

# Rotary Actuator with Solenoid Valve

## Series CVRA1

Rack Pinion Style/Size: 50, 63, 80, 100

### How to Order



Electrical entry		
G	Grommet (Lead wire:300mm)	
H	Grommet (Lead wire:600mm)	
E	Grommet terminal	
T	Conduit terminal	
D	DIN connector	
L	L plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M plug connector	With lead wire
MN		Without lead wire
MO		Without connector

Rated voltage	
1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	110 to 120V AC, 50/60Hz
4	220V AC, 50/60Hz
5	24V DC
6	12V DC
7	240V AC, 50/60Hz
9	Other voltages

Solenoid valve configuration	
1	Single solenoid
2	Double solenoid
3	Closed center
4	Exhaust center
5	Pressure center

Light/surge voltage suppressor	
—	—
Z*	With light/surge suppressor
S*	With surge suppressor

\*Light attached type (Z) is not available for grommet type. Surge voltage suppressor attached style is available only for grommet style.

Manual override	
—	Non-locking style (Std.)
B	Locking B style
C	Locking C style

Without auto switch

CVRA1 B S 50 90 1 1 G

With auto switch

CDVRA1 B S 50 90 1 1 G A53 S

Magnet installed

With solenoid valve

Mounting

B	Basic
L	Foot

Note) No flange type "F" is available.

Shaft styles

S	Single shaft
W	Double shaft
X	Single shaft with four chamfers
Y	Double shaft key
Z	Double shaft with four chamfers

Size

50
63
80
100

Cushion

—	Without cushion
C*	With cushion

\*Except for angle adjustable type "U".

Auto switch

\* Refer to the table below for part numbers of applicable auto switch.

No. of auto switches mounted

S	1
—	2

Styles

—	Standard
U	Angle adjustable

Rotation angle

Standard	90	90°
	180	180°
Option	100	100°
	190	190°

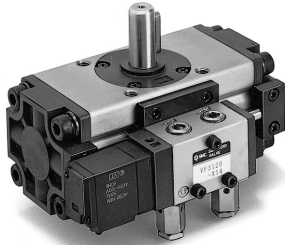
### Auto Switch Specifications

Refer to p.2.11-1 for further specifications of auto switch single unit.

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch part No.	Lead wire length* (m)			Applicable load					
					DC	AC		0.5 (—)	3 (L)	5 (Z)						
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	A56	●	●	—	IC	—			
						12V	—	A53	●	●	●	—	PLC			
				24V	—	100V, 200V	A54	●	●	●	—	Relay, PLC				
					—	100V, 200V	A64	●	●	—	IC	Relay, PLC				
Solid state switch	Diagnostic indicator (2 color)	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	F59	●	●	○	IC	Relay, PLC			
								F5P	●	●	○					
				3 wire (PNP)	—	100V, 200V	J51	●	●	○	—					
							J59	●	●	○	—					
				2 wire	—	12V	F5PW	●	●	○	IC					
							F59W	●	●	○	—					
				3 wire (NPN)	24V	5V, 12V	J59W	●	●	○	—					
							F5BA	—	●	○	—					
				Water resistant (2 color)	Timer	—	—	—	—	—	F5NT	—		●	○	IC
											F59F	●		●	○	—
Diagnostic output (2 color)	—	—	—	—	—	—	—	—	—	—	—					

\*Symbols for lead wire length 0.5m..... — Ex.) A53 \*Auto switches without contact point marked with "O" are made to order specification.

3m..... L Ex.) A53L  
5m..... Z Ex.) A53Z



**Specifications**

Fluid	Air	
Proof pressure	1.35MPa	
Max. operating pressure	0.9MPa	
Min. operating pressure	0.15MPa	
Ambient and fluid temperature	0°C to 50°C (No condensation)	
Lubrication	Not required	
Mounting	Basic, Foot style	
Part No. for solenoid valve	VF3□20-□□□□-20-X14	
Electrical entry	Grommet, Grommet terminal Conduit terminal, DIN connector L plug connector, M plug connector	
Coil rated voltage	AC	100, 200V(50/60Hz)
	DC	24V
Allowable voltage change	-15% to +10% of the rated voltage	
Coil insulation	Equivalent to B class (130°C)	
Apparent current	AC	Inrush 5.6VA(50Hz), 5.0VA(60Hz)
		Holding 3.4VA(50Hz), 2.3VA(60Hz)
Power consumption	DC	1.8W

