Rotary Actuator

Vane Type 10, 15, 20, 30, 40

New

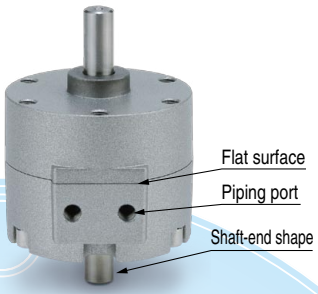
RoHS

Standard Type **Free Mount Type**

Many combinations available!

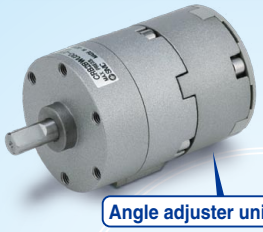
Standard type/Series CRB2

- **Piping ports are located on the flat surface.**
  Fittings can be secured firmly, piping is also improved.
- **Many variations of shaft-end shape (6 types)**



With auto switch unit

With angle adjuster unit



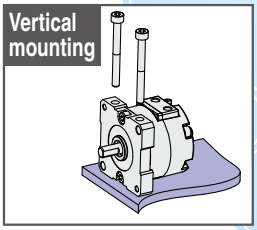
Possible to adjust the angle as desired

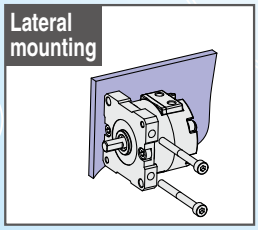
Rotating angle	Rotating angle adjustment range
270°	0 to 240° (Size 30)
180°	0 to 175°
90°	0 to 85°

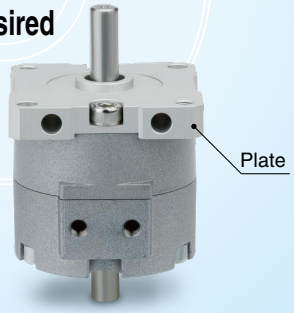
With angle adjuster unit
+
With auto switch unit

Free mount type/Series CRBU2 is added.

- **12% weight reduction**
- **Possible to move the plate mounting position as desired**
- **Many mounting variations**







With auto switch unit

With angle adjuster unit

With angle adjuster unit
+
With auto switch unit

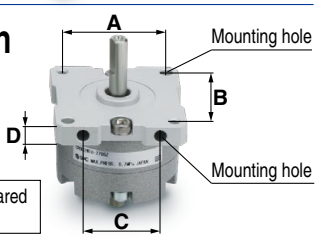
Rotating angle: 90°, 180°, 270° All series can rotate up to 270°.

The use of specially designed seals and stoppers now enables our compact vane type rotary actuators to rotate up to 270°. (Single vane type)

Interchangeable mounting pitch with the existing model

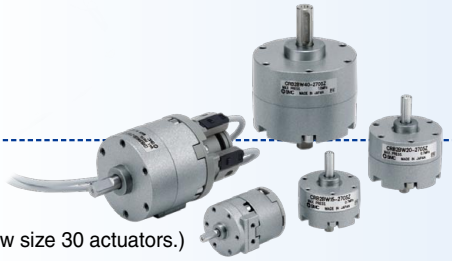
Mounting pitches A to C shown on the right and mounting hole diameters are interchangeable with the existing model.

D: Height is reduced compared to the existing model.



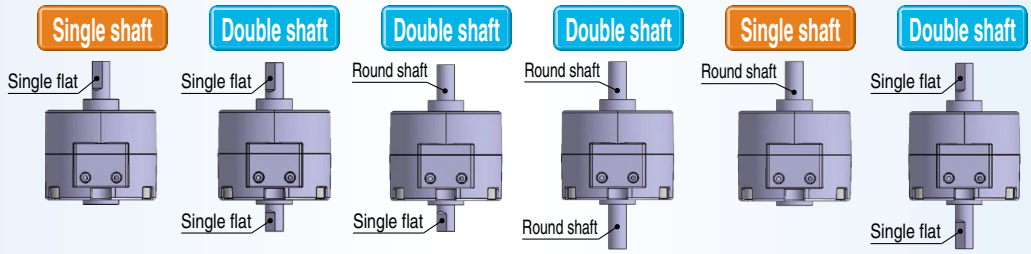
Series CRB□2

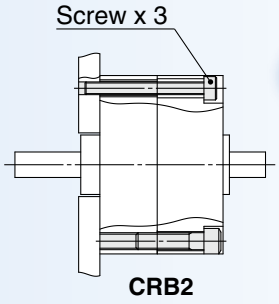
SMC



Shaft type variations

Six shaft options available (∗ The figures below show size 30 actuators.)





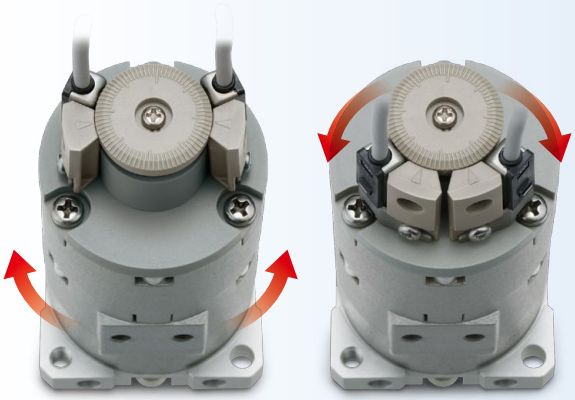
Direct mounting

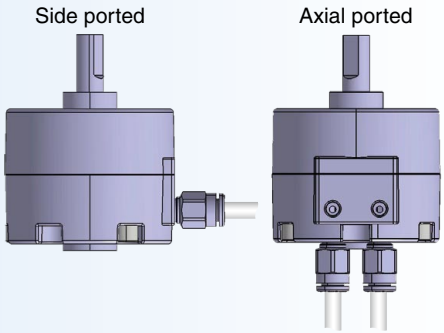
The rotary actuator body can be mounted directly.

∗ Not possible for size 10 to 40 with unit(s)

The mounting position of the auto switch can be set freely.

The switch can be fixed in the desired position in the circumferential direction.





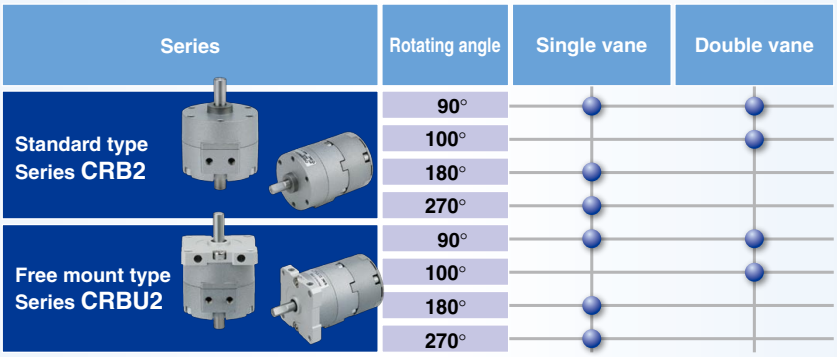
Connecting port location: Side ported or Axial ported

The port location can be selected according to the application.

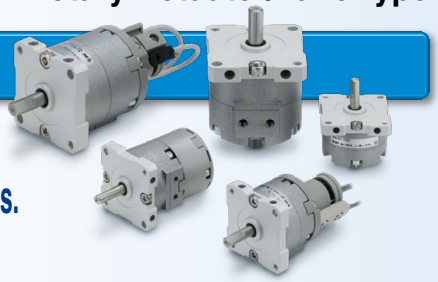
(Size 10 to 40 with unit(s) are side ported only.)

Double vane type is standardized for 90° and 100°.

The outside dimensions of the double vane type are equivalent to those of the single vane type (except size 10). Double vane construction can get twice the torque of the single vane type.



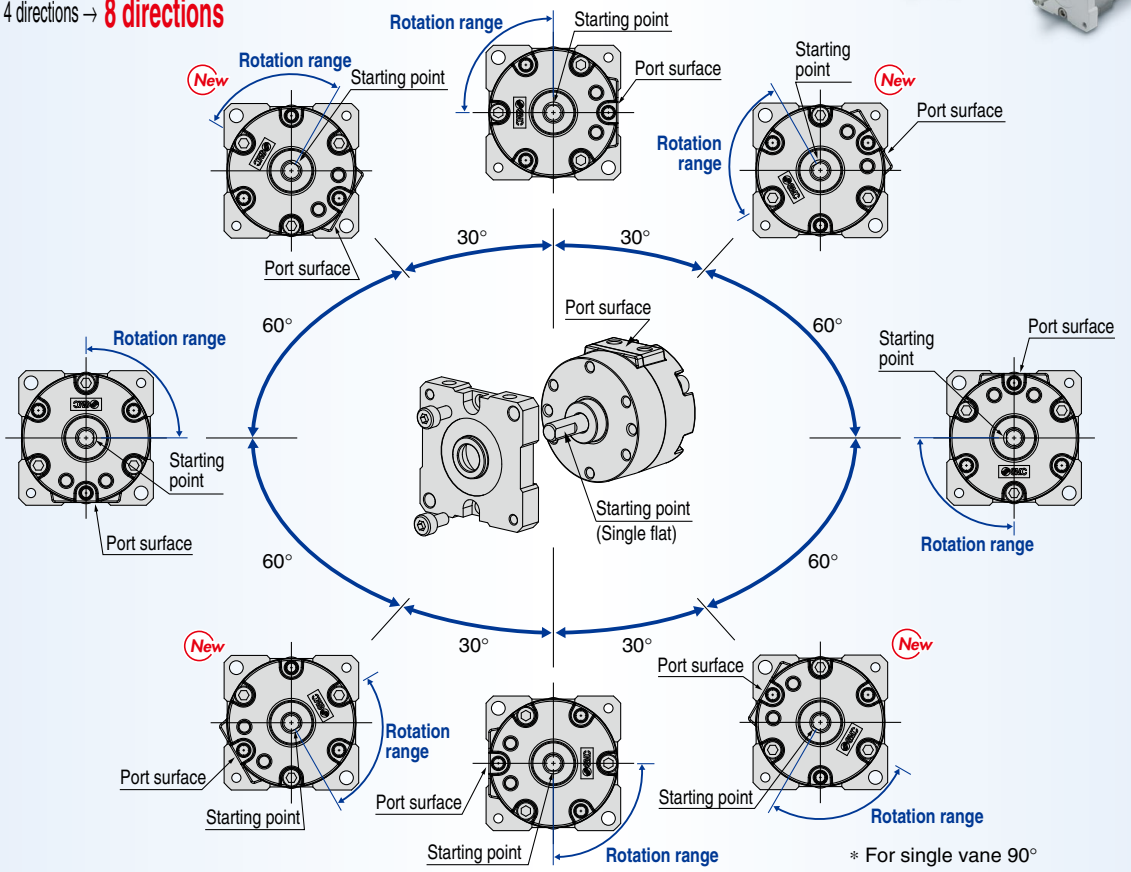
Free Mount Type/*Series* CRBU2



Size: 10, 15, 20, 30, 40

Possible to change the starting position as desired to suit the installation conditions.

Conventional: 4 directions → **8 directions**



∗ For single vane 90°
4 directions are used for size 10.

12% weight reduction

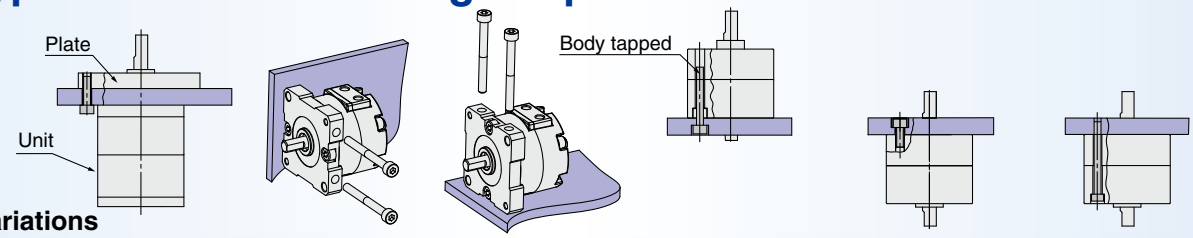
Lighter installation can be achieved.

Size	New CRBU2 (g)	Reduction rate (%)	Existing model (g)
10	42	12	47.5
15	64	12	73
20	130	10	143
30	248	5	263
40	465	5	491

∗ Compared with single vane at 90°

Interchangeable mounting with the existing model

Six types of direct mounting are possible.



Mounting Variations

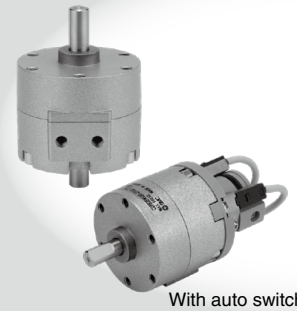
Applicable series	Free mount type	Free mount type	Free mount type	Standard type Free mount type	Standard type	Standard type
Mounting	Plate	Plate	Plate	Body tapped	Body tapped	Body through-hole (Fixed with the customer's plate.)
Mounting of each unit	Available	Available	Available	Not available	Available	Not available
Number of starting points	8 points	8 points	8 points	3 points	3 points	3 points
Workpiece removal during maintenance	No	No	No	No	Yes	Yes

Rotary Actuator/Vane Type

Series CRB2/CRBU2

Size: 10, 15, 20, 30, 40

Standard type
Series CRB2

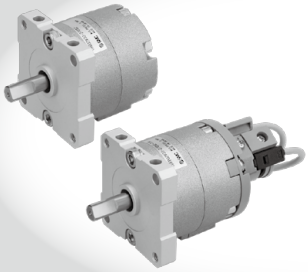


With auto switch

Standard type/With angle adjuster
Series CRB2□WU

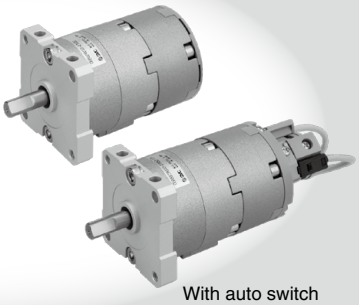
With auto switch

Free mount type
Series CRBU2



With auto switch

Free mount type/With angle adjuster
Series CRBU2WU



With auto switch

Standard/Free mount type

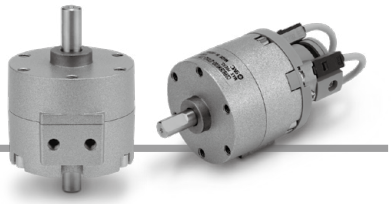
Fluid			Air													
Size			10				15				20, 30				40			
Vane type	S: Single vane D: Double vane		S		D		S		D		S		D		S		D	
Port location	Side ported (Nil) Axial ported (E)		Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported	Side ported	Axial ported
Rotating angle	90°		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	100°		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	180°		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	270°		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft type	Single shaft	S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Double shaft	W	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Long shaft with round shaft & Short shaft with single flat	J	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Same length double long shaft with single flat on both shafts	Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Double shaft key		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Double round shaft	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Single round shaft	T	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cushion	Rubber bumper		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Variations	With auto switch (WJ shaft)		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	With angle adjuster (WJ shaft)		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	With auto switch and angle adjuster (WJ shaft)		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Option: Mounting	With flange*	F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Made to Order: Pattern	Shaft pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Rotating angle pattern		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

* Series CRB2 only

Rotary Actuator
Vane Type

Series CRB2
Size: 10, 15, 20, 30, 40

RoHS



How to Order

CRB2 **B** **S** **20** – **180** **S** **E** **Z** ❼

With auto switch **CDRB2** **B** **W** **20** – **180** **S** **Z** — **T79** **L** [ ] – [ ]

❶ ❷ ❸ ❹ ❺ ❻ ❽ ❾ ❿ ⓫

❶ With auto switch
(With auto switch unit and built-in magnet)
∗ Refer to page 49 when the auto switch unit is needed separately.

❷ Mounting

Symbol	Mounting
B	Basic type
F∗	Flange type

∗ F: Except size 40

❸ Shaft type

Symbol	Shaft type	Shaft-end shape	
		Long shaft	Short shaft
S	Single shaft	Single flat∗	—
W	Double shaft	Single flat∗	Single flat
J∗∗	Double shaft	Round shaft	Single flat
K∗∗	Double shaft	Round shaft	Round shaft
T∗∗	Single shaft	Round shaft	—
Y∗∗	Double shaft	Single flat∗	Long shaft with single flat∗

∗ A key is used for size 40. ∗∗ J, K, T and Y are made to order.
∗∗∗ When an auto switch is mounted to the rotary actuator, only shaft types W and J are available.

❹ Size

10
15
20
30
40

❺ Rotating angle

Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

❻ Vane type

S	Single vane
D	Double vane

❼ Connecting port location

Nil	Side ported
E	Axial ported

❽ Auto switch

Nil	Without auto switch (Built-in magnet)

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

⓫ Made to Order
For details, refer to the table below.

❾ Electrical entry/Lead wire length

Nil	Grommet/Lead wire: 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire: 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/Without lead wire

∗ Connectors are available only for the R73, R80, T79.
∗∗ Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

❿ Number of auto switches

S	1 pc.∗
Nil	2 pcs.∗∗

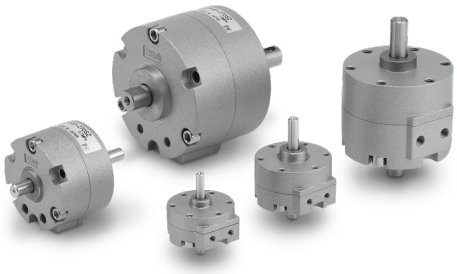
∗ S: A right-hand auto switch is shipped.
∗∗ Nil: A right-hand switch and a left-hand switch are shipped.

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

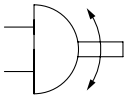
Applicable size	Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire type	Lead wire length (m)∗				Pre-wired connector	Applicable load	
						DC	AC	Perpendicular	In-line		0.5 (Nil)	3 (L)	5 (Z)	None (N)			
For 10, 15	**Solid state auto switch**	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	**S99V**	**S99**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			**S9PV**	**S9P**		●	●	○	—	○		
					2-wire	12 V		**T99V**	**T99**		●	●	○	—	○	—	
	Reed auto switch	—		No		24 V 5 V, 12 V	5 V, 12 V, 24 V	—	**90**	Vinyl parallel cord	●	●	●	—	—	IC circuit	
						5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	—	**90A**	Oilproof heavy-duty cord	●	●	●	—			
				Yes		—	—	—	**97**	Vinyl parallel cord	●	●	●	—		—	
						—	100 V	—	**93A**	Oilproof heavy-duty cord	●	●	●	—			
For 20, 30, 40	**Solid state auto switch**	—	Grommet	Yes	3-wire (NPN)	24 V 5 V, 12 V	—	—	**S79**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			—	**S7P**		●	●	○	—	○		
					2-wire	12 V		—	**T79**		●	●	○	—	○	—	
			Connector					—	**T79C**		●	●	●	●	—		
	Reed auto switch	—	Grommet			—	100 V	—	**R73**		●	●	○	—	—	—	
			Connector				—	—	**R73C**		●	●	●	●			
			Grommet	No		48 V, 100 V	100 V	—	**R80**		●	●	○	—		IC circuit	
			Connector			—	24 V or less	—	**R80C**		●	●	●	●		—	

∗ Lead wire length symbols: 0.5 m……Nil (Example) R73C
3 m…… L (Example) R73CL
5 m…… Z (Example) R73CZ
None …… N (Example) R73CN

∗ Auto switches are shipped together, (but not assembled).
∗ Solid state auto switches marked with "○" are produced upon receipt of order.



Symbol



Flange Assembly Part No.

(For details, refer to page 12.)

Model	Assembly part no.
CRB2F□10	P211070-2
CRB2F□15	P211090-2
CRB2F□20	P211060-2
CRB2F□30	P211080-2

Made to Order

(For details, refer to pages 34 to 48.)

Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern Ⅰ	W
XA31 to XA58	Shaft type pattern Ⅱ	S, J, K, T, Y
XC1	Add connecting ports	W, S, J, K, T, Y
XC2	Change threaded hole to through-hole	W, S, J, K, T, Y
XC3	Change the screw position	W, S, J, K, T, Y
XC4	Change the rotation range	W, S, J, K, T, Y
XC5	Change rotation range between 0 to 200°	W, S, J, K, T, Y
XC6	Change rotation range between 0 to 110°	W, S, J, K, T, Y
XC7	Reversed shaft	W, J
XC30	Fluorine grease	W, S, J, K, T, Y
X5	For M5 port (90°/180°)	W, S, J, K, T, Y

The above may not be selected when the product comes with an auto switch or angle adjustment unit. For details, refer to pages 34, 35, 40, 41, 46, 48.

Single Vane Specifications

Size		10	15	20	30	40
Rotating angle		90°, 180°, 270°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Rotation time adjustment range s/90° Note 1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (J) Note 2)		0.00015	0.001	0.003	0.02	0.04
			0.00025	0.0004	0.015	0.03
Shaft load (N)	**Allowable radial load**	15	15	25	30	60
	Allowable thrust load	10	10	20	25	40
Port location		Side ported or Axial ported				
Port size (Side ported, Axial ported)		M3 x 0.5		M5 x 0.8		
Angle adjustable range Note 3)		0 to 230°	0 to 240°			0 to 230°

Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speed (0.3 sec/90°) can cause the unit to stick or not operate.

Note 2) The upper numbers in this section in the table indicate the energy factor when the rubber bumper is used (at the end of the rotation), and the lower numbers indicate the energy factor when the rubber bumper is not used.

Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 14.

Double Vane Specifications

Size		10	15	20	30	40
Rotating angle		90°, 100°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Rotation time adjustment range s/90° Note 1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy(J)		0.0003	0.0012	0.0033	0.02	0.04
Shaft load (N)	**Allowable radial load**	15	15	25	30	60
	Allowable thrust load	10	10	20	25	40
Port location		Side ported or Axial ported				
Port size (Side ported, Axial ported)		M3 x 0.5		M5 x 0.8		
Angle adjustable range Note 3)		0 to 90°				

Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speed (0.3 sec/90°) can cause the unit to stick or not operate.

Note 3) Adjustment range in the table is for 100°. For 90°, refer to page 14.

Volume

(cm³)

Vane type	Single vane															Double vane									
Size	10			15			20			30			40			10		15		20		30		40	
Rotation	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Volume	1 (0.6)	1.2	1.5	1.5 (1.0)	2.9	3.7	4.8 (3.6)	6.1	7.9	11.3 (8.5)	15	20.2	25 (18.7)	31.5	41	1.0	1.1	2.6	2.7	5.6	5.7	14.4	14.5	33	34

∗ Values inside ( ) are volume of the supply side when A port is pressurized.

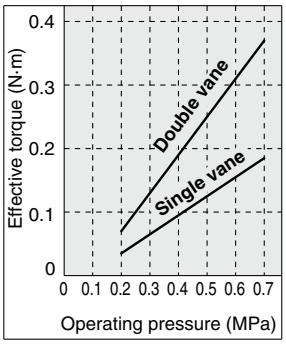
Weight

(g)

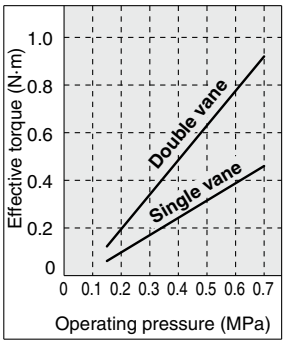
Vane type	Single vane															Double vane									
Size	10			15			20			30			40			10		15		20		30		40	
Rotating angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Rotary actuator body	27	26	26	48	47	46	104	103	101	199	194	189	385	374	363	42	43	55	58	119	142	219	239	398	444
Flange assembly	9			10			19			25			—			9		10		19		25		—	
Auto switch unit	15			20			28			38			43			15		20		28		38		43	
Angle adjuster unit	30			47			90			150			203			30		47		90		150		203	

Effective Output

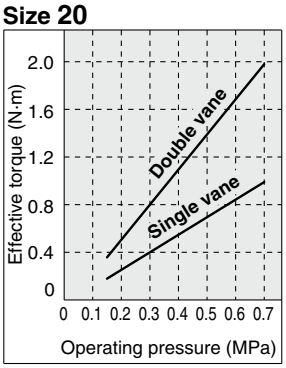
Size 10



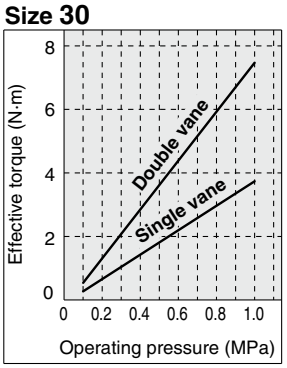
Size 15



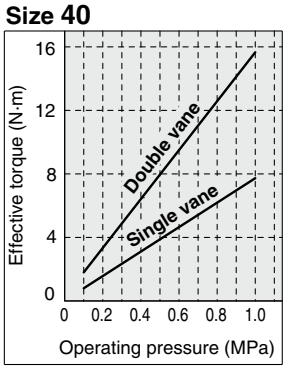
Size 20



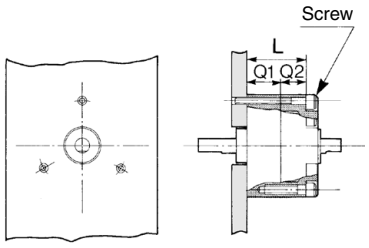
Size 30



Size 40



Direct Mounting of Body



Dimension "L" of the actuators is provided in the table below for JIS standard hexagon socket head cap screws. If these types of screw are used, their heads will fit in the mounting hole.

Reference Screw Size

Size	L	Screw
10	11.5*	M2.5
15	16	M2.5
20	24.5	M3
30	34.5	M4
40	39.5	M4

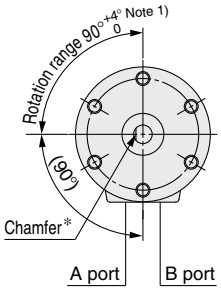
* Only the size 10 actuators have different L dimensions for single and double vane.
  Double vane: L = 20.5
* Refer to page 7 for Q1 and Q2 dimensions.

Chamfered Position and Rotation Range: Top View from Long Shaft Side

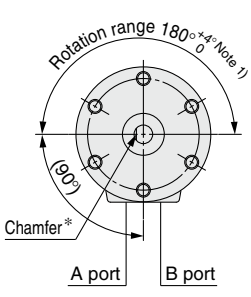
Chamfered positions shown below illustrate the conditions of actuators when B port is pressurized.

Single vane

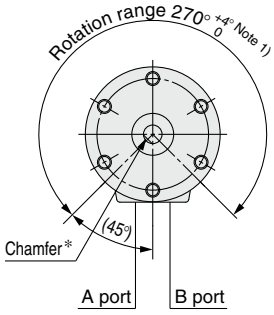
90S



180S

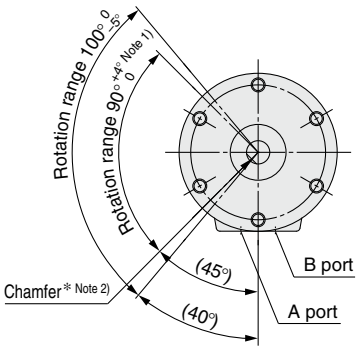


270S



Double vane

90, 100D



* For size 40 actuators, a parallel key will be used instead of chamfer.

Note 1) For single vane type, the tolerance of rotating angle of 90°, 180°, 270° will be $^{+5^\circ}_{0}$ for size 10 only.
For double vane type, the tolerance of rotating angle of 90° will be $^{+5^\circ}_{0}$ for size 10 only.

Note 2) The chamfered position of the double vane type shows the 90° specification position.

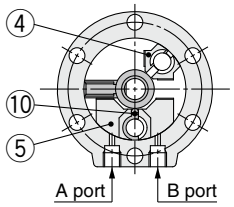
Construction

Single vane

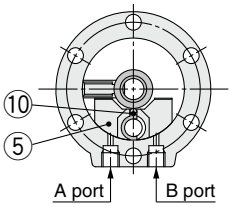
• Figures for 90° and 180° show the condition of the actuators when B port is pressurized, and the figure for 270° shows the position of the ports during rotation.

Size: 10, 15, 20, 30, 40

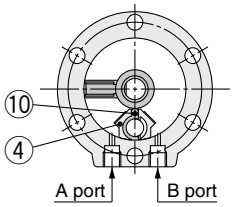
For 90°
(Viewed from the output shaft side)

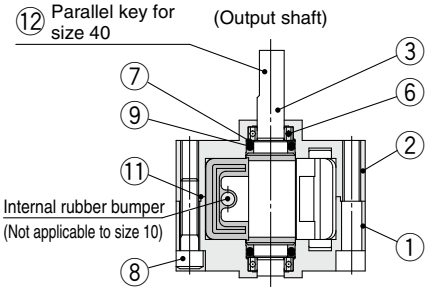


For 180°
(Viewed from the output shaft side)

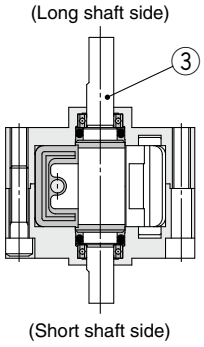


For 270°
(Viewed from the output shaft side)





Single shaft type



Double shaft type

Component Parts

No.	Description	Material	Note
1	**Body (A)**	Aluminum alloy	Painted
2	**Body (B)**	Aluminum alloy	Painted
3	**Vane shaft**	Stainless steel*	
4	**Stopper**	Resin	For 270°
5	**Stopper**	Resin	For 180°
6	**Bearing**	Bearing steel	
7	**Back-up ring**	Stainless steel	
8	**Hexagon socket head cap screw**	Chrome molybdenum steel	Special screw
9	**O-ring**	NBR	
10	**Stopper seal**	NBR	Special seal
11	**O-ring**	NBR	Size 40 only
12	**Parallel key**	Carbon steel	Size 40 only

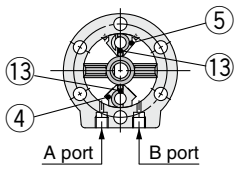
* The material is chrome molybdenum steel for size 30 and 40.

