



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





Added the D-M9 type compact auto switch.

# 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 standardised 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.



### Rotary Actuator/Vane Type Series CRB 2



# 12 % weight reduction

Lighter installation can be achieved.

Size	CRBU2 [g]	Reduction rate [%]	Current model [g]
10	42	12	47.5
15	64	12	73
20	130	10	143
30	248	5	263
40	465	5	491
-			

## Interchangeable mounting with the current model

\* Compared with single vane at 90°

# Six types of direct mounting are possible.



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 CRB 2



### **Series Variations**

		Fluid										А	ir							
		Size				1	0			1	5			20,	30			4	0	
	Vane typ	De S: Single v D: Double	vane vane		:	S		)	S D		)	s	s		D	ę	6		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		
	<u>e</u>	- 90°			+	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	
	g ang	100°		-		•	•	_	-	•	•	_	-	٠	•		+	•	•	
type	otatin	180°			+	•	-	_	•	•	_	_	•	•	-	_	•	٠	+	+
Jount	Ċ.	270°			+	•	-	_	•	•	-	_	•	•	+		•	•	+	+
ree n		Single shaft	+	•	•	•	•	•	•	•	•	•	٠	•	•	٠	•			
Jard/F		Double shaft	w	+	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	
Stano	e	Long shaft with round Short shaft with single	shaft & e flat	J	+	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	
	laft ty	Same length double lo with single flat on both	ng shaft shafts	v	+	•	•	•	•	•	•	•	•	•	٠	•	_	+	+	+
	Ś	Double shaft key					-		_	+	-	_	_	-	-		•	•	•	
		Double round shaf	:	к	+	•	•	•	•	٠	•	•	•	•	٠	•	•	٠	•	-
		Single round shaft		т	+	•	+	•	•	٠	•	•	•	•	٠	•	•	٠	•	•
	Cushion	Rubber bumper					-	_	•	٠	•	•	•	•	٠	•	•	•	•	-
	su	With auto switch (W	VJ shaf	t)	+		•	_	•	+	•	_	•	-	٠	_	•	+	•	+
	Iriatio	With angle adjuste	r (WJ sł	naft)	+		•	_	•	-	•	_	•	-	٠	_	•	+	•	+
	Note	With auto switch and ang	e adjuster	(WJ shaft)	+		•	_	•	-	•	_	•	-	٠	_	•	+	•	+
Option	Mounting	With flange*		F	+	•	•	•	•	•	•	•	•	•	٠	•	-	+	+	_
Made	Pattern	Shaft pattern			•	•	•	•	•	•	•	٠	•	•	٠	•	•	•	•	•
Order	rattern	ern Rotating angle pattern			•	•			•	•			•	•	-		•	•		

\* The CRB series only

# CONTENTS

# Rotary Actuator/Vane Type Series CRB 2





\* Lead wire length symbols: 0.5 m..... (Example) R73C 3 m..... L (Example) R73CL

5 m..... Z (Example) R73CZ

None ..... N (Example) R73CN

**SMC** 

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

\* Solid state auto switches marked with "O" are produced upon receipt of order.

Rotary Actuator Vane Type Series CRB2



Symbol



### Flange Assembly Part No.

(For details about dimensions, refer to page 15.)

Model	Assembly part no.
CRB2F□10	P211070-2
CBB2E 15	P211090-2
	1211030-2
CBB2E 20	P211060-2
	. 2.1000 2
CRB2F□30	P211080-2

Made to Order Order (For details, refer to pages 37 to 51.)

Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern I	W
XA31 to XA58	Shaft type pattern ${\mathbb I}$	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 $200^\circ$	W, S, J, K, T, Y
XC6	Change rotation range between 0 to $110^\circ$	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 37, 38, 43, 44, 49.

Refer to pages 55 to 59 for actuators with auto switches.

•Operating range and hysteresis

• How to change the auto switch detecting position

Auto switch mounting

Auto switch adjustment

### **Single Vane Specifications**

	Size	10	15	20	30	40						
Rotating	g angle		ę	90°, 180°, 270	0							
Fluid		Air (Non-lube)										
Proof pr	ressure [MPa]		1.05		1	.5						
Ambient a	and fluid temperature			5 to 60 °C								
Max. oper	rating pressure [MPa]		.0									
Min. oper	ating 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	kinotio onormy [1] Note 2)	0.00015	0.001	0.003	0.02	0.04						
Allowable	kinetic energy [J] ····· -/	0.00015	0.00025	0.0004	0.015	0.03						
Shaft load	Allowable radial load	15	15	25	30	60						
[N]	Allowable thrust load	ad 10 10 20 25 4										
Port loc	ation		Side p	orted or Axial	ported							
Port size (S	ide ported, Axial ported)	M3 >	¢ 0.5	M5 x 0.8	M5 x 0.8							
Angle ad	iustable range Note 3)	<sup>()</sup> 0 to 230° 0 to 240° 0 t										

Note 1) Make sure to operate within the speed regulation range. Speeds slower than the adjustment range can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

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 17.

### **Double Vane Specifications**

	Size	10	15	20	30	40						
Rotating	g angle			90°, 100°								
Fluid		Air (Non-lube)										
Proof p	ressure [MPa]		1.05		1.	.5						
Ambient	and fluid temperature			5 to 60 °C								
Max. oper	rating pressure [MPa]		0.7		1.	.0						
Min. oper	ating 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							
Allowab	e kinetic energy [J]	0.0003	0.0012	0.0033	0.02	0.04						
Shaft load	Allowable radial load	15	15	25	30	60						
[N]	Allowable thrust load	10	10	20	25	40						
Port loc	ation	Side ported or Axial ported										
Port size (S	ide ported, Axial ported)	M3 :	x 0.5		M5 x 0.8							
Angle ad	justable range Note 2)	0 to 90°										

Note 1) Make sure to operate within the speed regulation range. Speeds slower than the adjustment range can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

Note 2) Adjustment range in the table is for 100°. For 90°, refer to page 17.

**CRB2** 

CRB20WU

**CRBU2** 

Simple Specials CRBU2WU

**SMC** 

# Series CRB2

### Volume

Vane type		Single vane										Double vane													
Size		10			15			20			30			40		1	0	1	5	2	0	3	0	4	0
Rotating angle	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	100°	90°	100°	90°	100°	90°	$100^{\circ}$	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 pressurised.

