

RV3□

Selex Rotary Vane Type

Torque Size 0.12 to 206 N·m

Swing/Rotary Type



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Variation Table

Selex Rotary (Vane Type) RV3□ Series

● Compact (RV3□1 to RV3□30) ●: Standard, ◎: Option, ■: Not available

Variation	Model No.	Vane Type	Effective Torque (at 0.5 MPa) (N·m)	Oscillation Angle					With Switch	Port Position Axial Direction With switch not possible	With Flange Bracket	With Foot Bracket	With Shock Absorber	Page
				90°	100°	180°	270°	280°						
				S	FA	LS	C							
Standard Type	RV3S1	Single	0.12	●		●	●		◎	◎	◎		1288	
	RV3D1	Double	0.28	●					◎	◎	◎			
	RV3S3	Single	0.31	●		●	●		◎	◎	◎			
	RV3D3	Double	0.71	●					◎	◎	◎			
	RV3S10	Single	0.98	●		●	●		◎	◎	◎			
	RV3D10	Double	2.11	●					◎	◎	◎			
	RV3S20	Single	1.70	●		●	●		◎	◎	◎			
	RV3D20	Double	3.88	●					◎	◎	◎			
	RV3S30	Single	3.19	●		●	●		◎	◎	◎			
	RV3D30	Double	7.70	●					◎	◎	◎			
With Valve	RV3S _v 10	Single	0.98	●		●	●		◎	◎	◎		1304	
	RV3D _v 10	Double	2.11	●					◎	◎	◎			
	RV3S _v 20	Single	1.70	●		●	●		◎	◎	◎			
	RV3D _v 20	Double	3.88	●					◎	◎	◎			
	RV3S _v 30	Single	3.19	●		●	●		◎	◎	◎			
	RV3D _v 30	Double	7.70	●					◎	◎	◎			
Variable Angle Type	RV3SA3	Single	0.31			● (30 to 90° variable)			◎	◎	◎		1312	
	RV3DA3	Double	0.71	● (30 to 90° variable)					◎	◎	◎			
	RV3SA10	Single	0.98			● (30 to 90° variable)			◎	◎	◎			
	RV3DA10	Double	2.11	● (30 to 90° variable)					◎	◎	◎			
	RV3SA20	Single	1.70			● (30 to 90° variable)			◎	◎	◎			
	RV3DA20	Double	3.88	● (30 to 90° variable)					◎	◎	◎			
	RV3SA30	Single	3.19			● (30 to 90° variable)			◎	◎	◎			
	RV3DA30	Double	7.70	● (30 to 90° variable)					◎	◎	◎			

● Large (RV3□50 to RV3□800) ●: Standard, ◎: Option, ■: Not available

Variation	Model No.	Vane Type	Effective Torque	Oscillation Angle					With Switch	Port Position Axial Direction	With Flange Bracket	With Foot Bracket	With Shock Absorber	Page
				90°	100°	180°	270°	280°						
				S	FA	LS	C							
Standard Type	RV3S50	Single	4.7	●		●	●	●	●		◎	◎	◎	1324
	RV3D50	Double	10.1	●	●				●		◎	◎	◎	
	RV3S150	Single	14.7	●		●	●	●	●		◎	◎	◎	
	RV3D150	Double	34.3	●	●				●		◎	◎	◎	
	RV3S300	Single	27.9	●		●	●	●	●		◎	◎	◎	
	RV3D300	Double	66.6	●	●				●		◎	◎	◎	
	RV3S800	Single	102	●		●	●	●	●		◎	◎	◎	
	RV3D800	Double	206	●	●				●		◎	◎	◎	
With Valve	RV3S _v 50	Single	4.7	●		●	●	●	●		◎	◎	◎	1334
	RV3D _v 50	Double	10.1	●	●				●		◎	◎	◎	
	RV3S _v 150	Single	14.7	●		●	●	●	●		◎	◎	◎	
	RV3D _v 150	Double	34.3	●	●				●		◎	◎	◎	
	RV3S _v 300	Single	27.9	●		●	●	●	●		◎	◎	◎	
RV3D _v 300	Double	66.6	●	●				●		◎	◎	◎		
Low Hydraulic Pressure Type	RV3SH50	Single	4.7	●		●	●	●	●		◎	◎	◎	1344
	RV3DH50	Double	10.1	●	●				●		◎	◎	◎	
	RV3SH150	Single	14.7	●		●	●	●	●		◎	◎	◎	
	RV3DH150	Double	34.3	●	●				●		◎	◎	◎	
	RV3SH300	Single	27.9	●		●	●	●	●		◎	◎	◎	
	RV3DH300	Double	66.6	●	●				●		◎	◎	◎	
	RV3SH800	Single	102	●		●	●	●	●		◎	◎	◎	
RV3DH800	Double	206	●	●				●		◎	◎	◎		
Shock Absorber	RVC50			●	●	●	●	●					1350	
	RVC150			●	●	●	●	●						
	RVC300			●	●	●	●	●						

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Cylinder Switch

Ending

Specifications

●Single Vane Type

Item	RV3S																
Size	1			3			10			20			30				
Effective torque	N·m	0.12			0.31			0.98			1.70			3.19			
Actuation method	Single Vane																
Operating Fluid	Compressed Air																
Max Operating Pressure	MPa	0.7						1.0									
Min Operating Pressure	MPa	0.2															
Proof Pressure	MPa	1.05						1.5									
Ambient Temperature	°C	-5 to 80 *3 (provided there is no freezing)												-5 to 60 *3 (provided there is no freezing)			
Port Size	M5												Rc1/8				
Oscillating angle tolerance	°	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	
Oscillation Origin	°	45, 90		45	45, 90		45	45, 90		45	45, 90		45	45			
Allowable Absorption Energy *1	mJ	0.6			1.5			3			15			25			
Max Operating Frequency *2	cycle/min	300	180	96	240	150	60	240	150	90	210	120	84	180	90	60	
Volumetric capacity	cm ³	1.4	1.4	1.5	3.4		4	9.8		12	17		21	37			43
Allowable Radial Load	N	30			40			50			300			400			
Allowable Thrust Load	N	3			4			25			30						
Weight	kg	0.036			0.07			0.14			0.25			0.47		0.46	
Switch Unit Weight	kg	—			0.04			0.04			0.05			0.05			
Lubrication	Not Required (When lubricating, use turbine oil Class 1 ISO VG32)																

●Double Vane Type

Item	RV3D															
Size	1			3			10			20			30			
Effective torque	N·m	0.28			0.71			2.11			3.88			7.70		
Actuation method	Double Vane															
Operating Fluid	Compressed Air															
Max Operating Pressure	MPa	0.7						1.0								
Min Operating Pressure	MPa	0.2														
Proof Pressure	MPa	1.05						1.5								
Ambient Temperature	°C	-5 to 80 *3 (provided there is no freezing)												-5 to 60 *3 (provided there is no freezing)		
Port Size	M5												Rc1/8			
Oscillating angle tolerance	°	90 ⁺⁴ ₀														
Oscillation Origin	°	45														
Allowable Absorption Energy *1	mJ	0.6			1.5			3			15			25		
Max Operating Frequency *2	cycle/min	300			240			210			180					
Volumetric capacity	cm ³	1.1			2.8			8.1			15			34		
Allowable Radial Load	N	30			40			50			300			400		
Allowable Thrust Load	N	3			4			25			30					
Weight	kg	0.037			0.072			0.14			0.26			0.48		
Switch Unit Weight	kg	—			0.04			0.04			0.05			0.05		
Lubrication	Not Required (When lubricating, use turbine oil ISO VG32)															

*1: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) ≥ 1/2Iω²×10³ (For detailed calculation, refer to P. 1366.)

*2: Max operating frequency is at supply pressure 0.5 MPa <no load condition>

*3: For type with switch, it is 5 to 60°C.

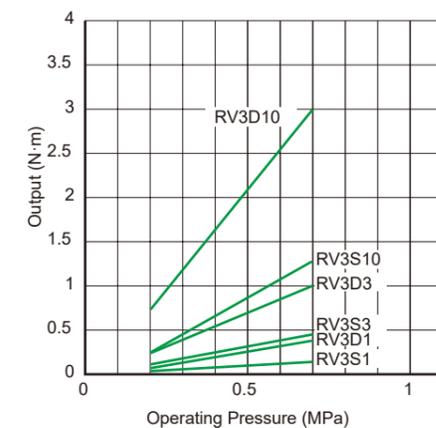
*4: Keys are included to Selex Rotary with keyway.

*5: Please consult us separately for non-standard specifications.

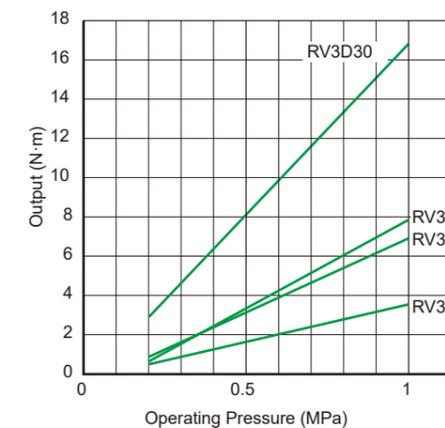
*6: For switch specifications, refer to P. 1354, 1355.

Output Characteristic Diagram (Effective Torque)

●RV3^S₁ to 10



●RV3^S_{20, 30}



Output Table (Effective Torque)

Operating Pressure (MPa)	Model No.	(N·m)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single Vane	RV3S1	0.04	0.07	0.10	0.12	0.15	0.18	—	—	—
	RV3S3	0.1	0.17	0.24	0.31	0.38	0.45	—	—	—
	RV3S10	0.35	0.56	0.75	0.98	1.2	1.39	—	—	—
	RV3S20	0.59	0.95	1.33	1.7	2.1	2.49	2.87	3.26	3.68
	RV3S30	1.1	1.8	2.5	3.19	4.1	4.8	5.8	6.5	7.2
Double Vane	RV3D1	0.10	0.16	0.22	0.28	0.34	0.40	—	—	—
	RV3D3	0.25	0.39	0.54	0.71	0.86	1.01	—	—	—
	RV3D10	0.76	1.17	1.62	2.11	2.54	3.03	—	—	—
	RV3D20	1.4	2.22	3.06	3.88	4.7	5.53	6.33	7.17	8.07
	RV3D30	2.7	4.4	6	7.7	9.5	11.2	12.99	14.8	16.6

Oscillation Time Setting

1. Use the oscillating time within the range in the table below as a guide.

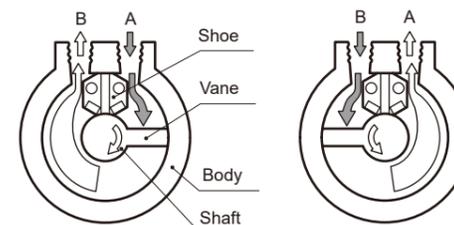
Compact Selex Rotary

Model No.	Oscillation Angle		
	90°	180°	270°
RV3 ^S ₁	0.03 to 0.3	0.06 to 0.6	0.09 to 0.9
RV3 ^S ₃	0.04 to 0.8	0.08 to 1.6	0.12 to 2.4
RV3 ^S ₁₀	0.045 to 0.9	0.09 to 1.8	0.135 to 2.7
RV3 ^S ₂₀	0.05 to 1.0	0.10 to 2	0.15 to 3
RV3 ^S ₃₀	0.07 to 0.7	0.14 to 1.4	0.21 to 2.1

Operational Principle

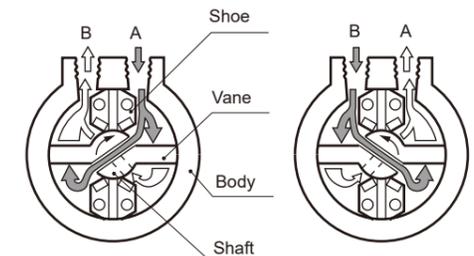
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



●Double Vane

1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.



Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

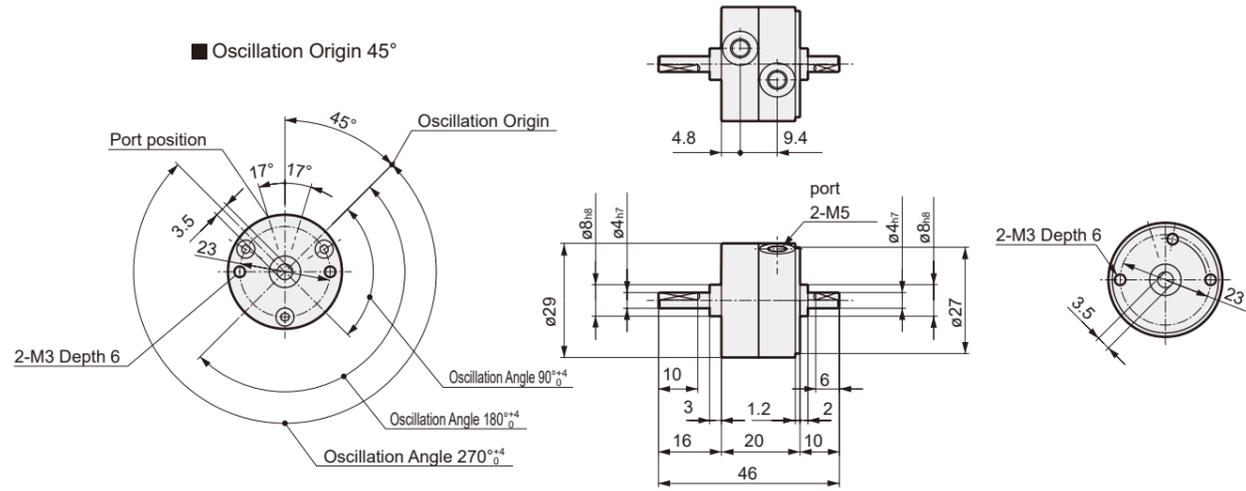
Ending

Cylinder Switch

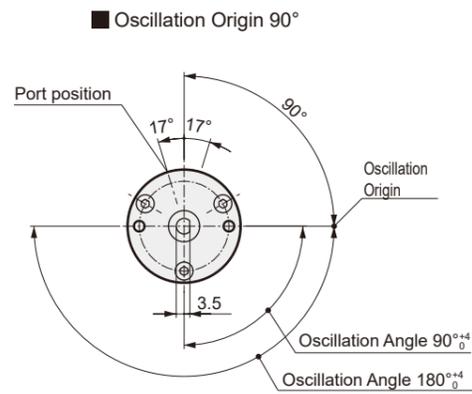
Ending

Dimensional Drawings

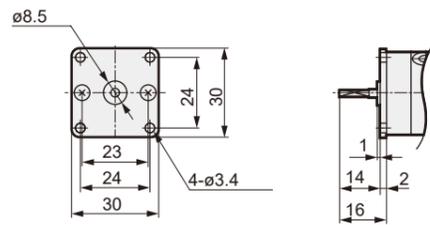
● RV3^S_{D1}



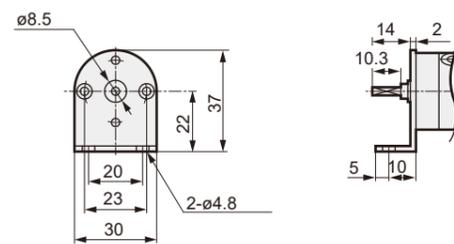
● S Type (Port Position Axial Direction)