Double vane

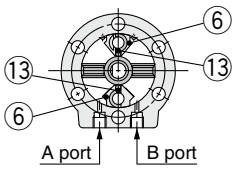
• Figures below show the intermediate rotation position when A or B port is pressurized.

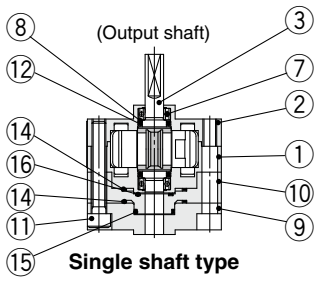
Size: 10

For 90°
(Viewed from the output shaft side)

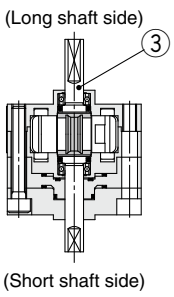


For 100°
(Viewed from the output shaft side)





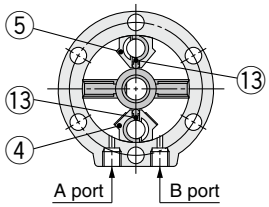
Single shaft type



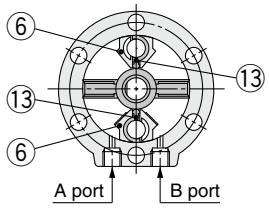
Double shaft type

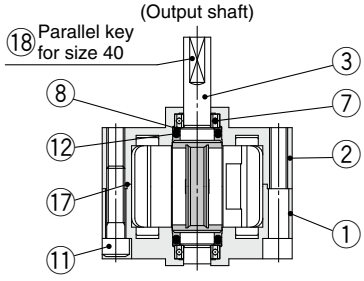
Size: 15, 20, 30, 40

For 90°
(Viewed from the output shaft side)

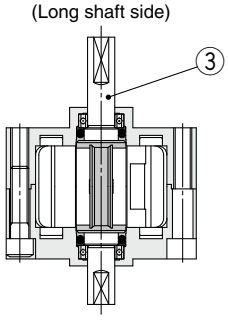


For 100°
(Viewed from the output shaft side)





Single shaft type



Double shaft type

Component Parts

No.	Description	Material	Note
1	**Body (A)**	Aluminum alloy	Painted
2	**Body (B)**	Aluminum alloy	Painted
3	**Vane shaft**	Chrome molybdenum steel	
4	**Stopper**	Stainless steel*	
5	**Stopper**	Resin	
6	**Stopper**	Stainless steel*	
7	**Bearing**	Bearing steel	
8	**Back-up ring**	Stainless steel	
9	**Cover**	Aluminum alloy	

* For size 40, material for ④, ⑥ is aluminum alloy.

No.	Description	Material	Note
10	**Plate**	Resin	
11	**Hexagon socket head cap screw**	Chrome molybdenum steel	Special screw
12	**O-ring**	NBR	
13	**Stopper seal**	NBR	Special seal
14	**Gasket**	NBR	Special seal
15	**O-ring**	NBR	
16	**O-ring**	NBR	
17	**O-ring**	NBR	Size 40 only
18	**Parallel key**	Carbon steel	Size 40 only

Construction (With Auto Switch)

Single vane

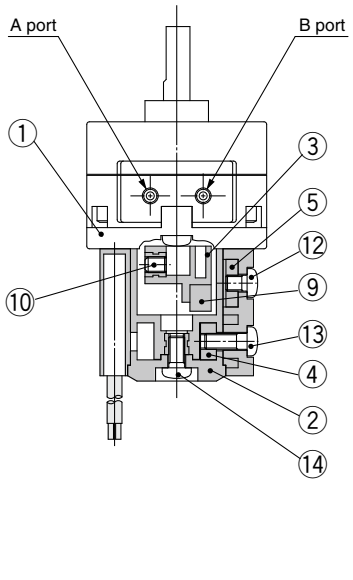
(The unit is common for single vane type and double vane type.)

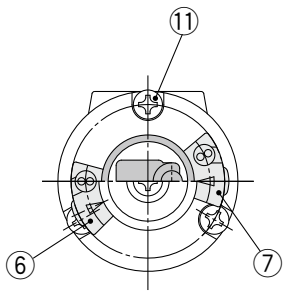
- Following figures show actuators for 90° and 180° when B port is pressurized.

Double vane

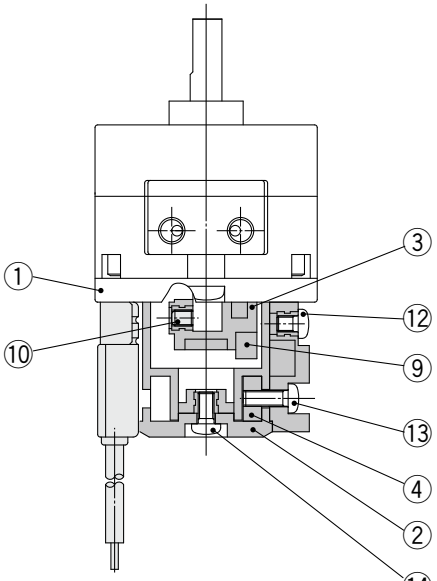
- Following figures show the intermediate rotation position when A or B port is pressurized.

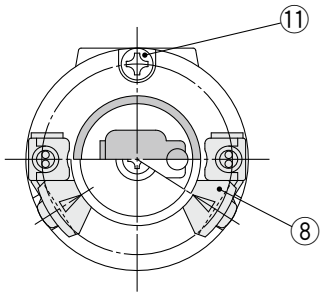
Size: 10, 15



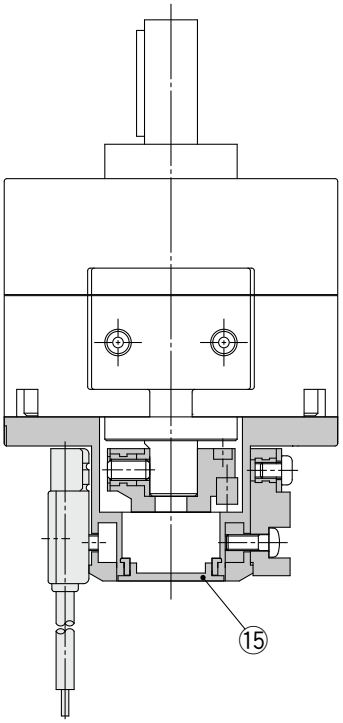


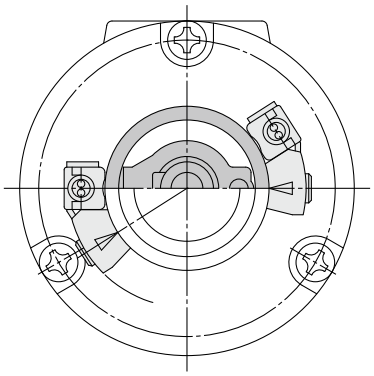
Size: 20, 30





Size: 40





Component Parts

No.	Description	Material
1	**Cover (A)**	Resin
2	**Cover (B)**	Resin
3	**Magnet lever**	Resin
4	**Holding block**	Stainless steel
5	**Holding block (B)**	Aluminum alloy
6	**Switch block (A)**	Resin
7	**Switch block (B)**	Resin
8	**Switch block**	Resin
9	**Magnet**	

No.	Description	Material
10	**Hexagon socket head set screw**	Stainless steel
11	**Cross recessed round head screw**	Stainless steel
12	**Cross recessed round head screw**	Stainless steel
13	**Cross recessed round head screw**	Stainless steel
14	**Cross recessed round head screw**	Stainless steel
15	**Rubber cap**	NBR

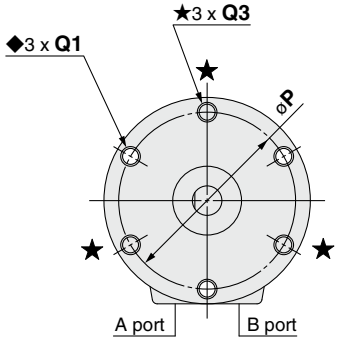
∗ For size 10, 2 cross recessed round head screws ⑪ are required.

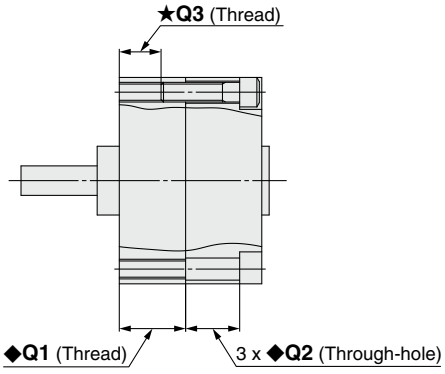
Dimensions: Standard Type 10, 15, 20, 30, 40

- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

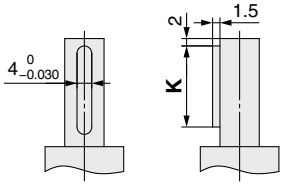
Single shaft/Port location: Side ported

(The size 10 double vane type is indicated on page 8.)

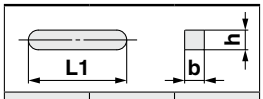




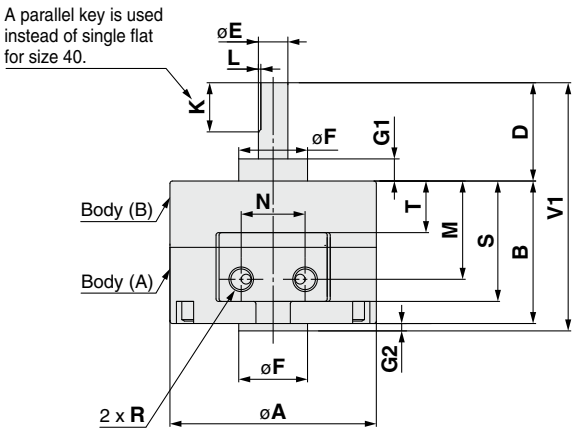
Shaft-end shape of size 40



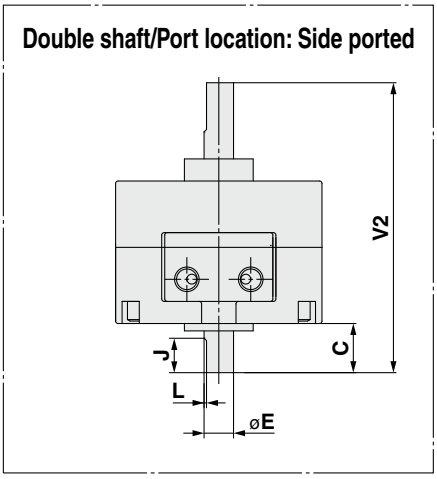
Parallel key dimensions



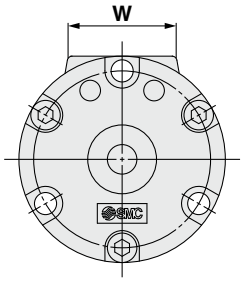
b (h9)	h (h9)	L1
4 0 −0.030	4 0 −0.030	20

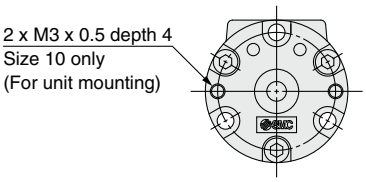


Double shaft/Port location: Side ported

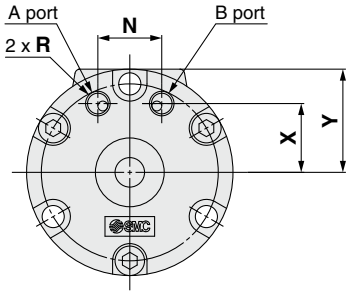


Size: 10
<Port location: Side ported>





Size: 10, 15, 20, 30, 40
<Port location: Axial ported>



Refer to page 11 for details of shaft types J, K, T and Y.

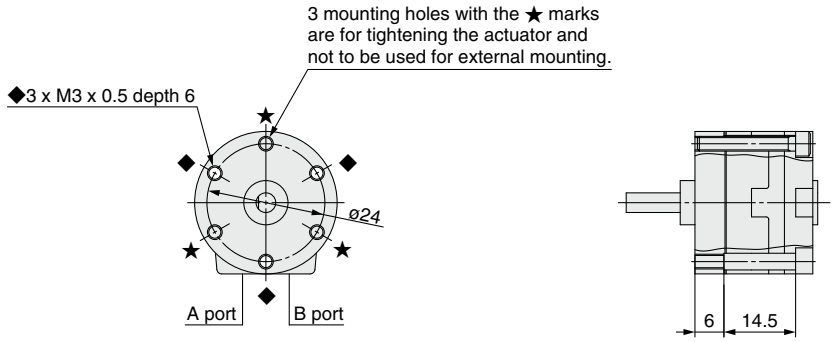
(mm)

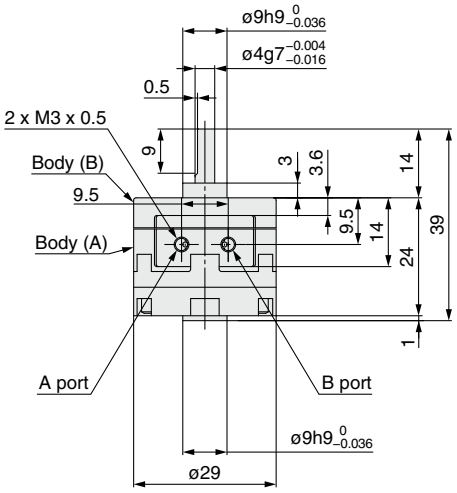
Size	A	B	C	D	E (g7)	F (h9)	G1	G2	J	K	L	M	N	P	Q			R	S	T	V1	V2	W	X	Y
															◆Q1	◆Q2	★Q3								
10	29	15	8	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	3	1	5	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	6	—	M3 x 0.5	14	3.6	30	37	19.8	8.5	14.5
15	34	20	9	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	4	1.5	6	10	0.5	14	10	29	M3 x 0.5 depth 10	6	M3 x 0.5 depth 5	M3 x 0.5	19	7.6	39.5	47	21	11	17
20	42	29	10	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	4.5	1.5	7	10	0.5	20	13	36	M4 x 0.7 depth 13.5	11	M4 x 0.7 depth 7.5	M5 x 0.8	24.5	10.5	50.5	59	22	14	21
30	50	40	13	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	5	2	8	12	1.0	26	14	43	M5 x 0.8 depth 18	16.5	M5 x 0.8 depth 10	M5 x 0.8	34.5	14	64	75	24	15.5	25
40	63	45	15	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	6.5	4.5	9	20	1.0	31	20	56	M5 x 0.8 depth 16	17.5	M5 x 0.8 depth 10	M5 x 0.8	39.8	17	79.5	90	30	21	31.6

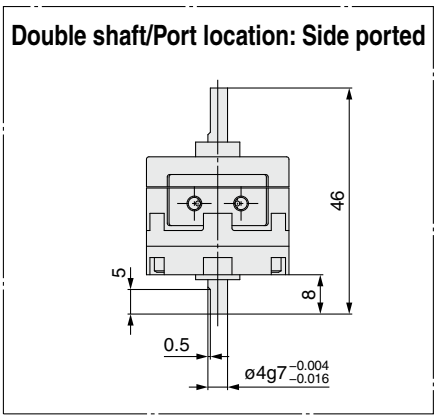
Dimensions: Standard Type 10

Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

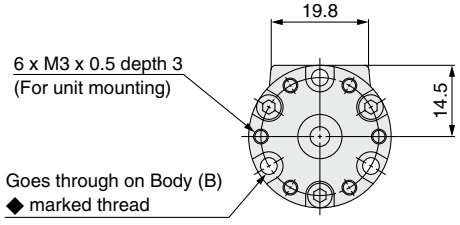
Single shaft/Port location: Side ported

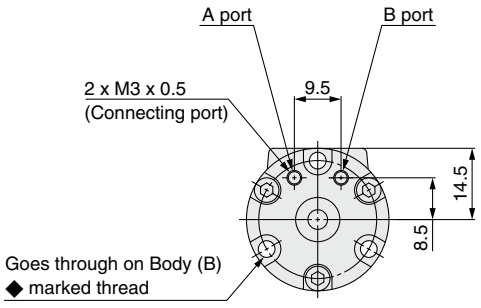






<Port location: Axial ported>





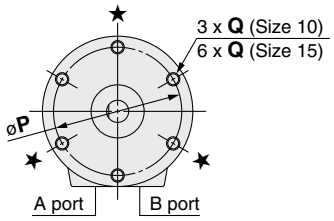
Refer to page 11 for details of shaft types J, K, T and Y.

Dimensions: Standard Type (With Auto Switch) 10, 15, 20, 30, 40

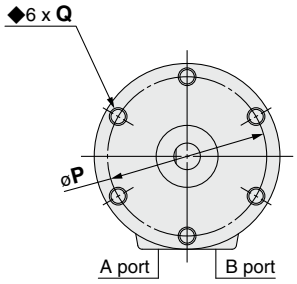
- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

Size: 10, 15

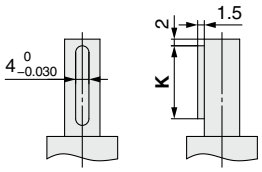
(The size 10 double vane type is indicated on page 10.)



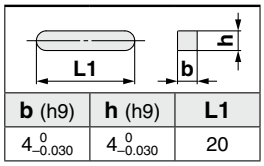
Size: 20, 30, 40



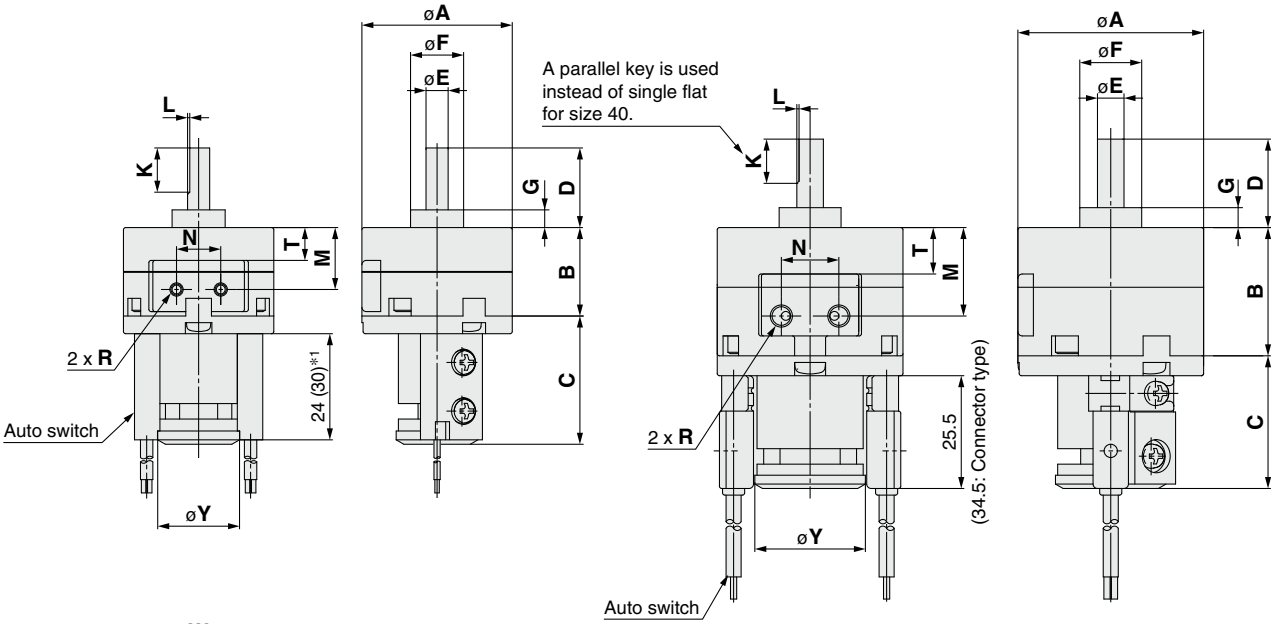
Shaft-end shape of size 40

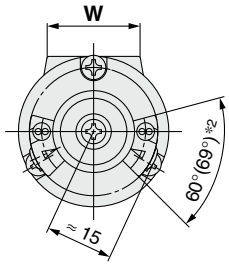


Parallel key dimensions

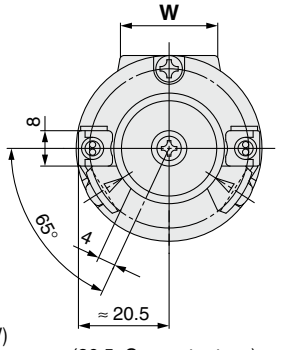


b (h9)	h (h9)	L1
$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20



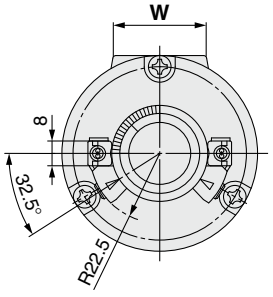


Size: 20, 30



(26.5: Connector type)

Size: 40



∗1. The length is 24 when any of the following auto switches are used:
D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 11 for details of shaft types J, K, T and Y.

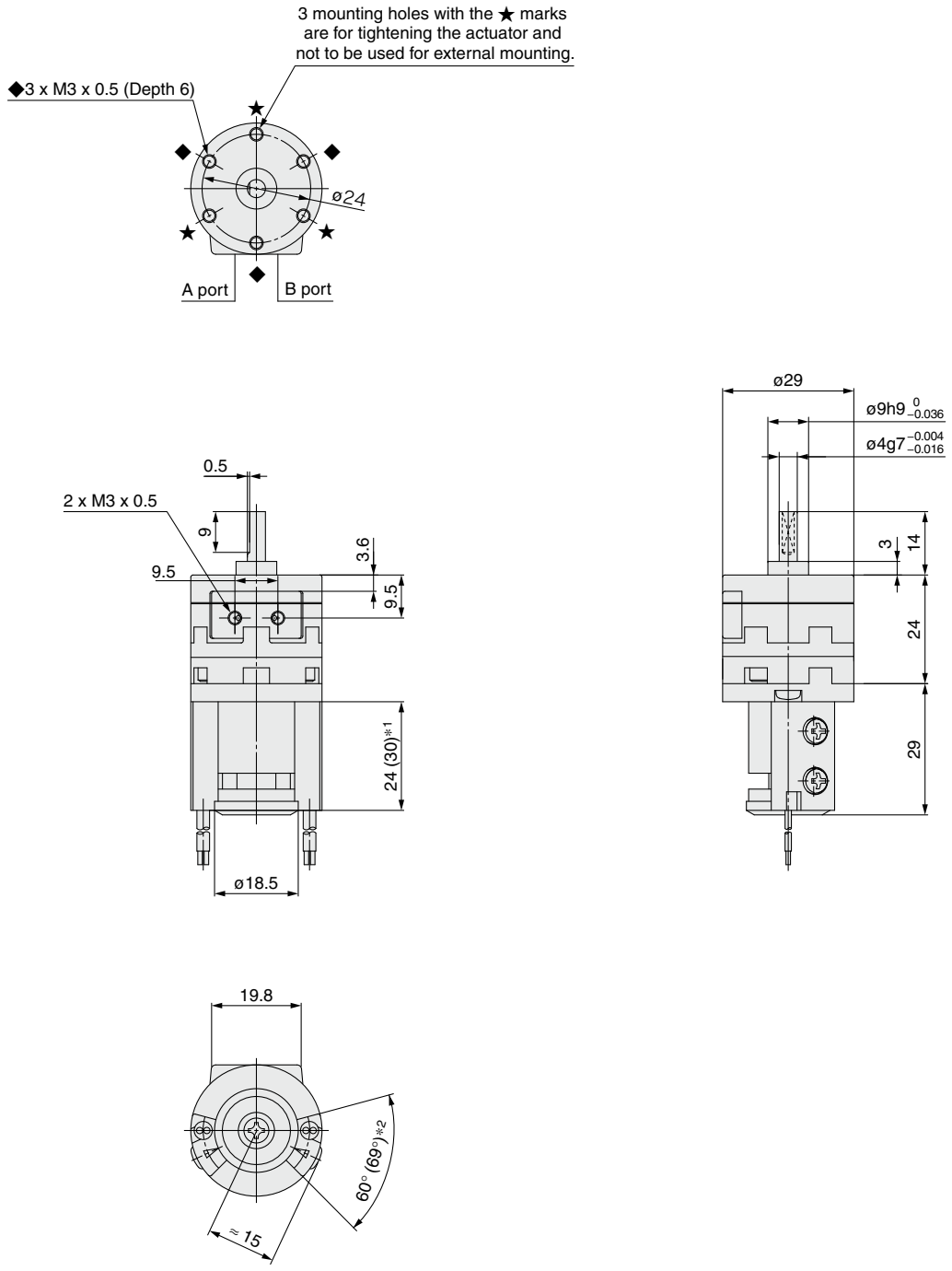
(mm)

Size	A	B	C	D	E (g7)	F (h9)	G	K	L	M	N	P	Q	R	T	W	Y
10	29	15	29	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	3	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	M3 x 0.5	3.6	19.8	18.5
15	34	20	29	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	4	10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6	21	18.5
20	42	29	30	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	4.5	10	0.5	20	13	36	M4 x 0.7 depth 7	M5 x 0.8	10.5	22	25
30	50	40	31	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	5	12	1.0	26	14	43	M5 x 0.8 depth 10	M5 x 0.8	14	24	25
40	63	45	31	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	6.5	20	1.0	31	20	56	M5 x 0.8 depth 10	M5 x 0.8	17	30	31

Dimensions: Standard Type (With Auto Switch) 10

Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

Size: 10



*1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

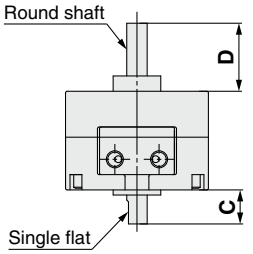
*2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 11 for details of shaft types J, K, T and Y.

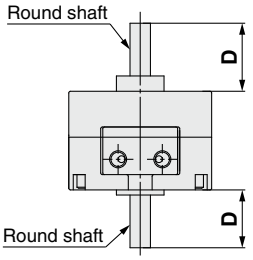
Shaft Type Dimensions (Dimensions other than specified below are the same as the standard type.)

Size: 10, 15, 20, 30, 40

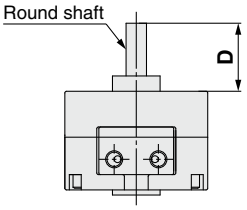
Double shaft/CRB2□J



Double shaft/CRB2□K

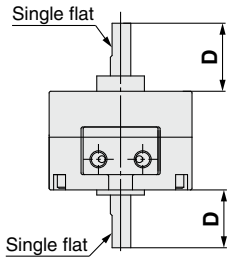


Single shaft/CRB2□T



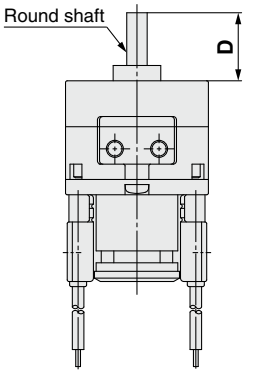
Single shaft/CRB2□Y

A parallel key is used instead of single flat for size 40.



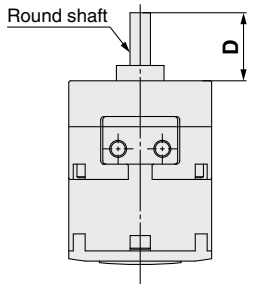
Double shaft/CDRB2□J

With auto switch



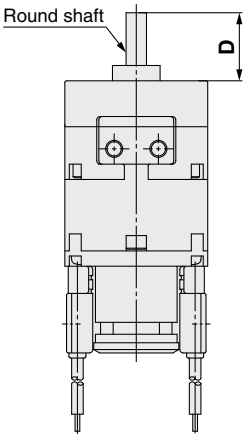
Double shaft/CRB2□JU

With angle adjuster unit



Double shaft/CDRB2□JU

With auto switch and angle adjuster unit



(mm)

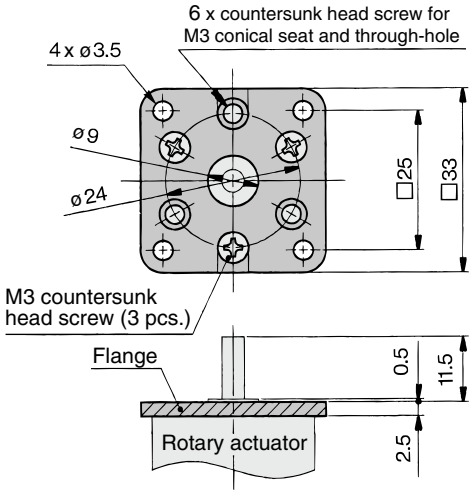
Size	10	15	20	30	40
C	8	9	10	13	15
D	14	18	20	22	30

Note 1) Dimensions and tolerance of the shaft and single flat (a parallel key for size 40) are the same as the standard.

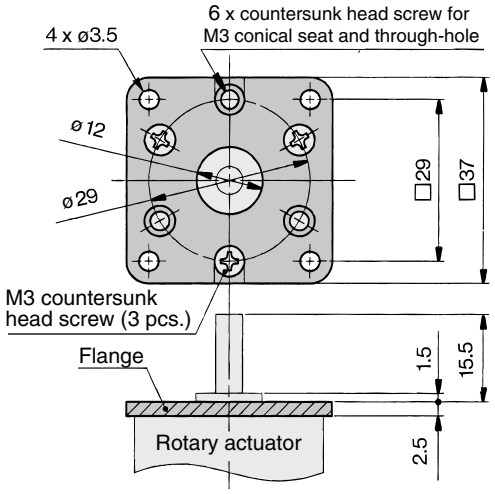
Note 2) For rotary actuators with auto switch and angle adjuster unit, connection ports are side ports.