CRB1

CRBU

CRA1

CRQ

MRQ

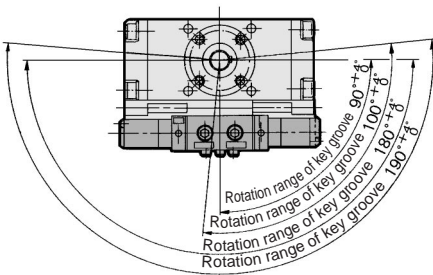
MSQ

MSUB

**⚠️ Precaution**

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instructions and common precautions on the products mentioned in this catalog, and refer to p.1.0-2 to 1.0-4 for precautions on every series.

**Rotation rage of key grooves/  
Solenoid valve mounting positions**



**Weight**

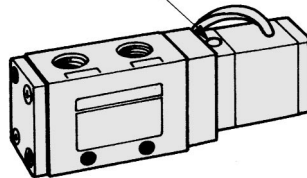
Model	Add'l weight	No. of positions/solenoids				
		2 position single	2 position double	3 position closed center	3 position exhaust center	3 position pressure center
CVRA1□□ 50 to 100	0.2	0.2	0.3	0.4	0.4	0.4

How to calculate weight  
Weight = Basic weight\* + Add'l weight + No. of positions/solenoids  
\*Refer to p.1.3-3 for basic weight.

**Manual override**

Non-locking push style is standard.

Manual override



**How to adjust rotating speed**

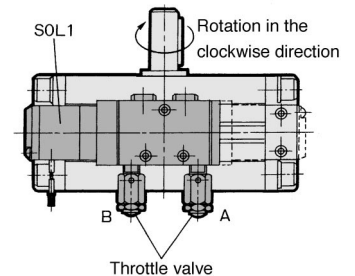
**Rotation direction**

When current is applied SOL1, the shaft rotates clockwise.

**How to adjust the rotation speed:**

Turn the needle valve of the throttle valve clockwise to reduce the exhaust flow volume, thus slowing the rotation speed.

Throttle valve A regulates the clockwise rotation speed of the shaft and throttle valve B regulates the counterclockwise speed to the shaft.

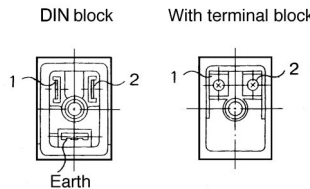


**Light/Surge suppresser**

Rated voltage	100V or less	AC
		DC
	100V or more	AC
		DC

**Electrical wiring**

The DIN type terminal and the terminal pin (with light and surge voltage suppresser) are connected internally as shown below. Therefore, connect them the respective power supply terminals.



Terminal No.	1	2
DIN connector	+	-
Terminal block	+	-

**Instant energizing time**

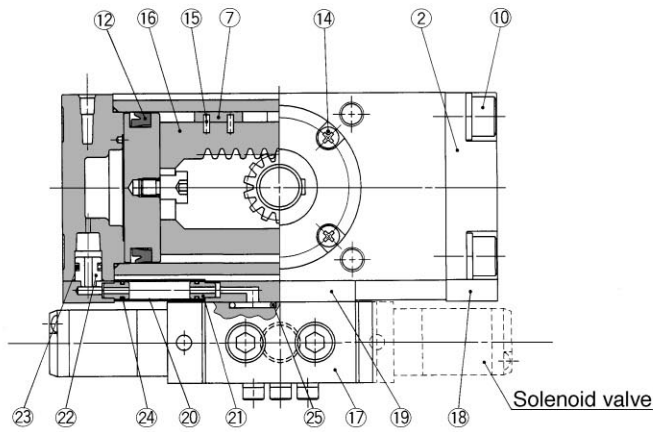
To operate the double solenoid type by applying an instantaneous current, ensure that the current is applied for at least 0.1 second.

Note) Light is not available on grommet type.