● RV3^S_{D1-FA}
■ With flange

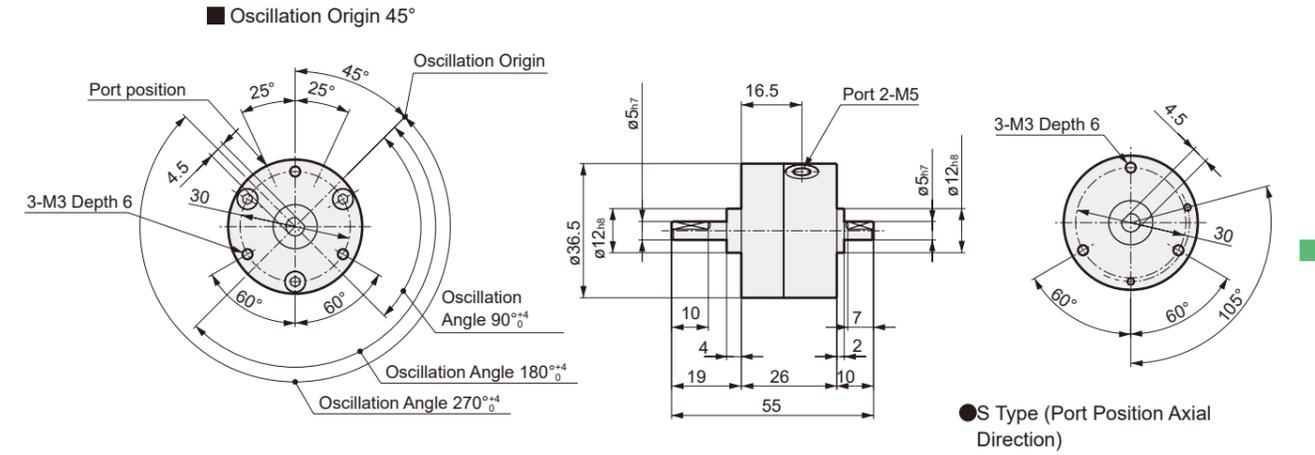


● RV3^S_{D1-LS}
■ With foot

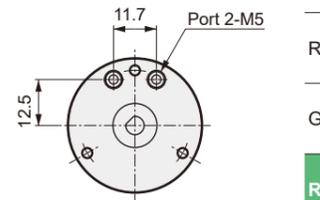
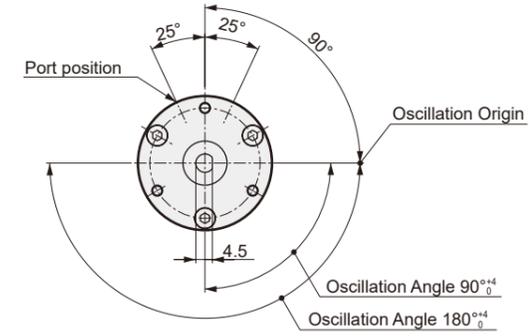


Dimensional Drawings

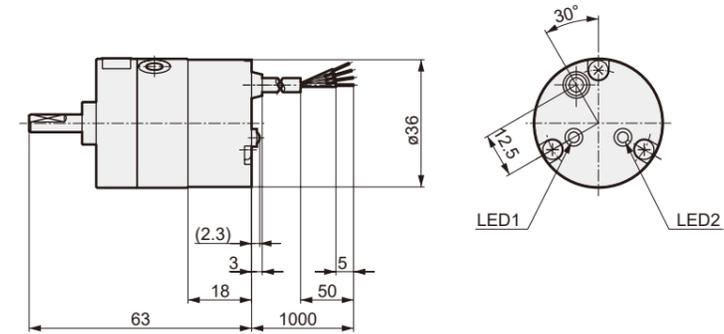
● RV3^S_{D3}



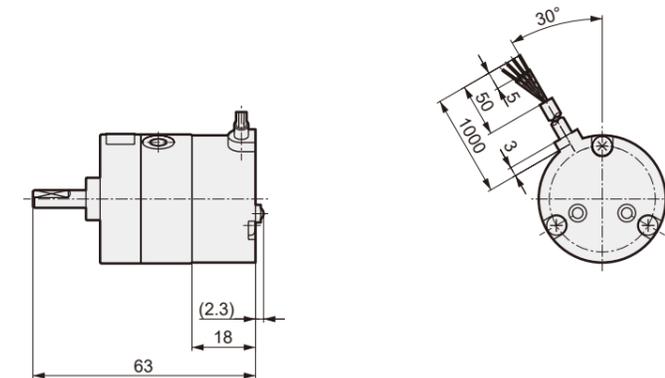
■ Oscillation Origin 90°



● RV3^S_{D3-SR (U)}
■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction



Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

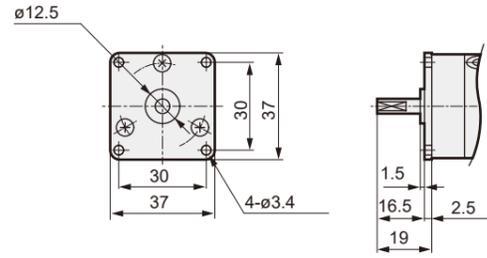
Ending

Cylinder Switch

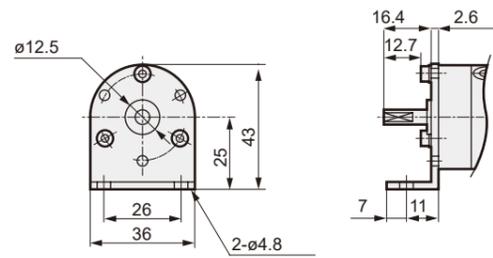
Ending

Dimensional Drawings

- RV3^S_D3-FA
- With flange



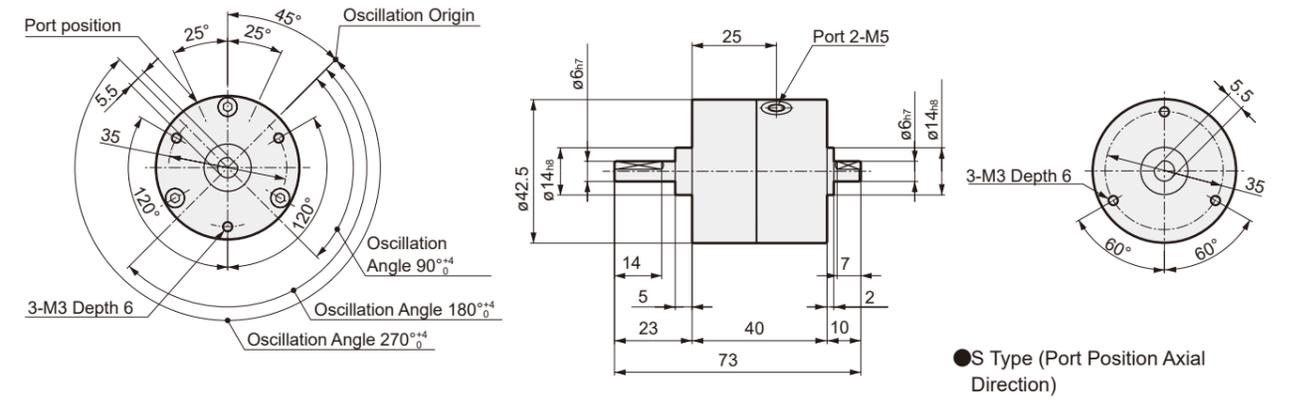
- RV3^S_D3-LS
- With foot



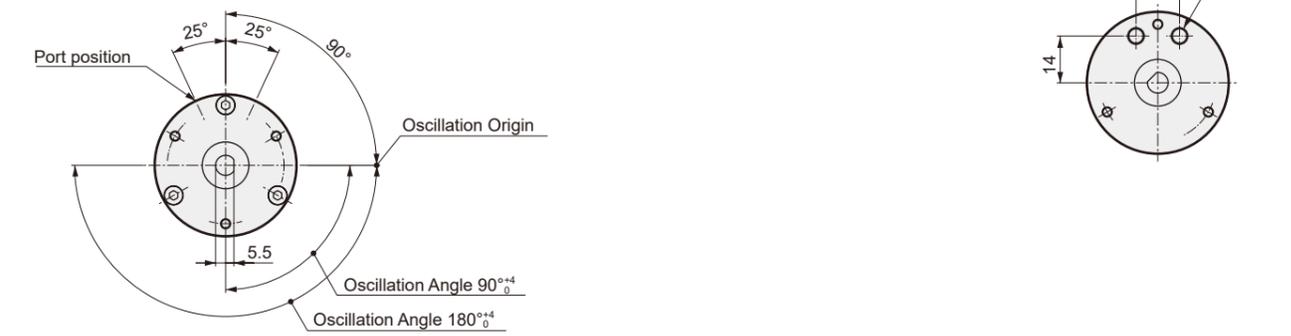
Dimensional Drawings

- RV3^S_D10

■ Oscillation Origin 45°

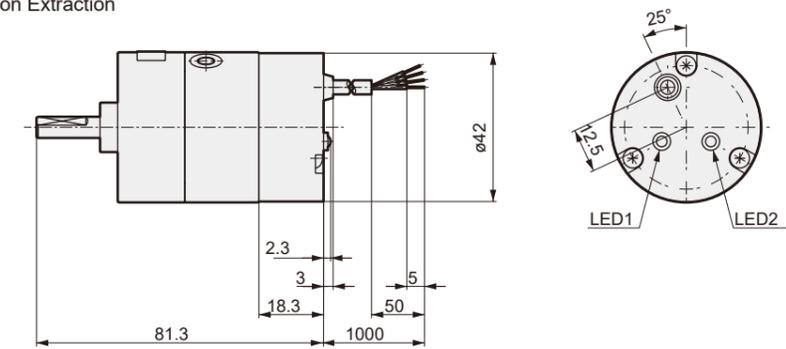


■ Oscillation Origin 90°

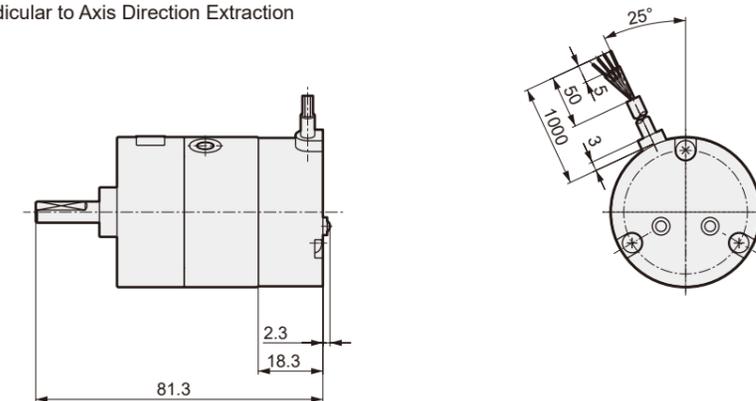


- RV3^S_D10-□-SR (U)

■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction



Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Swing/Rotary Type

RRC

GRC

RV3□

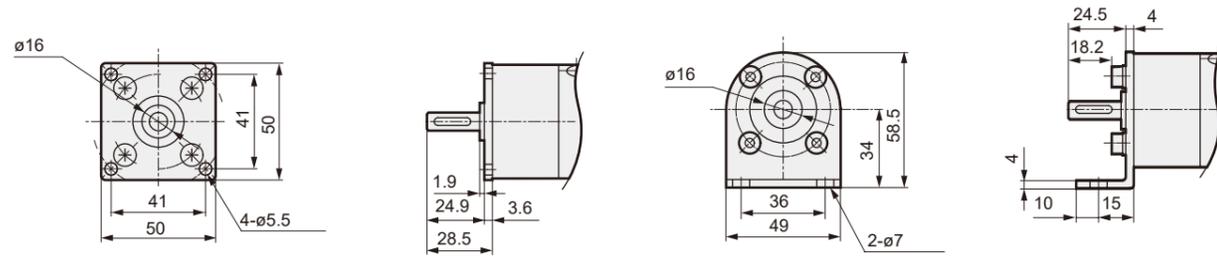
Cylinder Switch

Ending

Dimensional Drawings

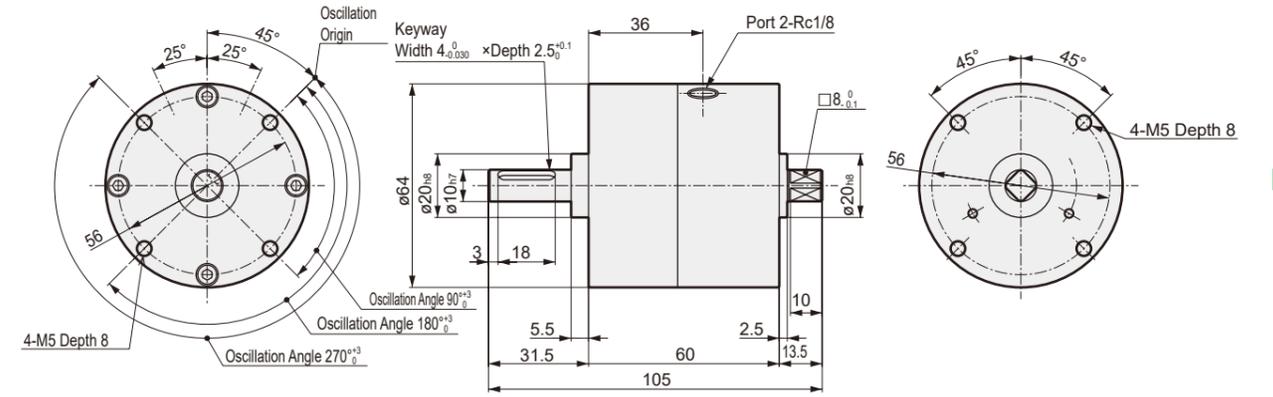
- RV3^S_D20-FA
- With flange

- RV3^S_D20-LS
- With foot



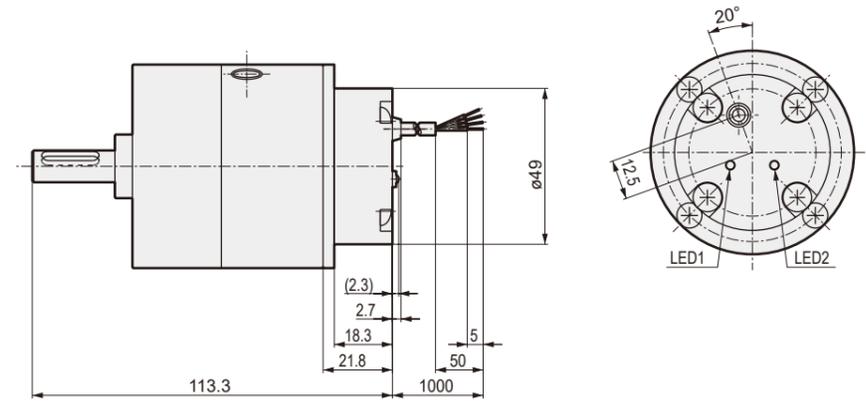
Dimensional Drawings

- RV3^S_D30

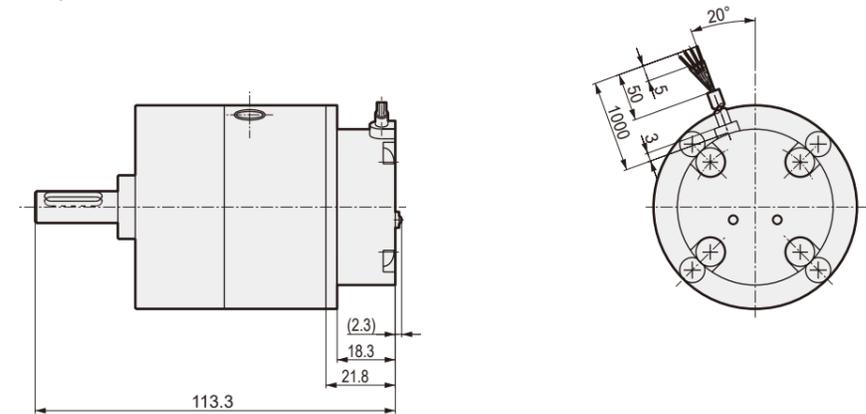


- RV3^S_D30-□-SR (U)