Optional Specifications: Flange (Size: 10, 15, 20, 30)

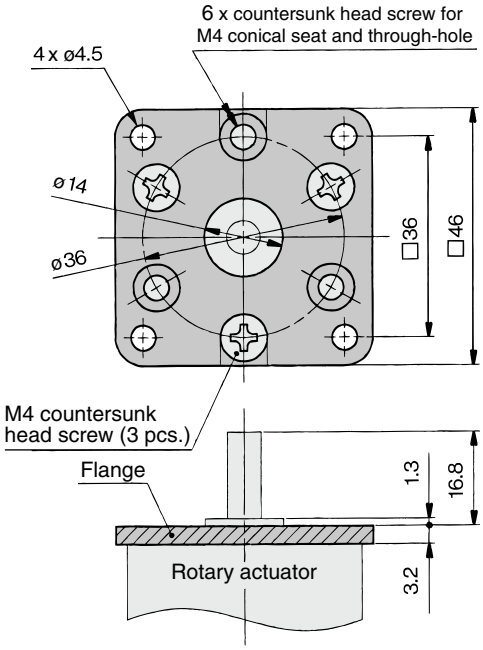
Flange assembly for C□RB2F□□10
Part no.: P211070-2



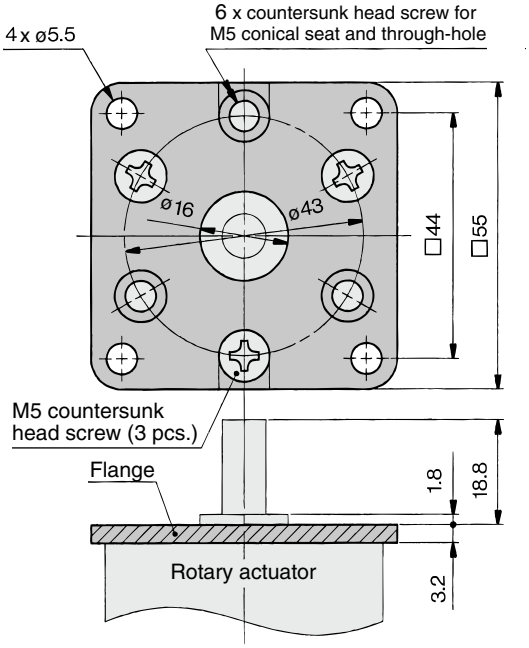
Flange assembly for C□RB2F□□15
Part no.: P211090-2



Flange assembly for C□RB2F□□20
Part no.: P211060-2



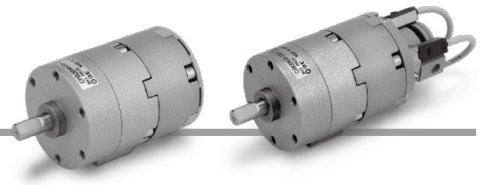
Flange assembly for C□RB2F□□30
Part no.: P211080-2



Rotary Actuator with Angle Adjuster
Vane Type

RoHS

Series CRB2□WU
Size: 10, 15, 20, 30, 40



How to Order

	CRB2 **B** **W** **U** **20** – **180** **S** **Z** ———
With auto switch	CDRB2 **B** **W** **U** **20** – **180** **S** **Z** – **T79** **L** –

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

❶ With auto switch
(With auto switch unit and built-in magnet)
∗ Refer to page 49 when the auto switch unit is needed separately.

❷ Mounting

Symbol	Mounting
B	Basic type
F*	Flange type

∗ F: Except size 40

❸ Shaft type

Symbol	Shaft-end shape
W	Single flat*
J**	Round shaft

∗ A key is used for size 40.
∗∗ J is made to order.

❹ With angle adjuster unit
∗ Refer to page 49 when the angle adjuster unit is needed separately.

❺ Size

10
15
20
30
40

❻ Rotating angle

Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

❼ Vane type

S	Single vane
D	Double vane

❽ Auto switch

Nil	Without auto switch (Built-in magnet)

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

❾ Electrical entry/Lead wire length

Nil	Grommet/Lead wire: 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire: 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/Without lead wire

∗ Connectors are available only for the R73, R80, T79.
∗∗ Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

❿ Number of auto switches

S	1 pc.*
Nil	2 pcs.**

∗ S: A right-hand auto switch is shipped.
∗∗ Nil: A right-hand switch and a left-hand switch are shipped.

⓫ Made to Order
For details, refer to the table below.

Made to Order (For details, refer to pages 34 to 48.)

Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern Ⅰ	W
XA31 to XA58	Shaft type pattern Ⅱ	J
XC1	Add connecting ports	W, J
XC2	Change threaded hole to through-hole	W, J
XC3	Change the screw position	W, J
XC4	Change the rotation range	W, J
XC5	Change rotation range between 0 and 200°	W, J
XC6	Change rotation range between 0 and 110°	W, J
XC7	Reversed shaft	W, J
XC30	Fluorine grease	W, J
X5	For M5 port (90°/180°)	W, J

The above may not be selected when the product comes with an auto switch or angle adjuster unit. For details, refer to pages 34, 35, 40, 41, 46, 48.

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

Applicable size	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 type	Lead wire length (m)∗: 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
For 10, 15	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	**S99V**	**S99**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			**S9PV**	**S9P**		●	●	○	—	○		
					2-wire	12 V		**T99V**	**T99**		●	●	○	—	○	—	
	Reed auto switch	—		No	2-wire	5 V, 12 V	5 V, 12 V, 24 V	—	**90**	Vinyl parallel cord	●	●	●	—	—	IC circuit	
						5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	—	**90A**	Oilproof heavy-duty cord	●	●	●	—			
				Yes		—	—	—	**97**	Vinyl parallel cord	●	●	●	—		—	
						—	100 V	—	**93A**	Oilproof heavy-duty cord	●	●	●	—			
For 20, 30, 40	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	—	**S79**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			—	**S7P**		●	●	○	—	○		
					2-wire	12 V		—	**T79**		●	●	○	—	○	—	
			Connector					—	**T79C**		●	●	●	●	—		
	Reed auto switch	—	Grommet			—	100 V	—	**R73**		●	●	○	—	—	—	
			Connector				—	—	**R73C**		●	●	●	●			
			Grommet	No		48 V, 100 V	100 V	—	**R80**		●	●	○	—		IC circuit	
			Connector			—	24 V or less	—	**R80C**		●	●	●	●		—	

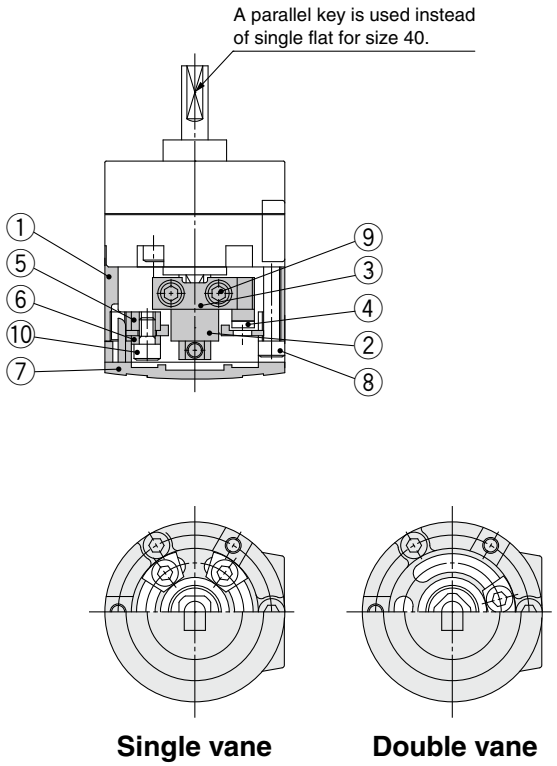
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) R73C
3 m ····· L (Example) R73CL
5 m ····· Z (Example) R73CZ
None ····· N (Example) R73CN

∗ Auto switches are shipped together, (but not assembled).
∗ Solid state auto switches marked with "○" are produced upon receipt of order.

Construction: 10, 15, 20, 30, 40

● The unit is common for single vane type and double vane type.

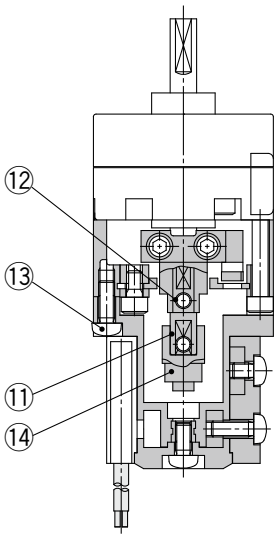
With angle adjuster
Size: 10, 15, 20, 30, 40



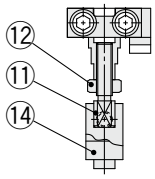
Single vane

Double vane

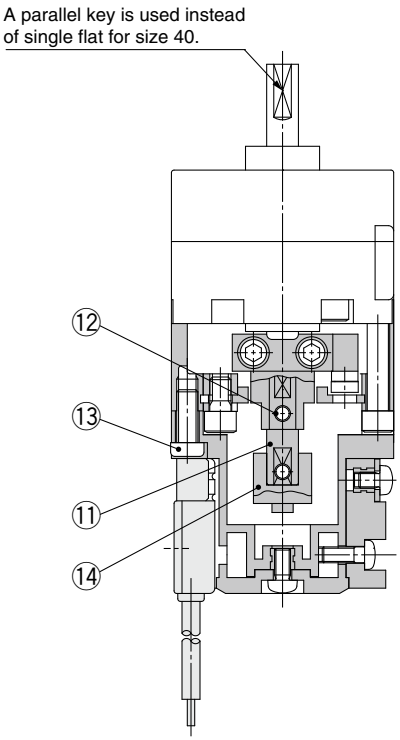
With auto switch and angle adjuster
Size: 10, 15



Size: 10



Size: 20, 30, 40



Component Parts

No.	Description	Material	Note
1	**Stopper ring**	Aluminum alloy	
2	**Stopper lever**	Chrome molybdenum steel	
3	**Lever retainer**	Rolled steel	Zinc chromated
4	**Rubber bumper**	NBR	
5	**Stopper block**	Chrome molybdenum steel	Zinc chromated
6	**Block retainer**	Rolled steel	Zinc chromated
7	**Cap**	Resin	
8	**Hexagon socket head cap screw**	Stainless steel	Special screw
9	**Hexagon socket head cap screw**	Stainless steel	Special screw
10	**Hexagon socket head cap screw**	Stainless steel	Special screw
11	**Joint**		
12	**Hexagon socket head cap screw**	Stainless steel	Hexagon nut will be used for size 10 only.
	Hexagon nut	Stainless steel	
13	**Cross recessed round head screw**	Stainless steel	
14	**Magnet lever**	—	

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Rotary Actuator Precautions and Auto Switch Precautions.

Angle Adjuster Unit

⚠ Caution

1. Since the maximum angle of the rotating angle adjustment range will be limited by the rotation of the rotary actuator, make sure to take this into consideration when ordering.

Rotating angle of rotary actuator	Rotating angle adjustment range
$270°^{+4}_{0}$	0° to 230° (Size: 10, 40) *
	0° to 240° (Size: 15, 20, 30)
$180°^{+4}_{0}$	0° to 175°
$90°^{+4}_{0}$	0° to 85°

* The maximum adjustment angle of the angle adjuster unit for size 10 and 40 is 230°

2. Connecting ports are side ported only.

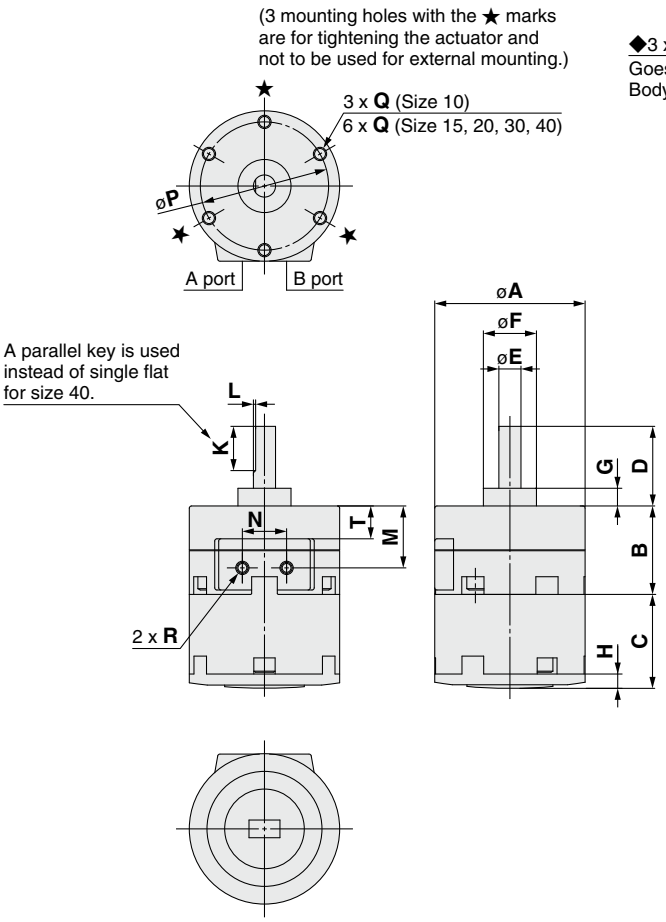
3. The allowable kinetic energy is the same as the specifications of the rotary actuator.

4. Use a 100° rotary actuator when you desire to adjust the angle to 90° using a double vane type.

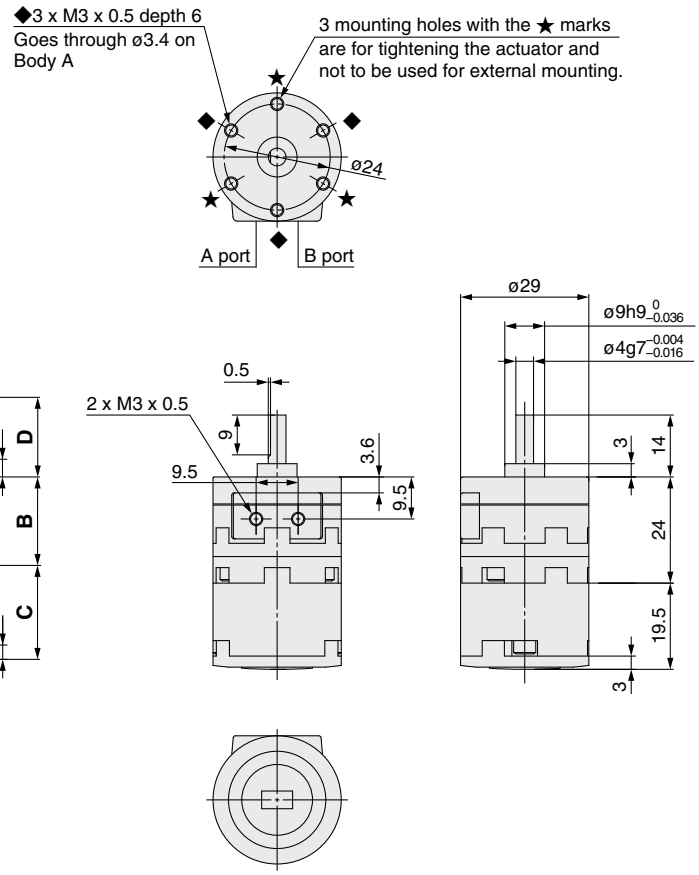
Dimensions: Standard Type (With Angle Adjuster) 10, 15, 20, 30, 40

- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

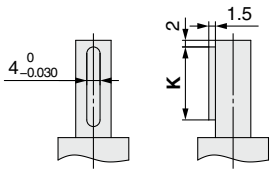
Size: 10, 15, 20, 30, 40



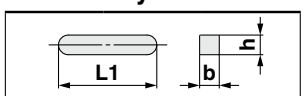
Size: 10 (Double vane)



Shaft-end shape of size 40



Parallel key dimensions



b (h9)	h (h9)	L1
$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20

Refer to page 11 for details of shaft type J.

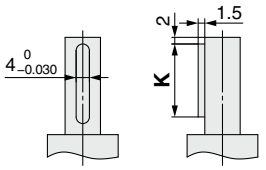
(mm)

Size	A	B	C	D	E (g7)	F (h9)	G	H	K	L	M	N	P	Q	R	T
10	29	15	19.5	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	3	3	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	M3 x 0.5	3.6
15	34	20	21.2	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	4	3.2	10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6
20	42	29	25	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	4.5	4	10	0.5	20	13	36	M4 x 0.7 depth 7	M5 x 0.8	10.5
30	50	40	29	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	5	4.5	12	1.0	26	14	43	M5 x 0.8 depth 10	M5 x 0.8	14
40	63	45	36.3	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	6.5	5	20	—	31	20	56	M5 x 0.8 depth 10	M5 x 0.8	17

Dimensions: Standard Type (With Auto Switch and Angle Adjuster) 10, 15, 20, 30, 40

- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

Shaft-end shape of size 40

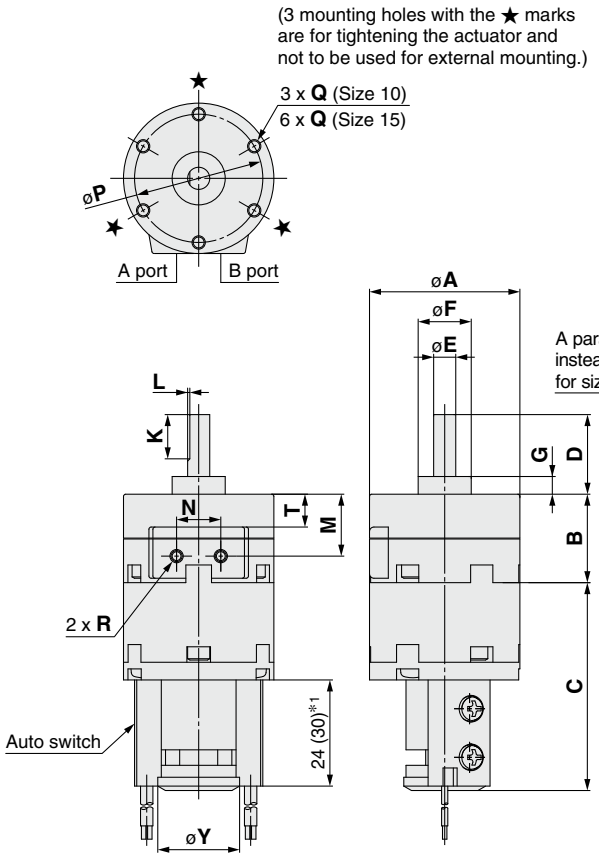


Parallel key dimensions

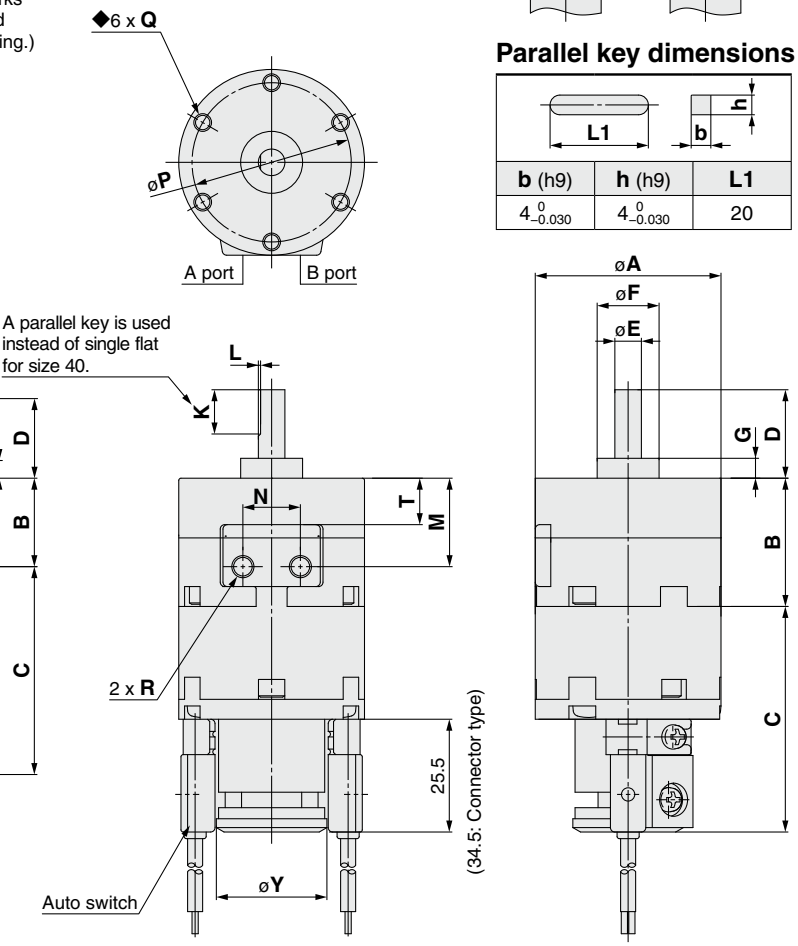
b (h9)	h (h9)	L1
$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20

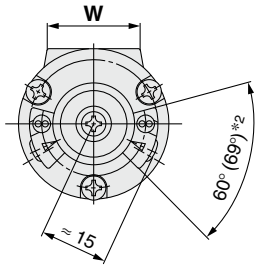
Size: 10, 15

(The size 10 double vane type is indicated on page 17.)

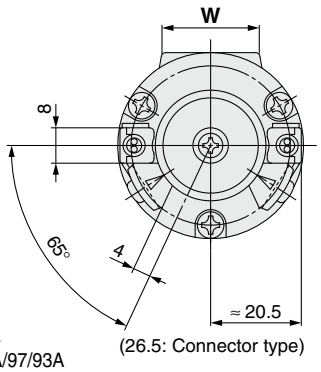


Size: 20, 30, 40

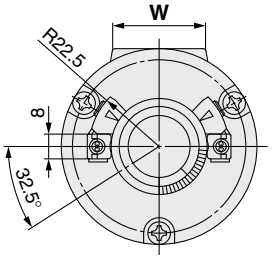




Size: 20, 30



Size: 40



Refer to page 11 for details of shaft type J.

*1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

*2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

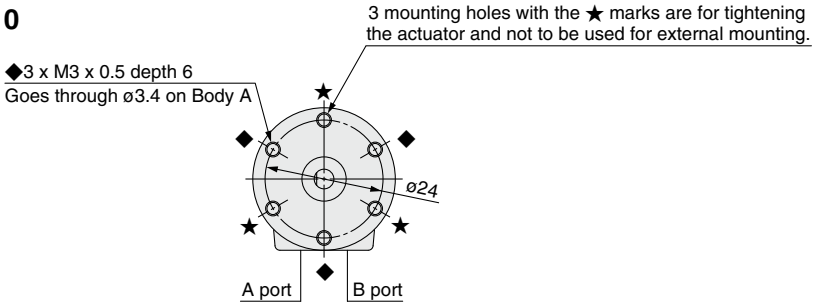
(mm)

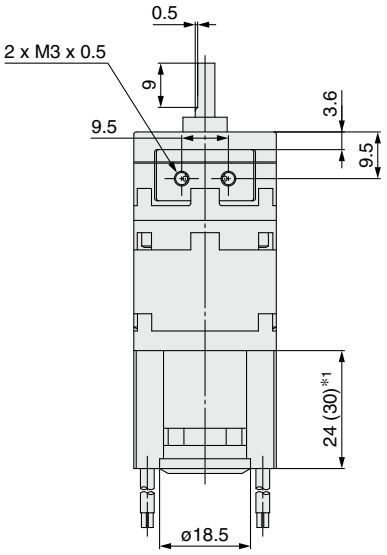
Size	A	B	C	D	E (g7)	F (h9)	G	K	L	M	N	P	Q	R	T	W	Y
10	29	15	45.5	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	3	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	M3 x 0.5	3.6	19.8	18.5
15	34	20	47	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	4	10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6	21	18.5
20	42	29	51	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	4.5	10	0.5	20	13	36	M4 x 0.7 depth 7	M5 x 0.8	10.5	22	25
30	50	40	55.5	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	5	12	1.0	26	14	43	M5 x 0.8 depth 10	M5 x 0.8	14	24	25
40	63	45	62.2	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	6.5	20	—	31	20	56	M5 x 0.8 depth 10	M5 x 0.8	17	30	31

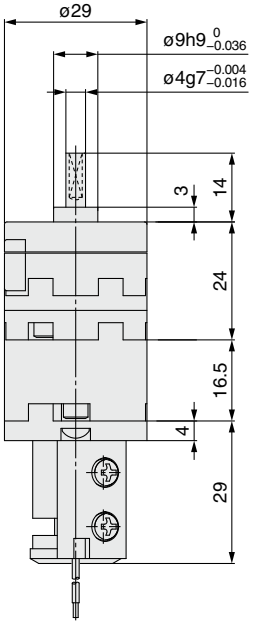
Dimensions: Standard Type (With Auto Switch and Angle Adjuster) 10

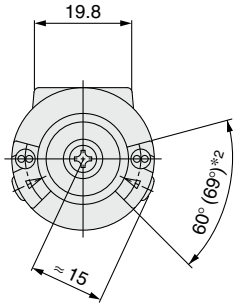
Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

Size: 10









Refer to page 11 for details of shaft type J.

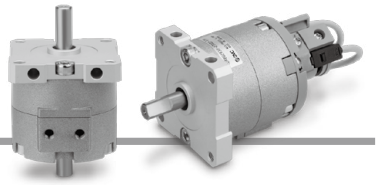
∗1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A
∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Free Mount Type Rotary Actuator
Vane Type

Series CRBU2

RoHS

Size: 10, 15, 20, 30, 40



How to Order

	CRBU2	W	20	–	180	S	E	Z							
With auto switch	CDRBU2	W	20	–	180	S	Z			T79	L		–		
	❶		❷	❸	❹	❺	❻			❼	❽	❾		❿	

Free mount type

❶ With auto switch
(With auto switch unit and built-in magnet)
∗ Refer to page 49 when the auto switch unit is needed separately.

❷ Shaft type

Symbol	Shaft type	Shaft-end shape	
		Long shaft	Short shaft
S	Single shaft	Single flat∗	—
W	Double shaft	Single flat∗	Single flat
J∗∗	Double shaft	Round shaft	Single flat
K∗∗	Double shaft	Round shaft	Round shaft
T∗∗	Single shaft	Round shaft	—
Y∗∗	Double shaft	Single flat∗	Long shaft with single flat∗

∗ A key is used for size 40. ∗∗ J, K, T and Y are made to order.
∗∗∗ When an auto switch is mounted to the rotary actuator, only shaft types W and J are available.

❸ Size

10
15
20
30
40

❹ Rotating angle

Single vane	**90**	90°
	180	180°
	270	270°
Double vane	**90**	90°
	100	100°

❺ Vane type

S	Single vane
D	Double vane

❻ Connecting port location

Nil	Side ported
E	Axial ported

❼ Auto switch

Nil	Without auto switch (Built-in magnet)

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

❽ Electrical entry/Lead wire length

Nil	Grommet/Lead wire: 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire: 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/Without lead wire

∗ Connectors are available only for the R73, R80, T79.
∗∗ Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

❾ Number of auto switches

S	1 pc.∗
Nil	2 pcs.∗∗

∗ S: A right-hand auto switch is shipped.
∗∗ Nil: A right-hand switch and a left-hand switch are shipped.

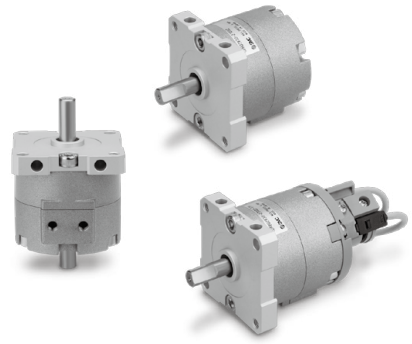
❿ Made to Order
For details, refer to the table below.

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

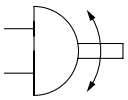
Applicable size	Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire type	Lead wire length (m)∗				Pre-wired connector	Applicable load	
						DC	AC	Perpendicular	In-line		0.5 (Nil)	3 (L)	5 (Z)	None (N)			
For 10, 15	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**S99V**	**S99**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)				**S9PV**	**S9P**		●	●	○	—	○		
					2-wire		12 V		**T99V**	**T99**		●	●	○	—	○	—	
	Reed auto switch	—		No			5 V, 12 V	5 V, 12 V, 24 V	—	**90**	Vinyl parallel cord	●	●	●	—	—	IC circuit	
							5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	—	**90A**	Oilproof heavy-duty cord	●	●	●	—			
				Yes			—	—	—	**97**	Vinyl parallel cord	●	●	●	—		—	
							—	100 V	—	**93A**	Oilproof heavy-duty cord	●	●	●	—			
For 10, 15	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	**S79**	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)				—	**S7P**		●	●	○	—	○		
					2-wire		12 V		—	**T79**		●	●	○	—	○	—	
			Connector						—	**T79C**		●	●	●	●	—		
	Reed auto switch	—	Grommet	No			—	100 V	—	**R73**		●	●	○	—	—	—	
			Connector					—	—	**R73C**		●	●	●	●			
			Grommet				48 V, 100 V	100 V	—	**R80**		●	●	○	—		IC circuit	
			Connector				—	24 V or less	—	**R80C**		●	●	●	●		—	

∗ Lead wire length symbols: 0.5 m·····Nil (Example) R73C
3 m····· L (Example) R73CL
5 m····· Z (Example) R73CZ
None····· N (Example) R73CN

∗ Auto switches are shipped together, (but not assembled).
∗ Solid state auto switches marked with "○" are produced upon receipt of order.



Symbol



Single Vane Specifications

Size		10	15	20	30	40
Rotating angle		90°, 180°, 270°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Rotation time adjustment range s/90° Note 1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (J) Note 2)		0.00015	0.001	0.003	0.02	0.04
			0.00025	0.0004	0.015	0.03
Shaft load (N)	**Allowable radial load**	15	15	25	30	60
	Allowable thrust load	10	10	20	25	40
Port location		Side ported or Axial ported				
Port size (Side ported, Axial ported)		M3 x 0.5		M5 x 0.8		
Angle adjustable range Note 3)		0 to 230°	0 to 240°			0 to 230°

Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speed (0.3 sec/90°) can cause the unit to stick or not operate.
Note 2) The upper numbers in this section in the table indicate the energy factor when the rubber bumper is used (at the end of the rotation), and the lower numbers indicate the energy factor when the rubber bumper is not used.
Note 3) Adjustment range in the table is for 270°. For 90° and 180°, refer to page 29.