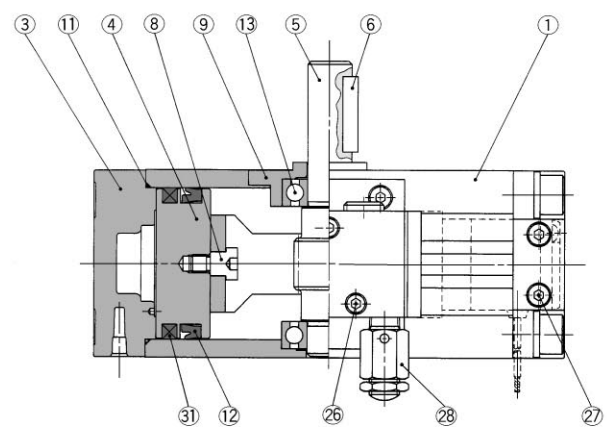
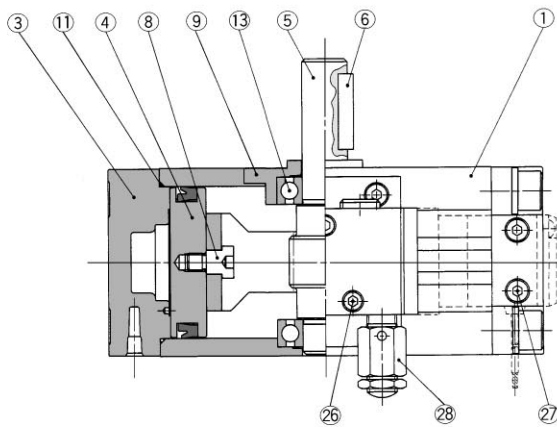
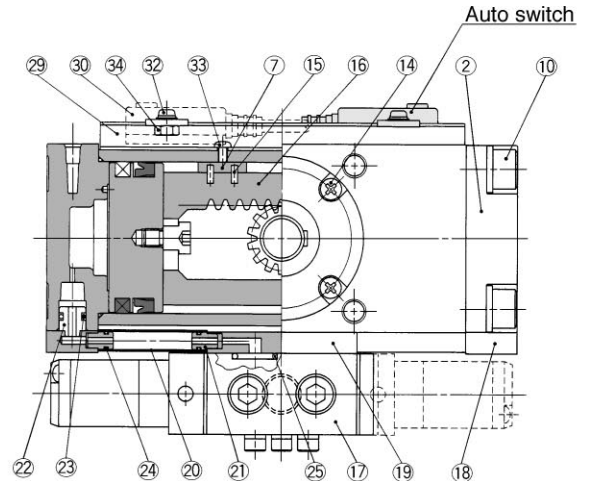
# Series CVRA1

## Construction

With solenoid valve



With solenoid valve and auto switch



### Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Right cover	Aluminum alloy	Black anodized
③	Left cover	Aluminum alloy	Black anodized
④	Piston	Aluminum alloy	Chromated
⑤	Shaft	Chromium-molybdenum steel	
⑥	Parallel key	Carbon steel	
⑦	Slider	Resin	
⑧	Connecting screw	Carbon steel	Zinc chromated
⑨	Bearing retainer	Aluminum alloy	Black anodized
⑩	Hexagon socket head cap screw with spring washer	Chromium-molybdenum steel	Black zinc chromated
⑪	Tube gasket	NBR	
⑫	Piston seal	NBR	
⑬	Bearing	Carbon steel	
⑭	Cross-recessed head cap screw	Steel wire	Black zinc chromated
⑮	Spring pin	Steel wire	Nitrided
⑯	Rack	Carbon steel	
⑰	Solenoid valve		