### Weight

Vane type		Single vane												Double vane											
Size		10			15			20			30			40		1	0	1	5	2	0	3	0	4	0
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	1	0	1	9	1	25	-	_
Auto switch unit		15			20			28			38			43		1	5	2	0	2	8	:	38	4	43
Angle adjuster unit		30			47			90			150			203		3	0	4	7	9	0	1!	50	20	03

### Effective Output



### **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

 $\ast$  Refer to page 10 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 pressurised. Single vane Double vane



 $\ast$  For size 40 actuators, a parallel key will be used instead of chamfer.

7

Note 1) For single vane type, the tolerance of rotating angle of 90°, 180°, 270° will be  $\frac{+5^{\circ}}{0}$  for size 10 only. For double vane type, the tolerance of rotating angle of 90° will be  $\frac{+5^{\circ}}{0}$  for size 10 only. Note 2) The chamfered position of the double vane type shows the 90° specification position.



[cm<sup>3</sup>]

[g]

### Construction



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

Aluminium alloy

9

Cover

SMC

18 Parallel key

Size 40 only

Carbon steel

# Series CRB2

### **Construction (With Auto Switch)**

### Single vane

 $\bullet$  Following figures show actuators for 90° and 180° when B port is pressurised.

Double vane

• Following figures show the intermediate rotation position when A or B port is pressurised.







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









Size: 10, 15

### **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)	Aluminium alloy
6	Switch block (A)	Resin
7	Switch block (B)	Resin
8	Switch block	Resin
9	Magnet	

# 

Size: 20, 30

**SMC** 

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
16	Switch holder	Stainless steel

Size: 40

 $\ast$  For size 10, 2 cross recessed round head screws 1 are required.

9

### Rotary Actuator Vane Type Series CRB2

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



# Series CRB2

### **Dimensions: Standard Type 10**

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

### Single shaft/Port location: Side ported



### <Port location: Axial ported>





Refer to page 14 for details of shaft types J, K, T and Y.

6 14.5

# Rotary Actuator With Auto Switch Series CDRB2

### 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 pressurised. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurised.

### Size: 10, 15

ØΑ

(The size 10 double vane type is indicated on page 13.)







ØΑ

ØF

ØΕ

¢

٩ -Ġ

Shaft-end shape of size 40

4<sub>-0.030</sub>

Parallel key dimensions

**h** (h9)

4\_0.030

1.1

**b** (h9)

4\_0.030

Ч

L1

20

b

1.5

2

for size 40.

(J) (D)

m

C

Size: 20, 30, 40



N

Æ

П

ø

П

<u>2 x</u> **R** 

Auto switch

ØP

 $\mathcal{R}$ 

A port

B port

H

≥

(34.5: Connector type)

25.5

**♦**6 x **Q** 

**CRB2** 

CRB2 UM

**CRBU2** 

**CRBU2WU** 

Simple Specials

Made to Order

ngle Adjustment Component Unit Setting







(3 mounting holes with the  $\bigstar$  marks are for tightening the actuator and not to be used for external mounting.)

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

The length is 30 when any of the following are used: D-97/93A The length is 25.5 when the D-M9 is used.

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

### Refer to page 14 for details of shaft types J, K, T and Y.

																		[mm]	◄
Size	Α	В	С	D	<b>E</b> (g7)	<b>F</b> (h9)	G	К	L	М	Ν	Р	Q	R	Т	W	W1	Υ	
10	29	15	29	14	4 <sup>-0.004</sup> -0.016	9_0_0_0	3	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	M3 x 0.5	3.6	19.8	35	18.5	ct l
15	34	20	29	18	5 <sup>-0.004</sup> -0.016	12_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0	4	10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6	21	35	18.5	Swi Natir
20	42	29	30	20	6 <sup>-0.004</sup> -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	500
30	50	40	31	22	8 <sup>-0.005</sup> -0.020	16_0.043	5	12	1.0	26	14	43	M5 x 0.8 depth 10	M5 x 0.8	14	24	_	25	A
40	63	45	31	30	10 <sup>-0.005</sup> -0.020	25_0_0_0	6.5	20	1.0	31	20	56	M5 x 0.8 depth 10	M5 x 0.8	17	30	_	31	



# Series CDRB2

### Dimensions: Standard Type (With Auto Switch) 10

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

### Size: 10



Ø 29 Ø 9h9\_0.036 Ø 4g7\_0.016





ŵ



\*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V) The length is 30 when any of the following are used: D-97/93A The length is 25.5 when the D-M9 is used.

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

Refer to page 14 for details of shaft types J, K, T and Y.

Single flat

Single flat

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

Size: 10, 15, 20, 30, 40

### Double shaft/CRB2

### Double shaft/CRB2

### Single shaft/CRB2

۵

Round shaft

### Single shaft/CRB2

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

ŀØ Ð Δ

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**CRB2** 

CRB2 WU

**CRBU2** 

Simple Specials CRBU2WU

Made to Order





### Double shaft/CDRB2

With auto switch



With angle adjuster unit

Double shaft/CRB2□JU

# Round shaft ŀØ 0

With auto switch and angle adjuster unit

ŀØ

-6



Double shaft/CDRB2



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.

# Series CRB2

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



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



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



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



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







able		Iction	Electrical	light	Wiring		l oad ve	ltago	Auto s	witch	Loodwire	Lea	d wii	re le	ngth	[m]	Dro wirod	Appli	ooblo
plice	Туре	ial fur	ontry	cator	(Output)		LUAU V	maye	mo	del	type	0.5	1	3	5	None	connector	Appii	ad
Api		Spec	entry	Indi	(Output)		DC	AC	Perpendicular	In-line	type	(—)	(M)	(L)	(Z)	(—)	CONTICCTO	10	au
					3-wire (NPN)		5 V 12 V		M9NV	M9N					0	—	0	IC	
	Solid				3-wire (PNP)		J V, 12 V		M9PV	M9P	Oilproof				0	—	0	circuit	
10	state	_		Vac	2-wire		12 V	_	M9BV	M9B	heavy-				0	—	0	—	
Ť	auto			100	3-wire (NPN)		5 V 12 V		S99V	S99	duty		—		0	—	0	IC	
l0,	switch		Grommet		3-wire (PNP)	24 V	0 1, 12 1		S9PV	S9P	cord		—		0	—	0	circuit	Relay,
L I			aronninci		2-wire	27 V	12 V		T99V	T99			—		0	—	0	—	PLC
Ъ	Road			No			5 V, 12 V	5 V, 12 V, 24 V	—	90	Vinyl parallel cord		—			—		IC	
	auto	_			2-wire		5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V	—	90A	Oilproof heavy-duty cord		—			—	_	circuit	
	switch			Yes	2 1110		_	_	—	97	Vinyl parallel cord		—			—		_	
				100				100 V	—	93A	Ollproof heavy-duty cord		—			—			
					3-wire (NPN)		5 V 12 V		M9NV	M9N					0	—	0	IC	
	Solid				3-wire (PNP)		• 1, 12 1		M9PV	M9P					0	—	0	circuit	
0	state		Grommet		2-wire		12V		M9BV	M9B					0	—	0	—	
4	auto	—	Grommor	Yes	3-wire (NPN)		5V 12V	—	—	S79	Oilproof		—		0	—	0	IC	
30	switch				3-wire (PNP)		01, 121		—	S7P	heavy-		—		0	—	0	circuit	Relav
ò,					2-wire	24 V	12 V		—	T79	duty		—		0	—	0	_	PLC
2			Connector						—	T79C	cord		—				_		
ō	Road		Grommet	Yes			_	100 V	—	R73			—		0	—		_	
-	auto	_	Connector		2-wire				—	R73C			—	•	•	•	_		
	switch		Grommet	No			48 V, 100 V	100 V	—	R80			—	•	0	—		IC circuit	
			Connector				—	24 V or less	—	R80C			—					—	
* Lo	Reed auto switch		Grommet Connector Grommet Connector	Yes No	2-wire	<u> </u>	48 V, 100 V —	100 V — 100 V 24 V or less (ample) F	— — — 373C	R73 R73C R80 R80C		• • •	— — —	• • •		d tor		IC circuit	