- Lead Wire Axial Direction Extraction



- Lead Wire Perpendicular to Axis Direction Extraction



Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Swing/Rotary Type

RRC

GRC

RV3□

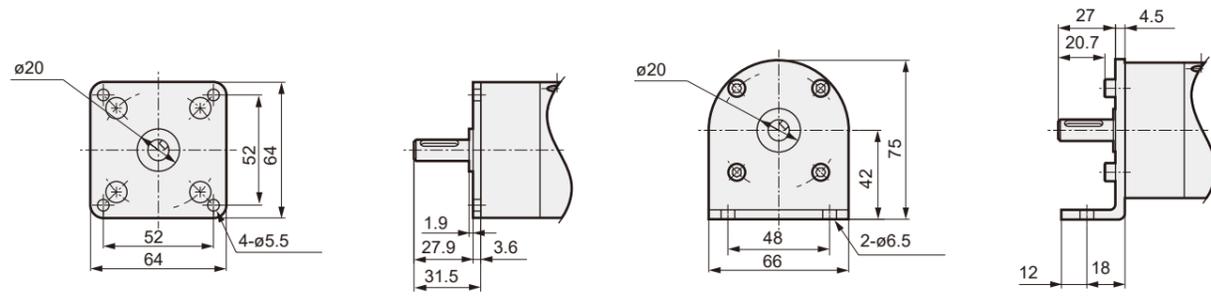
Cylinder Switch

Ending

Dimensional Drawings

● RV3^S₃₀-FA
■ With flange

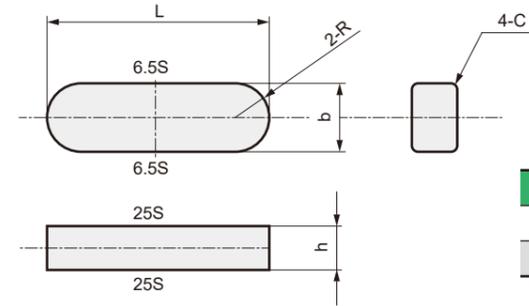
● RV3^S₃₀-LS
■ With foot



Accessory External Dimensions

● JIS B1301 Parallel Key b×h×L, Both Ends Rounded S45C

The following keys are included to Selex Rotary with keyway, respectively.



Unit: mm

Model No.	Key Nominal Size	b	h	L	C	R
RV3□20	3×3×16	3 ⁰ _{-0.025}	3 ⁰ _{-0.025}	16 ⁰ _{-0.18}	0.16 to 0.25 (R0.16 to 0.25)	1.5
RV3□30	4×4×18	4 ⁰ _{-0.03}	4 ⁰ _{-0.03}	18 ⁰ _{-0.18}	0.16 to 0.25 (R0.16 to 0.25)	2

Swing/Rotary Type

Swing/Rotary Type

RRC

RRC

GRC

GRC

RV3□

RV3□

Cylinder Switch

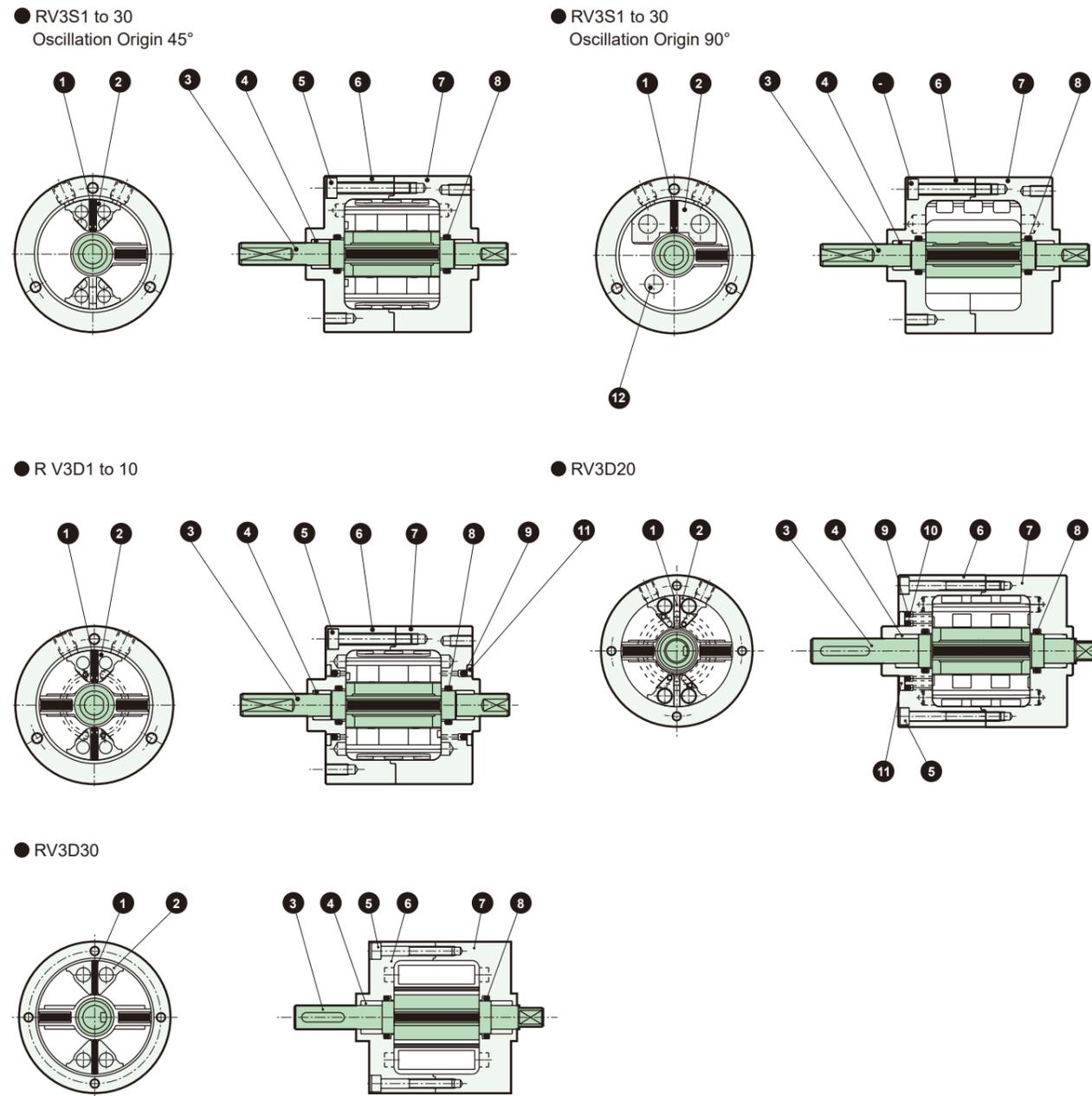
Cylinder Switch

Ending

Ending

Internal Structure Diagram/Material

MEMO

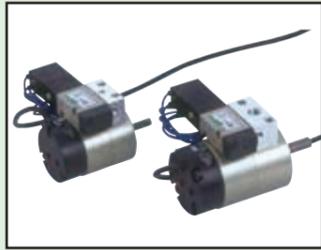


Part No.	Part Name	Material	Part No.	Part Name	Material
1	Shoe Seal	Nitrile Rubber	7	Body B	Aluminum Alloy
2	Shoe	Resin	8	O-ring	Nitrile Rubber
3	Vane Shaft	Steel, Resin, Nitrile Rubber	9	O-ring	Nitrile Rubber
4	Bearing	Oil-Impregnated Bearing Alloy	10	O-ring	Nitrile Rubber
5	Mounting Bolt	Steel	11	Plate	Steel
6	Body A	Aluminum Alloy	12	Stopper pin	Steel

For the consumable parts list, refer to P. 1361.

Mounting Type Material

Mounting Style	Material	Remarks
Foot (FA)	Steel	Zinc Chromate
Flange (LS)	Steel	Zinc Chromate



Compact Selex Rotary Vane Type, With Valve

RV3^{SV}_{DW} Series

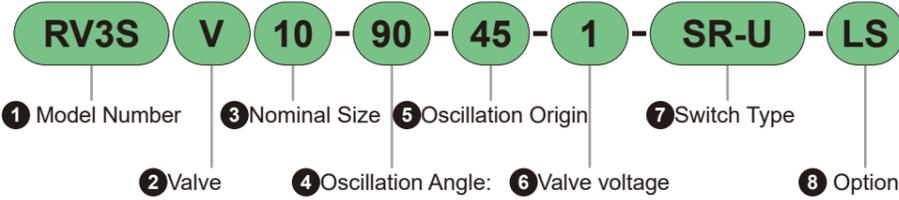
- Torque Size: 10, 20, 30
- Oscillation Angle: 90°, 180°, 270°

Circuit Diagram Code



Model Number Notation

● Compact rotary actuator (with valve) RV3□^v



1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Valve

Code	Content
V	Single solenoid
W	Double Solenoid

3 Nominal Size

Code	Content	Model No.		
		Nominal Size		
		RV3S	RV3D	
10	Effective Torque at 0.5 MPa	0.98 N·m	2.11 N·m	
20		1.70 N·m	3.88 N·m	
30		3.19 N·m	7.7 N·m	

4 Swing Angle (°)

Code	Content	Model No.	
		RV3S	RV3D
90	90°	●	●
180	180°	●	
270	270°	●	

5 Oscillation Origin (°)

Code	Content	Model No.					
		RV3S			RV3D		
		10	20	30	10	20	30
45	45°	●	●	●	●	●	●
90	90° (excluding 270° oscillation angle)	●	●				

6 Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

7 Switch Type

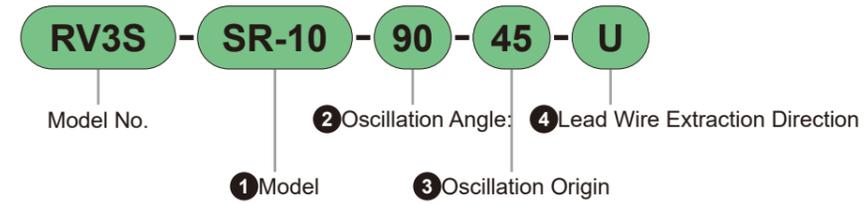
Code	Content	
Blank	Without switch	
SR	With Lead Wire Axial Direction Switch	
SR-U	With Lead Wire Perpendicular to Axis Direction Switch	

8 Option

Code	Content	
Blank	No option	
FA	With Flange Bracket	
LS	With Foot Bracket	

*1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1309.

● Switch Unit Model No. Notation



1 Model

Code	Content
SR-10	Applicable Actuator: RV3 ^S 10
SR-20	Applicable Actuator: RV3 ^S 20
SR-30	Applicable Actuator: RV3 ^S 30

2 Oscillation Angle:

Code	Content
90	90°
180	180°
270	270°

3 Oscillation Origin

Code	Content
45	45°
90	90°

*1

*1: For oscillation origin "90", SR-30 cannot be selected.

4 Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Specifications

● Single Vane Type

Item	RV3 ^{SV} _{DW}								
Size	10			20			30		
Effective torque N·m	0.98			1.70			3.19		
Actuation method	Single Vane								
Operating Fluid	Compressed Air								
Max Operating Pressure MPa	0.7								
Min Operating Pressure MPa	0.2								
Proof Pressure MPa	1.05								
Ambient Temperature °C	-5 to 50 *3 (provided there is no freezing)								
Port Size	M5			Rc1/8					
Oscillating angle tolerance °	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺⁴ ₀	180 ⁺⁴ ₀	270 ⁺⁴ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀
Oscillation Origin °	45, 90		45	45, 90		45	45		
Allowable Absorption Energy *1 mJ	3			15			25		
Max Operating Frequency *2 cycle/min	240	150	90	210	120	84	180	90	60
Internal Volume cm ³	9.8		12	17		21	37		43
Allowable Radial Load N	50			300			400		
Allowable Thrust Load N	4			25			30		
Weight kg	0.28		0.37	0.59		0.58			
Switch Unit Weight kg	0.04		0.05	0.05		0.05			
Lubrication	Not Required (When lubricating, use turbine oil ISO VG32)								

● Double Vane Type

Item	RV3 ^{SV} _{DW}								
Size	10			20			30		
Effective torque *1 N·m	2.11			3.88			7.70		
Actuation method	Double Vane								
Operating Fluid	Compressed Air								
Max Operating Pressure MPa	0.7								
Min Operating Pressure MPa	0.2								
Proof Pressure MPa	1.05								
Ambient Temperature °C	-5 to 50 *3 (provided there is no freezing)								
Port Size	M5			Rc1/8					
Oscillating angle tolerance °	90 ⁺⁴ ₀			90 ⁺³ ₀					
Oscillation Origin °	45								
Allowable Absorption Energy *1 mJ	3			15			25		
Max Operating Frequency *2 cycle/min	240			210			180		
Internal Volume cm ³	8.1			15			34		
Allowable Radial Load N	50			300			400		
Allowable Thrust Load N	4			25			30		
Weight kg	0.28		0.38	0.60		0.60			
Switch Unit Weight kg	0.04		0.05	0.05		0.05			
Lubrication	Not Required (When lubricating, use turbine oil ISO VG32)								

*1: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) $\geq 1/2I\omega^2 \times 10^3$ (For detailed calculation, refer to P. 1366.)

*2: Max operating frequency is at supply pressure 0.5 MPa [no load condition]

*3: For type with switch, it is 5 to 50°C.

*4: Keys are included to Selex Rotary with keyway.

*5: Please consult us separately for non-standard specifications.

*6: For switch specifications, refer to P. 1354, 1355.

Valve specifications

Item	Specifications (4KB1 Series)		
Rated Voltage V	100 VAC (50/60Hz)	200 VAC (50/60Hz)	24 VDC
Starting Current (A)	0.056 / 0.044	0.034 / 0.026	0.075
Holding Current A	0.028 / 0.022	0.017 / 0.013	
Power consumption W	1.8 / 1.4	2.1 / 1.6	1.8
Voltage fluctuation range	±10%		
Heat Resistance Class	Class B molded coil		

*1: 100 VAC / 200 VAC can be used at 110 VAC, 220 VAC (60 Hz).

*2: For details on the valve, refer to "Directional Control Valve" No. RJ-012AA.

Operational Principle



When the valve is OFF, the vane returns to the oscillation origin position.