Double Vane Specifications

Size		10	15	20	30	40
Rotating angle		90°, 100°				
Fluid		Air (Non-lube)				
Proof pressure (MPa)		1.05			1.5	
Ambient and fluid temperature		5 to 60°C				
Max. operating pressure (MPa)		0.7			1.0	
Min. operating pressure (MPa)		0.2	0.15			
Rotation time adjustment range s/90° Note 1)		0.03 to 0.3			0.04 to 0.3	0.07 to 0.5
Allowable kinetic energy (J)		0.0003	0.0012	0.0033	0.02	0.04
Shaft load (N)	**Allowable radial load**	15	15	25	30	60
	Allowable thrust load	10	10	20	25	40
Port location		Side ported or Axial ported				
Port size (Side ported, Axial ported)		M3 x 0.5		M5 x 0.8		
Angle adjustable range Note 3)		0 to 90°				

Note 1) Make sure to operate within the speed regulation range. Exceeding the maximum speed (0.3 sec/90°) can cause the unit to stick or not operate.
Note 3) Adjustment range in the table is for 100°. For 90°, refer to page 29.

Made to Order

Made to Order
(For details, refer to pages 34 to 48.)

Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern Ⅰ	W
XA31 to XA58	Shaft type pattern Ⅱ	S, J, K, T, Y
XC1	Add connecting ports	W, S, J, K, T, Y
XC2	Change threaded hole to through-hole	W, S, J, K, T, Y
XC3	Change the screw position	W, S, J, K, T, Y
XC4	Change the rotation range	W, S, J, K, T, Y
XC5	Change rotation range between 0 to 200°	W, S, J, K, T, Y
XC6	Change rotation range between 0 to 110°	W, S, J, K, T, Y
XC7	Reversed shaft	W, J
XC30	Fluorine grease	W, S, J, K, T, Y
X5	For M5 port (90°/180°)	W, S, J, K, T, Y

The above may not be selected when the product comes with an auto switch or angle adjustment unit. For details, refer to pages 34, 35, 40, 41, 46, 48.

Volume

(cm³)

Vane type	Single vane															Double vane									
Size	10			15			20			30			40			10		15		20		30		40	
Rotation	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Volume	1 (0.6)	1.2	1.5	1.5 (1.0)	2.9	3.7	4.8 (3.6)	6.1	7.9	11.3 (8.5)	15	20.2	25 (18.7)	31.5	41	1.0	1.1	2.6	2.7	5.6	5.7	14.4	14.5	33	34

∗ Values inside ( ) are volume of the supply side when A port is pressurized.

Weight

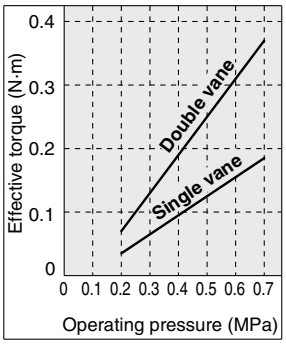
(g)

Vane type	Single vane															Double vane									
Size	10			15			20			30			40			10		15		20		30		40	
Rotating angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	100°	90°	100°
Rotary actuator body	42	42	42	64	63	62	130	129	127	248	243	238	465	454	443	58	59	71	74	145	168	268	288	478	524
Auto switch unit	15			20			28			38			43			15		20		28		38		43	
Angle adjuster unit	30			47			90			150			203			30		47		90		150		203	

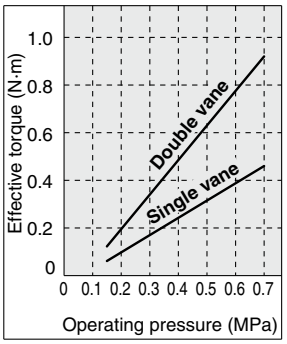
∗ The weight includes a plate and two hexagon socket head cap screws (shipped together). It does not include hexagon socket head cap screws (M3 × 12) for mounting size 10.

Effective Output

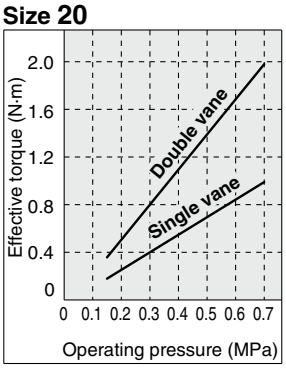
Size 10



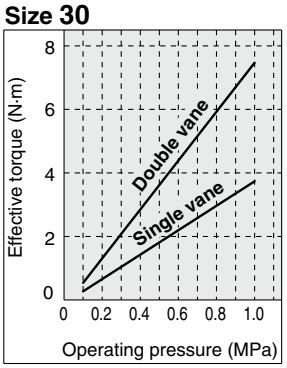
Size 15



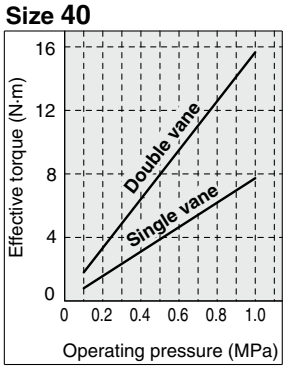
Size 20



Size 30



Size 40

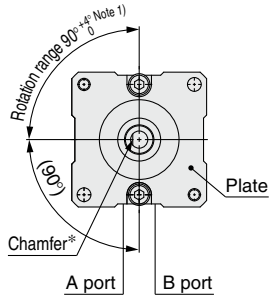


Chamfered Position and Rotation Range: Top View from Long Shaft Side

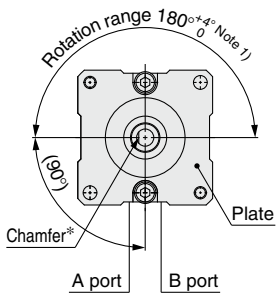
Chamfered positions shown below illustrate the conditions of actuators when B port is pressurized.

Single vane

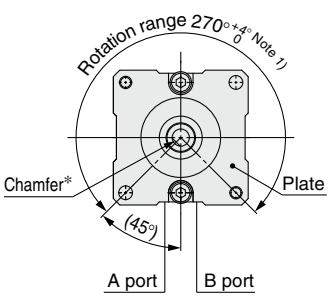
90S



180S

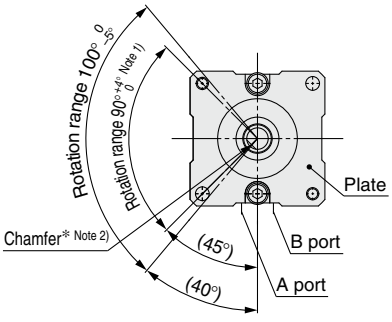


270S



Double vane

90, 100D



* For size 40 actuators, a parallel key will be used instead of chamfer.

Note 1) For single vane type, the tolerance of rotating angle of 90°, 180°, 270° will be $^{+5°}_{0}$ for size 10 only.
For double vane type, the tolerance of rotating angle of 90° will be $^{+5°}_{0}$ for size 10 only.

Note 2) The chamfered position of the double vane type shows the 90° specification position.

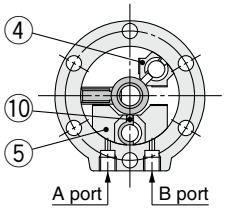
Note 3) Only size 10 has a different plate shape.

Construction

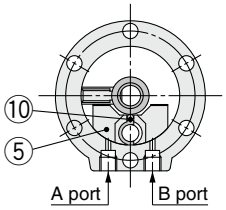
Single vane ● Figures for 90° and 180° show the condition of the actuators when B port is pressurized, and the figure for 270° shows the position of the ports during rotation.

Size: 10, 15, 20, 30, 40

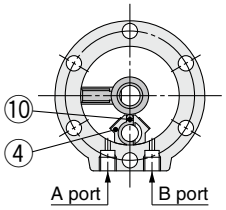
For 90°
(Viewed from the output shaft side)



For 180°
(Viewed from the output shaft side)

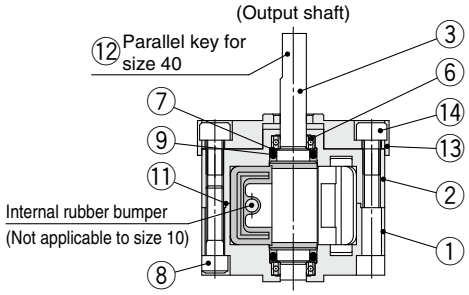


For 270°
(Viewed from the output shaft side)

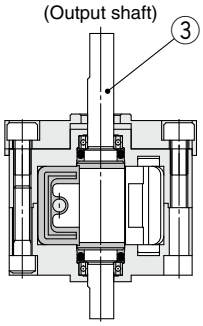


Component Parts

No.	Description	Material	Note
1	**Body (A)**	Aluminum alloy	Painted
2	**Body (B)**	Aluminum alloy	Painted
3	**Vane shaft**	Stainless steel*1	
4	**Stopper**	Resin	For 270°
5	**Stopper**	Resin	For 180°
6	**Bearing**	Bearing steel	
7	**Back-up ring**	Stainless steel	
8	**Hexagon socket head cap screw**	Chrome molybdenum steel	Special screw
9	**O-ring**	NBR	
10	**Stopper seal**	NBR	Special seal
11	**O-ring**	NBR	Size 40 only
12	**Parallel key**	Carbon steel	Size 40 only
13	**Plate**	Aluminum alloy	Anodized
14	**Hexagon socket head cap screw** *2	Chrome molybdenum steel	Special screw for size 40



Single shaft type



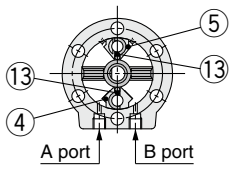
Double shaft type

*1. The material is chrome molybdenum steel for size 30 and 40.
*2. Hexagon socket flat countersunk head cap screw is used for size 10.
⑬ and ⑭ are shipped with the product for all sizes, and special mounting screws (M3 x 12) are attached for size 10.

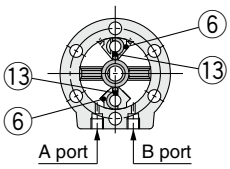
Double vane ● Figures below show the intermediate rotation position when A or B port is pressurized.

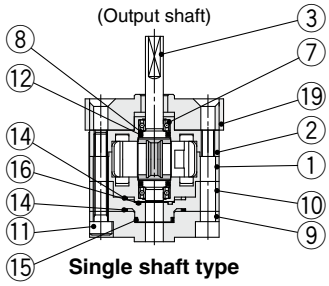
Size: 10

For 90°
(Viewed from the output shaft side)

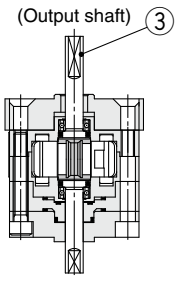


For 100°
(Viewed from the output shaft side)





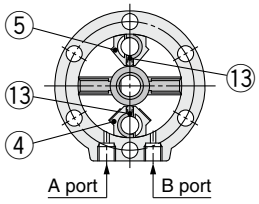
Single shaft type



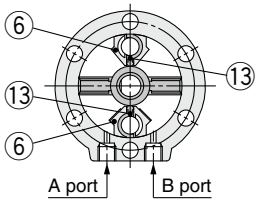
Double shaft type

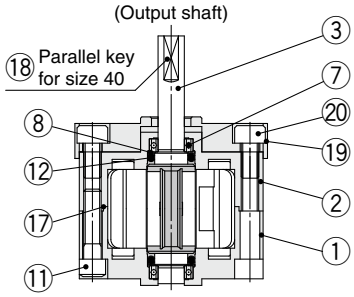
Size: 15, 20, 30, 40

For 90°
(Viewed from the output shaft side)

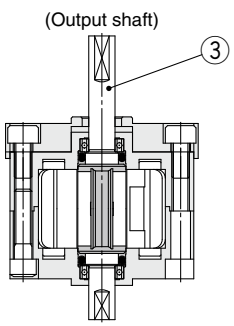


For 100°
(Viewed from the output shaft side)





Single shaft type



Double shaft type

Component Parts

No.	Description	Material	Note
1	**Body (A)**	Aluminum alloy	Painted
2	**Body (B)**	Aluminum alloy	Painted
3	**Vane shaft**	Chrome molybdenum steel	
4	**Stopper**	Stainless steel*1	
5	**Stopper**	Resin	
6	**Stopper**	Stainless steel*1	
7	**Bearing**	Bearing steel	
8	**Back-up ring**	Stainless steel	
9	**Cover**	Aluminum alloy	
10	**Plate**	Resin	

No.	Description	Material	Note
11	**Hexagon socket head cap screw**	Chrome molybdenum steel	Special screw
12	**O-ring**	NBR	
13	**Stopper seal**	NBR	Special seal
14	**Gasket**	NBR	Special seal
15	**O-ring**	NBR	
16	**O-ring**	NBR	
17	**O-ring**	NBR	Size 40 only
18	**Parallel key**	Carbon steel	Size 40 only
19	**Plate**	Aluminum alloy	Anodized
20	**Hexagon socket head cap screw** *2	Chrome molybdenum steel	Special screw for size 40

*1. For size 40, material for ④, ⑥ is aluminum alloy.
*2. Hexagon socket flat countersunk head cap screw is used for size 10. ⑲ and ⑳ are shipped with the product for all sizes, and special mounting screws (M3 x 12) are attached for size 10.

Construction (With Auto Switch)

Single vane

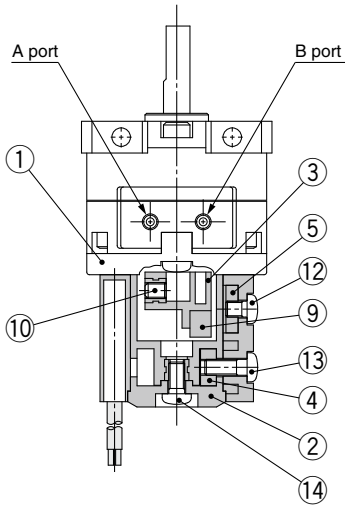
(The unit is common for single vane type and double vane type.)

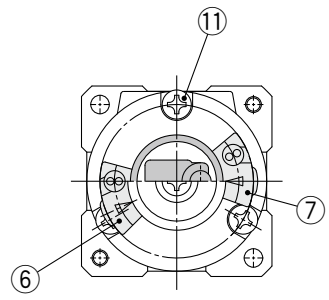
- Following figures show actuators for 90° and 180° when B port is pressurized.

Double vane

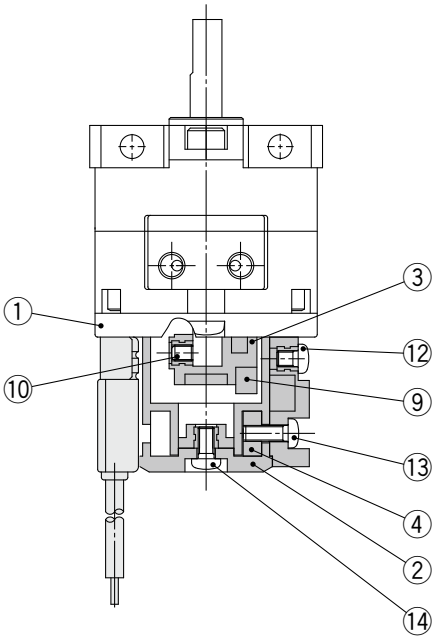
- Following figures show the intermediate rotation position when A or B port is pressurized.

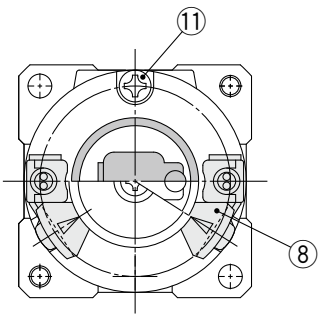
Size: 10, 15



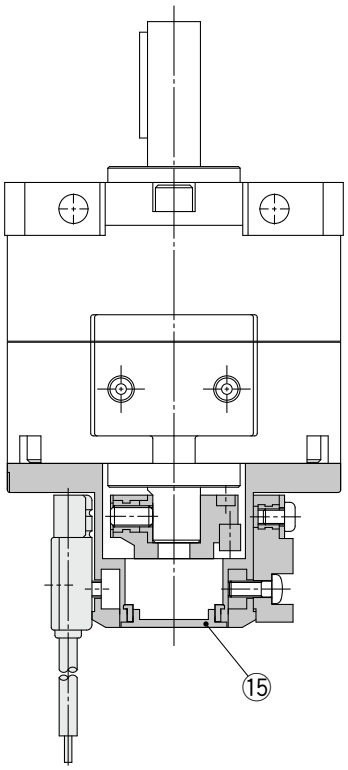


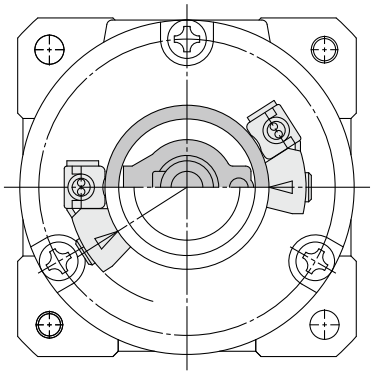
Size: 20, 30





Size: 40





Component Parts

No.	Description	Material
1	**Cover (A)**	Resin
2	**Cover (B)**	Resin
3	**Magnet lever**	Resin
4	**Holding block**	Stainless steel
5	**Holding block (B)**	Aluminum alloy
6	**Switch block (A)**	Resin
7	**Switch block (B)**	Resin
8	**Switch block**	Resin

No.	Description	Material
9	**Magnet**	
10	**Hexagon socket head set screw**	Stainless steel
11	**Cross recessed round head screw**	Stainless steel
12	**Cross recessed round head screw**	Stainless steel
13	**Cross recessed round head screw**	Stainless steel
14	**Cross recessed round head screw**	Stainless steel
15	**Rubber cap**	NBR

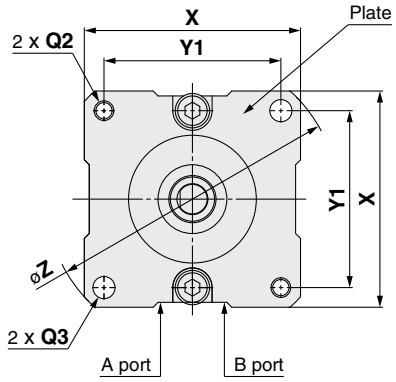
∗ For size 10, 2 cross recessed round head screws ⑪ are required.

Dimensions: Free Mount Type 10, 15, 20, 30, 40

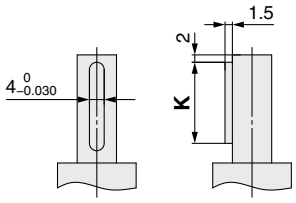
- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.
  Only size 10 has a different plate shape. (Refer to page 24.)

Single shaft/Port location: Side ported

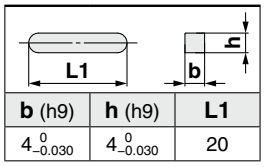
(The size 10 double vane type is indicated on page 24.)



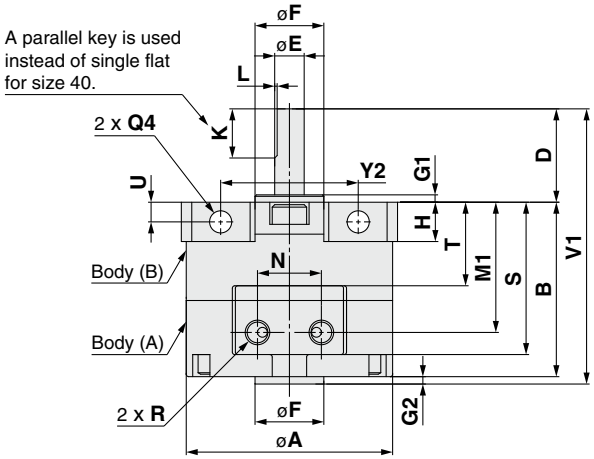
Shaft-end shape of size 40



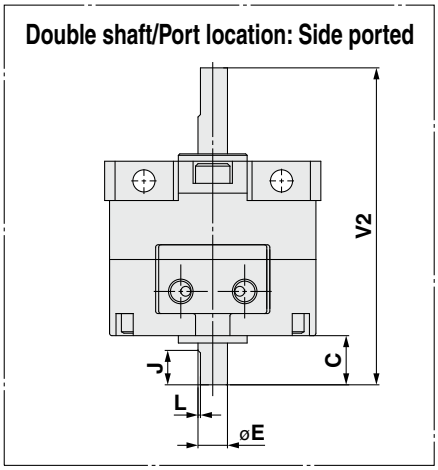
Parallel key dimensions



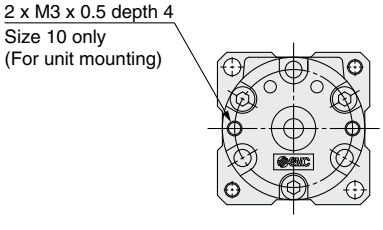
b (h9)	h (h9)	L1
$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20



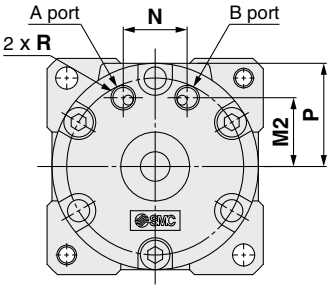
Double shaft/Port location: Side ported

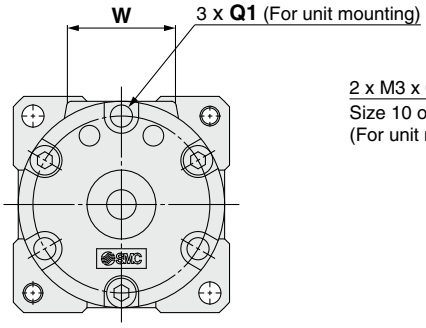


Size: 10 <Port location: Side ported>



Size: 10, 15, 20, 30, 40 <Port location: Axial ported>





Refer to page 27 for details of shaft types J, K, T and Y.

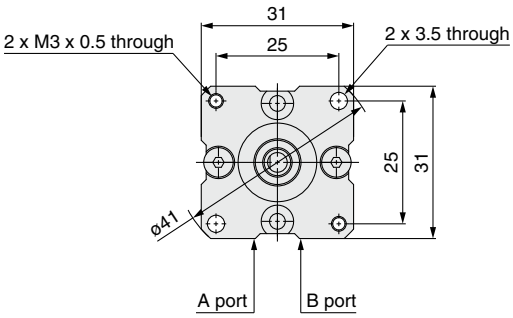
(mm)

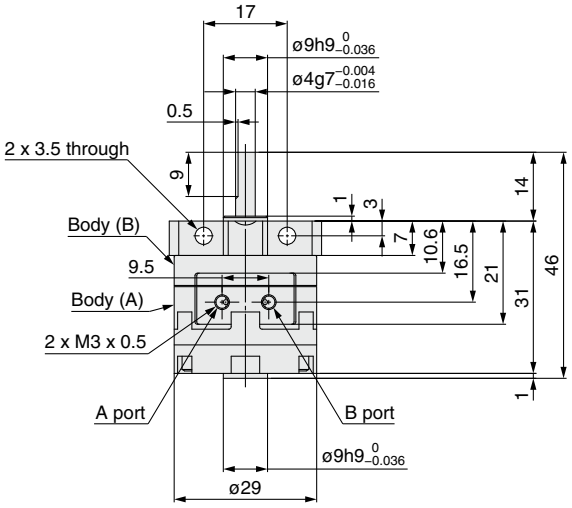
Size	A	B	C	D	E (g7)	F (h9)	G1	G2	H	J	K	L	M1	M2	N	P	Q				R	S	T	U	V1	V2	W	X	Y1	Y2	Z
																	Q1	Q2	Q3	Q4											
10	29	22	8	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	1	1	7	5	9	0.5	16.5	8.5	9.5	14.5	—	M3 x 0.5	3.5	3.5	M3 x 0.5	21	10.6	3	37	44	19.8	31	25	17	41
15	34	25	9	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	1.5	1.5	6	6	10	0.5	19	11	10	17	M3 x 0.5	M3 x 0.5	3.5	3.5	M3 x 0.5	24	12.6	3	44.5	52	21	36	29	21	48
20	42	34.5	10	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	1.5	1.5	8	7	10	0.5	25.5	14	13	21	M4 x 0.7	M4 x 0.7	4.5	4.5	M5 x 0.8	30	16	4	56	64.5	22	44	36	26	59
30	50	47.5	13	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	2	2	9	8	12	1.0	33.5	15.5	14	25	M5 x 0.8	M5 x 0.8	5.5	5.5	M5 x 0.8	42	21.5	4.5	71.5	82.5	24	52	42	29	69
40	63	53	15	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	3	4.5	10	9	20	1.0	39	21	20	31.6	M5 x 0.8	M5 x 0.8	5.5	5.5	M5 x 0.8	47.8	25	5	87.5	98	30	64	52	38	85

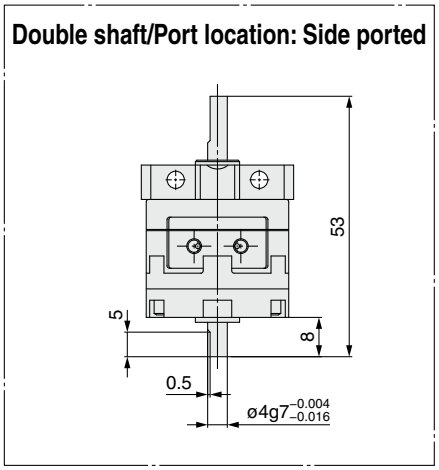
Dimensions: Free Mount Type 10

Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

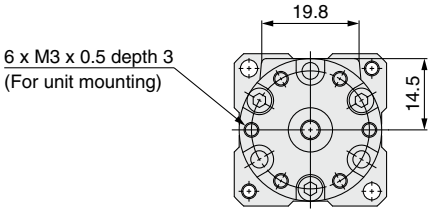
Single shaft/Port location: Side ported

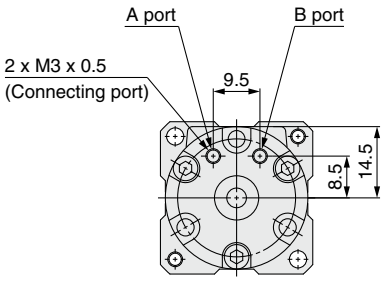






Size: 10
<Port location: Axial ported>





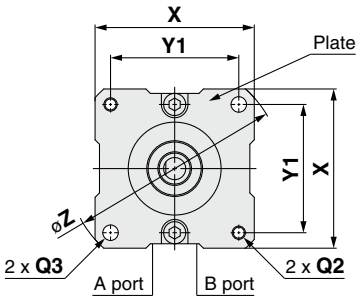
Refer to page 27 for details of shaft types J, K, T and Y.

Dimensions: Free Mount Type (With Auto Switch) 10, 15, 20, 30, 40

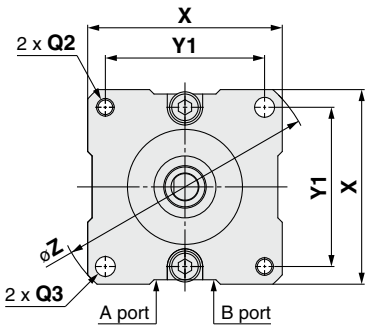
- For single vane type, the figures below show actuators for 90° and 180° when B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.
  Only size 10 has a different plate shape. (Refer to page 26.)

Size: 10, 15

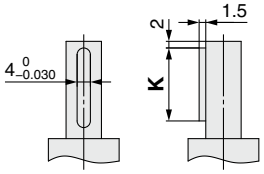
(The size 10 double vane type is indicated on page 26.)



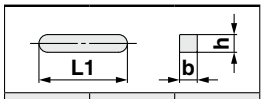
Size: 20, 30, 40



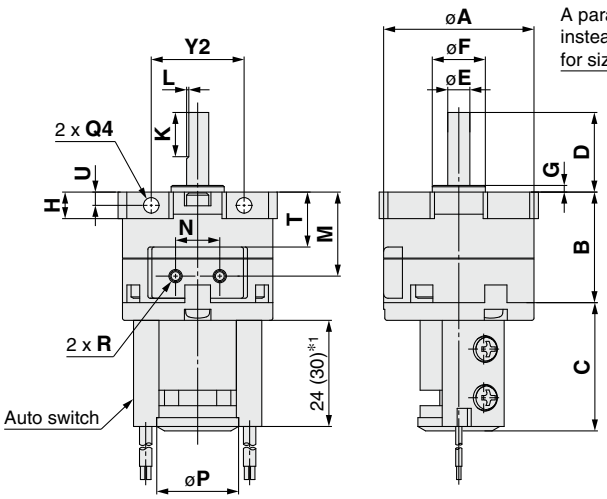
Shaft-end shape of size 40



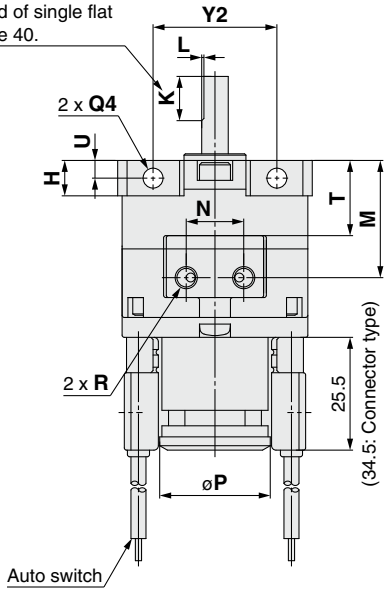
Parallel key dimensions

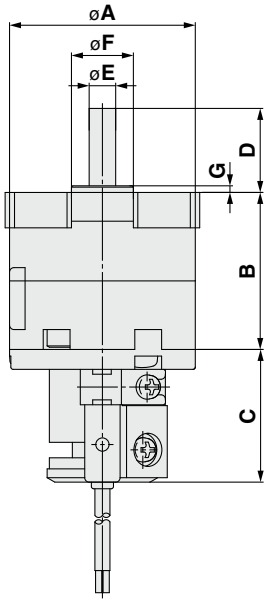


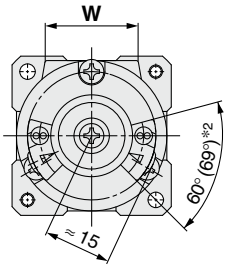
b (h9)	h (h9)	L1
$4^{0}_{-0.030}$	$4^{0}_{-0.030}$	20



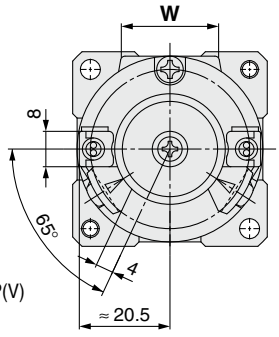
A parallel key is used instead of single flat for size 40.