3 m ····· L (Example) R73CL 5 m ····· Z (Example) R73CZ

None ····· N (Example) R73CN

assembled)

\* Solid state auto switches marked with "O" are produced upon receipt of order.

SMC

The above may not be selected when the product comes with an auto switch or angle adjuster unit. For details, refer to pages 37, 38, 43, 44, 49.

Shaft type

hole to through-hole Change the

screw position

rotation range Change rotation range

between 0 and 200° Change rotation range

between 0 and 110° Reversed

Fluorine grease

For M5 port

(90°/180°)

shaft

Change the

pattern I Add connecting

ports Change threaded

to XA58

XC1

XC2

XC3

XC4

XC5

XC6

XC7

XC30

X5

Л

W, J

W, J

W. J

W, J

W. J

W, J

W, J

W, J

W, J

Component Unit

Angle Adjustment Setting

Auto Switch Mounting

# Series CRB2 WU

### 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







12 (11) (14)

With auto switch and angle adjuster



Size: 20, 30, 40

### **Component Parts**

No.	Description	Material	Note
1	Stopper ring	Aluminium 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	Сар	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		
10	Hexagon socket head set screw	Stainless steel	Hexagon nut will be used
12	Hexagon nut	Stainless steel	for size 10 only.
13	Cross recessed round head screw	Stainless steel	
14	Magnet lever	_	

# ▲ Specific Product Precautions

Be sure to read this before handling. Refer to the I back cover for Safety Instructions. For Rotary Actuator Precautions and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smc.eu

### **Angle Adjuster Unit**

### \land 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° to 230° (Size: 10, 40) $^{\ast}$
270 0	0° to 240° (Size: 15, 20, 30)
180°+4	$0^{\circ}$ to $175^{\circ}$
90° <sup>+4</sup> 0	0° to 85°

 $\ast$  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.



### **Rotary Actuator with Angle Adjuster** Vane Type Series CRB2 WU

### 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 pressurised. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurised.

### Size: 10, 15, 20, 30, 40

### Size: 10 (Double vane)



⋝



(3 mounting holes with the  $\bigstar$  marks

not to be used for external mounting.)

are for tightening the actuator and

3 x Q (Size 10) 6 x Q (Size 15, 20, 30, 40)





### Shaft-end shape of size 40

ØP

A port

B port



### Parallel key dimensions

	.1 .	b
<b>b</b> (h9)	<b>h</b> (h9)	L1
4_0.030	4_0.030	20

### Refer to page 14 for details of shaft type J.

Size	Α	В	С	D	<b>E</b> (g7)	<b>F</b> (h9)	G	Н	K	L	М	Ν	Р	Q	R	Т	_
10	29	15	19.5	14	4 <sup>-0.004</sup> -0.016	9_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0_0	3	3	9	0.5	9.5	9.5	24	M3 x 0.5 depth 6	M3 x 0.5	3.6	d tc
15	34	20	21.2	18	5 <sup>-0.004</sup> -0.016	12_0_043	4	3.2	10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6	Dtir
20	42	29	25	20	6 <sup>-0.004</sup> -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	on
30	50	40	29	22	8 <sup>-0.005</sup> -0.020	16_0_043	5	4.5	12	1.0	26	14	43	M5 x 0.8 depth 10	M5 x 0.8	14	A
40	63	45	36.3	30	10 <sup>-0.005</sup>	25_0_0	6.5	5	20	—	31	20	56	M5 x 0.8 depth 10	M5 x 0.8	17	



[mm]

CRB2

CRB20WU

**CRBU2** 

# Series CDRB2 WU

### 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 pressurised. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurised.

### Size: 10, 15

(The size 10 double vane type is indicated on page 20.)



(3 mounting holes with the are for tightening the actua not to be used for external

A port

### Refer to page 14 for details of shaft type J.

- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V) The length is 30 when any of the following are used: D-97
  - The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90 The angle is 69° when any of the following are used: D-S

	Siz	e: 20	, 30,	40						
			Si	ize: 4	10	S	ize: 2	20, 30	)	
F &		8 32.55		W		8	V			
		ľ	•	Ø A Ø F		(26.	5: Conr	$=\frac{20.8}{100}$	/pe)	
					A parall instead for size	el key is used of single flat 40.				(34.5: Connector type)
					<u>Auto sv</u>	vitch 🗍			Ŧ	
-		Sha	ft-en	nd sh	ape of size	40				
*			2	, <b>→  </b> ▲ <mark>1.</mark> ξ		4		) )		
t ★ marks tor and mounting.	.)		×			ØP			ð,	
			Para	allel k	ey dimensio	ns <u>Ap</u>	ort	Вр	ort	
7/93A D/90A/97/	Size: 40 Size: 20, 30 Size:									
99(V)/T99	9(V)/S9	P(V)	4_0	.030	4 <sub>-0.030</sub>   20		_			[mm]
K	L	M Q 5	<b>N</b>	<b>P</b>	Q M3 x 0 5 dopth 6	R M3×05	T 26	10 g	W1	<b>Y</b>
10	0.5	14	10	29	M3 x 0.5 depth 5	M3 x 0.5	7.6	21	35	18.5
10	0.5	20	10	26	M4 x 0 7 depth 7	MEXOR	10.5	00		05

Size Α В С D **E** (g7) **F** (h9) G 10 4-0.004 9\_0.036 3 29 15 45.5 14 12\_0.043 15 34 20 47 18 5<sup>-0.004</sup> -0.016 4  $6^{-0.004}_{-0.016}$ 14\_0.043 20 42 29 51 20 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 16\_0.043 5 12 1.0 26 14 43 M5 x 0.8 depth 10 M5 x 0.8 14 24 \_ 25 10-0.005 25\_0\_0 40 M5 x 0.8 depth 10 63 45 62.2 6.5 20 31 20 56 M5 x 0.8 17 30 30 31 \_\_\_\_

# Rotary Actuator with Angle Adjuster With Auto Switch Series CDRB2 WU

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



### Size: 10



A port

B port

Refer to page 14 for details of shaft type J.

- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V) The length is 30 when any of the following are used: D-97/93A The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

Auto Switch Mounting



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

able		nction	Electrical	r light	Wiring		l oad vo	oltage	Auto s	switch	Lead wire	Le	ead wi	re ler	ngth [	m]	Pre-wired	Annli	cable
plic	Туре	cial fu	entry	cato	(Output)		2000.00	Jilligo	mo	del	type	0.5	1	3	5	None	connector		ad
Ap		Spec	0	Indi	(eupui)		DC	AC	Perpendicular	In-line	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(—)	(M)	(L)	(Z)	(N)			
					3-wire (NPN)		5 V 12 V		M9NV	M9N					0	—	0	IC	
	Solid				3-wire (PNP)		J V, 12 V		M9PV	M9P	Oilproof				0	—	0	circuit	
	state			Vaa	2-wire		12 V		M9BV	M9B	boow duty	۲			0	—	0		
15	auto			ies	3-wire (NPN)		EV 10V	_	S99V	S99	neavy-duty		—		0	—	0	IC	
ò.	switch		Customers		3-wire (PNP)	04 V	5 V, 12 V		S9PV	S9P	coru		—		0	—	0	circuit	Relay,
1			Gronniet		2-wire	24 V	12 V		T99V	T99			—		0	—	0	-	PLC
P L	Deed			No			5 V, 12 V	5 V, 12 V, 24 V	-	90	Vinyl parallel cord		—			—		IC	
_	neeu			INO	Quuiro		5 V, 12 V, 100 V	5 V, 12 V, 24 V, 100 V		90A	Oilproof heavy-duty cord		—			—		circuit	
	auto			Vaa	2-wile			_	_	97	Vinyl parallel cord		—			—			
	Switch			res				100 V	—	93A	Oilproof heavy-duty cord		—			—		_	
					3-wire (NPN)		5 V 10 V		M9NV	M9N		۲			0	—	0	IC	
	Colid				3-wire (PNP)		5 V, 12 V		M9PV	M9P		٠			0	—	0	circuit	
0	Solia		Grommot		2-wire		12 V		M9BV	M9B		۲			0	—	0		
4	Sidle	—	Gronniet	Yes	3-wire (NPN)		5 V 10 V	—	_	S79		۲	—		0	—	0	IC	
30	switch				3-wire (PNP)		5 V, 12 V		_	S7P	Oilproof		—		0	—	0	circuit	Delay
°,	Switch				2 wiro	24 V	10.1/		—	T79	heavy-duty	۲	—		0	—	0		
5			Connector		2-wile		12 V		_	T79C	cord		—				_		FLC
ō	Deed		Grommet	Vaa				100 V	—	R73			—		0	—			
	neeu		Connector	ies	0 wire			—	_	R73C			—						
	auto		Grommet	No	2-wile		48 V, 100 V	100 V	—	R80			—		0	—	_	IC circuit	
	Switch		Connector	110			_	24 V or less	_	R80C			—					_	]

\* Lead wire length symbols: 0.5 m ..... (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 "O" are produced upon receipt of order.

Free Mount Type Rotary Actuator Vane Type Series CRBU2





Symbol





Symbol	Description	Applicable shaft type
XA1 to XA24	Shaft type pattern ${\rm I}$	W
XA31 to XA58	Shaft type pattern ${\mathbb I}$	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 $200^\circ$	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 37, 38, 43, 44, 49.

Refer to pages 55 to 59 for actuators with auto switches.

•Operating range and hysteresis

- How to change the auto switch detecting position
- Auto switch mounting
- Auto switch adjustment

### **Single Vane Specifications**

	Size	10	15	20	30	40					
Rotating	g angle		9	90°, 180°, 270	0						
Fluid				Air (Non-lube)	)						
Proof pr	ressure [MPa]		1.05		1	.5					
Ambient	and fluid temperature			5 to 60 °C							
Max. oper	rating pressure [MPa]		0.7		1	.0					
Min. oper	ating 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	kinotio onormy [ 1] Note 2)	0.00015	0.001	0.003	0.02	0.04					
Allowable	kinetic energy [J] (100 2)	0.00015	0.00025	0.0004	0.015	0.03					
Shaft load	Allowable radial load	15	15	25	30	60					
[N] Allowable thrust load		10	10	25	40						
Port loc	ation	Side ported or Axial ported									
Port size (S	Side ported, Axial ported)	ed) M3 x 0.5 M5 x 0.8									
Angle ad	justable range Note 3)	0 to 230°		0 to 240°		0 to 230°					

Note 1) Make sure to operate within the speed regulation range. Speeds slower than the adjustment range can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

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.

### **Double Vane Specifications**

	Size	10	15	20	30	40					
Rotating	g angle			90°, 100°							
Fluid				Air (Non-lube)	)						
Proof p	ressure [MPa]		1.05		1	.5					
Ambient	and fluid temperature			5 to 60 °C							
Max. ope	rating pressure [MPa]		0.7		1	.0					
Min. oper	ating pressure [MPa]	0.2 0.15									
Rotation time	adjustment range s/90° Note 1)	0.03 to 0.3 0.04 to 0.3 0.0									
Allowab	e kinetic energy [J]	0.0003	0.0012	0.02 0.04							
Shaft load	Allowable radial load	15	15	25	30	60					
[N]	Allowable thrust load	10	10	20	25	40					
Port loc	ation		Side p	orted or Axial	ported						
Port size (S	Side ported, Axial ported)	ad) M3 x 0.5 M5 x 0.8									
Angle ad	justable range Note 2)	(e 2) 0 to 90°									

Note 1) Make sure to operate within the speed regulation range. Speeds slower than the adjustment range can cause the unit to stick or not operate.