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

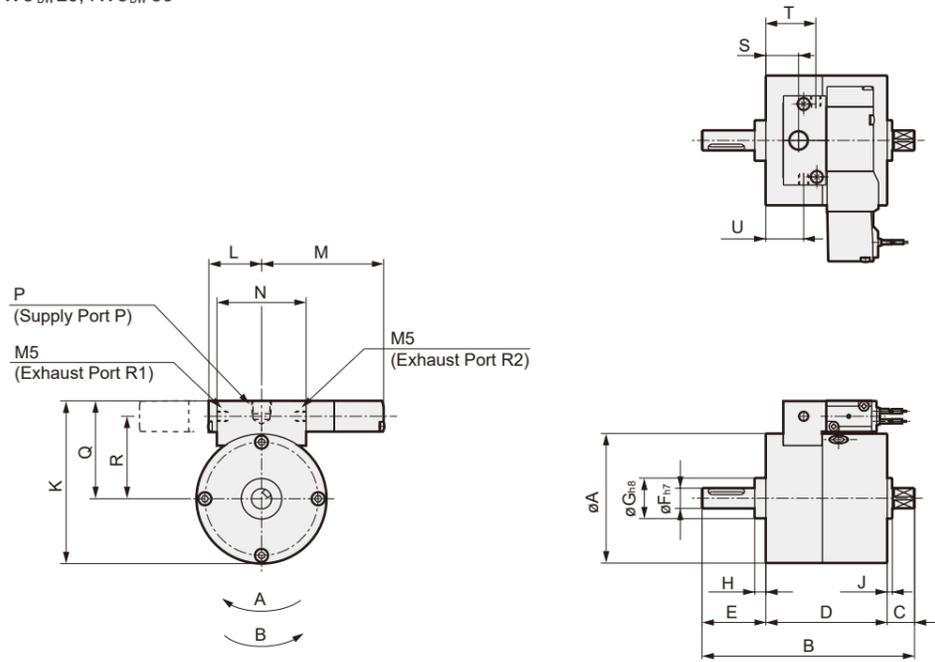
Ending

Cylinder Switch

Ending

Dimensional Drawings

● RV3^{SV}_{DW} 10, RV3^{SV}_{DW} 20, RV3^{SV}_{DW} 30



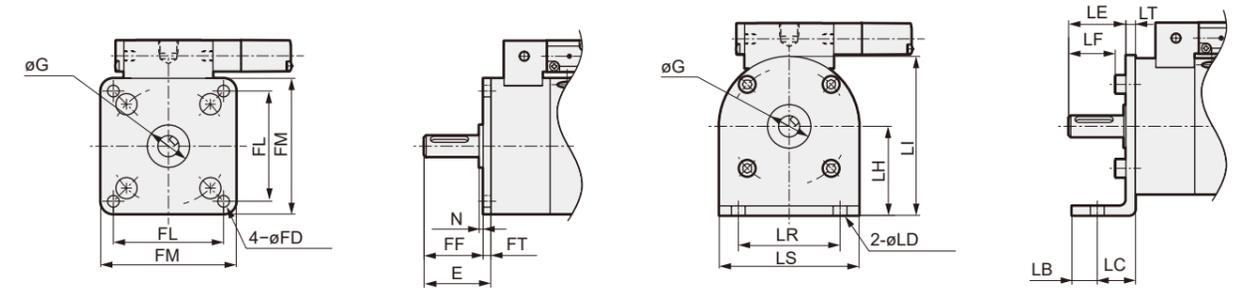
Code Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
RV3 ^{SV} _{DW} 10	42.5	73	10	40	23	6	14	5	2	58.3	26	60	35	M5	37	29.5	13.6	13.6	13.6
RV3 ^{SV} _{DW} 20	49.5	93.5	10	55	28.5	8	16	5.5	2	65.2	26	60	37	Rc1/8	40.4	32.9	16.2	23.2	23.2
RV3 ^{SV} _{DW} 30	64	105	13.5	60	31.5	10	20	5.5	2.5	80	26	60	44	Rc1/8	48	40.5	16.2	24.7	18.7

*1: Key included. For key outline dimension drawing, refer to P. 1301.
*2: Detailed dimensions of each part body are in order of RV3^S_D 10, RV3^S_D 20, RV3^S_D 30.

Dimensional Drawings

● RV3^{SV}_{DW} 30-FA
■ With flange

● RV3^{SV}_{DW} 30-LS
■ With foot



Code Model No.	E	FD	FF	G	FL	FM	FT	N
RV3 ^{SV} _{DW} 10	23	3.5	19.8	14	34	42	3.2	1.8
RV3 ^{SV} _{DW} 20	28.5	5.5	24.9	16	41	50	3.6	1.9
RV3 ^{SV} _{DW} 30	31.5	5.5	27.9	20	52	64	3.6	1.9

Code Model No.	G	LB	LC	LD	LE	LF	LH	LI	LR	LS	LT
RV3 ^{SV} _{DW} 10	14	8	12	5.8	19.8	16.1	30	51	30	42	3.2
RV3 ^{SV} _{DW} 20	16	10	15	7	24.5	18.2	34	58.5	36	49	4
RV3 ^{SV} _{DW} 30	20	12	18	6.5	27	20.7	42	75	48	66	4.5

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

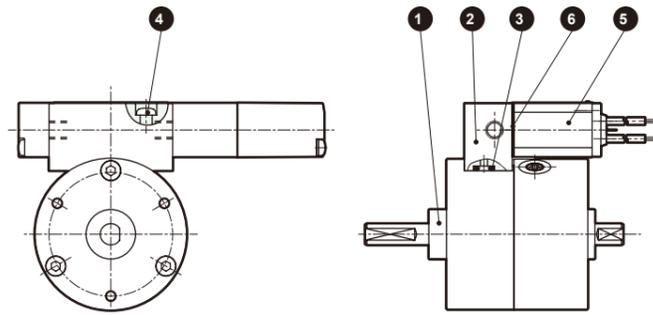
Ending

Cylinder Switch

Ending

Internal Structure Diagram/Material

● RV3SV10



Part No.	Part Name	Material	Remarks
1	Compact Selex Rotary Vane Type		RV3 (CKD)
2	Sub-base	Aluminum Alloy	
3	O-ring	Nitrile Rubber	
4	Phillips Pan Head Screw	Steel	Zinc Chromate
5	Selex Valve		4KB (CKD)
6	Gasket	Nitrile Rubber	

MEMO

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending



Compact Selex Rotary Vane Type, Variable Angle Type

RV3^SD A Series

- Torque Size: 3, 10, 20, 30
- Oscillation Angle: Angle specification

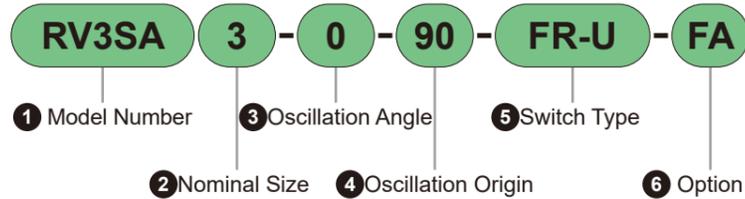
Circuit Diagram Code



RV3^SD A Series Model Number Notation

Model Number Notation

● Compact rotary actuator (angle variable) RV3□A



1 Model Number

Code	Content
RV3SA	Single Vane Type, Variable Angle Type
RV3DA	Double Vane Type, Variable Angle Type

2 Nominal Size

Code	Content	Model No.	
		RV3SA	RV3DA
3	Effective Torque at 0.5 MPa	0.31 N·m	0.71 N·m
10		0.98 N·m	2.11 N·m
20		1.70 N·m	3.88 N·m
30		3.19 N·m	7.70 N·m

3 Swing Angle (°)

Model No.	Nominal Size	Code	Content
RV3SA RV3DA	3 to 30	0	No Angle Specification
RV3SA	3 to 20	30 to 180	With Angle Specification *2, *3
	30	30 to 270	
RV3DA	3 to 30	30 to 90	

*1: For "No angle designation", the reference point stopper is included, and the angle setting stopper is shipped included with the product, so be sure to attach it when using.

*2: The desired angle is set to an approximate angle from the oscillating starting point, so be sure to perform final angle adjustment with the fine adjustment screw when using.

*3: The desired angle is in 10° increments.

5 Switch Type

Code	Content
Blank	Without switch
FR	With Lead Wire Axial Direction Switch
FR-U	With Lead Wire Perpendicular to Axis Direction Switch

*1: 2 switches are included.

*2: If the type with switch is selected, a switch unit is shipped with the product. Assemble after adjusting the external stopper.

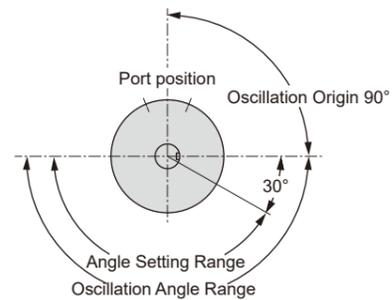
6 Option

Code	Content
Blank	No option
FA	With Flange Bracket
LS	With Foot Bracket
K	With Protective Cover

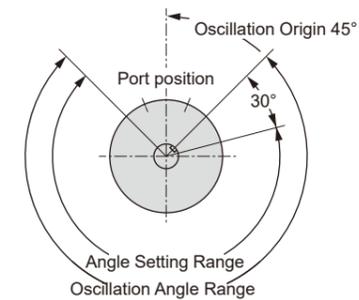
*1: For with switch, "K" (With protective cover) cannot be selected.
*2: Mounting bracket (FA, LS) is included with the product.
For external dimensions, refer to P. 1318 to 1321.

Oscillation Origin Position

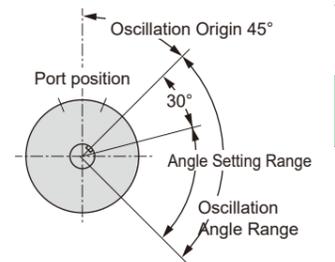
● Oscillating origin 90°
RV3SA3 to 20



● Oscillating origin 45°
RV3SA30

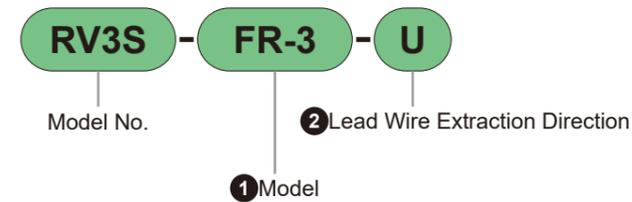


RV3DA3 to 30



Note: The tolerance of the oscillation origin is based on the mounting screw position.

● Switch Unit Model No. Notation



1 Model

Code	Content
FR-3	Applicable Actuator: RV3 ^S D A3
FR-10	Applicable Actuator: RV3 ^S D A10
FR-20	Applicable Actuator: RV3 ^S D A20
FR-30	Applicable Actuator: RV3 ^S D A30

2 Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Swing/Rotary Type

Swing/Rotary Type

RRC

RRC

GRC

GRC

RV3□

RV3□

Cylinder Switch

Cylinder Switch

Ending

Ending

Specifications

●Single Vane Type

Item	RV3SA			
Size	3	10	20	30
Effective torque N·m	0.31	0.98	1.70	3.19
Actuation method	Single Vane			
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7		1.0	
Min Operating Pressure MPa	0.2			
Proof Pressure MPa	1.05		1.5	
Ambient Temperature °C	-5 to 80 *4 (provided there is no freezing)			-5 to 60 *4 (provided there is no freezing)
Port Size	M5			Rc1/8
Oscillating angle setting range °	30 to 180			30 to 270
Oscillation Origin °	90			45
Allowable Absorption Energy *2mJ	1	2	3	7
Max Operating Frequency *3 cycle/min	150	150	120	90
Internal Volume cm ³	3.3	9.8	18	43
Allowable Radial Load N	40	50	300	400
Allowable Thrust Load N	4.0		25	30
Weight kg	0.085	0.17	0.28	0.51
Switch Unit Weight kg	0.06	0.06	0.07	0.07
Lubrication	Not Required (When lubricating, use turbine oil ISO VG32)			

●Double Vane Type

Item	RV3DA			
Size	3	10	20	30
Effective torque N·m	0.71	2.11	3.88	7.7
Actuation method	Double Vane			
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7		1.0	
Min Operating Pressure MPa	0.2			
Proof Pressure MPa	1.05		1.5	
Ambient Temperature °C	-5 to 80 *4 (provided there is no freezing)			-5 to 60 *4 (provided there is no freezing)
Port Size	M5			Rc1/8
Oscillating angle setting range °	30 to 90			
Oscillation Origin °	45			
Allowable Absorption Energy *2mJ	1	2	3	7
Max Operating Frequency *3 cycle/min	240	240	180	180
Internal Volume cm ³	2.8	8.1	15	34
Allowable Radial Load N	40	50	300	400
Allowable Thrust Load N	4.0		25	30
Weight kg	0.087	0.18	0.29	0.53
Switch Unit Weight kg	0.06	0.06	0.07	0.07
Lubrication	Not Required (When lubricating, use turbine oil ISO VG32)			

*1: Allowable absorption energy is different from Compact Selex Rotary RV3□ series.

*2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) ≥ 1/2Iω²×10³ (For detailed calculation, refer to P. 1366.)

*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition]

*4: For type with switch, it is 5 to 60°C.

*5: Keys are included to Selex Rotary with keyway.

*6: Please consult us separately for non-standard specifications.

*7: For switch specifications, refer to P. 1356.

External Stopper Specifications

Item	RV3SA3	RV3SA10	RV3SA20	RV3SA30	RV3DA3	RV3DA10	RV3DA20	RV3DA30
Min setting angle °	30							
Max setting angle °	180		270		90			
Angle setting pitch °	15							
Stopper fine adjustment range for angle setting °	-9 to +6							
Stopper fine adjustment range for reference point °	±3				-1 to +3		±3	
Angle Setting Stopper Fine Adjustment Width at Max Setting Angle °	-9 to +6		-9 to +3		-9 to +1		-9 to +3	

Oscillation Angle Setting Range and Oscillation Origin

Model No.		Oscillation Angle Setting Range	Oscillation Origin
Single Vane	RV3SA3	30 to 180°	90°
	RV3SA10		
	RV3SA20		
	RV3SA30		
Double Vane	RV3DA3	30 to 270°	45°
	RV3DA10		
	RV3DA20		
	RV3DA30		

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

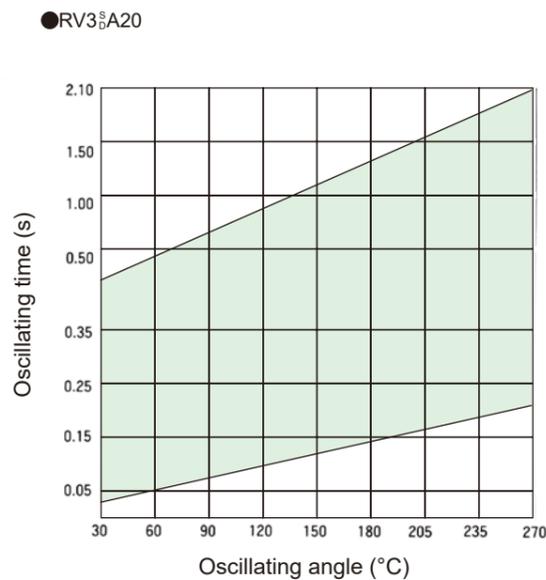
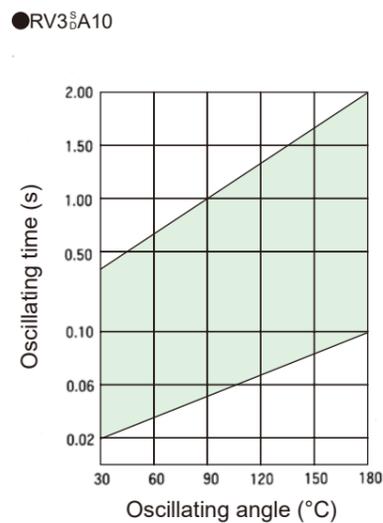
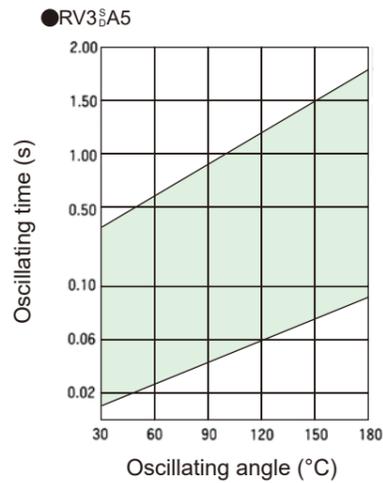
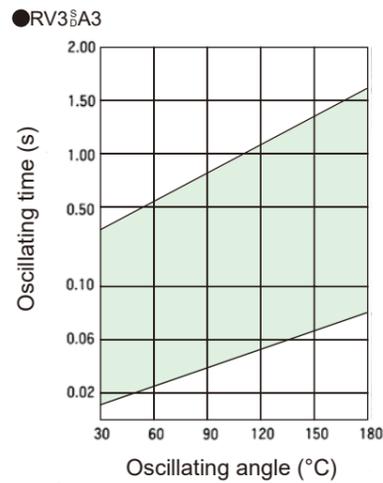
Ending