### Component Parts

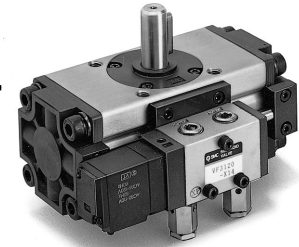
No.	Description	Material	Note
⑱	Sub-plate	Aluminum alloy	Black anodized
⑲	Sub-plate	Aluminum alloy	Black anodized
⑳	Pipe	Stainless	Chromated
㉑	Fittings	Aluminum alloy	Chromated
㉒	Fittings	Aluminum alloy	
㉓	O ring	NBR	
㉔	O ring	NBR	
㉕	O ring	NBR	Black dyed
㉖	Hexagon socket head cap screw	Steel wire	Black dyed
㉗	Hexagon socket head cap screw	Steel wire	
㉘	Metal valve	Stainless	
㉙	Switch mounting rail	Aluminum alloy	
㉚	Auto switch		
㉛	Plastic magnet	Magnetic substance	Nickel plated
㉜	Cross-recessed head cap screw	Steel wire	Nickel plated
㉝	Cross-recessed head cap screw	Steel wire	Nickel plated
㉞	Hexagon nut	Steel wire	

### Replacement Parts

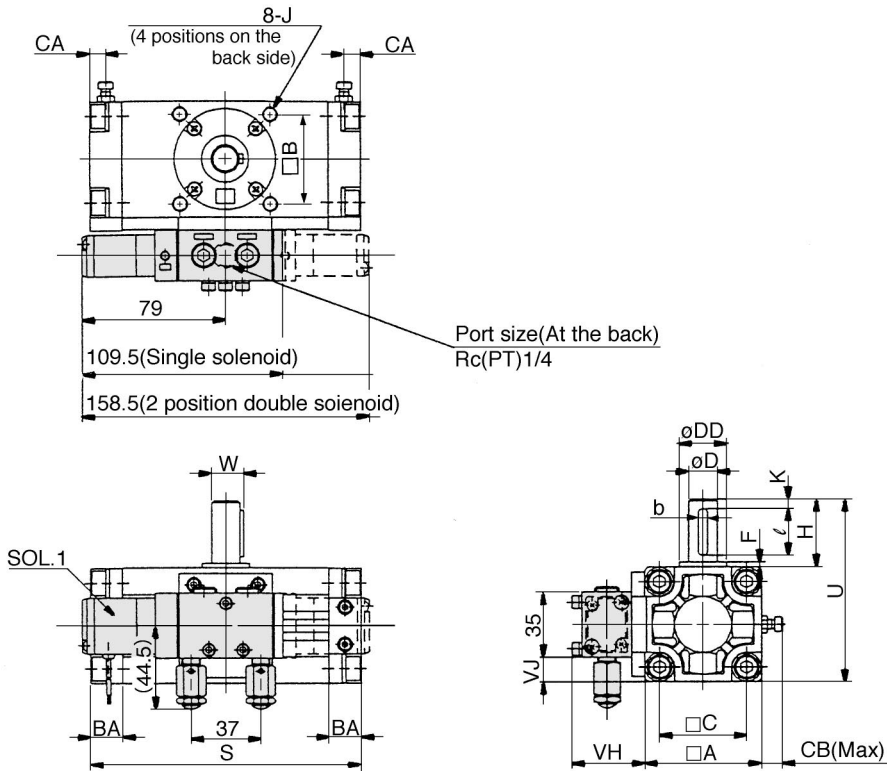
(The corresponding parts shown below are sets.)

Size (Type)	With solenoid valve, With solenoid valve auto switch
C□VRA1□□60	P294020-49A
C□VRA1□□63	P294030-49A
C□VRA1□□80	P294040-49
C□VRA1□□100	P294050-49A
Corresponding part No.	⑦, ⑪, ⑫, ⑮, ㉓, ㉔, ㉕ are set.

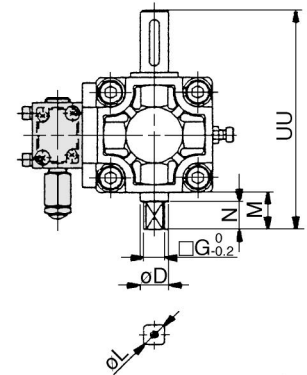
Size **50, 63, 80, 100**/Standard: CVRA1BS50 to 100



Single shaft style/CVRA1BS□50 to 100



Double shaft style/CVRA1BW□



CRB1

CRBU

**CRA1**

CRQ

MRQ

MSQ

MSUB

Double shaft style (mm)