For size 10, when operation at the maximum speed (0.03 s/90°) is required, the operating pressure should be set to 0.35 MPa or higher.

Note 2) Adjustment range in the table is for 100°. For 90°, refer to page 32.

CRB2

CRB20WU

**CRBU2** 



# Series CRBU2

### Volume

Vane type							Sin	gle va	ane										[	Double	e van	Э			
Size		10			15		20				30		40		10		15		20		3	0	4	0	
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°
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 pressurised.

### Weight

Vane type		Single vane									Double vane														
Size		10			15			20			30			40		1	0	1	5	2	0	3	0	4	0
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		1	5	2	0	2	8	3	38	2	13
Angle adjuster unit		30			47			90			150			203		3	0	4	7	9	0	15	50	20	)3

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

### **Effective Output**



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

Chamfered positions shown below illustrate the conditions of actuators when B port is pressurised. Single vane Double vane



\* 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.

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

23



[cm<sup>3</sup>]

[g]

### Free Mount Type Rotary Actuator Vane Type Series CRBU2

### Construction



\*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.

24

# Series CRBU2

### **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 pressurised.

### Double vane

(16)

• Following figures show the intermediate rotation position when A or B port is pressurised.







B port

(3) (5)

(12)

(9)

-(13)

(4)

(2) (14)



 $\oplus$ 

(3)

(12)

9

13

(4) (2)

(14)

 $\oplus$ 

Π

No.

9

10

11

12

13

14 15

(1)

10







Material

Stainless steel

Stainless steel

Stainless steel

Stainless steel

Stainless steel

NBR

Stainless steel





### **Component Parts**

A port

1

10

 $\oplus$   $\square$   $\oplus$   $\square$   $\oplus$ 

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

 $\ast$  For size 10, 2 cross recessed round head screws 1 are required.



16 Switch holder

Rubber cap

Size: 20, 30

Magnet

Description

Hexagon socket head set screw

Cross recessed round head screw

### Free Mount Type Rotary Actuator Vane Type Series CRBU2

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





# Series CRBU2

### **Dimensions: Free Mount Type 10**

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

### Single shaft/Port location: Side ported





Size: 10







Refer to page 30 for details of shaft types J, K, T and Y.

### Free Mount Type Rotary Actuator With Auto Switch Series CDRBU2

### 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 pressurised. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurised. Only size 10 has a different plate shape. (Refer to page 29.)



ØΑ

ØF

ØΕ

П

O

C



When D-M9 is used

m

C

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Y2

N

ØΡ

Х **Y1** 

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Н

φ

A port

Ø

<u>2 x **Q3**</u>

н

Plate

ž ×

2 x Q2

C

B port

<u>2 x Q4</u>

2 x **R** 

Auto switch



ØΑ

ØF

ØΕ



2 x **R** 

w

CRB2

CRB2 WU

**CRBU2** 

**CRBU2WU** 

Simple Specials

Made to Order

**Component Unit** 

Angle Adjustment Setting

Auto Switch Mounting

type)

(34.5: Connector

ß

25.



5



### Parallel key dimensions

<b>b</b> (h9)	<b>h</b> (h9)	L1
4_0.030	4_0.030	20



ØΡ

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

The length is 25.5 when the D-M9 is used. \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

Refer to page 30 for details of shaft type J. Q Α В С D F (h9) G М Ν Ρ Т W W1 **Y1** Y2 Size **E** (g7) н Κ L R X Q2 Q3 Q4  $4_{-0.016}^{-0.004}$ 10 22 29 9\_0.036 7 16.5 17 29 14 1 9 0.5 9.5 18.5 M3 x 0.5 3.5 3.5 M3 x 0.5 10.6 19.8 35 31 25  $5^{-0.004}_{-0.016}$ 12\_0.043 15 34 25 29 18 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 35 36 29 21 34.5 30  $6^{-0.004}_{-0.016}$ 14\_0.043 20 42 20 1.5 8 10 0.5 25.5 13 25 M4 x 0.7 4.5 4.5 44 36 26 M5 x 0.8 16 22 8-0.005 30 50 47.5 31 22 16<sub>-0.043</sub> 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 10\_0.005 25<sub>-0.052</sub> 40 39 31 38 63 53 31 30 3 10 20 20 M5 x 0.8 5.5 5.5 M5 x 0.8 25 30 64 52 **SMC** 

[mm]

Ζ

41

48

59

69

# Series CDRBU2

### Dimensions: Free Mount Type (With Auto Switch) 10

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

### Size: 10



When D-M9 is used









\*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V) The length is 30 when any of the following are used: D-97/93A The length is 25.5 when the D-M9 is used.

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

Refer to page 30 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

Ð

Round shaft

 $\bigcirc$ 

Single shaft/CRBU2Y A parallel key is used instead of single flat for size 40.

i l

¢

۵

Δ

Single flat

Single flat

 $\oplus$ 

CRB2

CRB2 WU

**CRBU2** 

Simple Specials CRBU2WU



# Round shaft

### Double shaft/CDRBU2J



### Double shaft/CRBU2JU

# With angle adjuster unit

### Double shaft/CDRBU2JU





					[mm]
Size	10	15	20	30	40
С	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.



Connecto 24 V or less R80C \* Lead wire length symbols: 0.5 m ..... (Example) R73C

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- 3 m ····· L (Example) R73CL 5 m ····· Z (Example) R73CZ
  - None ····· N (Example) R73CN

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

SMC

\* Solid state auto switches marked with "O" are produced upon receipt of order.

The above may not be selected when the product comes with an auto switch or angle adjuster unit. For details, refer to pages 37, 38, 43, 44, 49.

(90°/180°)

### Construction: 10, 15, 20, 30, 40



\* 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.

Auto Switch Mounting

# Series CRBU2WU

### 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 pressurised. For double vane type, the figures below show the intermediate rotation position when the A or B port is pressurised.

### Size: 10, 15, 20, 30, 40

### Size: 10 (Double vane)

(Only size 10 has a different plate shape.)





