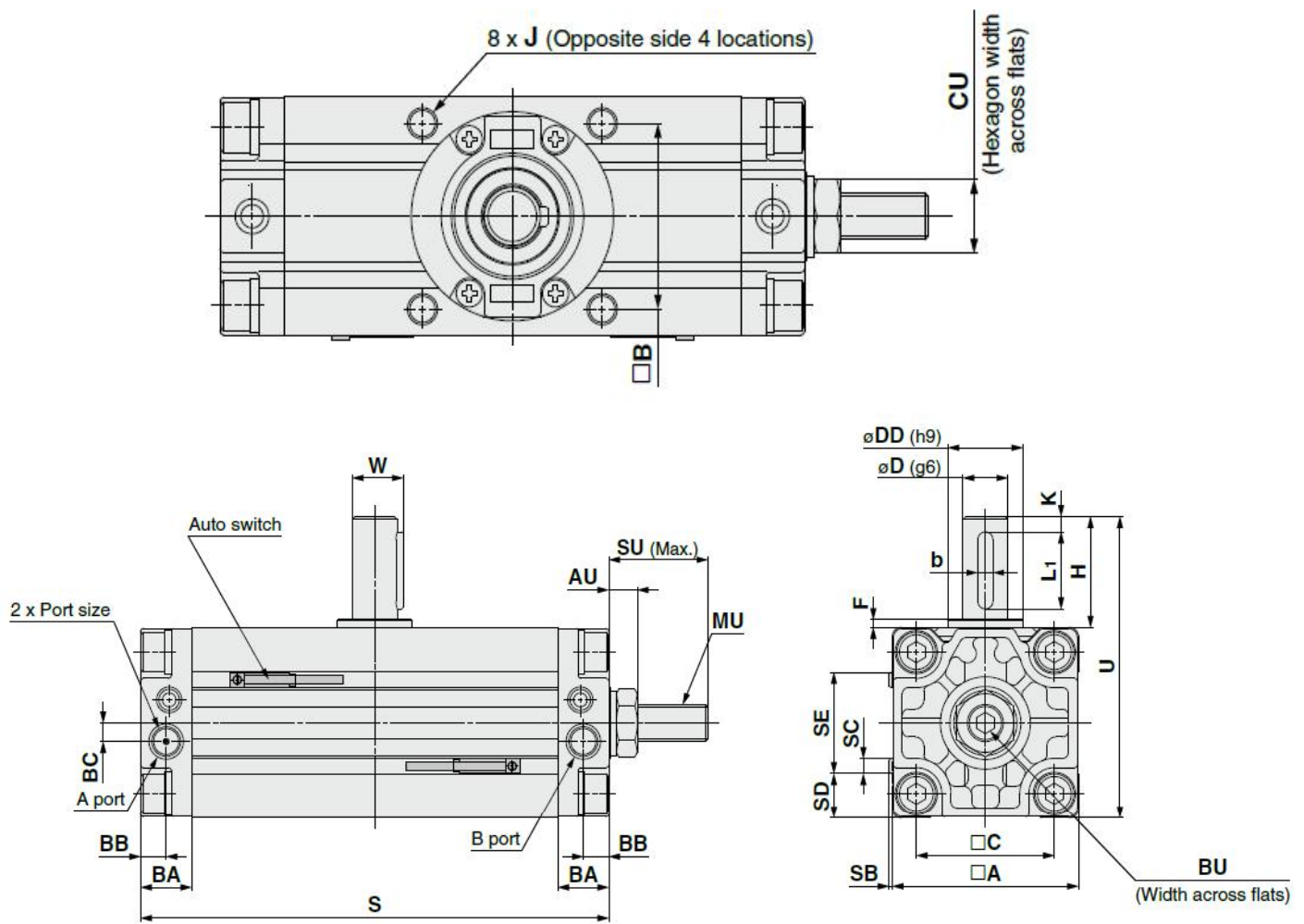
Double shaft with four chamfers: C□RA1FZ



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

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

13. Overall and Dimension Sheet (Angle adjustable type):



Size	Note 1) Port size	A	B	C	D (g6)	DD (h9)	F	H	J	K	With auto switch					Without auto switch	U	W	BA	BB	BC
											S	SB	SC	SD	SE	S					
50	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
63	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
80	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
100	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

Size	AU	BU	CU	SU	MU	Key Note 2) dimensions	
						b	L1
50	9.5	6	19	33	M12 x 1.75	5 ⁰ _{-0.030}	25
63	10.5	6	22	35.5	M14 x 2	6 ⁰ _{-0.030}	30
80	12.5	8	24	44	M16 x 2	6 ⁰ _{-0.030}	40
100	14.5	10	30	56	M20 x 2.5	8 ⁰ _{-0.036}	45

The dimensions of the shaft type (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), foot type, and flange type are the same as the standard type.

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).