Model	D(g6)	G	M	N	UU	L
CVRA1BW□50	15	11	20	15	118	14
CVRA1BW□63	17	13	22	17	139	16
CVRA1BW□80	20	15	25	20	167	19
CVRA1BW□100	25	19	30	25	202	24

Single shaft style

Model	A	B	BA	C	CA	CB	D (g6)	DD (h9)	F	H	J	K	S*	U	W	Solenoid valve dimensions		Key dimensions	
																VH	VJ	b	ℓ
CVRA1BS□50	62	48	17	46	8.5	13	15	25	2.5	36	M8 X 1.25 Depth 8	5	144 (177)	98	17	39	13.5	5 <sup>0</sup> <sub>-0.030</sub>	25
CVRA1BS□63	76	60	20	57	10	14	17	30	2.5	41	M10 X 1.5 Depth 12	5	163 (201.5)	117	19.5	39	20.5	6 <sup>0</sup> <sub>-0.030</sub>	30
CVRA1BS□80	92	72	23.5	70	12	18	20	35	3	50	M12 X 1.75 Depth 13	5	186 (230)	142	22.5	43	28.5	6 <sup>0</sup> <sub>-0.030</sub>	40
CVRA1BS□100	112	85	25	85	12.5	18	25	40	4	60	M12 X 1.75 Depth 14	5	245 (311)	172	28	43	38.5	8 <sup>0</sup> <sub>-0.036</sub>	45

\* ( ) are the dimensions for rotation of 180° and 190°

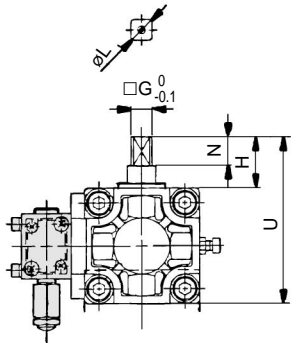
Port size

Model	Port size
CVRA1BS□50	Rc(PT)1/4
CVRA1BS□63	Rc(PT)1/4
CVRA1BS□80	Rc(PT)1/4
CVRA1BS□100	Rc(PT)1/4

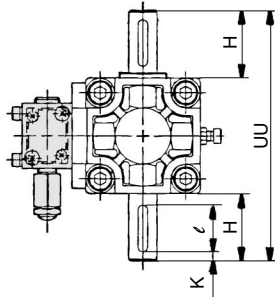
# Series CVRA1

## Size 50, 63, 80, 100/Standard: CVRA1B, Foot Style: CVRA1L

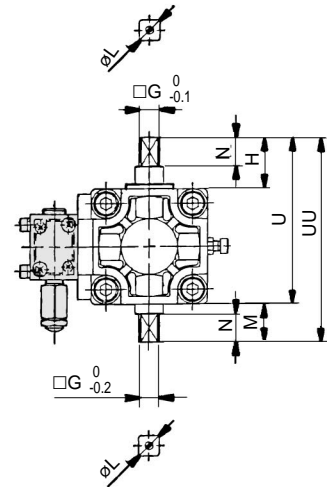
Single shaft with four chamfers/  
CVRA1BX□



Double shaft key/CVRA1BY□



Double shaft with four chamfers/  
CVRA1BZ□



Model	G	H	L	N	U
CVRA1BX□50	11	27	14	15	89
CVRA1BX□63	13	29	16	17	105
CVRA1BX□80	15	38	19	20	130
CVRA1BX□100	19	44	24	25	156

Other dimensions are the same as the single shaft.