Cylinder Switch

Ending

Oscillation Time Setting

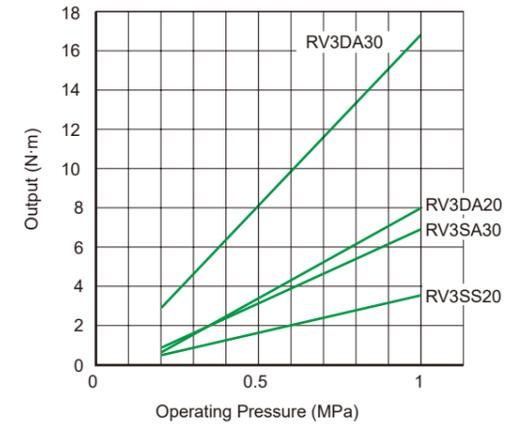
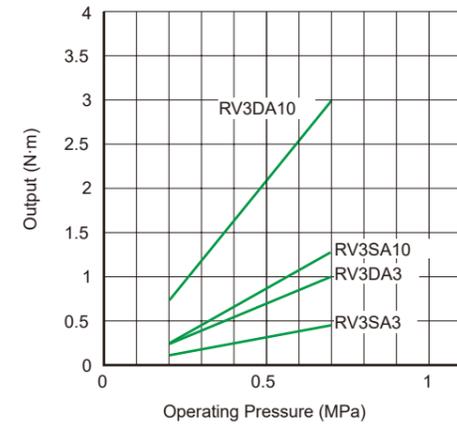
1. Use the oscillating time within the range in the table below. If used outside this range, smooth operation may not be obtained due to stick-slip phenomenon, etc.



Output Table (Effective Torque)

●RV3^SA3 to 10

●RV3^SA20, 30



Output Table (Effective Torque)

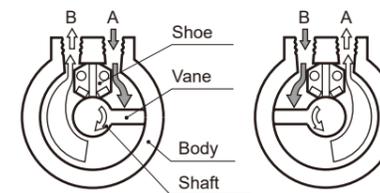
Unit: N·m

Operating Pressure (MPa)		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Model No.										
Single Vane	RV3SA3	0.1	0.17	0.24	0.31	0.38	0.45	-	-	-
	RV3SA10	0.35	0.56	0.75	0.98	1.2	1.39	-	-	-
	RV3SA20	0.59	0.95	1.33	1.7	2.1	2.49	2.87	3.26	3.68
	RV3SA30	1.1	1.8	2.5	3.19	4.1	4.8	5.8	6.5	7.2
Double Vane	RV3DA3	0.25	0.39	0.54	0.71	0.86	1.01	-	-	-
	RV3DA10	0.76	1.17	1.62	2.11	2.54	3.03	-	-	-
	RV3DA20	1.4	2.22	3.06	3.88	4.7	5.53	6.33	7.17	8.07
	RV3DA30	2.7	4.4	6	7.7	9.5	11.2	12.99	14.8	16.6

Operational Principle

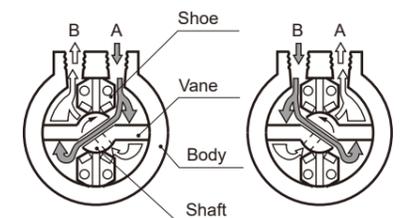
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



●Double Vane

1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.



Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

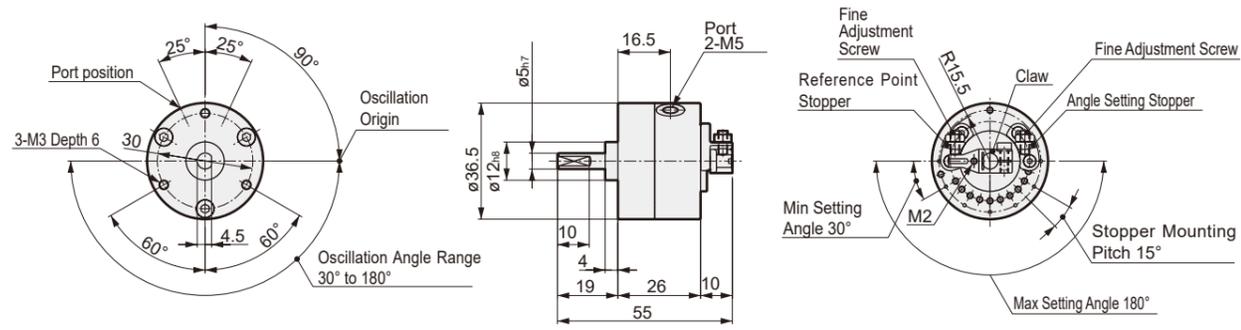
Ending

Cylinder Switch

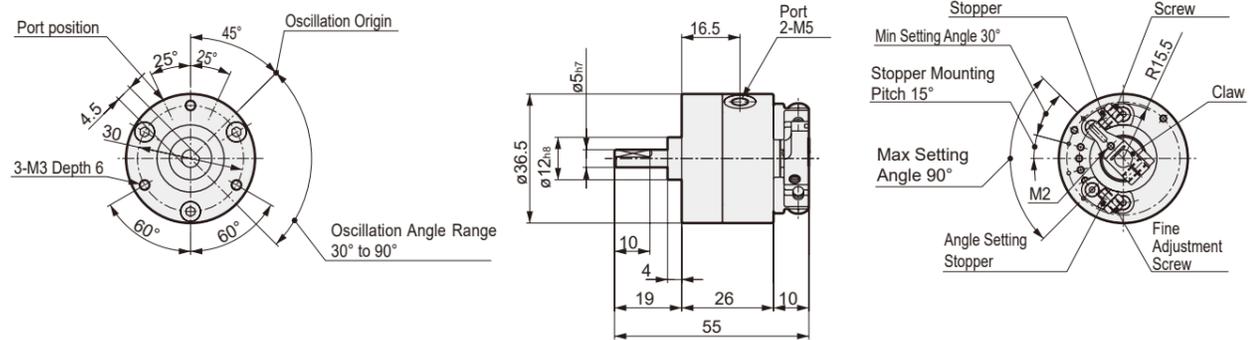
Ending

Dimensional Drawings

● RV3SA3



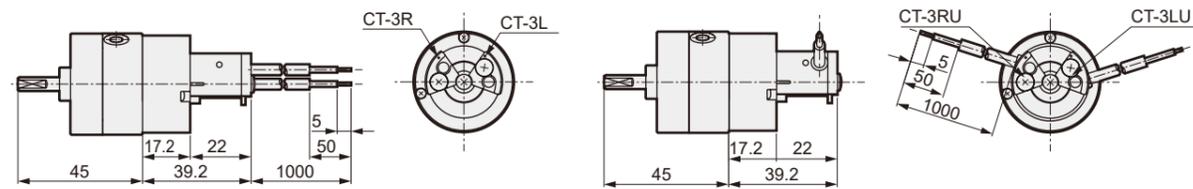
● RV3DA3



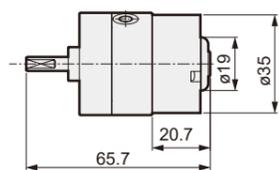
● RV3^SA3-□-FR(U)

■ Lead Wire Axial Direction Extraction

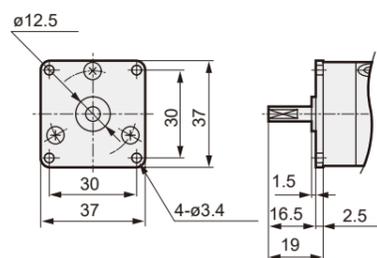
■ Lead Wire Perpendicular to Axis Direction Extraction



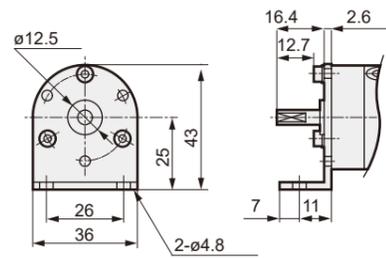
● RV3^SA3-□-K (With Protective Cover)



● RV3^SA3-FA (With flange)



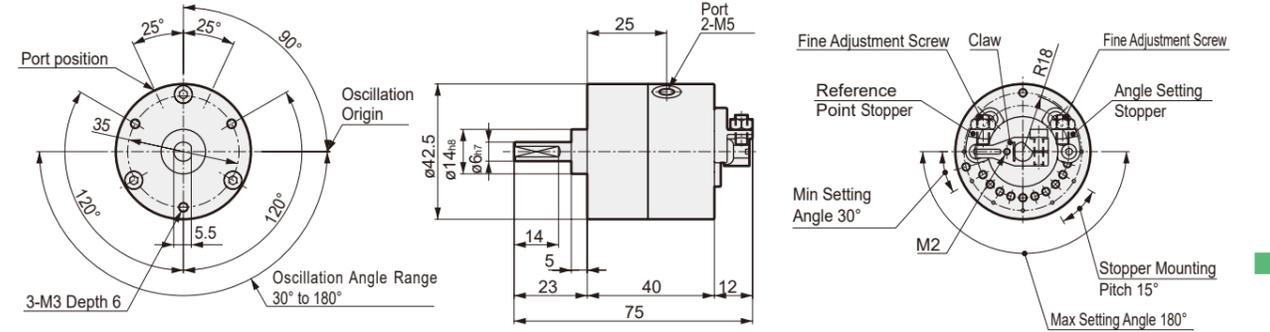
● RV3^SA3-LS (With foot)



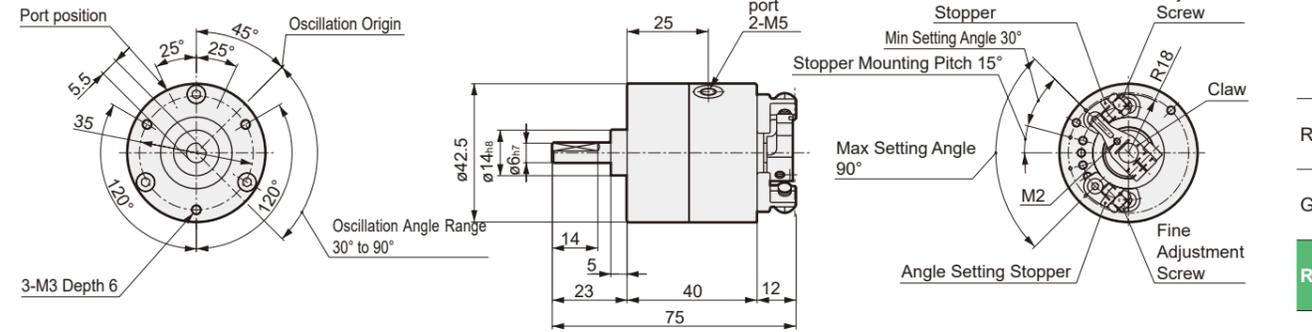
Dimensional Drawings

Dimensional Drawings

● RV3SA10



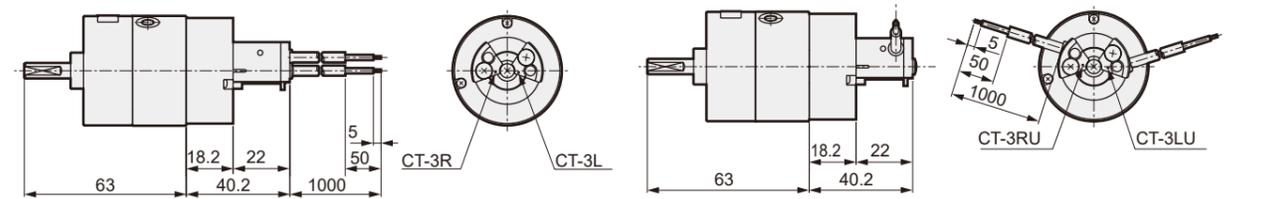
● RV3DA10



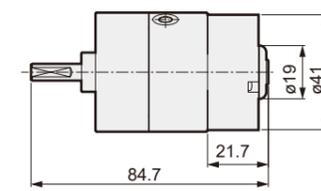
● RV3^SA10-□-FR(U)

■ Lead Wire Axial Direction Extraction

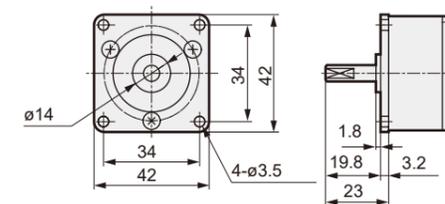
■ Lead Wire Perpendicular to Axis Direction Extraction



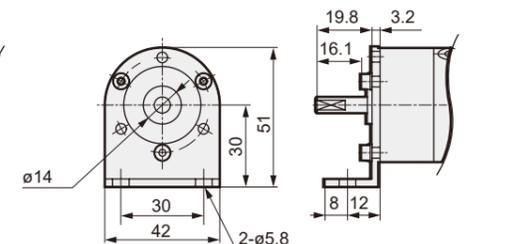
● RV3^SA10-□-K (With Protective Cover)



● RV3^SA10-FA (With flange)



● RV3^SA10-LS (With foot)



Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

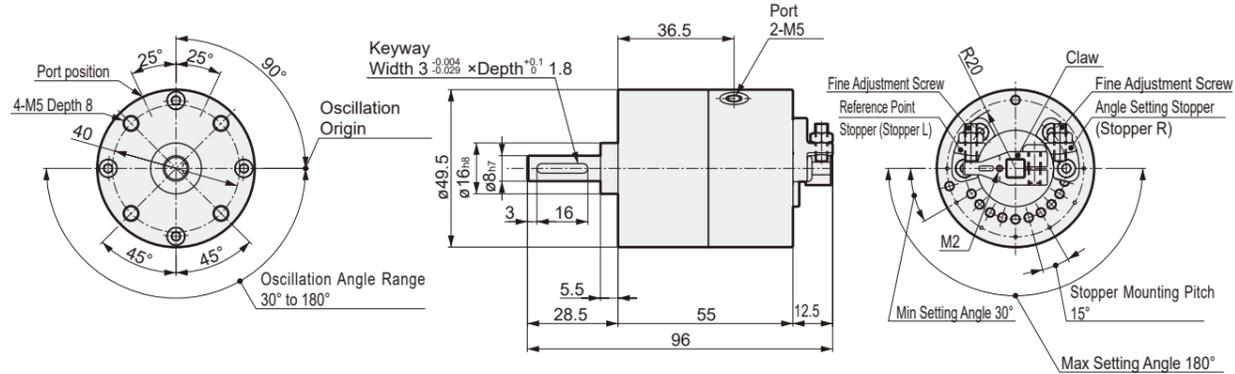
Ending

Cylinder Switch

Ending

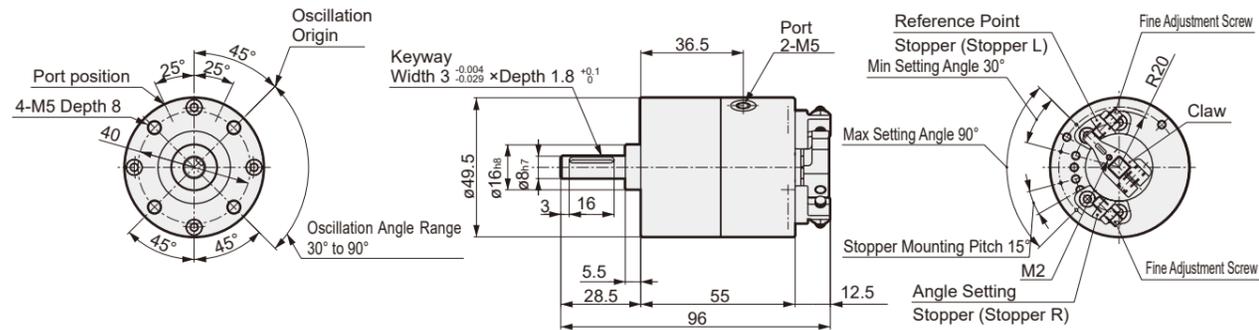
Dimensional Drawings

● RV3SA20



*1: Key included. For key outline dimension drawing, refer to P. 1301.