### Shaft-end shape of size 40



Parallel key dimensions

	.1 ,	b b
<b>b</b> (h9)	<b>h</b> (h9)	L1
4 <sup>0</sup> <sub>-0.030</sub>	4 <sup>-0</sup> <sub>-0.030</sub>	20

Refer	to pa	ge 30	for de	tails	of shaft	type J.																	[mm]
Size	Δ	в	C	п	<b>E</b> (g7)	<b>E</b> (b9)	G	н	к		м	N	Р		Q	,	B	т	п	x	V1	V2	7
0120						<b>I</b> (113)	ŭ						•	Q2	Q3	Q4					25 1	12	-
10	29	22	19.5	14	4 -0.004 -0.016	9 <sup>0</sup> <sub>-0.036</sub>	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 <sup>0</sup> <sub>-0.043</sub>	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 <sup>-0.004</sup> -0.016	14 <sup>0</sup> <sub>-0.043</sub>	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 <sup>0</sup> <sub>-0.043</sub>	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 <sup>0</sup> <sub>-0.052</sub>	3	10	20	—	39	20	5	M5 x 0.8	5.5	5.5	M5 x 0.8	25	5	64	52	38	85



### Free Mount Type Rotary Actuator with Angle Adjuster With Auto Switch Series CDRBU2WU

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





# Series CDRBU2WU

### 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 pressurised.

### Size: 10











### Refer to page 30 for details of shaft type J.

- \*1. The length is 24 when any of the following are used: D-90/90A/S99(V)/T99(V)/S9P(V) The length is 30 when any of the following are used: D-97/93A The length is 25.5 when the D-M9 is used.
- \*2. The angle is 60° when any of the following are used: D-90/90A/97/93A The angle is 69° when any of the following are used: D-S99(V)/T99(V)/S9P(V)

	CRB2
	CRB2 WU
	CRBU2
	CRBU2WU
	Simple Specials
	Made to Order
	Component Unit
	Angle Adjustment Setting
	Auto Switch Mounting
36	



# 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. Please contact SMC for a specification sheet when placing an order.

### Shaft Pattern Sequencing I



### Applicable shaft type: W (Standard)



### Shaft Pattern Sequencing Symbol

### •Axial: Top (Long shaft side)

Symbol	Description	A	ppli	cable	e siz	е
Symbol	Description	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	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	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	A	ppli	cable	ə siz	е
Symbol	Description	10	15	20	30	40
<b>XA2</b> *	Shaft-end female thread					
<b>XA</b> 4*	Shaft-end male thread	•				•
<b>XA6</b> *	Stepped round shaft					
<b>XA8</b> *	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

Sumbol	Description	Applicable size							
Symbol	Description	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



A total of two XAD and XAD combinations is available. Example: -XA2A24

### XA , XC Combination

Combination other than -XAD, such as Made to Order (-XCD), is also available. Refer to pages 49 to 51 for details on the Made-to-Order specifications.

Symbol	Description	Appliachla size	Combination
Symbol	Description	Applicable size	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		•
XC4	Change the rotation range		•
XC5*	Change rotation range between 0 to 200°	10 15 00 00 40	•
<b>XC6</b> *	Change rotation range between 0 to 110°	10, 15, 20, 30, 40	•
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

Simple Specials

Made to Order

Angle Adjustment Component Unit Setting

### 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]					
Cizo	CF	8B2	CRBU2						
Size	Х	Q1	X	Q1					
15	4 to 18	M3	1.5 to 18	М3					
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]
Cizo	CRB2			CRBU2		
Size	Х	L1 max	Q1	Х	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 CA, indicate "\*" instead.)



						[mm]
Cizo		CRB2			CRBU2	
Size	Х	L1 max	D1	Х	L1 max	D1
10	4 to 14	X-3	Ø3	2 to 14	X-1	Ø 3
15	5 to 18	X-4	Ø 3 to Ø 4	3 to 18	X-1.5	Ø 3 to Ø 4
20	6 to 20	X-4.5	Ø 3 to Ø 5	3 to 20	X-1.5	Ø 3 to Ø 5
30	6 to 22	X-5	Ø 3 to Ø 6	3 to 22	X-2	Ø 3 to Ø 6

### 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]
Cizo	CRB2,	CRBU2
Size	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]
Cizo		CR	B2, CRB	U2
Size		Υ	L2 max	Q2
10	7	to 8	Y-3	M4
15	8.	5 to 9	Y-3.5	M5
20	10		Y-4	M6
30	13		Y-5	M8
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 CB, indicate "\*" instead.)



[mm]

			[11111]		
Cizo	CRB2, CRBU2				
Size	Y	L2 max	D2		
10	2 to 8	Y-1	Ø3		
15	3 to 9	Y-1.5	Ø 3 to Ø 4		
20	3 to 10	Y-1.5	Ø 3 to Ø 5		
30	3 to 13	Y-2	Ø 3 to Ø 6		
40	6 to 15	Y-4.5	Ø 3 to Ø 8		



### 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 CA, indicate "\*" instead.)



[mm]

						[[[[[[
0:		CRB2		CRBU2		
Size	Х	L1 max	Q1	Х	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]	
Cizo		CRB2	CRBU2		
Size	Х	L1	Х	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



• Applicable shaft type: W

bore size of Ø 30.

					[mm]
CRB2			CRBU2		
Х	L1	L3 max	Х	L1	L3 max
5 to 14	9-(14-X) to (X-3)	X-3	3 to 14	9-(14-X) to (X-1)	X-1
8 to 18	10-(18-X) to (X-4)	X-4	3 to 18	10-(18-X) to (X-1.5)	X-1.5
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
10 to 22	12-(22-X) to (X-5)	X-5	5 to 22	12-(22-X) to (X-2)	X-2
	<b>X</b> 5 to 14 8 to 18 10 to 20 10 to 22	CRB2           X         L1           5 to 14         9-(14-X) to (X-3)           8 to 18         10-(18-X) to (X-4)           10 to 20         10-(20-X) to (X-45)           10 to 22         12-(22-X) to (X-5)	K         L1         L3 max           5 to 14         9-(14-X) to (X-3)         X-3           8 to 18         10-(18-X) to (X-4)         X-4           10 to 20         10-(20-X) to (X-4)         X-4.5           10 to 22         12-(22-X) to (X-5)         X-5	CRB2         K           X         L1         L3 max         X           5 to 14         9-(14-X) to (X-3)         X-3         3 to 14           8 to 18         10-(18-X) to (X-4)         X-4         3 to 18           10 to 20         10-(20-X) to (X-4.5)         X-4.5         3 to 20           10 to 22         12-(22-X) to (X-5)         X-5         5 to 22	CRB2         CRBU2           X         L1         L3 max         X         L1           5 to 14         9-(14-X) to (X-3)         X-3         3 to 14         9-(14-X) to (X-1)           8 to 18         10-(18-X) to (X-4)         X-4         3 to 14         9-(14-X) to (X-1)           10 to 20         10-(20-X) to (X-4)         X-4         3 to 20         10-(20-X) to (X-1)           10 to 22         12-(22-X) to (X-5)         X-5         5 to 22         12-(22-X) to (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

indicate "\*" instead.)