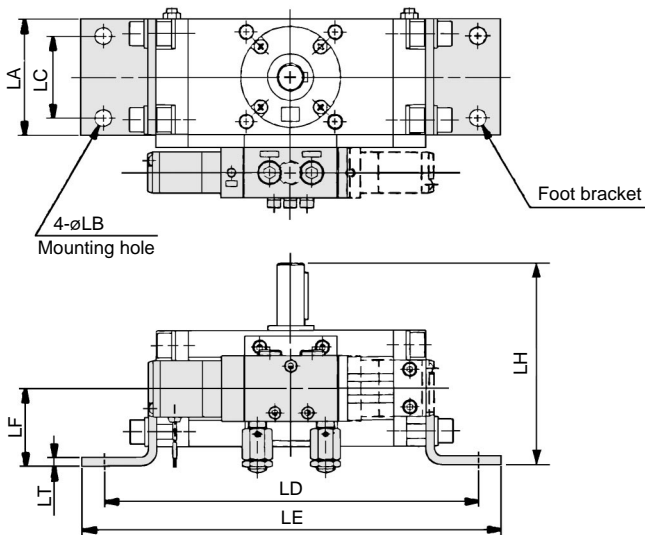
Model	ℓ	H	K	UU
CVRA1BY□50	25	36	5	134
CVRA1BY□63	30	41	5	158
CVRA1BY□80	40	50	5	192
CVRA1BY□100	45	60	5	232

Other dimensions are the same as the single shaft.

Model	G	H	L	M	N	U	UU
CVRA1BZ□50	11	27	14	20	15	89	109
CVRA1BZ□63	13	29	16	22	17	105	127
CVRA1BZ□80	15	38	19	25	20	130	155
CVRA1BZ□100	19	44	24	30	25	156	186

Other dimensions are the same as the single shaft.

Foot style/CVRA1L□□



\*The dimensions above show pressurization to B port.

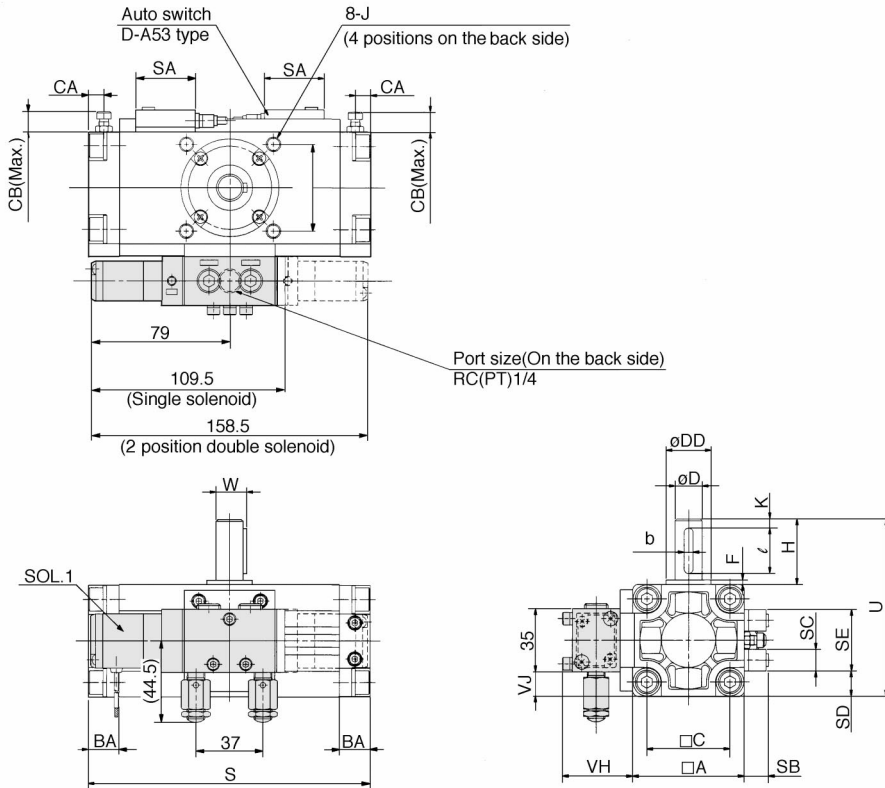
Model	LA	LB	LC	LD	LE	LF	LH	LT
CVRA1L□□50	62	9	44	200 (233)	224 (257)	41	108	4.5
CVRA1L□□63	76	11	55	235 (273.5)	263 (301.5)	48	127	5
CVRA1L□□80	92	13	67	274 (318)	316 (360)	58	154	6
CVRA1L□□100	112	13	87	333 (399)	375 (441)	73.5	189.5	6

\* ( ) are the dimensions for rotation of 180° and 190°.  
Other dimensions are the same as the single shaft.