● RV3DA20

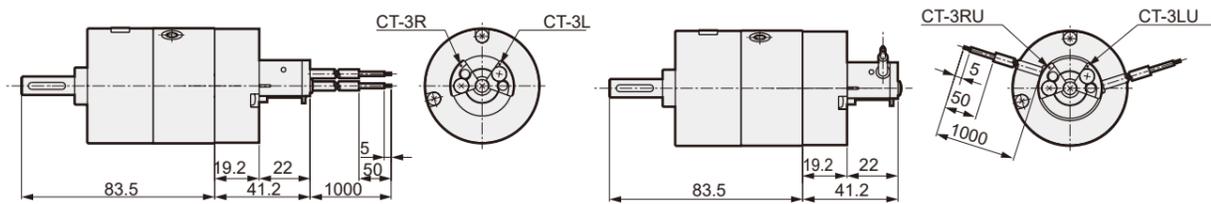


*1: Key included. For key outline dimension drawing, refer to P. 1301.

●RV3^SA20-□-FR(U)

■ Lead Wire Axial Direction Extraction

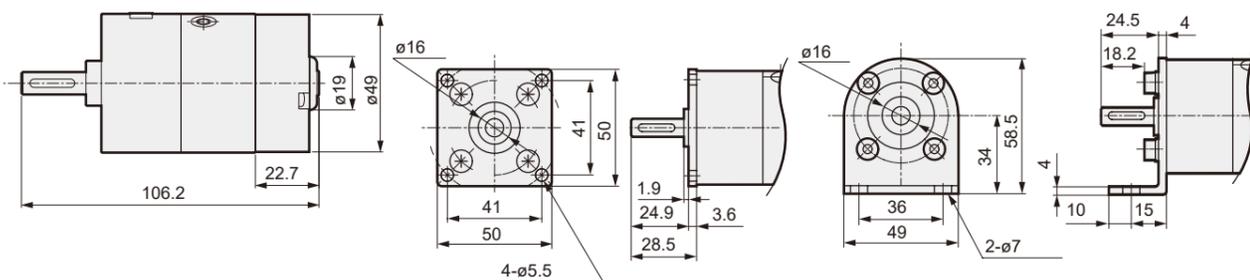
■ Lead Wire Perpendicular to Axis Direction Extraction



●RV3^SA20-□-K (With Protective Cover)

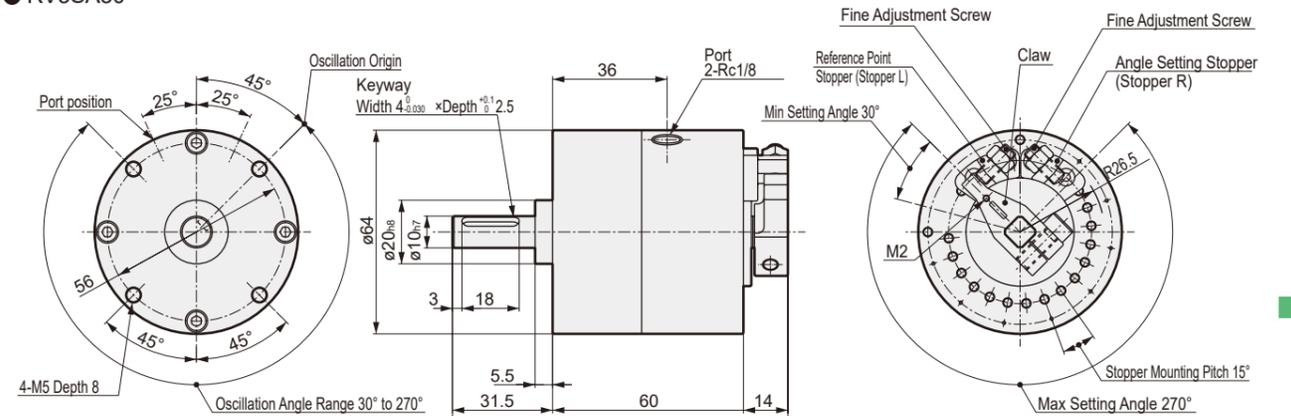
●RV3^SA20-FA (With flange)

●RV3^SA20-LS (With foot)



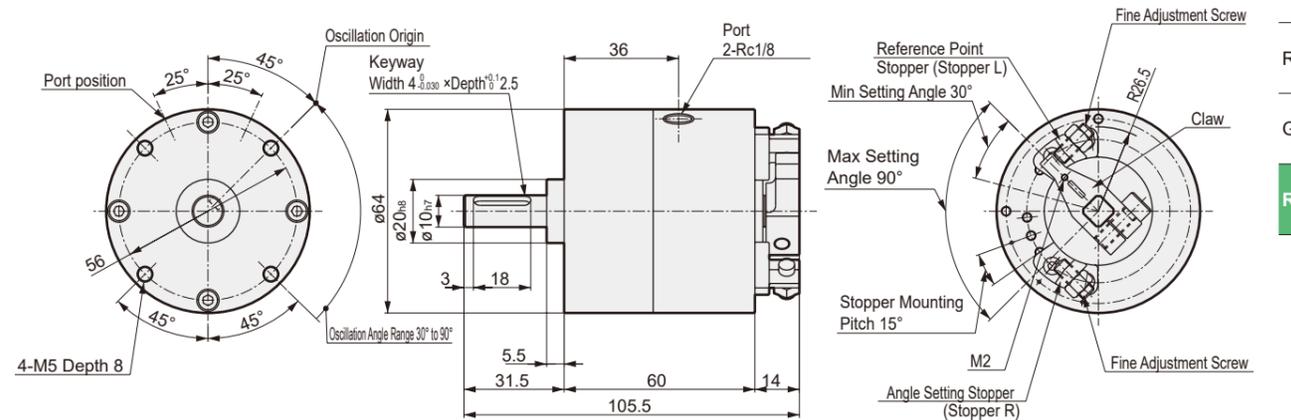
Dimensional Drawings

● RV3SA30



*1: Key included. For key outline dimension drawing, refer to P. 1301.

● RV3DA30

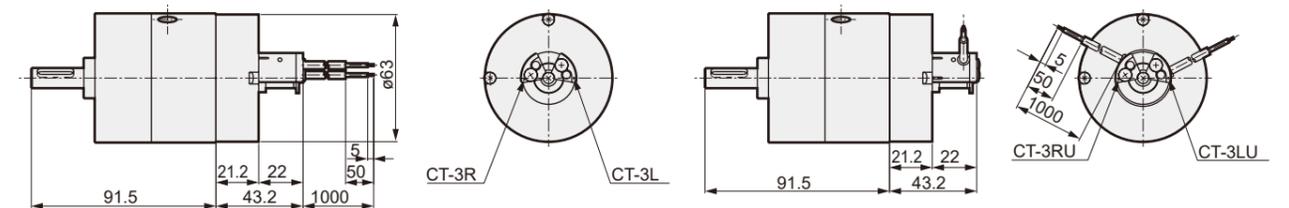


*1: Key included. For key outline dimension drawing, refer to P. 1301.

●RV3^SA30-□-FR(U)

■ Lead Wire Axial Direction Extraction

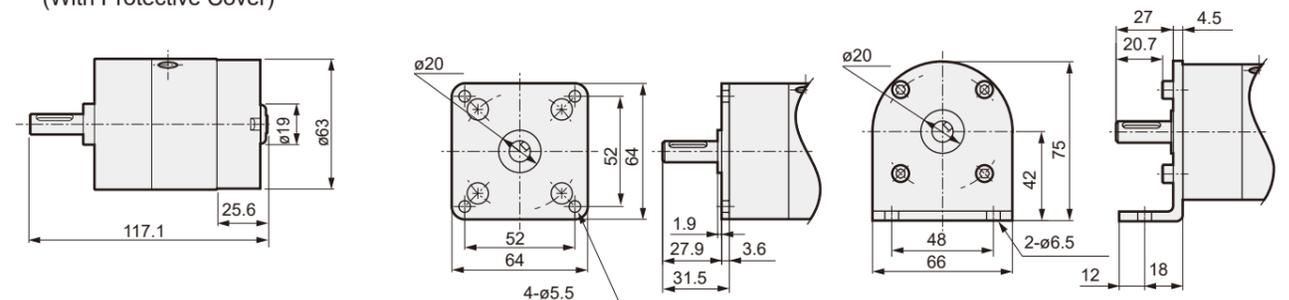
■ Lead Wire Perpendicular to Axis Direction Extraction



●RV3^SA30-□-K (With Protective Cover)

●RV3^SA30-FA (With flange)

●RV3^SA30-LS (With foot)



Swing/Rotary Type

RRC

GRC

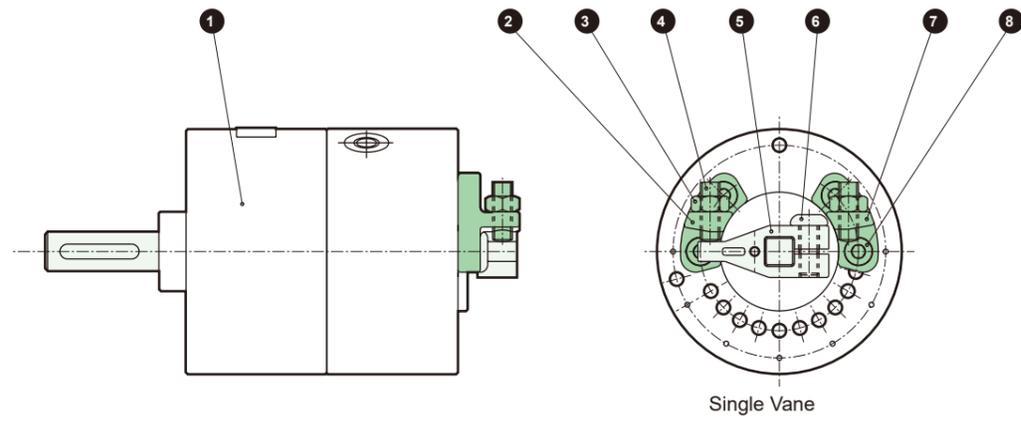
RV3□

Cylinder Switch

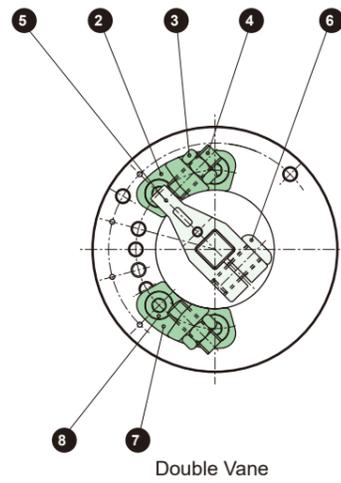
Ending

Internal Structure Diagram/Material

●RV3SA□



●RV3SDA□



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Compact Selex Rotary Vane Type		RV3 (CKD)	5	Claw	Steel	
2	Stopper L	Steel	For Reference Point	6	Claw Mounting Bolt	Steel	
3	Lock Nut	Steel		7	Stopper R	Steel	For Angle Setting
4	Fine Adjustment Screw	Steel		8	Stopper Mounting Bolt	Steel	

MEMO

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Cylinder Switch

Ending



Large Selex Rotary Vane Type, Standard Type

RV3^S_D Series

- Torque Size: 50, 150, 300, 800
- Oscillation Angle: 90°/100°/180°/270°/280°

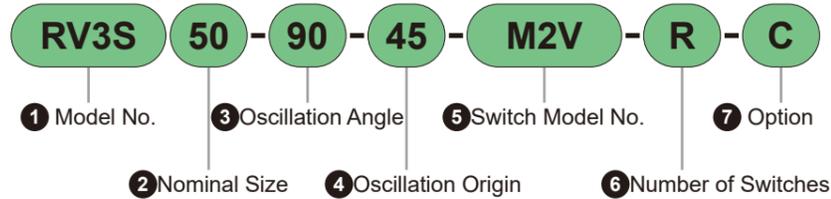


RV3^S_D Series

Model No. Notation

Model No. Notation

● Large rotary actuator (standard) RV3□



6 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

7 Option

Code	Content	Model No.								
		RV3S				RV3D				
		Nominal Size								
		50	150	300	800	50	150	300	800	
Blank	No option	●	●	●	●	●	●	●	●	
*1 FA	With Flange Bracket	●	●	●	●	●	●	●	●	
*1 LS	With Foot Bracket	●	●	●	●	●	●	●	●	
*2 *3 C	With Shock absorber	●	●	●	●	●	●	●	●	

*1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1332.

*2: Refer to P. 1350 for details on Shock Absorbers (C).

*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Nominal Size

Code	Content	Model No.	
		RV3S	RV3D
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m
800		102 N·m	206 N·m

3 Swing Angle (°)

Code	Content	Model No.	
		RV3S	RV3D
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
*1 280	280°	●	

*1: In the case of with shock absorber, with switch cannot be manufactured.

4 Oscillation Origin (°)

Code	Content	Model No.	
		RV3S	RV3D
40	40°	●	●
45	45°	●	●

Note: Refer to the table below for the relationship between oscillation angle and oscillation origin.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin	
	40°	45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

5 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□

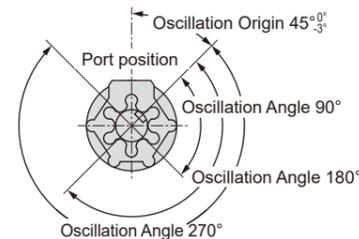
* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

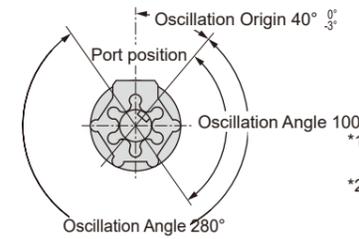
Example) Lead wire length
 1 m M2V
 3 m M2V [3]
 5 m M2V [5]

Oscillation Origin Position

● Oscillation Origin 45°
RV3□50 to 800



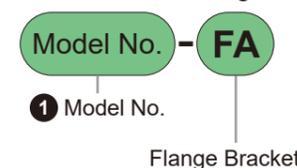
● Oscillation Origin 40°
RV3□50 to 800



*1: The tolerance of the oscillating starting point is based on the mounting screw position.