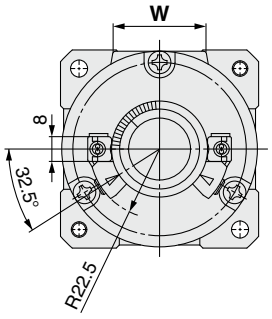




Size: 20, 30



Size: 40



∗1. The length is 24 when any of the following auto switches are used:
D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 27 for details of shaft type J.

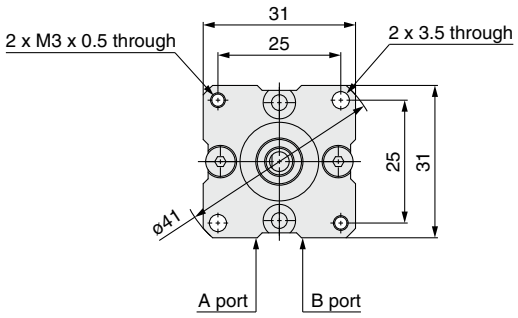
(mm)

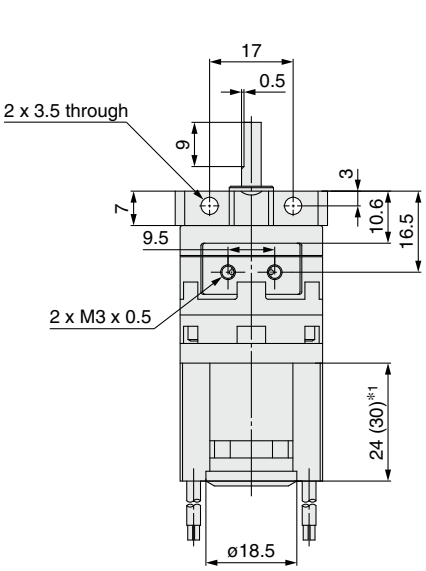
Size	A	B	C	D	E (g7)	F (h9)	G	H	K	L	M	N	P	Q			R	T	W	X	Y1	Y2	Z
														Q2	Q3	Q4							
10	29	22	29	14	$4^{-0.004}_{-0.016}$	$9^{0}_{-0.036}$	1	7	9	0.5	16.5	9.5	18.5	M3 x 0.5	3.5	3.5	M3 x 0.5	10.6	19.8	31	25	17	41
15	34	25	29	18	$5^{-0.004}_{-0.016}$	$12^{0}_{-0.043}$	1.5	6	10	0.5	19	10	18.5	M3 x 0.5	3.5	3.5	M3 x 0.5	12.6	21	36	29	21	48
20	42	34.5	30	20	$6^{-0.004}_{-0.016}$	$14^{0}_{-0.043}$	1.5	8	10	0.5	25.5	13	25	M4 x 0.7	4.5	4.5	M5 x 0.8	16	22	44	36	26	59
30	50	47.5	31	22	$8^{-0.005}_{-0.020}$	$16^{0}_{-0.043}$	2	9	12	1.0	33.5	14	25	M5 x 0.8	5.5	5.5	M5 x 0.8	21.5	24	52	42	29	69
40	63	53	31	30	$10^{-0.005}_{-0.020}$	$25^{0}_{-0.052}$	3	10	20	—	39	20	31	M5 x 0.8	5.5	5.5	M5 x 0.8	25	30	64	52	38	85

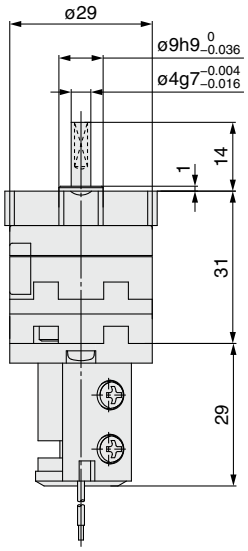
Dimensions: Free Mount Type (With Auto Switch) 10

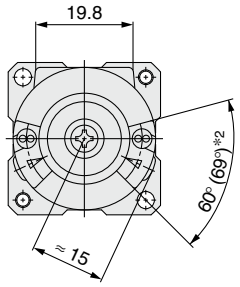
Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

Size: 10









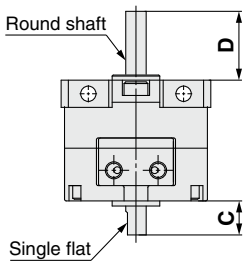
∗1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A
∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 27 for details of shaft type J.

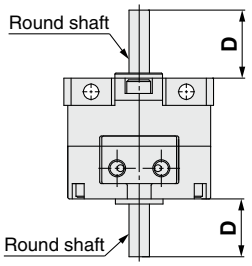
Shaft Type Dimensions (Dimensions other than specified below are the same as the standard type.)

Size: 10, 15, 20, 30, 40

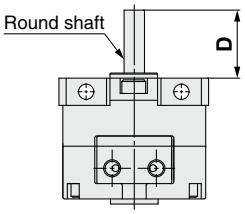
Double shaft/CRBU2J



Double shaft/CRBU2K

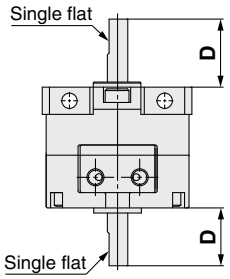


Single shaft/CRBU2T



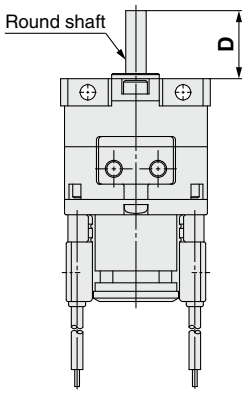
Single shaft/CRBU2Y

A parallel key is used instead of single flat for size 40.



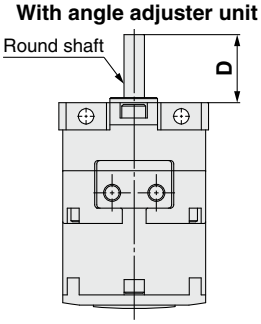
Double shaft/CDRBU2J

With auto switch



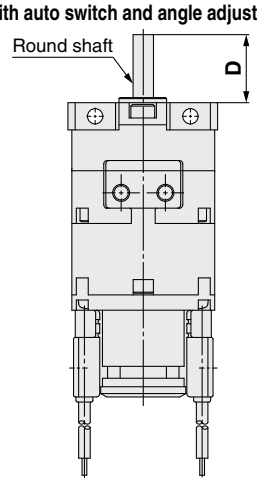
Double shaft/CRBU2JU

With angle adjuster unit



Double shaft/CDRBU2JU

With auto switch and angle adjuster unit



(mm)

Size	10	15	20	30	40
C	8	9	10	13	15
D	14	18	20	22	30

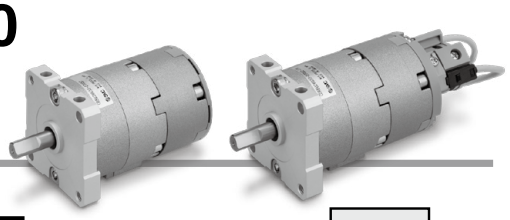
Note 1) Dimensions and tolerance of the shaft and single flat (a parallel key for size 40) are the same as the standard.

Note 2) For rotary actuators with auto switch and angle adjuster unit, connection ports are side ports.

Free Mount Type Rotary Actuator
With Angle Adjuster/Vane Type

RoHS

Series CRBU2WU
Size: 10, 15, 20, 30, 40



How to Order

	❶		❷	❸	❹	❺	❻	❼	❽	❾	❿
	CRBU2		W	U	20	– 180	S	Z			
With auto switch	CDRBU2		W	U	20	– 180	S	Z	– T79	L	–

Free mount type

❶ With auto switch
(With auto switch unit and built-in magnet)
∗ Refer to page 49 when the auto switch unit is needed separately.

❷ Shaft type

Symbol	Shaft-end shape
W	Single flat∗
J∗∗	Round shaft

∗ A key is used for size 40.
∗∗ J is made to order.

❸ With angle adjuster unit
∗ Refer to page 49 when the angle adjuster unit is needed separately.

❹ Size

10
15
20
30
40

❺ Rotating angle

Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

❻ Vane type

S	Single vane
D	Double vane

❼ Auto switch

Nil	Without auto switch (Built-in magnet)

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

❽ Electrical entry/Lead wire length

Nil	Grommet/Lead wire: 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire: 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/Without lead wire

∗ Connectors are available only for the R73, R80, T79.
∗∗ Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

❾ Number of auto switches

S	1 pc.∗
Nil	2 pcs.∗∗

∗ S: A right-hand auto switch is shipped.
∗∗ Nil: A right-hand switch and a left-hand switch are shipped.

❿ Made to Order
For details, refer to the table below.

Made to Order
(For details, refer to pages 34 to 48.)

Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern Ⅰ	W
XA31 to XA58	Shaft type pattern Ⅱ	J
XC1	Add connecting ports	W, J
XC2	Change threaded hole to through-hole	W, J
XC3	Change the screw position	W, J
XC4	Change the rotation range	W, J
XC5	Change rotation range between 0 and 200°	W, J
XC6	Change rotation range between 0 and 110°	W, J
XC7	Reversed shaft	W, J
XC30	Fluorine grease	W, J
X5	For M5 port (90°/180°)	W, J

The above may not be selected when the product comes with an auto switch or angle adjuster unit. For details, refer to pages 34, 35, 40, 41, 46, 48.

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

Applicable size	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 type	Lead wire length (m)∗: 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
For 10, 15	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	S99V	S99	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			S9PV	S9P		●	●	○	—	○		
					2-wire	12 V		T99V	T99		●	●	○	—	○	—	
	Reed auto switch	—		No	2-wire	24 V 5 V, 12 V	5 V, 12 V, 24 V	—	90	Vinyl parallel cord	●	●	●	—	—	IC circuit	
						5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	—	90A	Oilproof heavy-duty cord	●	●	●	—			
				Yes		—	—	—	97	Vinyl parallel cord	●	●	●	—		—	
						—	100 V	—	93A	Oilproof heavy-duty cord	●	●	●	—			
For 20, 30, 40	Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	—	S79	Oilproof heavy-duty cord	●	●	○	—	○	IC circuit	Relay, PLC
					3-wire (PNP)			—	S7P		●	●	○	—	○		
					2-wire	12 V		—	T79		●	●	○	—	○	—	
			Connector					—	T79C		●	●	●	●	—		
	Reed auto switch	—	Grommet			—	100 V	—	R73		●	●	○	—	—	—	
			Connector				—	—	R73C		●	●	●	●			
			Grommet	No		48 V, 100 V	100 V	—	R80		●	●	○	—		IC circuit	
			Connector			—	24 V or less	—	R80C		●	●	●	●		—	

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) R73C
3 m ····· L (Example) R73CL
5 m ····· Z (Example) R73CZ
None ····· N (Example) R73CN

∗ Auto switches are shipped together, (but not assembled).
∗ Solid state auto switches marked with "○" are produced upon receipt of order.

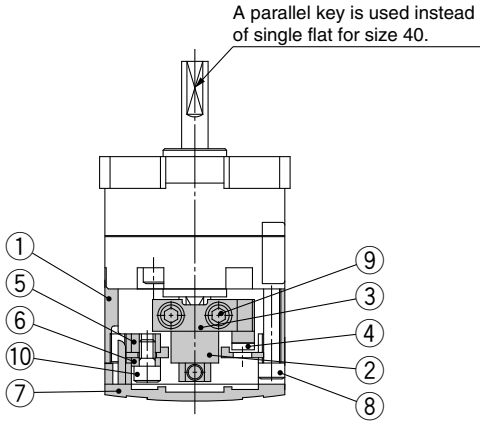
SMC

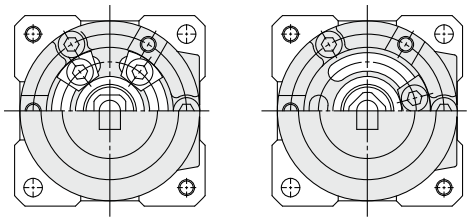
Construction: 10, 15, 20, 30, 40

● The unit is common for single vane type and double vane type.

With angle adjuster

Size: 10, 15, 20, 30, 40

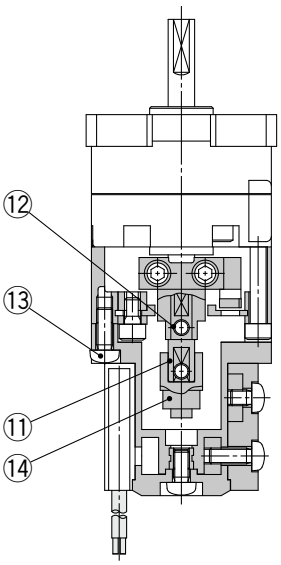




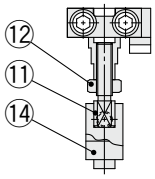
Single vane　　Double vane

With auto switch and angle adjuster

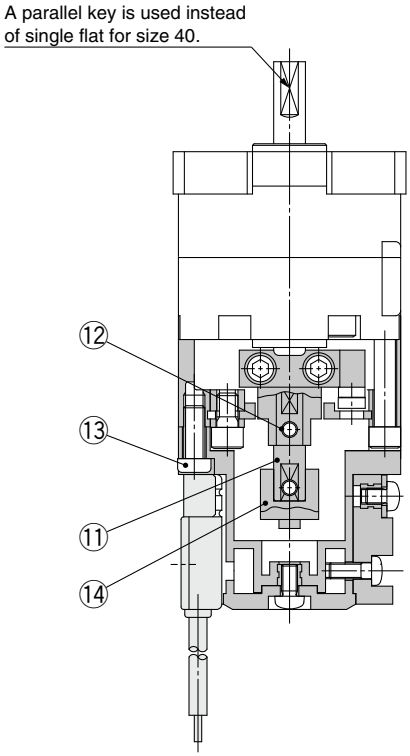
Size: 10, 15



Size: 10



Size: 20, 30, 40



Component Parts

No.	Description	Material	Note
1	**Stopper ring**	Aluminum alloy	
2	**Stopper lever**	Chrome molybdenum steel	
3	**Lever retainer**	Rolled steel	Zinc chromated
4	**Rubber bumper**	NBR	
5	**Stopper block**	Chrome molybdenum steel	Zinc chromated
6	**Block retainer**	Rolled steel	Zinc chromated
7	**Cap**	Resin	
8	Hexagon socket head cap screw	Stainless steel	Special screw
9	Hexagon socket head cap screw	Stainless steel	Special screw
10	Hexagon socket head cap screw	Stainless steel	Special screw
11	**Joint**		
12	Hexagon socket head cap screw	Stainless steel	Hexagon nut will be used for size 10 only.
	Hexagon nut	Stainless steel	
13	Cross recessed round head screw	Stainless steel	
14	**Magnet lever**	—	

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Rotary Actuator Precautions and Auto Switch Precautions.

Angle Adjuster Unit

⚠ Caution

1. Since the maximum angle of the rotating angle adjustment range will be limited by the rotation of the rotary actuator, make sure to take this into consideration when ordering.

Rotating angle of rotary actuator	Rotating angle adjustment range
$270°\ ^{+4}_{0}$	0° to 230° (Size: 10, 40) *
	0° to 240° (Size: 15, 20, 30)
$180°\ ^{+4}_{0}$	0° to 175°
$90°\ ^{+4}_{0}$	0° to 85°

* The maximum adjustment angle of the angle adjuster unit for size 10 and 40 is 230°.

2. Connecting ports are side ported only.

3. The allowable kinetic energy is the same as the specifications of the rotary actuator.

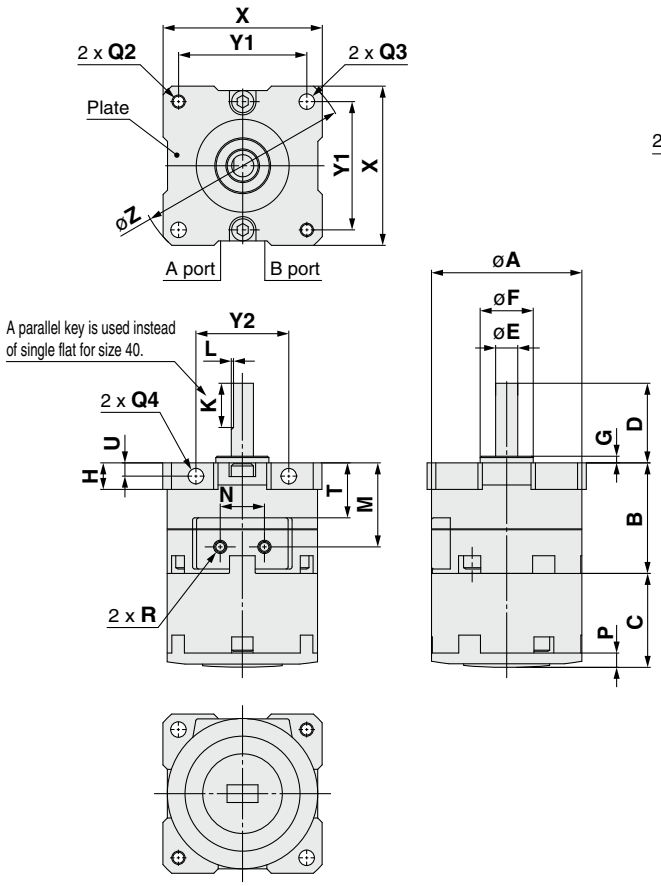
4. Use a 100° rotary actuator when you desire to adjust the angle to 90° using a double vane type.

Dimensions: Free Mount Type (With Angle Adjuster) 10, 15, 20, 30, 40

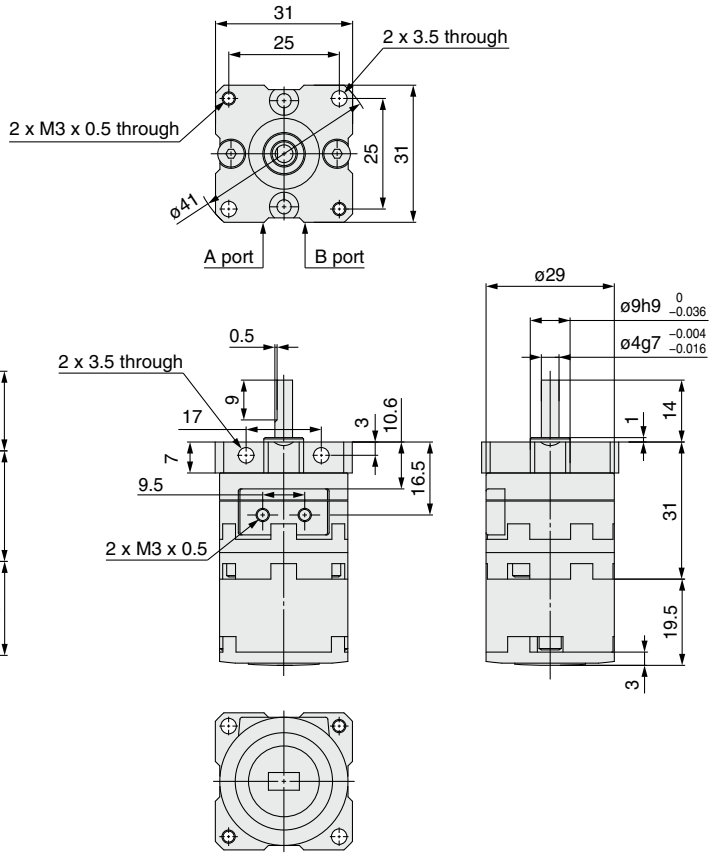
- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized.
  For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized.

Size: 10, 15, 20, 30, 40

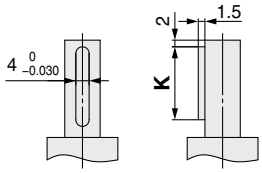
(Only size 10 has a different plate shape.)



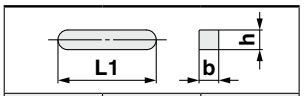
Size: 10 (Double vane)



Shaft-end shape of size 40



Parallel key dimensions



b (h9)	h (h9)	L1
4 0 −0.030	4 −0 −0.030	20

Refer to page 27 for details of shaft type J.

(mm)

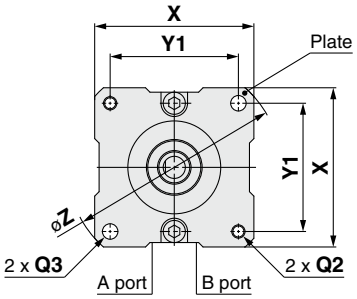
Size	A	B	C	D	E (g7)	F (h9)	G	H	K	L	M	N	P	Q			R	T	U	X	Y1	Y2	Z
														Q2	Q3	Q4							
10	29	22	19.5	14	4 −0.004 −0.016	9 0 −0.036	1	7	9	0.5	16.5	9.5	3	M3 x 0.5	3.5	3.5	M3 x 0.5	10.6	3	31	25	17	41
15	34	25	21.2	18	5 −0.004 −0.016	12 0 −0.043	1.5	6	10	0.5	19	10	3.2	M3 x 0.5	3.5	3.5	M3 x 0.5	12.6	3	36	29	21	48
20	42	34.5	25	20	6 −0.004 −0.016	14 0 −0.043	1.5	8	10	0.5	25.5	13	4	M4 x 0.7	4.5	4.5	M5 x 0.8	16	4	44	36	26	59
30	50	47.5	29	22	8 −0.005 −0.020	16 0 −0.043	2	9	12	1.0	33.5	14	4.5	M5 x 0.8	5.5	5.5	M5 x 0.8	21.5	4.5	52	42	29	69
40	63	53	36.3	30	10 −0.005 −0.020	25 0 −0.052	3	10	20	—	39	20	5	M5 x 0.8	5.5	5.5	M5 x 0.8	25	5	64	52	38	85

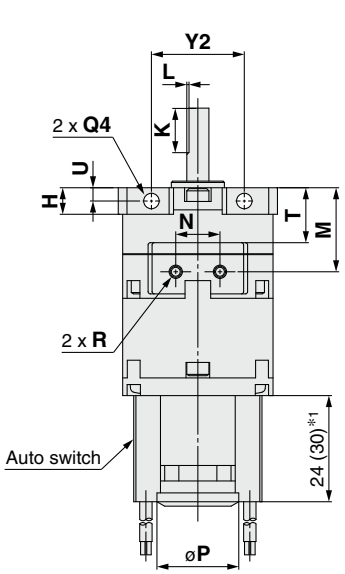
Dimensions: Free Mount Type (With Auto Switch and Angle Adjuster) 10, 15, 20, 30, 40

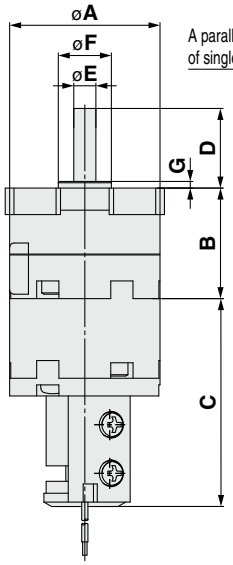
- For single vane type, the figures below show actuators for 90° (without unit) when the B port is pressurized. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurized. Only size 10 has a different plate shape. (Refer to page 32.)

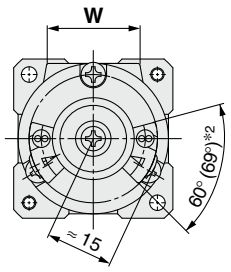
Size: 10, 15

(The size 10 double vane type is indicated on page 32.)

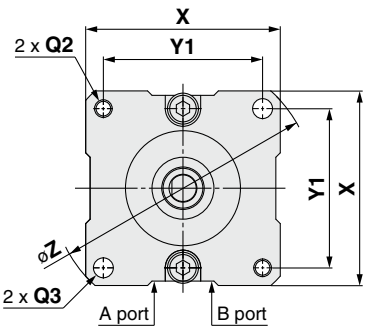


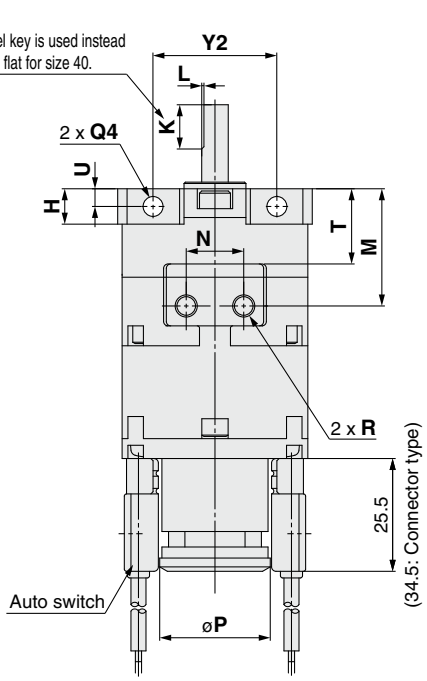


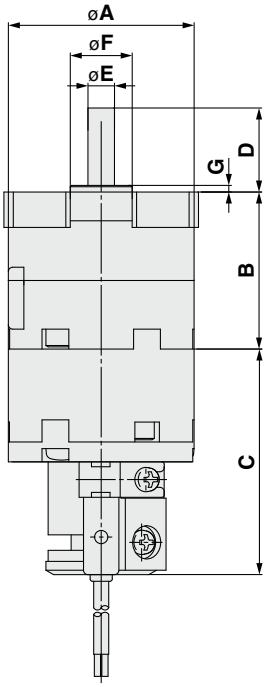




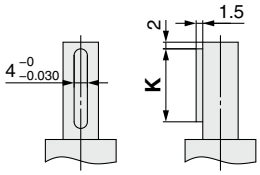
Size: 20, 30, 40



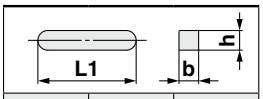




Shaft-end shape of size 40

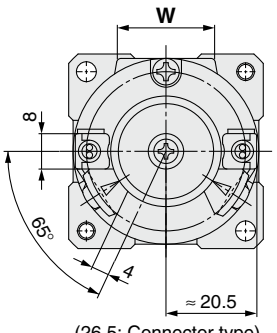


Parallel key dimensions



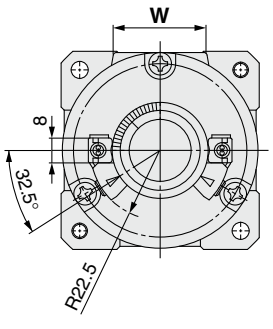
b (h9)	**h** (h9)	**L1**
$4^{\ 0}_{-0.030}$	$4^{\ 0}_{-0.030}$	20

Size: 20, 30



(26.5: Connector type)

Size: 40



Refer to page 27 for details of shaft type J.

∗1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

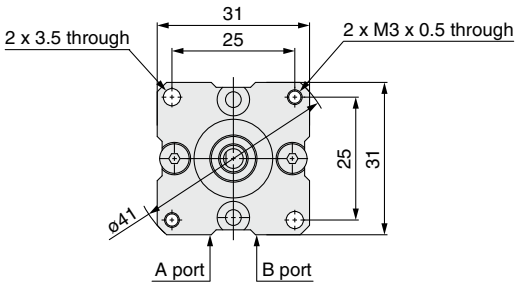
(mm)

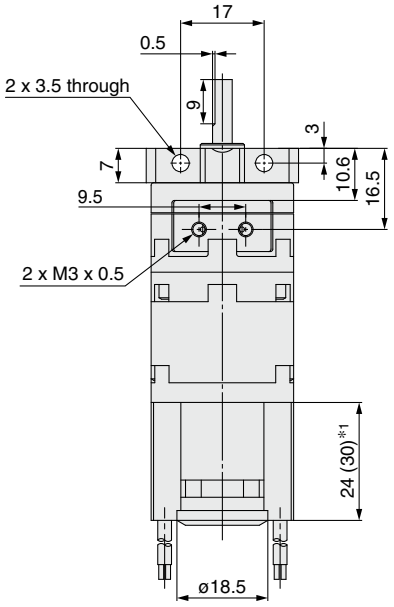
Size	**A**	**B**	**C**	**D**	**E** (g7)	**F** (h9)	**G**	**H**	**K**	**L**	**M**	**N**	**P**	**Q**			**R**	**T**	**U**	**W**	**X**	**Y1**	**Y2**	**Z**
														Q2	**Q3**	**Q4**								
10	29	22	45.5	14	$4^{-0.004}_{-0.016}$	$9^{\ 0}_{-0.036}$	1	7	9	0.5	16.5	9.5	18.5	M3 x 0.5	3.5	3.5	M3 x 0.5	10.6	3	19.8	31	25	17	41
15	34	25	47	18	$5^{-0.004}_{-0.016}$	$12^{\ 0}_{-0.043}$	1.5	6	10	0.5	19	10	18.5	M3 x 0.5	3.5	3.5	M3 x 0.5	12.6	3	21	36	29	21	48
20	42	34.5	51	20	$6^{-0.004}_{-0.016}$	$14^{\ 0}_{-0.043}$	1.5	8	10	0.5	25.5	13	25	M4 x 0.7	4.5	4.5	M5 x 0.8	16	4	22	44	36	26	59
30	50	47.5	55.5	22	$8^{-0.005}_{-0.020}$	$16^{\ 0}_{-0.043}$	2	9	12	1.0	33.5	14	25	M5 x 0.8	5.5	5.5	M5 x 0.8	21.5	4.5	24	52	42	29	69
40	63	53	62.2	30	$10^{-0.005}_{-0.020}$	$25^{\ 0}_{-0.052}$	3	10	20	—	39	20	31	M5 x 0.8	5.5	5.5	M5 x 0.8	25	5	30	64	52	38	85

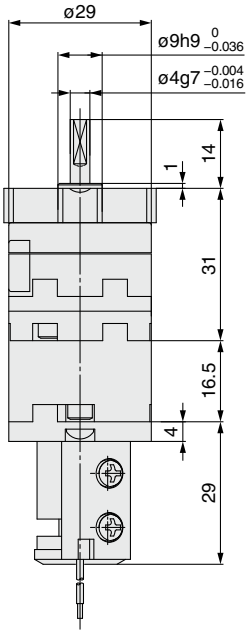
Dimensions: Free Mount Type (With Auto Switch and Angle Adjuster) 10

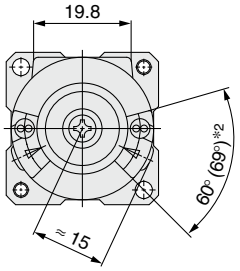
Double vane • Following figures show the intermediate rotation position when A or B port is pressurized.