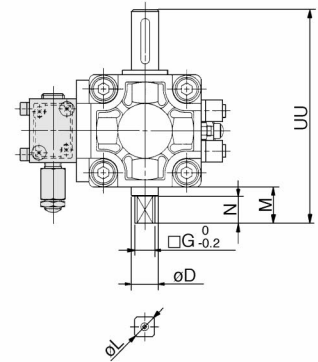


Size **50, 63, 80, 100**/Standard: CDVRA1BS50 to 100

Single shaft style/CDVRA1BS□50 to 100



Double shaft style/CDVRA1BW□



Double shaft style

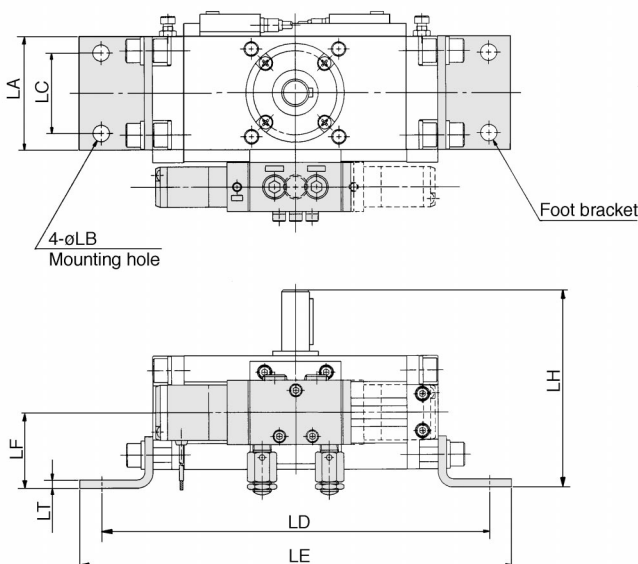
Model	D (g6)	G	M	N	UU	øL
CDVRA1BW□50	15	11	20	15	118	14
CDVRA1BW□63	17	13	22	17	139	16
CDVRA1BW□80	20	15	25	20	167	19
CDVRA1BW□100	25	19	30	25	202	24

Single shaft style

Model	A	B	BA	C	CA	CB	øD (g6)	øDD (h9)	F	H	J	S	K	U	W	SA	SB	SC	SD	SE	Valve dimensions		Key dimensions	
																					VH	VJ	b	ℓ
CDVRA1BS□50	62	48	17	46	8.5	13	15	25	2.5	36	M8 X 1.25 Depth 8	5	156 (189)	98	17	33	13.5	12	14	34	39	13.5	5 <sup>0</sup> <sub>-0.030</sub>	25
CDVRA1BS□63	76	60	20	57	10	14	17	30	2.5	41	M10 X 1.5 Depth 12	5	175 (213.5)	117	19.5	33	14.5	12	21	34	39	20.5	6 <sup>0</sup> <sub>-0.030</sub>	30
CDVRA1BS□80	92	72	23.5	70	12	18	20	35	3	50	M12 X 1.75 Depth 13	5	199 (243)	142	22.5	33	15.5	12	29	34	43	28.5	6 <sup>0</sup> <sub>-0.030</sub>	40
CDVRA1BS□100	112	85	25	85	12.5	18	25	40	4	60	M12 X 1.75 Depth 14	5	259 (325)	172	28	33	16	12	39	34	43	38.5	8 <sup>0</sup> <sub>-0.036</sub>	45

\*( ) are the dimensions for rotation of 180° and 190°.

Foot style/CDVRA1L □□



Model	LA	LB	LC	LD	LE	LF	LH	LT
CDVRA1L□□50	62	9	44	212 (245)	236 (269)	41	108	4.5
CDVRA1L□□63	76	11	55	247 (285.5)	275 (313.5)	48	127	5
CDVRA1L□□80	92	13	67	287 (331)	329 (373)	58	154	6
CDVRA1L□□100	112	13	87	347 (413)	389 (455)	73.5	189.5	6

\*( ) are the dimensions for rotation of 180° and 190°.

- CRB1
- CRBU
- CRA1**
- CRQ
- MRQ
- MSQ
- MSUB