• Equal dimensions are indicated by the same marker. (If not specifying dimension CB,



			[mm]
Cizo	CF	RB2, CR	BU2
Size	Y	<b>L2</b> 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

Ш

Ы

### 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

		$\Psi$
		[mm]
Cina		CRB2, CRBU2
Size	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)] <sup>Note)</sup>
Note) Va	lues inside	e [ ] 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 Ø 30 and Ø 40.
- Applicable shaft type: W

<b>[</b> ]	
E2 = :	E4 = :::::

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



CRB2

CRB2 WU

CRBU2

**CRBU2WU** 

[mm]

Q1 = M

### 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 The above figure shows the CRB2 series. shaft for size 40.
- Applicable shaft type: W

				[mm]		
Size	CRB2, CRBU2					
Thread	15	20	30	40		
M3 x 0.5	Ø 2.5	Ø 2.5	Ø 2.5	Ø 2.5		
M4 x 0.7	—	Ø 3.3	Ø 3.3	—		
M5 x 0.8	_	_	Ø 4.2			

### Symbol: A17

The long shaft is shortened.

• Applicable shaft type: W

Long	shaft side	
	Body (B)	
	Body (A)	ח
Short	shaft side	

The above figure shows the CRB2 series.

		[mm]
Cizo	CRB2	CRBU2
Size	Х	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 CA, indicate "\*" instead.)



								[mm]
Cizo	CRB2			CRBU2				
Size	X	L1 max	L3	D1	Х	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	Ø 3 to Ø 4	4.5 to 18	X-3	L1 + 1.5	Ø 3 to Ø 4
20	8 to 20	X-6.5	L1 + 2	Ø 3 to Ø 5	5 to 20	X-3.5	L1 + 2	Ø 3 to Ø 5
30	10 to 22	X-8	L1 + 3	Ø 3 to Ø 6	7 to 22	X-5	L1 + 3	Ø 3 to Ø 6

### Axial: Bottom (Short shaft side)

M5 x 0.8

### 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

				[mm]
Size	0	CRB2,	CRBU	2
hread	15	20	30	40
M3 x 0.5	Ø 2.5	Ø 2.5	Ø 2.5	Ø 2.5
M4 x 0 7		Ø33	Ø33	

Ø 4.2

### 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]
Cine	CRB2, CRBU2
Size	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 CB, indicate "\*" instead.)



Sizo			CRB2	, CRBU2	
Size		Υ	L1 max	L4	D2
10	4	to 8	Y-2.5	L2 + 1.5	Ø3
15	4.5	5 to 9	Y-3	L2 + 1.5	Ø 3 to Ø 4
20	5	to 10	Y-3.5	L2 + 2	Ø 3 to Ø 5
30	7	to 13	Y-5	L2 + 3	Ø 3 to Ø 6
40	8	to 15	Y-5.5	L2 + 5 [L2 + 3] <sup>Note)</sup>	Ø 3 to Ø 6
Note) Values inside [ ] are for the CRBU2.					



The above figure shows the CRB2 series.

### **Double Shaft**



# 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. Please contact SMC for a specification sheet when placing an order.



### Shaft Pattern Sequencing Symbol

### •Axial: Top (Long shaft side)

Symbol	Description	Shoft tuno	Applicable size					
Symbol	Description	Shan type	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	Choft turns	Applicable size					
Symbol	Description	Shan type	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						
10								

### Double Shaft

Symbol	Description	Shoft tuno	Applicable size					
Symbol	Description	Shan type	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			٠		٠	
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			٠			

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

### Combination

### **XA** Combination



Example: XA31A32

### XA, XC Combination

Combination other than XA $\square$ , such as Made to Order (XC $\square$ ), is also available. Refer to pages 49 to 51 for details on the Made-to-Order specifications.

Symbol	Description	Applicable size	Combination	
Symbol	Description	Applicable Size	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		•	
XC4	Change the rotation range		•	
XC5*	Change rotation range between 0 to 200°	10 15 00 00 40	•	
<b>XC6</b> *	Change rotation range between 0 to $110^\circ$	10, 15, 20, 30, 40	•	
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

Simple Specials

Made to Order

Angle Adjustment Component Unit Setting



### 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]			
$\bigwedge$	CRB2, CRBU2				
Starr	Q2				
Size	S	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

Si

			[mm]
/	CR	B2, CRB	U2
Star		Q2	
ze 🕅	J	K	Т
10	N	lot availabl	е
15	1	VI3	
20	1	//3, M4	
30	1	//3, M4, M	5
40	1	//3, M4, M	5

### 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 CB, indicate "\*" instead.)



[mm]

			լուոյ		
Cizo	CRB2, CRBU2				
Size	Y	L2 max	D2		
10	2 to 14	Y-1	Ø 3 to Ø 3.9		
15	3 to 18	Y-1.5	Ø 3 to Ø 4.9		
20	3 to 20	Y-1.5	Ø 3 to Ø 5.9		
30	3 to 22	Y-2	Ø 3 to Ø 7.9		
40	6 to 30	Y-4.5	Ø 5 to Ø 9.9		



30

40

6 to 22

8 to 30

X-5

X-6.5

Ø 3 to Ø 7.9

Ø 3 to Ø 9.9 4 to 30

3 to 22

X-2

X-3

Ø 3 to Ø 7.9

Ø 3 to Ø 9.9

### 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



											[I	mmj
$\bigwedge$		CRB2, CRBU2										
Sar.	Х		W1		L1 max		L3 max					
Size 🕅	J	Κ	Т	J	Κ	Т	J	Κ	Т	J	Κ	Т
10	6.	5 to	14	0.5	5 to 2	2	Х	(-3			L1-1	
15	8	to	18	0.5	5 to 2	2.5	Х	-4			L1-1	
20	9	to	20	0.5	5 to 3	3	Х	-4.5	;		L1-1	
30	11.	5 to	22	0.5	5 to 4	4	Х	(-5			L1-2	2
40	15.	5 to	30	0.5	5 to !	5	X	-5.5	,		L1-2	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]		
Cizo	CRB2, CRBU2				
Size	a1	L1	N1		
20	2h9 <sub>-0.025</sub>	10	6.8		
30	3h9 <sub>-0.025</sub>	14	9.2		
	-				

### Symbol: A48

The long shaft is shortened.