Size: 10









Refer to page 27 for details of shaft type J.

∗1. The length is 24 when any of the following auto switches are used: D-90/90A/S99(V)/T99(V)/S9P(V)
The length is 30 when any of the following auto switches are used: D-97/93A

∗2. The angle is 60° when any of the following auto switches are used: D-90/90A/97/93A
The angle is 69° when any of the following auto switches are used: D-S99(V)/T99(V)/S9P(V)

Series CRB2/CRBU2 (Size: 10, 15, 20, 30, 40)
Simple Specials
-XA1 to -XA24: Shaft Pattern Sequencing I

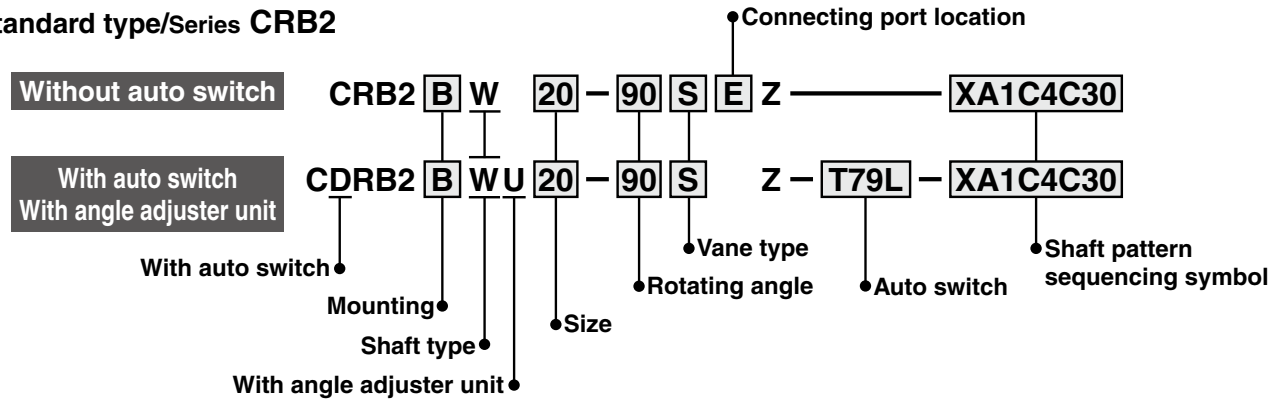
Shaft shape pattern is dealt with simple made-to-order system. (Refer to Best Pneumatics No.4)
Please contact SMC for a specification sheet when placing an order.

Symbol

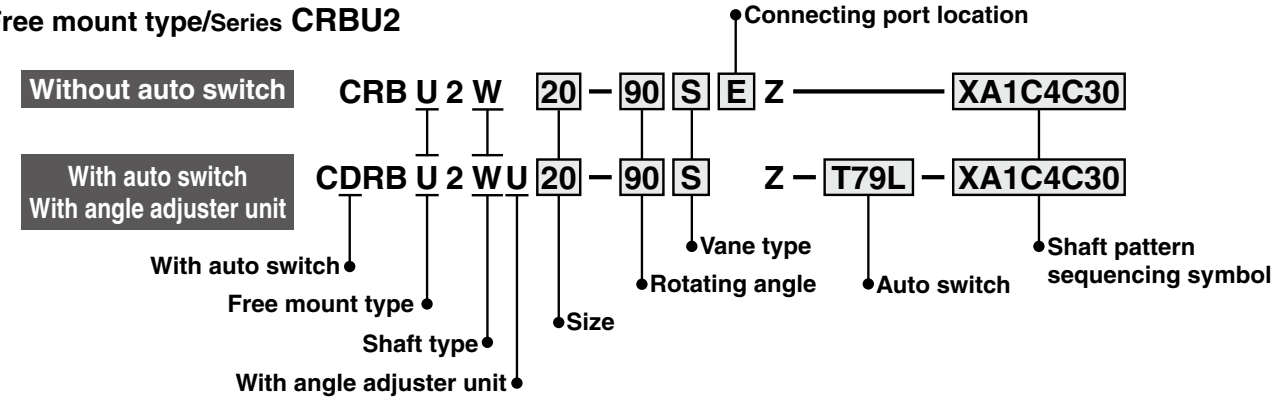
Shaft Pattern Sequencing I — -XA1 to -XA24

Applicable shaft type: W (Standard)

Standard type/Series CRB2



Free mount type/Series CRBU2



Shaft Pattern Sequencing Symbol

●Axial: Top (Long shaft side)

Symbol	Description	Applicable size				
		10	15	20	30	40
XA1	Shaft-end female thread		●	●	●	
XA3	Shaft-end male thread	●	●	●	●	
XA5	Stepped round shaft	●	●	●	●	
XA7	Stepped round shaft with male thread	●	●	●	●	
XA9	Modified length of standard chamfer	●	●	●	●	
XA11	Double-sided chamfer	●	●	●	●	
XA14*	Shaft through-hole + Shaft-end female thread		●	●	●	●
XA17	Shortened shaft	●	●	●	●	●
XA21	Stepped round shaft with double-sided chamfer	●	●	●	●	
XA23	Right-angle chamfer	●	●	●	●	
XA24	Double key					●

* These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.

●Axial: Bottom (Short shaft side)

Symbol	Description	Applicable size				
		10	15	20	30	40
XA2*	Shaft-end female thread		●	●	●	●
XA4*	Shaft-end male thread	●	●	●	●	●
XA6*	Stepped round shaft	●	●	●	●	●
XA8*	Stepped round shaft with male thread	●	●	●	●	●
XA10*	Modified length of standard chamfer	●	●	●	●	●
XA12*	Double-sided chamfer	●	●	●	●	●
XA15*	Shaft through-hole + Shaft-end female thread		●	●	●	●
XA18*	Shortened shaft	●	●	●	●	●
XA22*	Stepped round shaft with double-sided chamfer	●	●	●	●	●

●Double Shaft

Symbol	Description	Applicable size				
		10	15	20	30	40
XA13*	Shaft through-hole		●	●	●	●
XA16*	Shaft through-hole + Double shaft-end female thread		●	●	●	●
XA19*	Shortened shaft	●	●	●	●	
XA20*	Reversed shaft	●	●	●	●	●

Combination

XA□Combination

Symbol	Combination																						
XA1	**XA1**																						
XA2	●	**XA2**																					
XA3	—	●	**XA3**																				
XA4	●	—	●	**XA4**																			
XA5	—	●	—	●	**XA5**																		
XA6	●	—	●	—	●	**XA6**																	
XA7	—	●	—	●	—	●	**XA7**																
XA8	●	—	●	—	●	—	●	**XA8**															
XA9	—	●	—	●	—	●	—	●	**XA9**														
XA10	●	—	●	—	●	—	●	—	●	**XA10**													
XA11	—	●	—	●	—	●	—	●	—	●	**XA11**												
XA12	●	—	●	—	●	—	●	—	●	—	●	**XA12**											
XA13	—	—	—	—	—	—	—	—	●	●	—	—	**XA13**										
XA14	—	—	—	—	—	—	—	—	●	●	—	—	—	**XA14**									
XA15	—	—	—	—	—	—	—	—	●	●	—	—	—	—	**XA15**								
XA16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**XA16**							
XA17	—	●	—	●	—	●	—	●	—	●	—	●	—	—	●	—	**XA17**						
XA18	●	—	●	—	●	—	●	—	●	—	●	—	●	●	—	—	●	**XA18**					
XA19	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	**XA19**				
XA20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**XA20**			
XA21	—	●	—	●	—	●	—	●	—	●	—	●	—	—	—	—	—	●	—	●	**XA21**		
XA22	●	—	●	—	●	—	●	—	●	—	●	—	—	—	—	—	●	—	●	—	●	**XA22**	
XA23	—	●	—	●	—	●	—	●	—	●	—	●	●	●	●	●	—	●	●	●	—	●	**XA22**
XA24	—	●	—	●	—	●	—	●	—	●	—	●	—	—	—	—	—	●	—	—	—	●	—

A combination of up to two XA□s are available.
Example: -XA2A24

XA□, XC□Combination

Combination other than -XA□, such as Made to Order (-XC□), is also available.
Refer to pages 46 to 48 for details on the Made-to-Order specifications.

Symbol	Description	Applicable size	Combination
			XA1 to XA24
XC1∗	Add connecting ports	10, 15, 20, 30, 40	●
XC2∗	Change threaded hole to through-hole	10, 20, 30, 40	●
XC3∗	Change the screw position	10, 15, 20, 30, 40	●
XC4	Change the rotation range		●
XC5∗	Change rotation range between 0 to 200°		●
XC6∗	Change rotation range between 0 to 110°		●
XC7∗	Reversed shaft		—
XC30	Fluorine grease		●
X5∗∗	For M5 port	10, 15	●

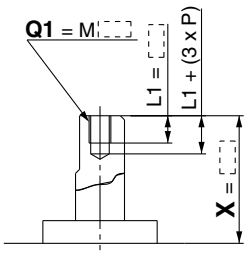
∗ These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.
∗∗ Only the shaft type W or J can select “with auto switch” and/or “with angle adjuster unit”.
A total of four XA□ and XC□ combinations is available.
Example: -XA2A24C1C30
-XA2C1C4C30

Axial: Top (Long shaft side)

Symbol: A1

The long shaft can be further shortened by machining female threads into it.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M3: L1 = 6 mm
- Applicable shaft type: W



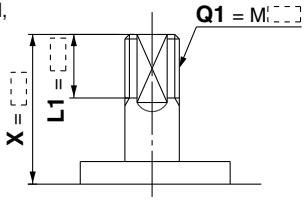
(mm)

Size	CRB2		CRBU2	
	X	Q1	X	Q1
15	4 to 18	M3	1.5 to 18	M3
20	4.5 to 20	M3, M4	1.5 to 20	M3, M4
30	5 to 22	M3, M4, M5	2 to 22	M3, M4, M5

Symbol: A3

The long shaft can be further shortened by machining male threads into it.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft type: W



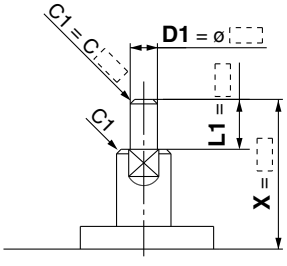
(mm)

Size	CRB2			CRBU2		
	X	L1 max	Q1	X	L1 max	Q1
10	9 to 14	X-5	M4	7 to 14	X-3	M4
15	11 to 18	X-6	M5	8.5 to 18	X-3.5	M5
20	13 to 20	X-7	M6	10 to 20	X-4	M6
30	16 to 22	X-8	M8	13 to 22	X-5	M8

Symbol: A5

The long shaft can be further shortened by machining it into a stepped round shaft.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C1, indicate "∗" instead.)



(mm)

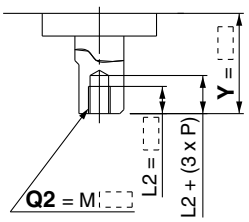
Size	CRB2			CRBU2		
	X	L1 max	D1	X	L1 max	D1
10	4 to 14	X-3	ø3	2 to 14	X-1	ø3
15	5 to 18	X-4	ø3 to ø4	3 to 18	X-1.5	ø3 to ø4
20	6 to 20	X-4.5	ø3 to ø5	3 to 20	X-1.5	ø3 to ø5
30	6 to 22	X-5	ø3 to ø6	3 to 22	X-2	ø3 to ø6

Axial: Bottom (Short shaft side)

Symbol: A2

The short shaft can be further shortened by machining female threads into it.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Not available for size 10
- The maximum dimension L2 is, as a rule, twice the thread size.
  (Example) For M3: L2 = 6 mm
- Applicable shaft type: W



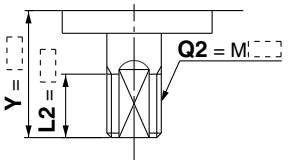
(mm)

Size	CRB2, CRBU2	
	Y	Q2
15	1.5 to 9	M3
20	1.5 to 10	M3, M4
30	2 to 13	M3, M4, M5
40	4.5 to 15	M3, M4, M5

Symbol: A4

The short shaft can be further shortened by machining male threads into it.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: W



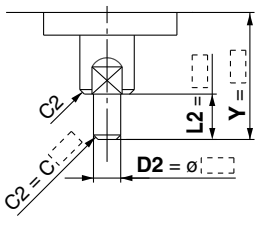
(mm)

Size	CRB2, CRBU2		
	Y	L2 max	Q2
10	7 to 8	Y-3	M 4
15	8.5 to 9	Y-3.5	M 5
20	10	Y-4	M 6
30	13	Y-5	M 8
40	15	Y-6	M10

Symbol: A6

The short shaft can be further shortened by machining it into a stepped round shaft.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C2, indicate "∗" instead.)



(mm)

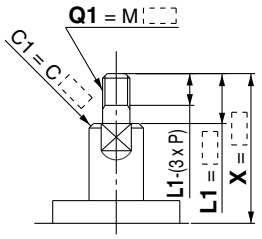
Size	CRB2, CRBU2		
	Y	L2 max	D2
10	2 to 8	Y-1	ø3
15	3 to 9	Y-1.5	ø3 to ø4
20	3 to 10	Y-1.5	ø3 to ø5
30	3 to 13	Y-2	ø3 to ø6
40	6 to 15	Y-4.5	ø3 to ø8

Axial: Top (Long shaft side)

Symbol: A7

The long shaft can be further shortened by machining it into a stepped round shaft with male threads.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C1, indicate "∗" instead.)



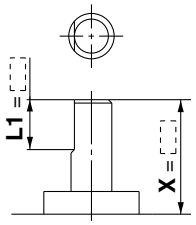
(mm)

Size	CRB2			CRBU2		
	X	L1 max	Q1	X	L1 max	Q1
10	7.5 to 14	X-3	3	5.5 to 14	X-1	3
15	10 to 18	X-4	3, 4	7.5 to 18	X-1.5	3
20	12 to 20	X-4.5	3, 4, 5	9 to 20	X-1.5	3, 4
30	14 to 22	X-5	3, 4, 5, 6	11 to 22	X-2	3, 4, 5, 6

Symbol: A9

The long shaft can be further shortened by changing the length of the standard chamfer on the long shaft side.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft type: W



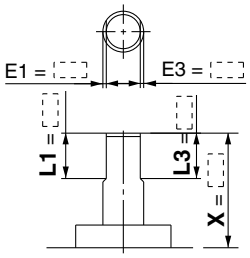
(mm)

Size	CRB2		CRBU2	
	X	L1	X	L1
10	5 to 14	9-(14-X) to (X-3)	3 to 14	9-(14-X) to (X-1)
15	8 to 18	10-(18-X) to (X-4)	5.5 to 18	10-(18-X) to (X-1.5)
20	10 to 20	10-(20-X) to (X-4.5)	7 to 20	10-(20-X) to (X-1.5)
30	10 to 22	12-(22-X) to (X-5)	7 to 22	10-(22-X) to (X-2)

Symbol: A11

The long shaft can be further shortened by machining a double-sided chamfer onto it.
(If altering the standard chamfer and shortening the shaft are not required, indicate "∗" for both the L1 and X dimensions.)

- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore size of ø30.
- Applicable shaft type: W



(mm)

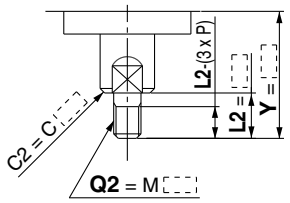
Size	CRB2			CRBU2		
	X	L1	L3 max	X	L1	L3 max
10	5 to 14	9-(14-X) to (X-3)	X-3	3 to 14	9-(14-X) to (X-1)	X-1
15	8 to 18	10-(18-X) to (X-4)	X-4	3 to 18	10-(18-X) to (X-1.5)	X-1.5
20	10 to 20	10-(20-X) to (X-4.5)	X-4.5	3 to 20	10-(20-X) to (X-1.5)	X-1.5
30	10 to 22	12-(22-X) to (X-5)	X-5	5 to 22	12-(22-X) to (X-2)	X-2

Axial: Bottom (Short shaft side)

Symbol: A8

The short shaft can be further shortened by machining it into a stepped round shaft with male threads.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C2, indicate "∗" instead.)



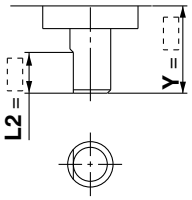
(mm)

Size	CRB2, CRBU2		
	Y	L2 max	Q2
10	5.5 to 8	Y-1	3
15	7.5 to 9	Y-1.5	3, 4
20	9 to 10	Y-1.5	3, 4, 5
30	11 to 13	Y-2	3, 4, 5, 6
40	14 to 15	Y-4.5	3, 4, 5, 6, 8

Symbol: A10

The short shaft can be further shortened by changing the length of the standard chamfer on the short shaft side.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: W



(mm)

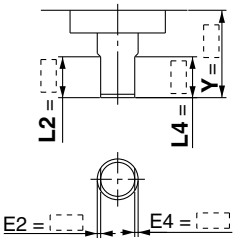
Size	CRB2, CRBU2	
	Y	L2
10	3 to 8	5-(8-Y) to (Y-1)
15	3 to 9	6-(9-Y) to (Y-1.5)
20	3 to 10	7-(10-Y) to (Y-1.5)
30	5 to 13	8-(13-Y) to (Y-2)
40	7 to 15	9-(15-Y) to (Y-2) [9-(15-Y) to (Y-4.5)] Note)

Note) Values inside [ ] are for the CRBU2.

Symbol: A12

The short shaft can be further shortened by machining a double-sided chamfer onto it.
(If altering the standard chamfer and shortening the shaft are not required, indicate "∗" for both the L2 and Y dimensions.)

- Since L2 is a standard chamfer, dimension E2 is 0.5 mm or more, and 1 mm or more with shaft bore size of ø30 and ø40.
- Applicable shaft type: W



(mm)

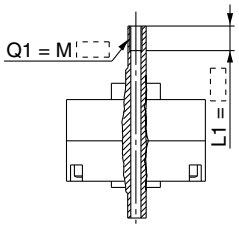
Size	CRB2, CRBU2		
	Y	L2	L4 max
10	3 to 8	5-(8-Y) to (Y-1)	Y-1
15	3 to 9	6-(2-Y) to (Y-1.5)	Y-1.5
20	3 to 10	7-(10-Y) to (Y-1.5)	Y-1.5
30	5 to 13	8-(13-Y) to (Y-2)	Y-2
40	7 to 15	9-(15-Y) to (Y-4.5)	Y-4.5

Axial: Top (Long shaft side)

Symbol: A14

Applicable to single vane type only.
A special end is machined onto the long shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M3: L1 max. = 6 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



The above figure shows the CRB2 series.

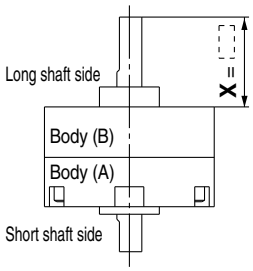
(mm)

Size / Thread	CRB2, CRBU2			
	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: A17

The long shaft is shortened.

- Applicable shaft type: W



The above figure shows the CRB2 series.

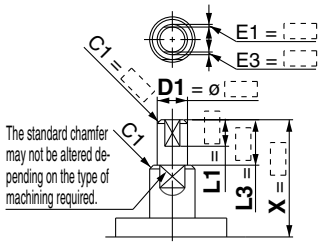
(mm)

Size	CRB2	CRBU2
	X	X
10	3 to 14	1 to 14
15	4 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20
30	5 to 22	2 to 22
40	18 to 30	18 to 30

Symbol: A21

The long shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C1, indicate "∗" instead.)



mm

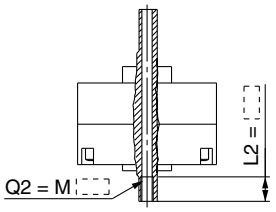
Size	CRB2				CRBU2			
	X	L1 max	L3	D1	X	L1 max	L3	D1
10	6 to 14	X-4.5	L1+1.5	ø3	4 to 14	X-2.5	L1 + 1.5	ø3
15	7 to 18	X-5.5	L1+1.5	ø3 to ø4	4.5 to 18	X-3	L1 + 1.5	ø3 to ø4
20	8 to 20	X-6.5	L1+2	ø3 to ø5	5 to 20	X-3.5	L1 + 2	ø3 to ø5
30	10 to 22	X-8	L1+3	ø3 to ø6	7 to 22	X-5	L1 + 3	ø3 to ø6

Axial: Bottom (Short shaft side)

Symbol: A15

Applicable to single vane type only.
A special end is machined onto the short shaft, and a through-hole is drilled into it. Female threads are machined into the through-hole, whose diameter is equivalent to the pilot hole diameter.

- A parallel key is used on the long shaft for size 40.
- Not available for size 10
- The maximum dimension L2 is, as a rule, twice the thread size.
  (Example) For M4: L2 max. = 8 mm
- Applicable shaft type: W



The above figure shows the CRB2 series.

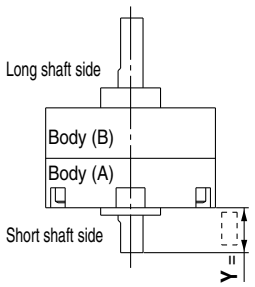
(mm)

Size / Thread	CRB2, CRBU2			
	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: A18

The short shaft is shortened.

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



The above figure shows the CRB2 series.

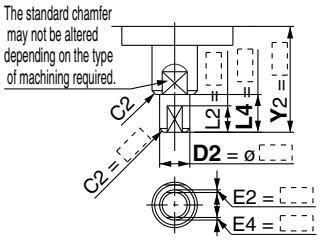
(mm)

Size	CRB2, CRBU2
	Y
10	1 to 8
15	1.5 to 9
20	1.5 to 10
30	2 to 13
40	4.5 to 15

Symbol: A22

The short shaft can be further shortened by machining it into a stepped round shaft with a double-sided chamfer.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.
  (If not specifying dimension C2, indicate "∗" instead.)



(mm)

Size	CRB2, CRBU2			
	Y	L1 max	L4	D2
10	4 to 8	Y-2.5	L2 + 1.5	ø3
15	4.5 to 9	Y-3	L2 + 1.5	ø3 to ø4
20	5 to 10	Y-3.5	L2 + 2	ø3 to ø5
30	7 to 13	Y-5	L2 + 3	ø3 to ø6
40	8 to 15	Y-5.5	L2 + 5 [L2 + 3] Note)	ø3 to ø6

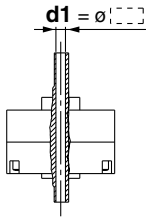
Note) Values inside [ ] are for the CRBU2.

Double Shaft

Symbol: A13

Applicable to single vane type only.
Shaft with through-hole

- Not available for size 10
- Minimum machining diameter for d1 is 0.1 mm.
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



The above figure shows the CRB2 series.

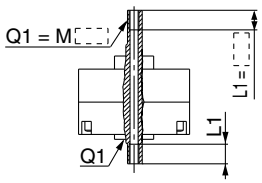
(mm)

Size	CRB2, CRBU2
	d1
15	ø2.5
20	ø2.5 to ø3.5
30	ø2.5 to ø4
40	ø2.5 to ø3

Symbol: A16

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

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 max. = 10 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

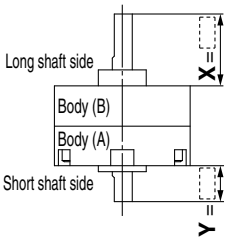
(mm)

Thread \ Size	CRB2, CRBU2			
	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	—
M5 x 0.8	—	—	ø4.2	—

Symbol: A19

Both the long shaft and short shaft are shortened.

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W



The above figure shows the CRB2 series.

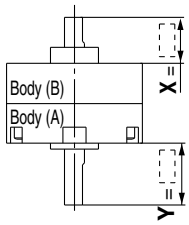
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 14	1 to 8	1 to 14	1 to 8
15	4 to 18	1.5 to 9	1.5 to 18	1.5 to 9
20	4.5 to 20	1.5 to 10	1.5 to 20	1.5 to 10
30	5 to 22	2 to 13	2 to 22	2 to 13
40	18 to 30	4.5 to 15	18 to 30	4.5 to 15

Symbol: A20

The shafts are reversed.
(Both the long shaft and the short shaft are shortened.)

- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: W
- Dimensions inside ( ) are for double vane type of size 10.



The above figure shows the CRB2 series.

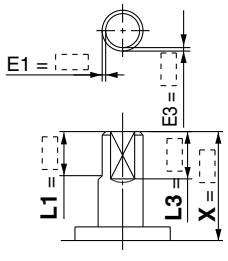
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 10 (19)	1 to 12 (3)	1 to 3 (12)	1 to 19 (10)
15	4 to 11.5	1.5 to 15.5	1.5 to 6.5	1.5 to 20.5
20	4.5 to 13	1.5 to 17	1.5 to 7.5	1.5 to 22.5
30	5 to 16	2 to 19	2 to 8.5	2 to 26.5
40	6.5 to 17	16 to 28	3 to 9	24 to 36

Symbol: A23

The long shaft can be further shortened by machining right-angle double-sided chamfer onto it.
(If altering the standard chamfer and shortening the shaft are not required, indicate "∗" for both the L1 and X dimensions.)

- Since L1 is a standard chamfer, dimension E1 is 0.5 mm or more, and 1 mm or more with a shaft bore size of ø30 and ø40.
- Applicable shaft type: W



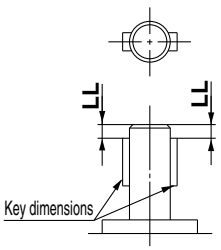
(mm)

Size	CRB2			CRBU2		
	X	L1	L3 max	X	L1	L3 max
10	5 to 14	9-(14-X) to (X-3)	X-3	3 to 14	9-(14-X) to (X-1)	X-1
15	8 to 18	10-(18-X) to (X-4)	X-4	3 to 18	10-(18-X) to (X-1.5)	X-1.5
20	10 to 20	10-(20-X) to (X-4.5)	X-4.5	3 to 20	10-(20-X) to (X-1.5)	X-1.5
30	10 to 22	12-(22-X) to (X-5)	X-5	5 to 22	12-(22-X) to (X-2)	X-2

Symbol: A24

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

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



(mm)

Size	CRB2, CRBU2	
	Key dimensions	LL
40	4 x 4 x 20	2

Series CRB2/CRBU2 (Size: 10, 15, 20, 30, 40)
Simple Specials
-XA31 to -XA58: Shaft Pattern Sequencing II

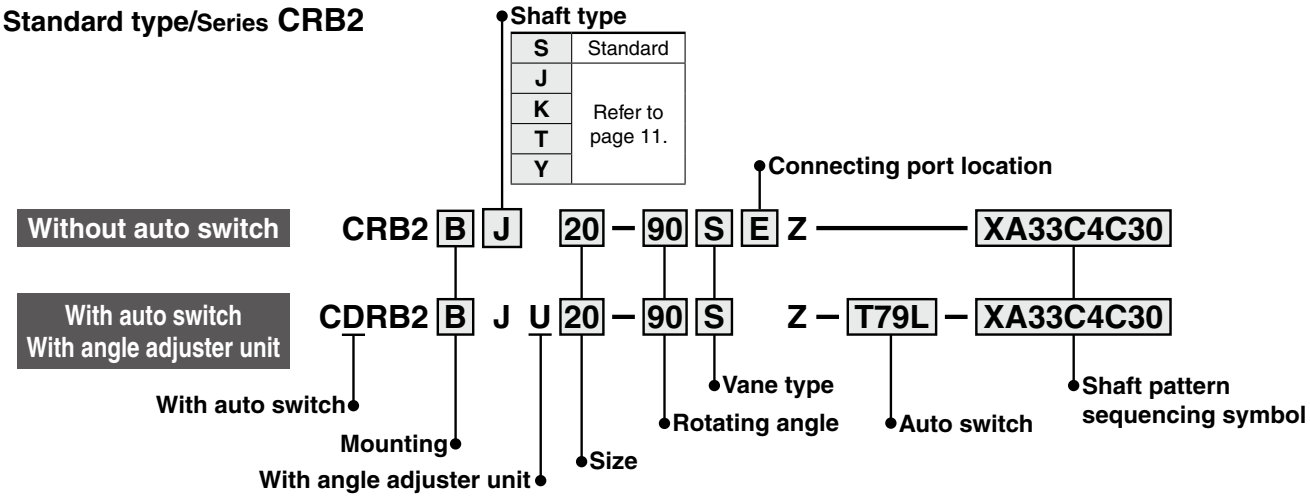
Shaft shape pattern is dealt with simple made-to-order system. (Refer to Best Pneumatics No.4)
Please contact SMC for a specification sheet when placing an order.