*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

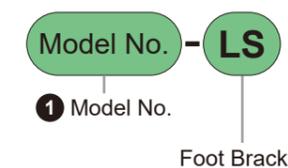
● How to order flange bracket



1 Model No.

Code	Applicable Model
RVS50	RV3 ^S _D 50
RVS150	RV3 ^S _D 150

● How to order Foot Bracket



1 Model No.

1 Model No.

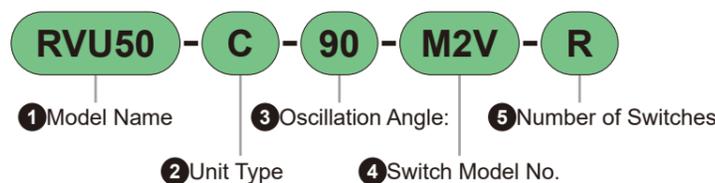
Code	Applicable Model
RVS50	RV3 ^S _D 50
RVS150	RV3 ^S _D 150
RVS300	RV3 ^S _D 300
RVS800	RV3 ^S _D 800

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

Switch Unit Model No. Notation

Switch Unit



1 Model Name

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle:

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M2V
3 m M2V₃
5 m M2V₅

Specifications

● Single Vane Type

Item	Single Vane Type RV3S													
Size	50			150			300			800				
Effective Torque (N·m)	4.7			14.7			27.9			102				
Actuation method	Single Vane													
Operating Fluid	Compressed Air													
Max Operating Pressure MPa	1.0													
Min Operating Pressure MPa	0.2 *1													
Proof Pressure MPa	1.5													
Ambient Temperature °C	5 to 60													
Port Size	Rc1/8			Rc1/4			Rc3/8			Rc 1/2				
Oscillating angle tolerance °	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀		
Oscillation Origin °	45		40		45		40		45		40			
Allowable Absorption Energy ² mJ	49			225			1078			3820				
Max Operating Frequency ³ cycle/min	180	90	60	120	80	50	90	60	40	70	45	30		
Volumetric capacity cm ³	51	61	62	146	179	185	244	283	352	365	754	869	1036	1046
Allowable Radial Load N	588			1176			1960			4900				
Allowable Thrust Load N	44.1			88.2			147			490				
Weight kg	0.82	0.79	0.73	0.7	2.0	1.9	1.7	1.6	3.7	3.6	12.7	12.2	11.2	11.0
Switch Unit Weight kg ⁶	Without Shock Absorber													
	0.1			0.14			0.18			0.28				
	With Shock Absorber	90°			0.16			0.27			0.50			
		100°			0.15			0.26			0.49			
		180°			0.16			0.27			0.50			
270°			0.14			0.23			0.41					
280°			0.14			0.22			0.39					
Lubrication														
Not required (When lubricating, use turbine oil Class 1 ISO VG32)														

● Double Vane Type

Item	Double Vane Type RV3D												
Size	50			150			300			800			
Effective Torque (N·m)	10.1			34.3			66.6			206			
Actuation method	Double Vane												
Operating Fluid	Compressed Air												
Max Operating Pressure MPa	1.0												
Min Operating Pressure MPa	0.2 *1												
Proof Pressure MPa	1.5												
Ambient Temperature °C	5 to 60												
Port Size	Rc1/8			Rc1/4			Rc3/8			Rc 1/2			
Oscillating angle tolerance °	90 ⁺³ ₀	100 ⁺³ ₀		90 ⁺³ ₀	100 ⁺³ ₀		90 ⁺³ ₀	100 ⁺³ ₀		90 ⁺³ ₀	100 ⁺³ ₀		
Oscillation Origin °	45	40		45	40		45	40		45	40		
Allowable Absorption Energy ² mJ	49			225			1078			3820			
Max Operating Frequency ³ cycle/min	180			120			90			90			
Volumetric capacity cm ³	42	43		127	123		244	271		754	774		
Allowable Radial Load N	588			1176			1960			4900			
Allowable Thrust Load N	44.1			88.2			147			490			
Weight kg	0.82	0.8		2.0	1.9		4.3	4.1		12.7	12.5		
Switch Unit Weight kg ⁶	Without Shock Absorber												
	0.1			0.14			0.18			0.28			
	With Shock Absorber	90°			0.16			0.27			0.50		
		100°			0.15			0.26			0.49		
		180°			0.16			0.27			0.50		
270°			0.14			0.23			0.41				
280°			0.14			0.22			0.39				
Lubrication													
Not Required (When lubricating, use turbine oil ISO VG32)													

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.

*2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. [Allowable energy] ≥ (1/2) × I × ω² × 10³ (Refer to P. 1366 for details on calculation.) If the above formula is not satisfied, defects such as shaft breakage may occur.

*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition].

*4: Keys are included to Selex Rotary with keyway.

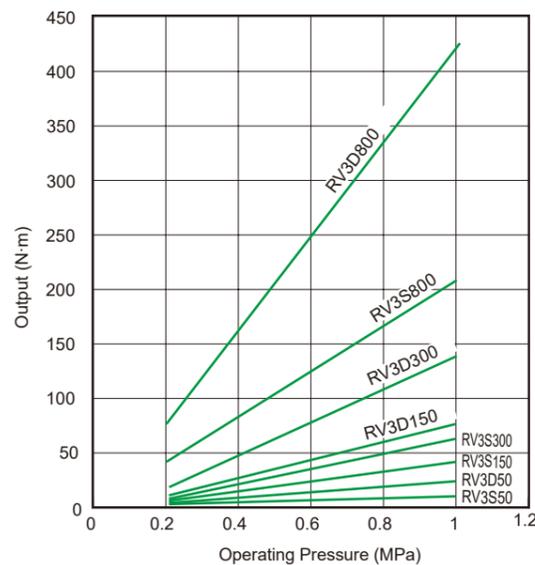
*5: Please consult us separately for non-standard specifications.

*6: Switch unit weight is the weight when 2 pcs. are included.

*7: For switch specifications, refer to P. 1359.

Output Characteristic Diagram (Effective Torque)

● RV3^S_D 50, 150, 300, 800



Output Table (Effective Torque)

Unit: N·m

Operating Pressure (MPa)		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Model No.										
Single Vane	RV3S50	1.25	2.59	3.69	4.79	5.9	7	8.29	9.5	10.6
	RV3S150	5.5	8.5	11.5	15	18	21	24	27.3	30.5
	RV3S300	10.5	16.5	22.5	28.5	34.5	40.5	46	51.8	57.5
	RV3S800	37.8	59.1	81	102	123	144	166	186	205
Double Vane	RV3D50	3.3	5.79	8.29	10.4	12.8	15.1	17.6	20.1	22.5
	RV3D150	12.5	19	27	35	41.5	48	55	62	69
	RV3D300	25.5	39	54	68	83	97	110	124	137
	RV3D800	77.4	120	161	206	247	288	332	371	411

Oscillation Time Setting

1. Use the oscillating time within the range in the table below. If used outside this range, smooth operation may not be obtained due to stick-slip phenomenon, etc.

Unit: S

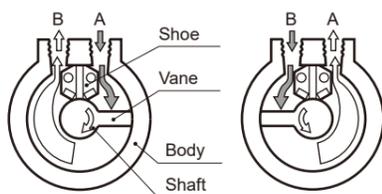
Model No.	Oscillation Angle				
	90°	100°	180°	270°	280°
RV3 ^S _D 50	0.08 to 0.8	0.09 to 0.9	0.16 to 1.6	0.24 to 2.4	0.25 to 2.5
RV3 ^S _D 150	0.12 to 1.2	0.13 to 1.3	0.24 to 2.4	0.36 to 3.6	0.37 to 3.7
RV3 ^S _D 300	0.16 to 1.6	0.17 to 1.7	0.32 to 3.2	0.48 to 4.8	0.49 to 4.9
RV3□800	0.22 to 2.2	0.24 to 2.4	0.44 to 4.4	0.66 to 6.6	0.68 to 6.8

MEMO

Operational Principle

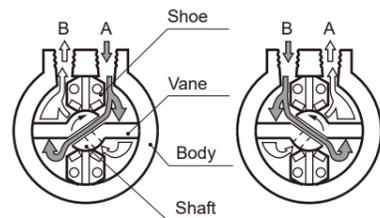
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



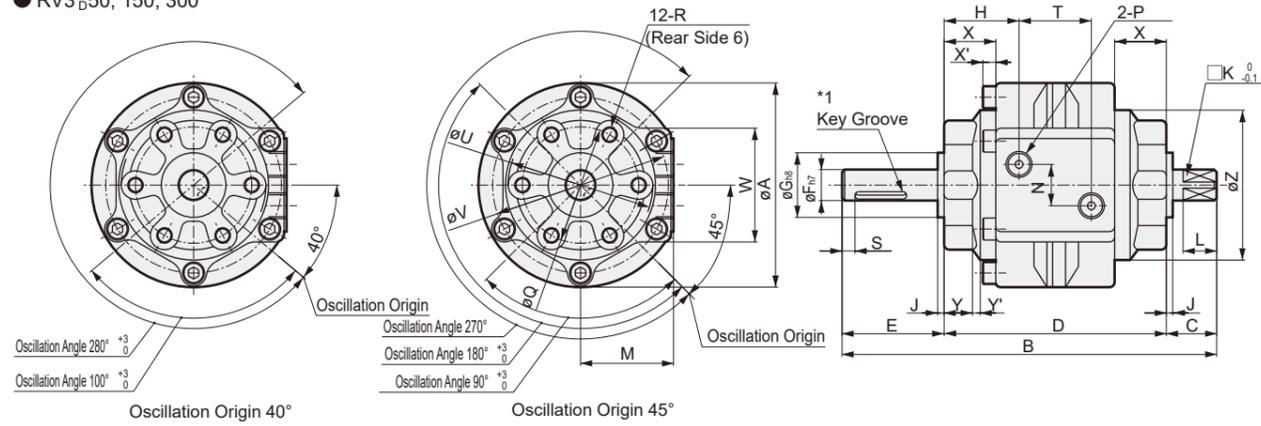
●Double Vane

1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.



Dimensional Drawings

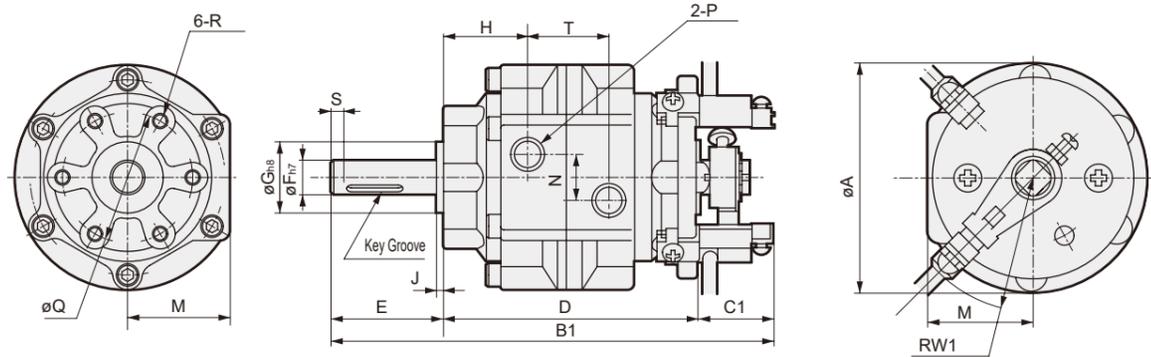
● RV3^S_{50, 150, 300}



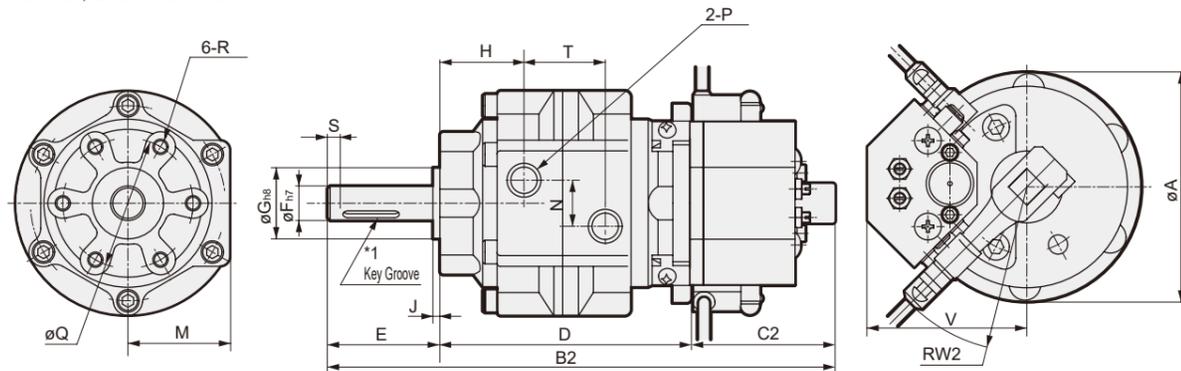
Code Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	Key Groove WxDxL	U	W	V	Z	X	X'	Y	Y'
RV3 ^S ₅₀	79	145	19.5	86	39.5	12	25	29	2.5	10	13	36	16	Rc1/8	45	M6 Depth 9	5	28	4×2.5×20	57	44	68	58	20	5	11	3
RV3 ^S ₁₅₀	110	180	23.5	103	53.5	17	30	34.5	3	13	16	51	24	Rc1/4	70	M8 Depth 12	5	34	5×3×36	85	61	97	85.2	23.5	6	10.5	5
RV3 ^S ₃₀₀	141.5	220	30	125	65	25	45	41.5	3.5	19	22	66	32	Rc3/8	80	M10 Depth 15	5	42	7×4×40	98.5	78	125	110	27.5	8	13	4.5

*1: Key included. For key outline dimension drawing, refer to P. 1332.

● With Switch



● With Switch, Shock Absorber

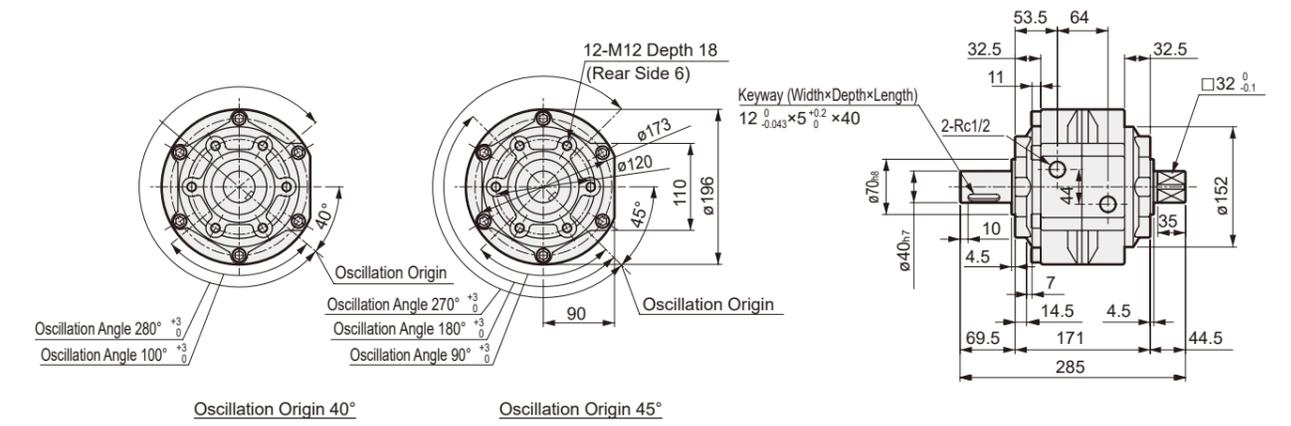


Code Model No.	A	B1	B2	C1	C2	D	E	F	G	H	J	M	N	P	Q	R	S	T	V	W1	W2	Key Groove WxDxL
RV3 ^S ₅₀	79	157.2	177.2	30.5	50.5	87.2	39.5	12	25	29	2.5	36	16	Rc1/8	45	M6 Depth 9	5	28	54	47	58	4×2.5×20
RV3 ^S ₁₅₀	110	188.2	214.2	30.5	56.5	104.2	53.5	17	30	34.5	3	51	24	Rc1/4	70	M8 Depth 12	5	34	71.5	61	72	5×3×36
RV3 ^S ₃₀₀	141.5	221.7	253.7	30.5	62.5	126.2	65	25	45	41.5	3.5	66	32	Rc3/8	80	M10 Depth 15	5	42	95	69	88	7×4×40

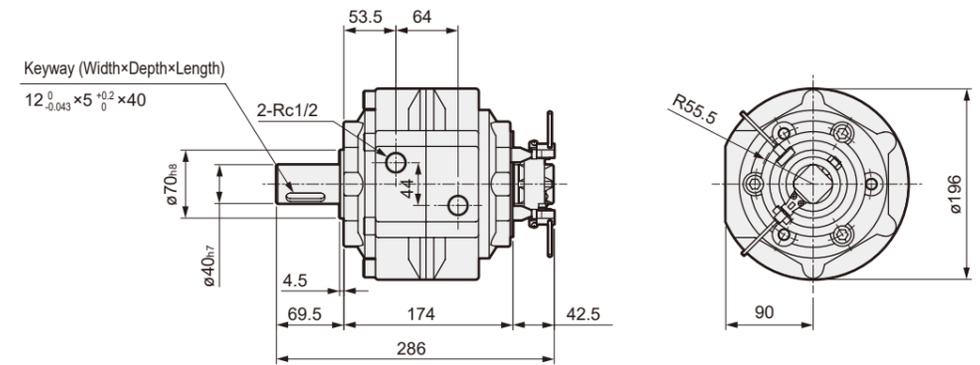
*1: Key included. For key outline dimension drawing, refer to P. 1332.