• Applicable shaft type: S, Y



Size: 10 to 30

		[mm]
0:	CRB2	CRBU2
Size	Х	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



CRB2

CRB2 WU

**CRBU2** 

**CRBU2WU** 

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						[mm]
0:	CRB2, CRBU2					
Size	Size	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

Size:	40	

	[mm]
Cizo	CRB2, CRBU2
Size	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]
Sizo	CRB2, CRBU2
Size	Y
10	1 to 14
15	1.5 to 18
20	1.5 to 20
30	2 to 22
40	4.5 to 30

# Series CRB 2

### Axial: Top (Long shaft side)



### Axial: Bottom (Short shaft side)

### Symbol: A55

The short shaft is shortened. • Applicable shaft type: J



	[mm]
Cizo	CRB2, CRBU2
Size	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**





### Made to Order Symbol

Symbol	Description	Applicable shaft type	Applicable
Symbol	Description	W, J, K, S, T, Y	size
XC1*	Add connecting ports	•	
XC2*	Change threaded holes to through-holes	•	10
XC3*	Change the screw position	•	15
XC4	Change the rotation range	•	20
XC5*	Change rotation range between 0 to 200°	•	20
XC6*	Change rotation range between 0 to 110°	•	30
XC7*	Reversed shaft	W, J	40
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	٠	XC2						
XC3	•	—	XC3	]				
XC4	•	•	•	XC4	]			
XC5	٠		•	—	XC5	]		
XC6	•	•	•	—	—	XC6	]	
XC7	٠		•	•		_	XC7	
XC30	•		•	•				
X5	•	•	•	•				



### Symbol: C1

The connecting ports are added on the Body (A) end surface. (It will have an aluminium 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]
Cizo	CRB2, CRBU2		
Size	Q	М	Ν
10	M3	8.5	9.5
15	M3	11	10
20	M5	14	13
30	M5	15.5	14
40	M5	21	20

### 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: 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°
- Port size for CRB2BW10, 15 is M3.
- A parallel key is used instead of chamfer for size 40.





A port B port 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)

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Auto Switch Mounting

# Series CRB 2

### 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]
Cine	CRB2		CRBU2	
Size	Y	Х	Y	Х
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  $\ensuremath{\mathsf{M5}}$ 

- 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]
Cine	CRB2,	CRBU2
Size	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)

# Series CRB 2 **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.



\* 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  $\star$  are additional parts required for connection (joint unit parts), and the items marked with  $\blacklozenge$  are unnecessary. \* Use a unit part number when ordering joint unit separately.

Note) The figures show the CRB2 series.

### Unit Part Number for D-M9

Size	Auto switch unit part number*1	Switch block unit part number Common to right-hand and left-hand	Angle adjuster unit part number	Auto switch angle adjuster unit part number	Joint unit part number∗³
10	P611070-1M		P811010-3	P811010-4M	P211070-10
15	P611090-1M	P811010-8M	P811020-3	P811020-4M	P211090-10
20	P611060-1M	De11020 PM	P811030-3	P811030-4M	P211060-10
30	P611080-1M	P011030-0101	P811040-3	P811040-4M	P211080-10
40	P611010-1M	P811010-8M	P811050-3	P811050-4M	P211010-10

### Unit Part Number Common to Series (Except D-M9<sup>-</sup>)

Size	Auto switch unit	Switch block unit part number*2		Angle adjuster	Auto switch angle	Joint unit part number*3
	part number*1 Right-hand Left-hand		unit part number	adjuster unit part number	•	
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.

<sup>\*3.</sup> 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.



Auto Switch Mounting

CRB2

# Series CRB□2 Angle Adjustment Setting

### **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.)



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

### 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.

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  $50^{\circ}$  or  $60^{\circ}$  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.)



\* These figures show the CRB2 series.

### **Rotating Angle Setting Examples**



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 CRB 2 Auto Switch Mounting

### **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 auto 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 <b>m</b> : Operating range	θ d: Hysteresis range
10, 15	170°	20°
20, 30	100°	15°
40	86°	10°

### D-S/T99(V)□, S9P(V), S/T79, S7P, D-97/93A, 90/90A, R73/80□

Size	θ <b>m</b> : Operating range	θ d: Hysteresis range
10, 15	110°	100
20, 30	90°	10*
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 cross recessed round head 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. Proper tightening torque: 0.4 to 0.6 [N·m] When tightening the cross recessed round head screw, take care that the auto switch does not tilt.



### Auto Switch Mounting: Size 10 to 40 (D-M9<sup>-</sup>)



# Series CRB 2

### Auto Switch Mounting: Size 10, 15 (D-S/T99(V), S9P(V), 97/93A, 90/90A)

### 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. Auto switch mounting

Secure the auto switch with the cross recessed round head screw (1) and holding block . Proper tightening torque: 0.4 to 0.6 [N-m]

- \* Since the holding block 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. Auto switch mounting

Insert the 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.

D-93A

### 3. Auto switch securing

Tighten the cross recessed round head screw (2) to secure the 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 Mounting: Size 20 to 40 (D-S/T79, S7P, R73/80)

### External view and descriptions of auto switch unit



### **Mounting Procedure**

<Applicable auto switch> Solid state auto switch D-S79, S7P D-T79, T79C

Reed auto switch D-R73, R73C D-R80, R80C

### 1. Auto switch mounting

Loosen the cross recessed round head screw (2), and insert the arm of the auto switch.



### 2. Auto switch securing

Set the auto switch so that it is in contact with the switch block, and tighten the cross recessed round head screw (2).

\* Proper tightening torque: 0.4 to 0.6 [N·m]



### 3. Switch holder securing

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

 $\ast$  Proper tightening torque: 0.4 to 0.6 [N·m]

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CRB2

CRB2 WU

**CRBU2** 

Simple Specials CRBU2WU

Angle Adjustment Component Unit Made to Order Setting

Auto Switch Mounting

# Series CRB 2

### 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>



- \* 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.



$\land$	Safety I	nstructions	These safety instructions damage. These instructi	3 are intended to prevent hazardous situations and/or equipment ons indicate the level of potential hazard with the labels of
			"Caution," "Warning" of followed in addition to In	or " <b>Danger</b> ." They are all important notes for safety and must be iternational Standards (ISO/IEC) <sup>1)</sup> , and other safety regulations.
	Danger:	<b>Danger</b> indicates a hazard wit which, if not avoided, will resu injury.	th a high level of risk It in death or serious	<ol> <li>ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.</li> <li>ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.</li> </ol>
$\wedge$	Warning:	<b>Warning</b> indicates a hazard w which, if not avoided, could re injury.	vith a medium level of risk sult in death or serious	IEC 60204-1: Safety of machinery – Electrical equipment of machines (Part 1: General requirements) ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
$\wedge$	Caution:	<b>Caution</b> indicates a hazard wi which, if not avoided, could re injury.	ith a low level of risk sult in minor or moderate	etc.

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