Symbol

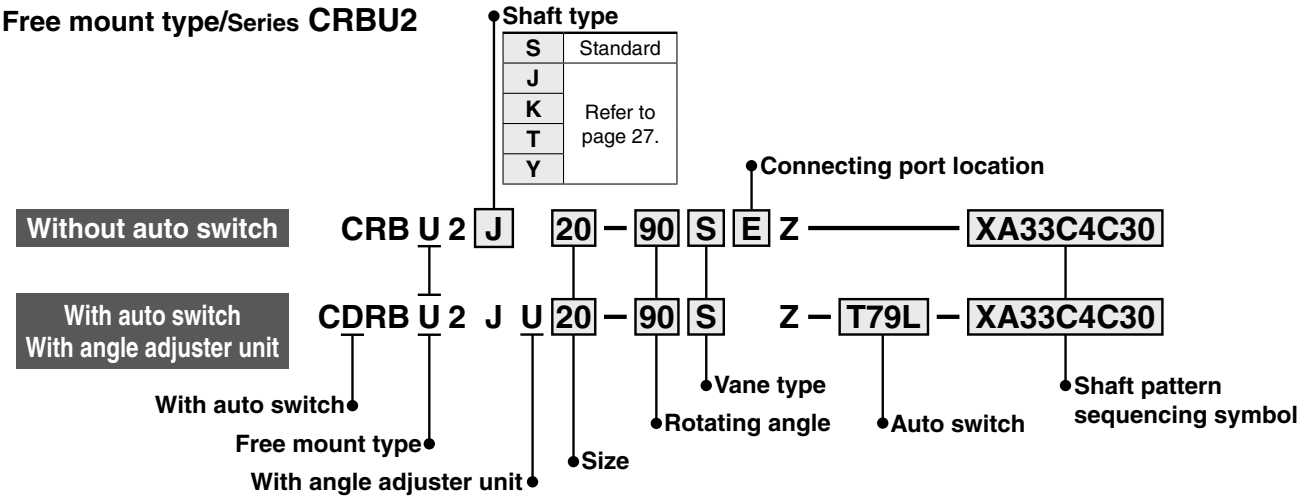
Shaft Pattern Sequencing II — -XA31 to -XA58

Applicable shaft type: S, J, K, T, Y

Standard type/Series CRB2



Free mount type/Series CRBU2



Shaft Pattern Sequencing Symbol

●Axial: Top (Long shaft side)

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA31	Shaft-end female thread	S, Y		●	●	●	
XA33	Shaft-end female thread	J, K, T		●	●	●	●
XA37	Stepped round shaft	J, K, T	●	●	●	●	●
XA45	Middle-cut chamfer	J, K, T	●	●	●	●	●
XA47	Machined keyway	J, K, T			●	●	
XA48	Change of long shaft length	S, Y	●	●	●	●	●
XA51	Change of long shaft length	J, K, T	●	●	●	●	●

●Axial: Bottom (Short shaft side)

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA32*	Shaft-end female thread	S, Y		●	●	●	
XA34*	Shaft-end female thread	J, K, T		●	●	●	●
XA38*	Stepped round shaft	K	●	●	●	●	●
XA46*	Middle-cut chamfer	K	●	●	●	●	●
XA49*	Change of short shaft length	Y	●	●	●	●	●
XA52*	Change of short shaft length	K	●	●	●	●	●
XA55*	Change of short shaft length	J	●	●	●	●	●

●Double Shaft

Symbol	Description	Shaft type	Applicable size				
			10	15	20	30	40
XA39*	Shaft through-hole	S, Y		●	●	●	●
XA40*	Shaft through-hole	K, T		●	●	●	●
XA41*	Shaft through-hole	J		●	●	●	●
XA42*	Shaft through-hole + Shaft-end female thread	S, Y		●	●	●	●
XA43*	Shaft through-hole + Shaft-end female thread	K, T		●	●	●	●
XA44*	Shaft through-hole + Shaft-end female thread	J		●	●	●	●
XA50*	Change of double shaft length	Y	●	●	●	●	●
XA53*	Change of double shaft length	K	●	●	●	●	●
XA57*	Change of double shaft length	J	●	●	●	●	●
XA58*	Reversed shaft, Change of double shaft length	J	●	●	●	●	●

* These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.

Combination

XA□Combination

Symbol	Description	Axial direction		Applicable shaft type					Combination
		Top	Bottom	J	K	S	T	Y	
XA31	Shaft-end female thread	●				●		●	XA31
XA32	Shaft-end female thread		●			●		●	● XA32
XA33	Shaft-end female thread	●		●	●		●		XA33
XA34	Shaft-end female thread		●	●	●		●		● XA34
XA37	Stepped round shaft	●		●	●		●		XA37
XA38	Stepped round shaft		●		●				K* XA38
XA39	Shaft through-hole	●	●			●		●	XA39
XA40	Shaft through-hole	●	●		●		●		XA40
XA41	Shaft through-hole	●	●	●					XA41
XA42	Shaft through-hole + Shaft-end female thread	●	●			●		●	XA42
XA43	Shaft through-hole + Shaft-end female thread	●	●		●		●		XA43
XA44	Shaft through-hole + Shaft-end female thread	●	●	●					XA44
XA45	Middle-cut chamfer	●		●	●		●		XA45
XA46	Middle-cut chamfer		●		●				XA46
XA47	Machined keyway	●		●	●		●		XA47
XA48	Change of long shaft length	●				●		●	● XA48
XA49	Change of short shaft length		●					●	Y* Y* XA49
XA50	Change of double shaft length	●	●					●	Y* Y* ● XA50
XA51	Change of long shaft length	●		●	●		●		● K,T* J* K,T* J* ● K* ● XA51
XA52	Change of short shaft length		●		●				K* K* K* K* K* K* K* K* XA52
XA53	Change of double shaft length	●	●		●				K* K* K* K* K* K* K* K* ● XA53
XA55	Change of short shaft length		●	●					J* J* J* J* J* J* J* J* J* XA55
XA57	Change of double shaft length	●	●	●					J* J* J* J* J* J* J* J* J* ● XA57
XA58	Reversed shaft, Change of double shaft length	●	●	●					J* J* J* J* J* J* J* J* J* J* J*

∗ Shaft type available for combination

A combination of up to two XA□s are available.
Example: XA31A32

XA□, XC□ Combination

Combination other than XA□, such as Made to Order (XC□), is also available.
Refer to pages 46 to 48 for details on the Made-to-Order specifications.

Symbol	Description	Applicable size	Combination
			XA31 to XA58
XC1∗	Add connecting ports	10, 15, 20, 30, 40	●
XC2∗	Change threaded holes to through-holes	15, 20, 30, 40	●
XC3∗	Change the screw position	10, 15, 20, 30, 40	●
XC4	Change the rotation range		●
XC5∗	Change rotation range between 0 to 200°		●
XC6∗	Change rotation range between 0 to 110°		●
XC7∗	Reversed shaft		—
XC30	Fluorine grease		●
X5∗∗	For M5 port	10, 15	●

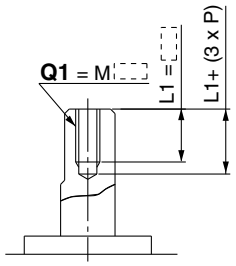
∗ These specifications are not available for rotary actuators with auto switch and/or with angle adjuster unit.
∗∗ Only the shaft type W or J can select “with auto switch” and/or “with angle adjuster unit”.
A total of four XA□ and XC□ combinations is available.
Example: XA33A34C5C30

Axial: Top (Long shaft side)

Symbol: A31

Machine female threads into the long shaft.

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



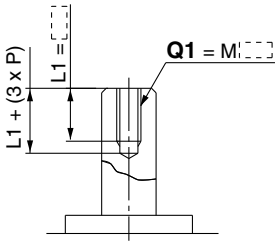
(mm)

Size \ Shaft type	CRB2, CRBU2 Q1 S	Q1 Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A33

Machine female threads into the long shaft.

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



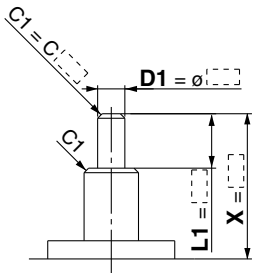
(mm)

Size \ Shaft type	CRB2, CRBU2 Q1 J	Q1 K	Q1 T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

Symbol: A37

The long shaft can be further shortened by machining it into a stepped round shaft.
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft types: J, K, T
- Equal dimensions are indicated by the same marker. (If not specifying dimension C1, indicate "∗" instead.)



(mm)

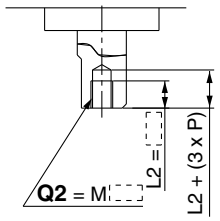
Size	CRB2 X	CRB2 L1 max	CRB2 D1	CRBU2 X	CRBU2 L1 max	CRBU2 D1
10	4 to 14	X-3	ø3 to ø3.9	2 to 14	X-1	ø3 to ø3.9
15	5 to 18	X-4	ø3 to ø4.9	3 to 18	X-1.5	ø3 to ø4.9
20	6 to 20	X-4.5	ø3 to ø5.9	3 to 20	X-1.5	ø3 to ø5.9
30	6 to 22	X-5	ø3 to ø7.9	3 to 22	X-2	ø3 to ø7.9
40	8 to 30	X-6.5	ø3 to ø9.9	4 to 30	X-3	ø3 to ø9.9

Axial: Bottom (Short shaft side)

Symbol: A32

Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M4: L2 = 8 mm However, for M5 with S shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: S, Y



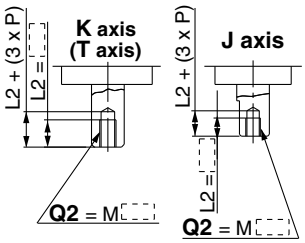
(mm)

Size \ Shaft type	CRB2, CRBU2 Q2 S	Q2 Y
10	Not available	
15	M3	
20	M3, M4	
30	M3, M4, M5	

Symbol: A34

Machine female threads into the short shaft.

- The maximum dimension L2 is, as a rule, twice the thread size. (Example) For M3: L2 = 6 mm However, for M5 with T shaft, the maximum dimension L2 is 1.5 times the thread size.
- Applicable shaft types: J, K, T



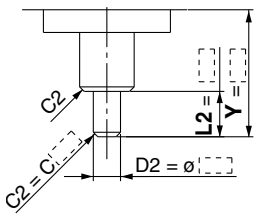
(mm)

Size \ Shaft type	CRB2, CRBU2 Q2 J	Q2 K	Q2 T
10	Not available		
15	M3		
20	M3, M4		
30	M3, M4, M5		
40	M3, M4, M5		

Symbol: A38

The short shaft can be further shortened by machining it into a stepped round shaft.
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: K
- Equal dimensions are indicated by the same marker. (If not specifying dimension C2, indicate "∗" instead.)



(mm)

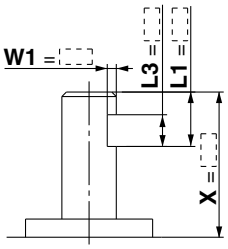
Size	CRB2, CRBU2 Y	CRB2, CRBU2 L2 max	CRB2, CRBU2 D2
10	2 to 14	Y-1	ø3 to ø3.9
15	3 to 18	Y-1.5	ø3 to ø4.9
20	3 to 20	Y-1.5	ø3 to ø5.9
30	3 to 22	Y-2	ø3 to ø7.9
40	6 to 30	Y-4.5	ø5 to ø9.9

Axial: Top (Long shaft side)

Symbol: A45

The long shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)
(If shortening the shaft is not required, indicate "∗" for dimension X.)

- Applicable shaft types: J, K, T



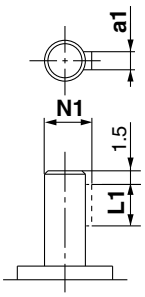
(mm)

Size \ Shaft type	CRB2, CRBU2											
	X			W1			L1 max			L3 max		
	J	K	T	J	K	T	J	K	T	J	K	T
10	6.5 to 14			0.5 to 2			X-3			L1-1		
15	8 to 18			0.5 to 2.5			X-4			L1-1		
20	9 to 20			0.5 to 3			X-4.5			L1-1		
30	11.5 to 22			0.5 to 4			X-5			L1-2		
40	15.5 to 30			0.5 to 5			X-5.5			L1-2		

Symbol: A47

Machine a keyway into the long shaft. (The position of the keyway is the same as the standard model.)
The key must be ordered separately.

- Applicable shaft type: J, K, T



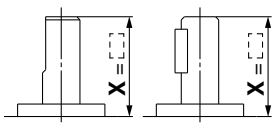
(mm)

Size	CRB2, CRBU2		
	a1	L1	N1
20	$2h9^{0}_{-0.025}$	10	6.8
30	$3h9^{0}_{-0.025}$	14	9.2

Symbol: A48

The long shaft is shortened.

- Applicable shaft type: S, Y



Size: 10 to 30 **Size: 40**

(mm)

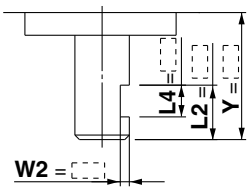
Size	CRB2	CRBU2
	X	X
10	3 to 14	1 to 14
15	4 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20
30	5 to 22	2 to 22
40	18 to 30	18 to 30

Axial: Bottom (Short shaft side)

Symbol: A46

The short shaft can be further shortened by machining a middle-cut chamfer into it.
(The position of the chamfer is same as the standard one.)
(If shortening the shaft is not required, indicate "∗" for dimension Y.)

- Applicable shaft type: K



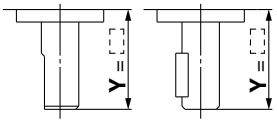
(mm)

Size	CRB2, CRBU2			
	Y	W2	L2 max	L4 max
10	4.5 to 14	0.5 to 2	Y-1	L2-1
15	5.5 to 18	0.5 to 2.5	Y-1.5	L2-1
20	6 to 20	0.5 to 3	Y-1.5	L2-1
30	8.5 to 22	0.5 to 4	Y-2	L2-2
40	13.5 to 30	0.5 to 5	Y-4.5	L2-2

Symbol: A49

The short shaft is shortened.

- Applicable shaft type: Y



Size: 10 to 30 **Size: 40**

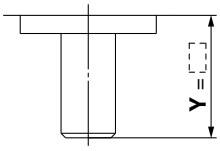
(mm)

Size	CRB2, CRBU2
	Y
10	1 to 14
15	1.5 to 18
20	1.5 to 20
30	2 to 22
40	18 to 30

Symbol: A52

The short shaft is shortened.

- Applicable shaft type: K



(mm)

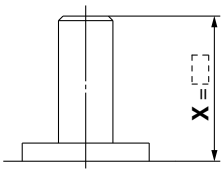
Size	CRB2, CRBU2
	Y
10	1 to 14
15	1.5 to 18
20	1.5 to 20
30	2 to 22
40	4.5 to 30

Axial: Top (Long shaft side)

Symbol: A51

The long shaft is shortened.

- Applicable shaft type: J, K, T



(mm)

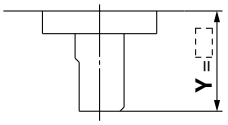
Size	CRB2	CRBU2
	X	X
10	3 to 14	1 to 14
15	4 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20
30	5 to 22	2 to 22
40	6.5 to 30	3 to 30

Axial: Bottom (Short shaft side)

Symbol: A55

The short shaft is shortened.

- Applicable shaft type: J



(mm)

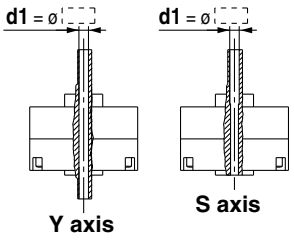
Size	CRB2, CRBU2
	Y
10	1 to 8
15	1.5 to 9
20	1.5 to 10
30	2 to 13
40	4.5 to 15

Double Shaft

Symbol: A39

Applicable to single vane type only.
Shaft with through-hole (Additional machining of S, Y shaft)

- Applicable shaft type: S, Y
- Equal dimensions are indicated by the same marker.
- Not available for size 10
- A parallel key is used on the long shaft for size 40.
- Minimum machining diameter for d1 is 0.1 mm.



The above figure shows the CRB2 series.

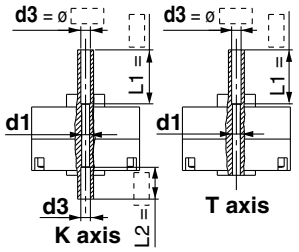
(mm)

Size \ Shaft type	CRB2		CRBU2	
	S	Y	S	Y
	d1		d1	
15	ø2.5		ø2.5	
20	ø2.5 to ø3.5		ø2.5 to ø3.5	
30	ø2.5 to ø4		ø2.5 to ø4	
40	ø2.5 to ø3		ø2.5 to ø5	

Symbol: A40

Applicable to single vane type only.
Shaft with through-hole (Additional machining of K, T shaft)

- Applicable shaft type: K, T
- Equal dimensions are indicated by the same marker.
- Not available for size 10
- d1 = ø2.5, L1 = 18 (max.) for size 15; minimum machining diameter for d1 is 0.1 mm.
- d1 = d3 for size 20 to 40



The above figure shows the CRB2 series.

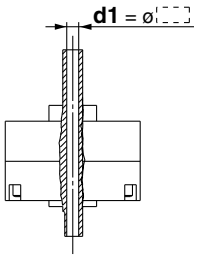
(mm)

Size \ Shaft type	CRB2, CRBU2			
	K	T	K	T
	d1		d3	
15	ø2.5		ø2.5 to ø3	
20	—		ø2.5 to ø4	
30	—		ø2.5 to ø4.5	
40	—		ø2.5 to ø5	

Symbol: A41

Applicable to single vane type only.
Shaft with through-hole

- Not available for size 10
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

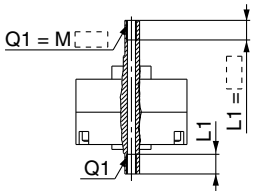
(mm)

Size	CRB2, CRBU2
	d1
15	ø2.5
20	ø2.5 to ø3.5
30	ø2.5 to ø4
40	ø2.5 to ø4.5

Symbol: A42

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

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 max. = 10 mm
  However, for M5 on the short shaft of S shaft: L1 max. = 7.5 mm
- A parallel key is used on the long shaft for size 40.
- Applicable shaft type: S, Y
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

(mm)

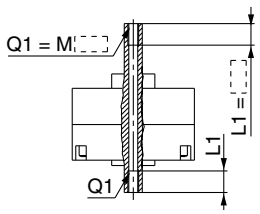
Size \ Shaft type	CRB2, CRBU2							
	15		20		30		40	
Thread	S	Y	S	Y	S	Y	S	Y
M3 x 0.5	ø2.5		ø2.5		ø2.5		ø2.5	
M4 x 0.7	—		ø3.3		ø3.3		—	
M5 x 0.8	—		—		ø4.2		—	

Double Shaft

Symbol: A43

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

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 max. = 10 mm
  However, for M5 on the short shaft of T shaft: L1 max. = 7.5 mm
- Applicable shaft type: K, T
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

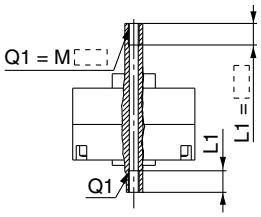
(mm)

Size / Shaft type / Thread	CRB2, CRBU2							
	15		20		30		40	
	K	T	K	T	K	T	K	T
M3 x 0.5	ø2.5		ø2.5		ø2.5		ø2.5	
M4 x 0.7	—		ø3.3		ø3.3		ø3.3	
M5 x 0.8	—		—		ø4.2		ø4.2	

Symbol: A44

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

- Not available for size 10
- The maximum dimension L1 is, as a rule, twice the thread size.
  (Example) For M5: L1 max. = 10 mm
- Applicable shaft type: J
- Equal dimensions are indicated by the same marker.



The above figure shows the CRB2 series.

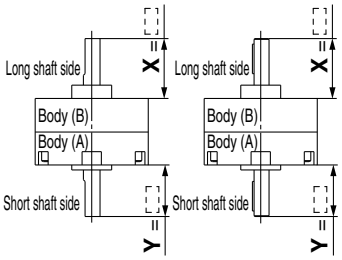
(mm)

Size / Thread	CRB2, CRBU2			
	15	20	30	40
M3 x 0.5	ø2.5	ø2.5	ø2.5	ø2.5
M4 x 0.7	—	ø3.3	ø3.3	ø3.3
M5 x 0.8	—	—	ø4.2	ø4.2

Symbol: A50

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: Y



Size: 10 to 30 **Size: 40**

The above figure shows the CRB2 series.

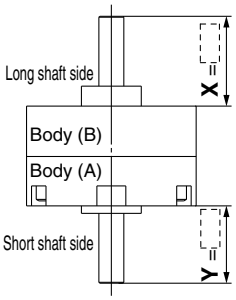
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 14	1 to 14	1 to 14	1 to 14
15	4 to 18	1.5 to 18	1.5 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20	1.5 to 20	1.5 to 20
30	5 to 22	2 to 22	2 to 22	2 to 22
40	18 to 30	18 to 30	18 to 30	18 to 30

Symbol: A53

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: K



The above figure shows the CRB2 series.

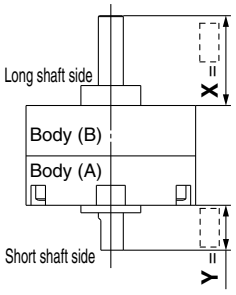
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 14	1 to 14	1 to 14	1 to 14
15	4 to 18	1.5 to 18	1.5 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20	1.5 to 20	1.5 to 20
30	5 to 22	2 to 22	2 to 22	2 to 22
40	6.5 to 30	4.5 to 30	3 to 30	4.5 to 30

Symbol: A57

Both the long shaft and the short shaft are shortened.

- Applicable shaft type: J



The above figure shows the CRB2 series.

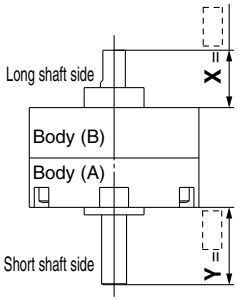
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 14	1 to 14	1 to 14	1 to 14
15	4 to 18	1.5 to 18	1.5 to 18	1.5 to 18
20	4.5 to 20	1.5 to 20	1.5 to 20	1.5 to 20
30	5 to 22	2 to 22	2 to 22	2 to 22
40	6.5 to 30	4.5 to 30	3 to 30	3 to 30

Symbol: A58

The shafts are reversed. Additionally, both the long shaft and the short shaft are shortened.
(If shortening the shaft is not required, indicate "∗" for dimension X, Y.)

- Applicable shaft type: J
- Dimensions inside ( ) are for double vane type of size 10.



The above figure shows the CRB2 series.

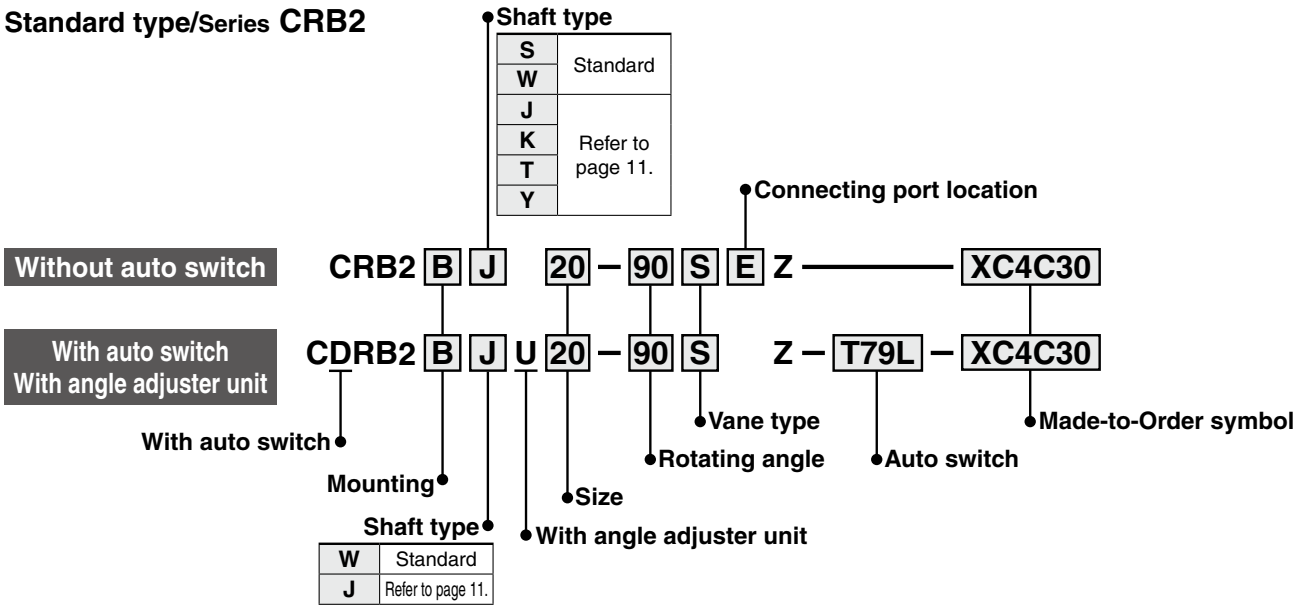
(mm)

Size	CRB2		CRBU2	
	X	Y	X	Y
10	3 to 10 (19)	1 to 12 (3)	1 to 3 (12)	1 to 19 (10)
15	4 to 11.5	1.5 to 15.5	1.5 to 6.5	1.5 to 20.5
20	4.5 to 13	1.5 to 17	1.5 to 7.5	1.5 to 22.5
30	5 to 16	2 to 19	2 to 8.5	2 to 26.5
40	6.5 to 17	4.5 to 28	3 to 9	4.5 to 36

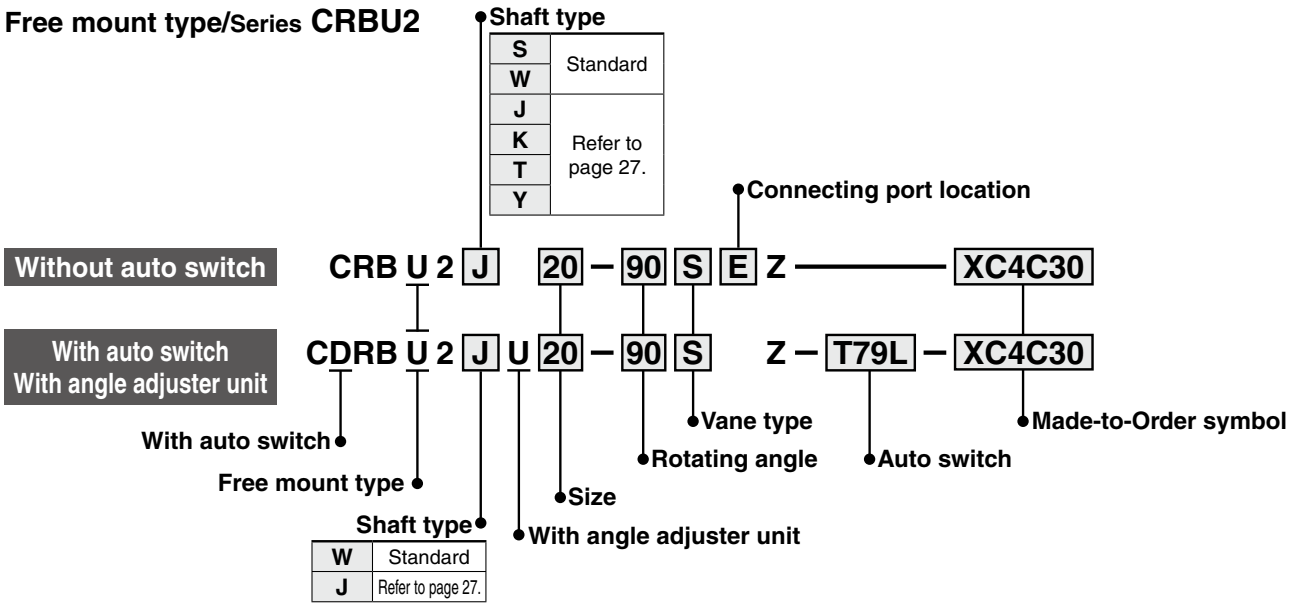
Series CRB2/CRBU2 (Size: 10, 15, 20, 30, 40)
Made to Order
-XC1, 2, 3, 4, 5, 6, 7, 30, X5

Symbol
-XC1 to -XC7, -XC30

Standard type/Series CRB2



Free mount type/Series CRBU2



Made to Order Symbol

Symbol	Description	Applicable shaft type W, J, K, S, T, Y	Applicable size
XC1*	Add connecting ports	●	10 15 20 30 40
XC2*	Change threaded holes to through-holes	●	
XC3*	Change the screw position	●	
XC4	Change the rotation range	●	
XC5*	Change rotation range between 0 to 200°	●	
XC6*	Change rotation range between 0 to 110°	●	
XC7*	Reversed shaft	W, J	
XC30	Fluorine grease	●	
X5**	For M5 port (90°/180°)	●	10, 15

* These specifications are not available for rotary actuators with auto switch and/or angle adjuster unit.

** Only the shaft type W or J can select "with auto switch" and/or "with angle adjuster unit".

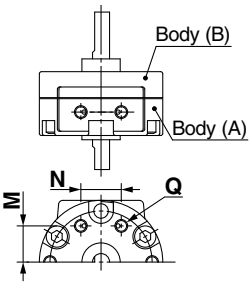
Combination

Symbol	Combination						
XC1	**XC1**						
XC2	●	**XC2**					
XC3	●	—	**XC3**				
XC4	●	●	●	**XC4**			
XC5	●	●	●	—	**XC5**		
XC6	●	●	●	—	—	**XC6**	
XC7	●	●	●	●	●	—	**XC7**
XC30	●	●	●	●	●	●	●
X5	●	●	●	●	●	●	●

Symbol: C1

The connecting ports are added on the Body (A) end surface.
(It will have an aluminum surface since the additional machining will be left unfinished.)

- A parallel key is used instead of chamfer on the long shaft for size 40.
- Not available for the rotary actuator with auto switch



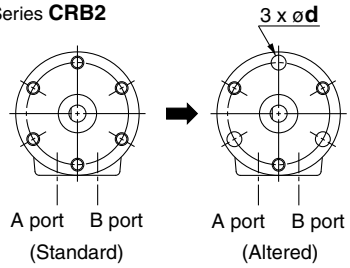
The above figure shows the CRB2 series.

(mm)

Size	CRB2, CRBU2		
	Q	M	N
10	M3	8.5	9.5
15	M3	11	10
20	M5	14	13
30	M5	15.5	14
40	M5	21	20

Symbol: C2

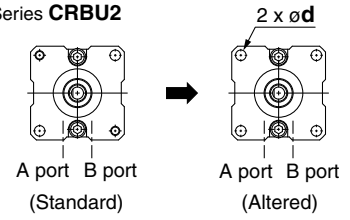
Series **CRB2**



The threaded holes on the Body (B) are changed to through-holes.
(It will have an aluminum surface since the additional machining will be left unfinished.)

- Not available for the rotary actuator with auto switch

Series **CRBU2**



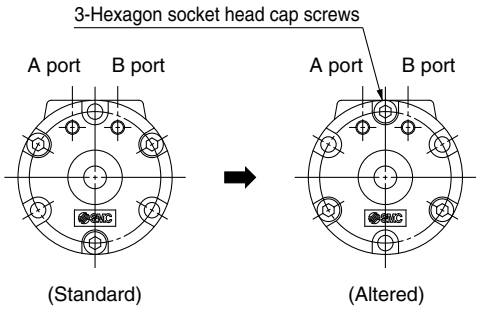
(mm)

Size	CRB2, CRBU2
	d
15	3.4
20	4.5
30	5.5
40	5.5

(Viewed from the long shaft side)

Symbol: C3

The position of the screws for tightening the actuator body is changed.

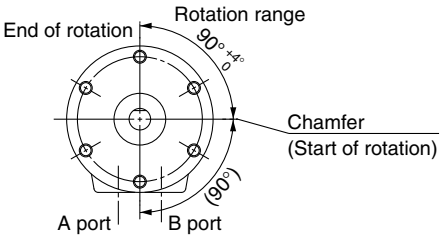


The above figure shows the CRB2 series. (Viewed from the short shaft side)

Symbol: C4

Applicable to single vane type only.
The rotation range is changed. Rotating angle 90°.
Starts of rotation is the horizontal line (90° down from the top to the right side).

- Rotation tolerance for CRB2BW10 is $^{+5^\circ}_{0}$
- A parallel key is used instead of chamfer on the long shaft for size 40.

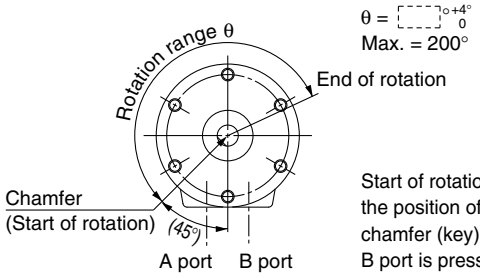


Start of rotation is the position of the chamfer (key) when A port is pressurized.
The above figure shows the CRB2 series. (Viewed from the long shaft side)

Symbol: C5

Applicable to single vane type only.
Start of rotation is 45° up from the bottom of the vertical line to the left side.

- Rotation tolerance for CRB2BW10 is $^{+5^\circ}_{0}$
- Port size for CRB2BW10, 15 is M3.
- A parallel key is used instead of chamfer for size 40.



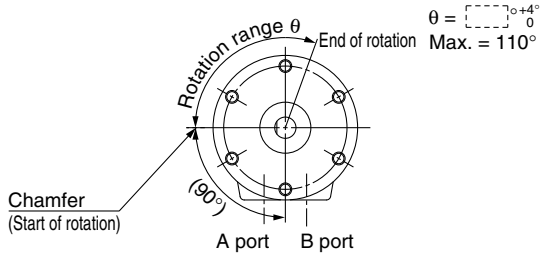
Start of rotation is the position of the chamfer (key) when B port is pressurized.

The above figure shows the CRB2 series. (Viewed from the long shaft side)

Symbol: C6

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

- Rotation tolerance for CRB2BW10 is $^{+5^\circ}_{0}$
- A parallel key is used instead of chamfer on the long shaft for size 40.

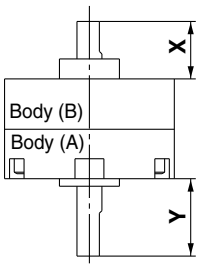


Start of rotation is the position of the chamfer (key) when B port is pressurized.
The above figure shows the CRB2 series. (Viewed from the long shaft side)

Symbol: C7

The shafts are reversed.

- A parallel key is used instead of chamfer on the long shaft for size 40.
- Dimensions inside ( ) are for double vane type of size 10.



The above figure shows the CRB2 series.

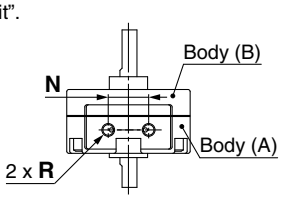
(mm)

Size	CRB2		CRBU2	
	Y	X	Y	X
10	12 (3)	10 (19)	19 (10)	3 (12)
15	15.5	11.5	20.5	6.5
20	17	13	22.5	7.5
30	19	16	26.5	8.5
40	28	17	36	9

Symbol: X5

Specifications with connection port size of sizes 10 and 15 changed to M5

- The rotating angle is only 90° and 180°.
- The vane type is compatible with single vanes only.
- Only the shaft type W or J can select “with auto switch” and/or “with angle adjuster unit”.



The above figure shows the CRB2 series.

(mm)

Size	CRB2, CRBU2	
	N	R
10	11.7	M5
15	11.7	M5

Symbol: C30

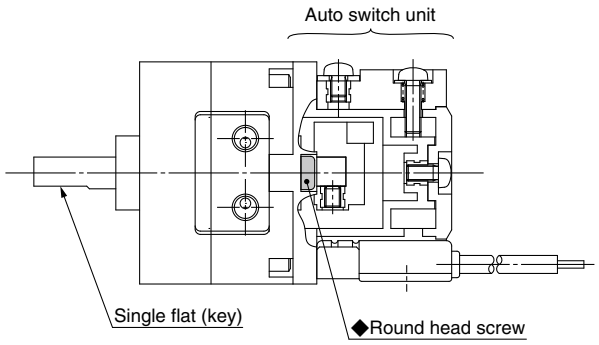
The standard grease is changed to fluorine grease. (Not the low-speed specification)

Component Unit

Auto Switch Unit and Angle Adjuster Unit

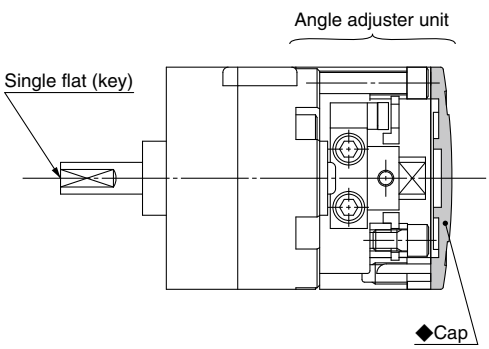
Series CRB2/CRBU2 Auto switch unit and/or angle adjuster unit can be mounted on the rotary actuator vane type.

Rotary actuator with auto switch unit
CDRB2BW□-□□-□
CDRBU2W□-□□-□



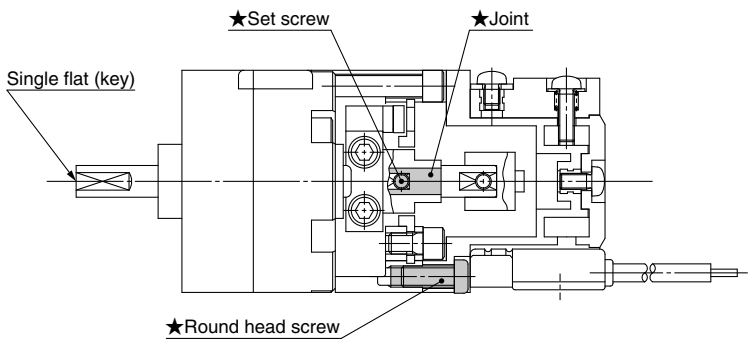
Retrofit unit	Auto switch unit

Rotary actuator with angle adjuster unit
CRB2BWU□-□□-□
CRBU2WU□-□□-□



Retrofit unit	Angle adjuster unit

Rotary actuator with auto switch unit and angle adjuster unit
CDRB2BWU□-□□-□
CDRBU2WU□-□□-□



Retrofit unit	Auto switch unit/Angle adjuster unit

∗ The rotary actuator with auto switch and angle adjuster is basically a combination of the auto switch unit and angle adjuster unit.
The items marked with ★ are additional parts required for connection (joint unit parts), and the items marked with ◆ are unnecessary.
Note) The figures show the CRB2 series.

Unit Part No. (Common to Series CRB2/CRBU2)

Size	Auto switch unit part no.∗1	Switch block unit part no.∗2		Angle adjuster unit part no.	Auto switch angle adjuster unit part no.	Joint unit part no.∗3
		Right-hand	Left-hand			
10	P611070-1	P611070-8	P611070-9	P811010-3	P811010-4	P211070-10
15	P611090-1			P811020-3	P811020-4	P211090-10
20	P611060-1	P611060-8		P811030-3	P811030-4	P211060-10
30	P611080-1			P811040-3	P811040-4	P211080-10
40	P611010-1	P611010-8	P611010-9	P811050-3	P811050-4	P211010-10

∗1. An auto switch will not be included, please order it separately.
∗2. Auto switch unit comes with one right-hand and one left-hand switch blocks that are used for addition or when the switch block is damaged.
Since the solid state switch for size 10 and 15 requires no switch block, the unit part number will be the P211070-13.
∗3. Joint unit is required to retrofit the angle adjuster unit to a rotary actuator with auto switch or to retrofit the auto switch unit to a rotary actuator with angle adjuster.

Series CRB□2
Angle Adjustment Setting

Specifications

Single Vane

Size	Rotating angle adjustment range	Rubber bumper
10	0 to 230°	Yes
15	0 to 240°	
20		
30		
40	0 to 230°	

Note 1) Use rotary actuator for 270°.
Note 2) Connecting ports are side ported only.
Note 3) The allowable kinetic energy is the same as the specifications of the rotary actuator.

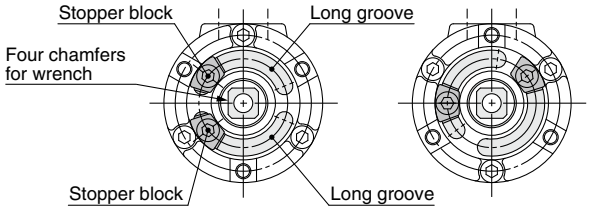
Double Vane

Size	Rotating angle adjustment range	Rubber bumper
10	0 to 90°	Yes
15		
20		
30		
40		

Note 1) Since the maximum angle of the rotating angle adjustment range will be limited by the rotation when using a rotary actuator for 90°, make sure to take this into consideration when ordering. Rotary actuator for 90° should be used to adjust the angle of 85° or less as a guide.
Note 2) Connecting ports are side ported only.
Note 3) The allowable kinetic energy is the same as the specifications of the rotary actuator.

Rotating Angle Adjustment Method

Remove the resin cap in the illustrations below, slide the stopper block on the long groove and lock it into the appropriate position to adjust the rotating angle and rotating position. Protruding four chamfers for wrench on the output shaft that rotates allows manual operation and convenient positioning. (Refer to the rotating angle setting examples shown in the next page for details.)



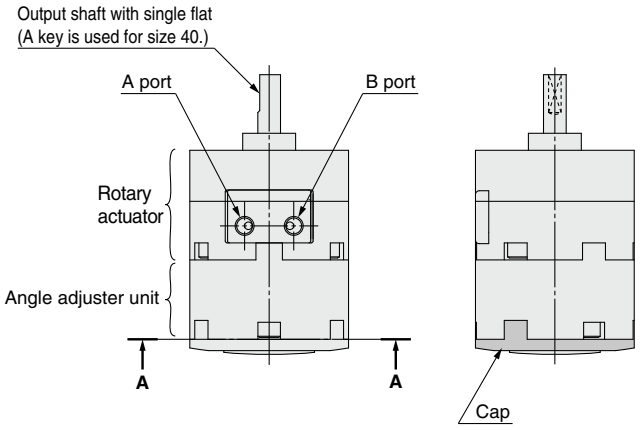
Section A-A (Single vane)　　**Section A-A** (Double vane)

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

Recommended Tightening Torque for Holding Stopper Block

Size	Tightening torque (N·m)
10	1.0 to 1.2
15	
20	2.5 to 2.9
30	3.4 to 3.9
40	

Note) Stopper block is tightened temporarily at the time of shipment. Angle is not adjusted before shipment.

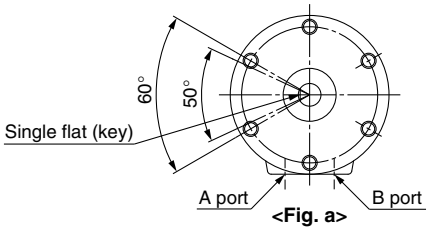


Other Operating Method

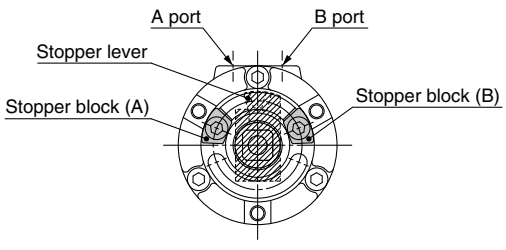
Although one stopper block is mounted on each long groove for standard specifications as shown in the illustrations below, 2 stopper blocks can be mounted on one long groove.

Angle adjustment range when 2 stopper blocks are mounted on one long groove
Size: 10, 40 ·····50°
Size: 15, 20, 30 ·····60°

As shown in <Fig. b>, when mounting 2 stopper blocks on one long groove, by revolving each stopper block (A)(B), the rotation range of the output shaft with single flat (key) is adjustable, as described in <Fig. a>, within either left 50° or 60° against port A and B.
(Rotation range of single flat (key) when mounting 2 stopper blocks on the other side's groove is the opposite side from <Fig. a> and the setting range is within either right 50° or 60° against port A and B.)



<Fig. a>

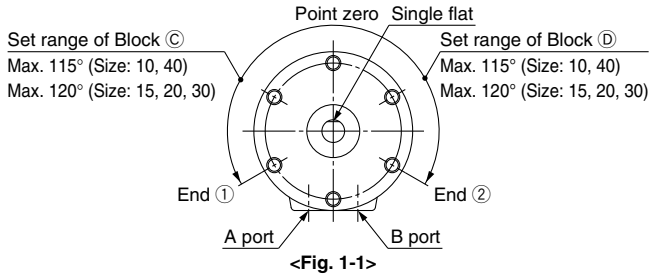


<Fig. b>

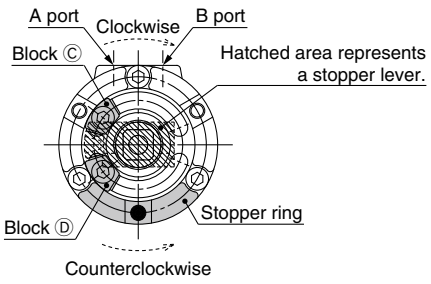
∗ These figures show the CRB2 series.

Rotating Angle Setting Examples

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



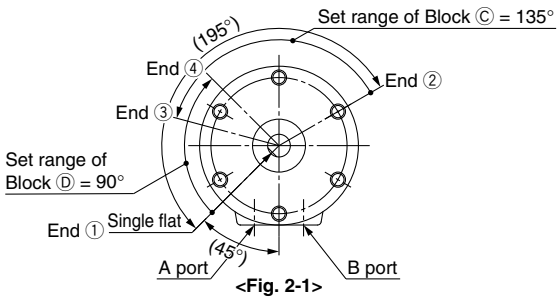
<Fig. 1-1>



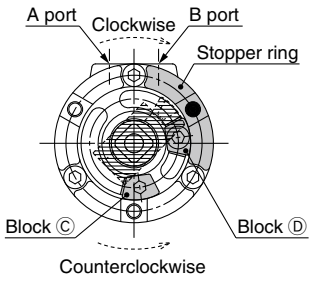
<Fig. 1-2>

Lock Block Ⓓ in Fig. 1-2, and move Block Ⓒ clockwise to allow the rotation of the shaft with single flat in Fig. 1-1 from point zero to End ①. When Block Ⓒ is locked and Block Ⓓ is moved counterclockwise, the shaft with single flat in Fig. 1-1 rotates from point zero to End ②. The maximum rotation range of the shaft with single flat is as follows: Sizes 10, 40: up to 230°; Sizes 15, 20, 30: up to 240° (Fig. 1-2 shows when the rotating angle is 0°.)

Example 2 The stopper ring is mounted on 120° counterclockwise from the standard position shown in Fig. 1-2 of Example 1.



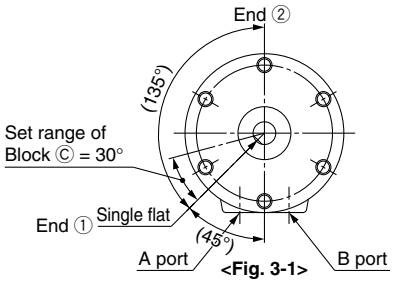
<Fig. 2-1>



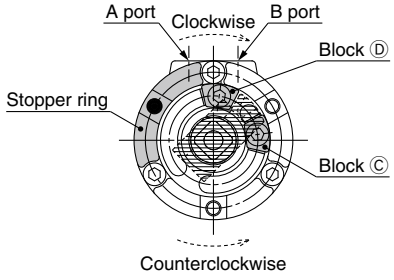
<Fig. 2-2>

The maximum rotation range of the shaft with single flat in Fig. 2-2 is 195°, from End ① to End ②. The rotation range of the shaft with single flat in Fig. 2-1 decreases to the range between End ② and ③ when moving Block Ⓒ in Fig. 2-2 clockwise, and similarly when moving Block Ⓓ counterclockwise, the rotation range decreases to the range between End ① and ④. However, since the internal stopper will come into contact with the vane at End ① position of the shaft with single flat in Fig. 2-1, make sure that the stopper lever stops at Block Ⓓ when adjusting.

Example 3 The stopper ring is mounted on 120° clockwise from the standard position shown in Fig. 1-2 of Example 1 as in Fig. 4-2 of Example 4.



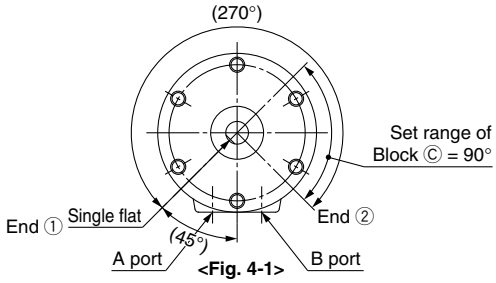
<Fig. 3-1>



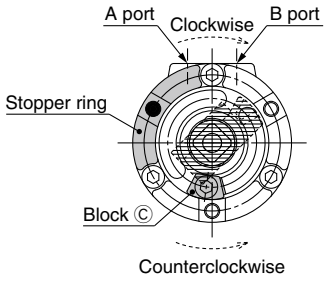
<Fig. 3-2>

Lock Block Ⓒ in Fig. 3-2 and move Block Ⓓ counterclockwise to allow the rotation of the shaft with single flat in Fig. 3-1 from End ① to End ②. However, since the internal stopper will come into contact with the vane at End ① position of the shaft with single flat make sure that the stopper lever stops at Block Ⓒ when adjusting. End ① side can be adjusted within 30° by moving Block Ⓒ counterclockwise.

Example 4 The stopper ring is mounted on 120° clockwise from the standard position shown in Fig. 1-2 of Example 1 as in Fig. 3-2 of Example 3.



<Fig. 4-1>



<Fig. 4-2>

The maximum rotation range of the shaft with single flat is 270°, from End ① to End ②, when using the actuator for 270° and End ① side in Fig. 4-1 is stopped using the internal stopper and End ② side is adjusted using Block Ⓒ.The rotation range can be adjusted within 90° in End ② side. Note that Block Ⓒ cannot be moved and set 90° or more counterclockwise from its position in Fig. 4-2 since the internal stopper will come into contact with the vane.

Note 1) Mounting of the stopper ring shown in Examples 2, 3, 4 are not applicable for size 10.
Note 2) ● marks in the illustrations above indicate the mounting position of the stopper ring.
Note 3) Select the appropriate rotation of the rotary actuator after careful consideration of the content of "Angle Adjustment Setting".
Note 4) For size 40, each block comes with 2 holding screws.
Note 5) These figures show the CRB2 series.

Series CDRB□2
With Auto Switch

Applicable Auto Switches

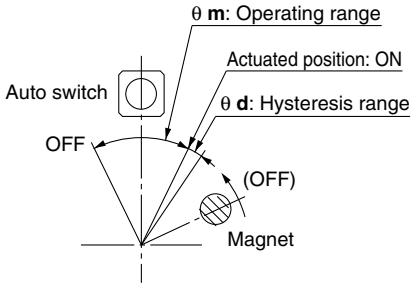
Size	Auto switch model		Electrical entry
10, 15	Reed	D-90/90A	Grommet, 2-wire
		D-97/93A	
	Solid state	D-S99/S99V*	Grommet, 3-wire (NPN)
		D-S9P/S9PV*	Grommet, 3-wire (PNP)
		D-T99/T99V	Grommet, 2-wire
30, 40	Reed	D-R73	Grommet, 2-wire
		D-R80	Connector, 2-wire
	Solid state	D-S79*	Grommet, 3-wire (NPN)
		D-S7P*	Grommet, 3-wire (PNP)
		D-T79	Grommet, 2-wire; Connector, 2-wire

* Solid state switch with 3-wire type has no connector type.

Operating Range and Hysteresis

* **Operating range: θ m**
  The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the switch turns OFF as the magnet travels the same direction.

* **Hysteresis range: θ d**
  The range between the position where the auto switch turns ON as the magnet inside the auto switch unit moves and the position where the auto switch turns OFF as the magnet travels the opposite direction.

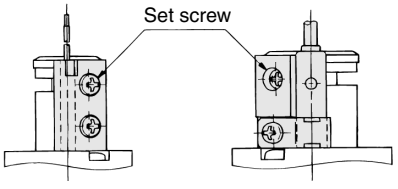


Size	θ **m**: Operating range	θ **d**: Hysteresis range
10, 15	110°	10°
20, 30	90°	
40	52°	8°

Note) Since the figures in the above table are provided as a guideline only, they cannot be guaranteed.
Adjust the auto switch after confirming the operating conditions in the actual setting.

How to Change the Auto Switch Detecting Position

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

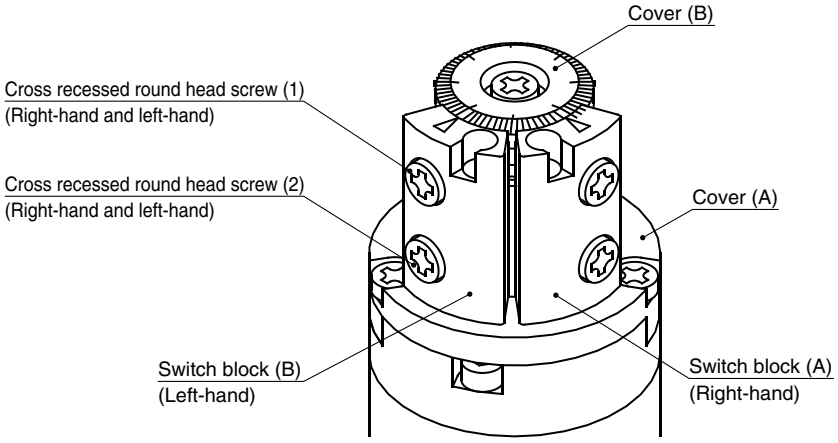


Size: 10, 15 **Size: 20 to 40**

Auto Switch Mounting

External view and descriptions of auto switch unit

This following shows the external view and typical descriptions of the auto switch unit.



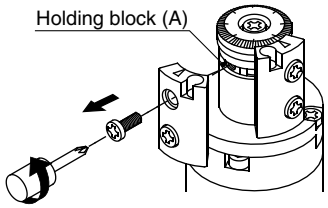
Solid state auto switch

<Applicable auto switch>

3-wire type……D-S99(V)□/S9P(V)□
2-wire type……D-T99(V)□

1. Switch block detaching

Remove the cross recessed round head screw (1) to detach the switch block.



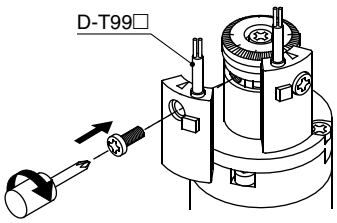
2. Solid state auto switch mounting

Secure the solid state auto switch with the cross recessed round head screw (1) and holding block (A).

Proper tightening torque: 0.4 to 0.6 (N·m)

∗ Since the holding block (A) moves inside the groove, move it to the mounting position beforehand.

· After the actuated position has been adjusted with the cross recessed round head screw (1), use the auto switch.



Reed auto switch

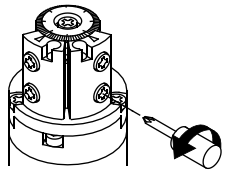
<Applicable auto switch>

D-97/93A (With indicator light)
D-90/90A (Without indicator light)

1. Preparations

Loosen the cross recessed round head screw (2) (About 2 to 3 turns).

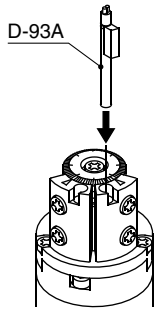
∗ This screw has been secured temporarily at shipment.



2. Reed auto switch mounting

Insert the reed auto switch until it is in contact with the switch block hole.

∗ For the D-97/93A model, insert the auto switch in the direction shown in the Fig. on the right.
∗ Since the D-90/90A model is a round type, it has no directionality.

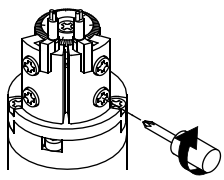


3. Reed auto switch securing

Tighten the cross recessed round head screw (2) to secure the reed auto switch.

Proper tightening torque: 0.4 to 0.6 (N·m)

· After the actuated position has been adjusted with the cross recessed round head screw (1), use the auto switch.

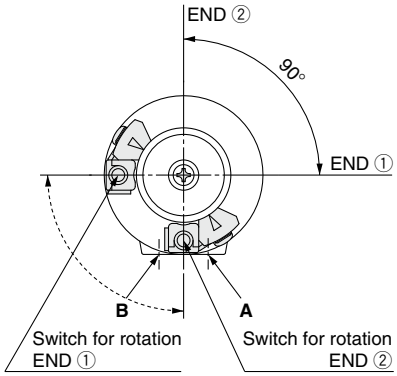


Auto Switch Adjustment

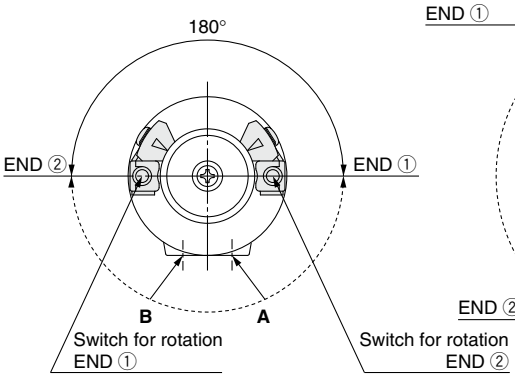
Rotation range of the output shaft with single flat (key for size 40 only) and auto switch mounting position <Applicable models/Size: 10, 15, 20, 30, 40>

<Single vane>

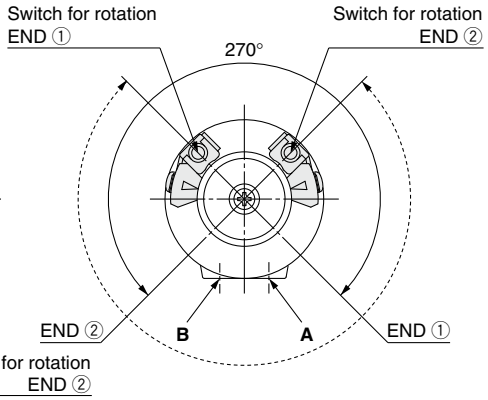
Rotating angle: **90°**



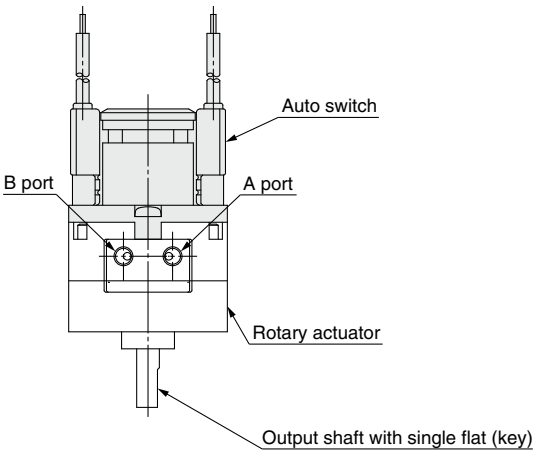
Rotating angle: **180°**



Rotating angle: **270°**



- Solid-lined curves indicate the rotation range of the output shaft with single flat (key). When the single flat (key) is pointing to the END ① direction, the switch for rotation END ① will operate, and when the single flat (key) is pointing to the END ② direction, the switch for rotation END ② will operate.
- Broken-lined curves indicate the rotation range of the built-in magnet. Operating angle of the switch can be decreased by either moving the switch for rotation END ① clockwise or moving the switch for rotation END ② counterclockwise. Auto switch in the figures above is at the most sensitive position.
- Each auto switch unit comes with one right-hand and one left-hand switch.



Size: 10 to 40

∗ The above figure shows the CRB2 series.

⚠ 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, whichever is first.*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.

Revision history

Edition B * Addition of free mount type

RU