Dimensional Drawings

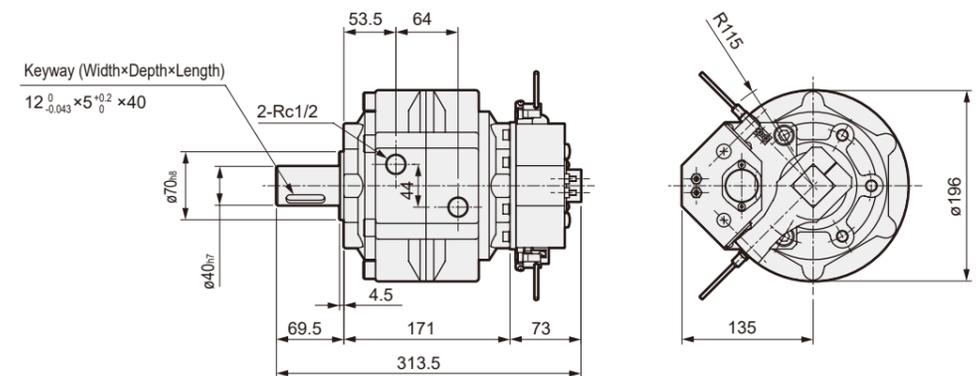
● RV3^S₈₀₀



● With Switch



● With Switch, Shock Absorber



Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

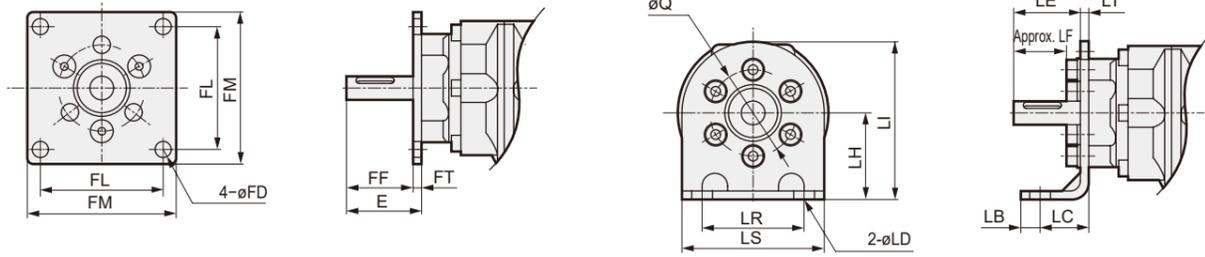
Cylinder Switch

Ending

Dimensional Drawings with Option

● RVS⁵⁰₁₅₀-FA *2

● RVS⁵⁰₁₅₀³⁰⁰₈₀₀LS



Model No.	E	FD	FF	FL	FM	FT
RV□50	39.5	7	35	64	80	4.5
RV□150	53.5	9	47.5	88	110	6

Model No.	LB	LC	LD	LE	LF	LH	LI	LR	LS	LT	Q
RV□50	10	25	11	35	27.5	45	82.5	55	75	4.5	45
RV□150	12	28	13	43.5	33.5	65	115	80	110	10	70
RV□300	13	32	15	53	40.5	80	135	100	140	12	80
RV□800	15	35	15	54.5	39.5	110	185	140	185	15	120

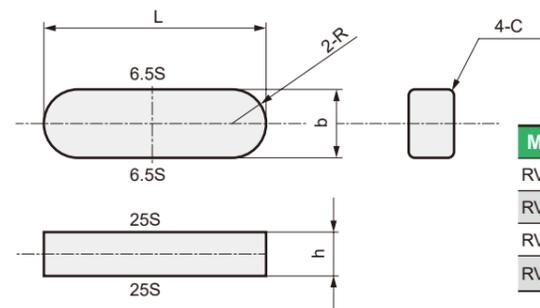
*1: Shipped with 1 bracket and mounting bolts (required quantity).
*2: RV□300 does not have a flange bracket.

*1: LI dimension indicates the dimension of the Foot Bracket.
*2: The Foot Bracket can be rotated by 60° for mounting.

Accessory External Dimensions

● JIS B1301 Parallel Key b×h×L, Both Ends Rounded S45C

The following keys are included to Selex Rotary with keyway, respectively.

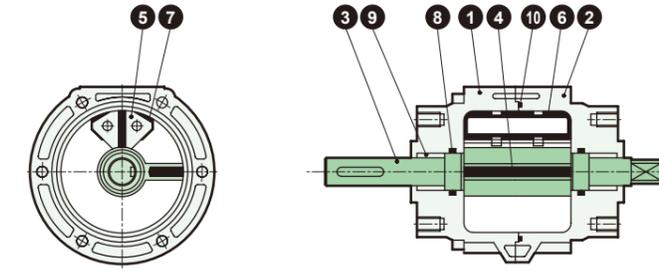


Unit: mm

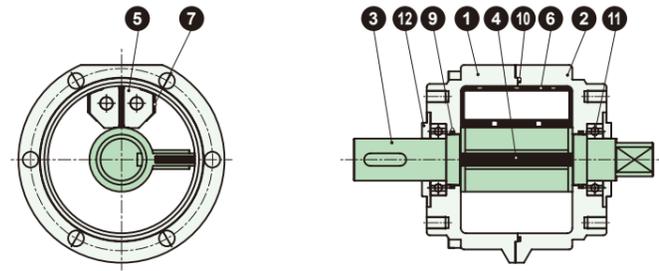
Model No.	Key Nominal Size	b	h	L	C	R
RV3□50	4×4×20	4 ⁰ _{-0.03}	4 ⁰ _{-0.03}	20 ⁰ _{-0.21}	0.16 to 0.25 (R0.16 to 0.25)	2
RV3□150	5×5×36	5 ⁰ _{-0.03}	5 ⁰ _{-0.03}	36 ⁰ _{-0.25}	0.25 to 0.40 (R0.25 to 0.40)	2.5
RV3□300	7×7×40	7 ⁰ _{-0.036}	7 ⁰ _{-0.036}	40 ⁰ _{-0.25}	0.25 to 0.40 (R0.25 to 0.40)	3.5
RV3□800	12×8×40	12 ⁰ _{-0.043}	8 ⁰ _{-0.09}	40 ⁰ _{-0.25}	0.40 to 0.60	6

Internal Structure Diagram/Material

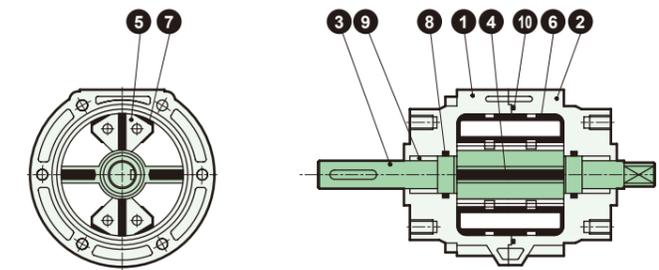
● RV3S50, 150, 300



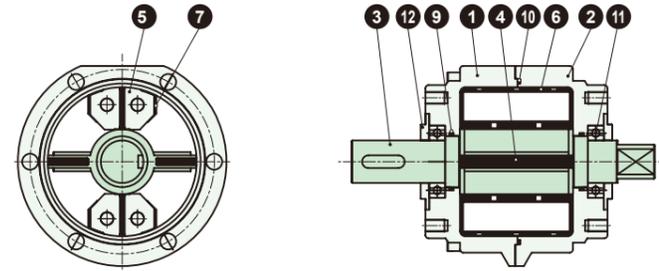
● RV3S800



● RV3D50, 150, 300



● RV3D800



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body A	Aluminum Alloy		7	Damper	Urethane Rubber	
2	Body B	Aluminum Alloy		8	O-ring	Nitrile Rubber	
3	Vane Shaft	Steel		9	Bearing	Oil-Impregnated Bearing Alloy	
4	Vane Seal, Vane Shaft	Nitrile Rubber		10	O-ring	Nitrile Rubber	
5	Shoe	Zinc Alloy		11	Bearing	Steel	
6	Shoe Seal	Nitrile Rubber		12	Cover Plate	Steel	

*1: Vane seal and vane shaft are integrated.

*2: For the consumable parts list, refer to P. 1362.

Mounting Type Material

Mounting Style	Material	Remarks
Flange (FA)	Steel	Zinc Chromate
Foot (LS)	50, 150: Steel 300, 800: Cast Iron	Zinc Chromate

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Cylinder Switch

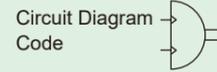
Ending



Large Selex Rotary Vane Type, With Valve

RV3^{SV}_{DW} Series

- Torque Size: 50, 150, 300
- Oscillation Angle: 90°, 100°, 180°, 270°, 280°



RV3^{SV}_{DW} Series

Model No. Notation

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
 1 m M2V □
 3 m M2V □₃
 5 m M2V □₅

7 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

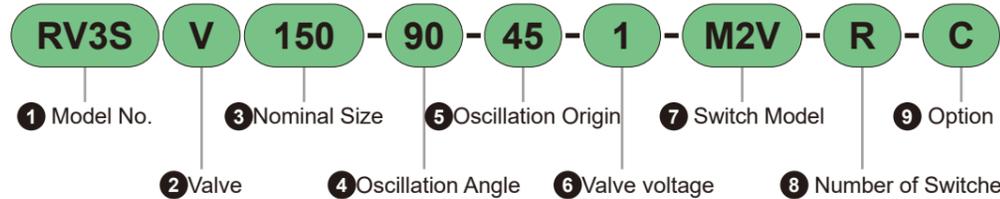
Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V □
	None		110	5/12/24	—	50 or less	M5V □
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V □
		3-wire (NPN)	—	30 or less	—	100 or less	M3V □

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

Model No. Notation

● Large Selex Rotary (with valve) RV3□^V_W



1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Valve

Code	Content
V	Single solenoid
W	Double Solenoid

3 Nominal Size

Code	Content	Model No.	
		RV3S	RV3D
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m

4 Swing Angle (°)

Code	Content	Model No.	
		RV3S	RV3D
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
280	280° (With switch cannot be manufactured for type with shock absorber)	●	

5 Oscillation Origin (°)

Code	Contents
40	40°
45	45°

*1: Refer to the table below for the relationship between oscillating angle and oscillating starting point.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin	
	40°	45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

6 Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

8 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

9 Option

Code	Content	Model No.						Image
		RV3S			RV3D			
		Nominal Size						
Blank	No option	●	●	●	●	●	●	
FA	With Flange Bracket	●	●		●	●		
LS	With Foot Bracket	●	●	●	●	●	●	
C	With Shock absorber	●	●	●	●	●	●	

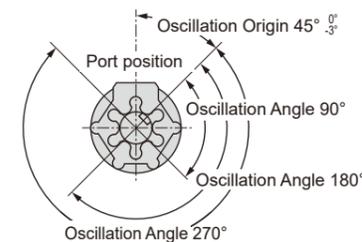
*1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1341.

*2: Refer to P. 1350 for details on Shock Absorbers (C).

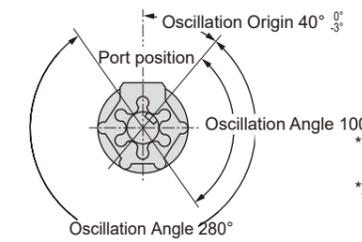
*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

Oscillation Origin Position

● Oscillation Origin 45°
RV3□50 to 800



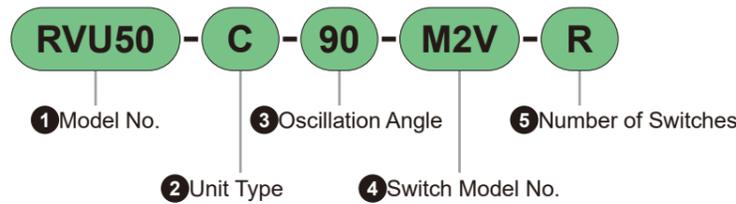
● Oscillation Origin 40°
RV3□50 to 800



*1: The tolerance of the oscillating starting point is based on the mounting screw position.

*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

Switch Unit Model No. Notation



1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M2V
3 m M2V [3]
5 m M2V [5]

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

Specifications

Item	Single Vane Type RV3SV/RV3SW						Double Vane Type RV3DV/RV3DW																	
	50		150		300		50		150		300													
Size	50		150		300		50		150		300													
Effective Torque N·m	4.7		14.7		27.9		10.1		34.3		66.6													
Actuation method	Single Vane						Double Vane																	
Operating Fluid	Compressed Air																							
Max Operating Pressure MPa	0.7																							
Min Operating Pressure MPa	0.2																							
Proof Pressure MPa	1.05																							
Ambient Temperature °C	5 to 50																							
Connection Port (Intake)	Rc1/8			Rc1/4			Rc3/8			Rc1/8			Rc1/4			Rc3/8								
Connection Port (Exhaust)	M5						Rc1/4						M5						Rc1/4					
Oscillating angle tolerance°	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀	90 ⁺³ ₀	180 ⁺³ ₀	270 ⁺³ ₀	280 ⁺³ ₀	90 ⁺³ ₀	100 ⁺³ ₀	90 ⁺³ ₀	100 ⁺³ ₀	90 ⁺³ ₀	100 ⁺³ ₀	90 ⁺³ ₀	100 ⁺³ ₀				
Oscillation Origin °	45			40			45			40			45			40			45			40		
Allowable Absorption Energy *2mJ	49			225			1078			49			225			1078								
Max Operating Frequency *3 cycle/min	180	90	60	120	80	50	90	60	40	180	120	90	90	60	40	180	120	90						
Volumetric capacity cm ³	51	61	62	146	179	185	244	283	352	365	42	43	127	123	244	271								
Allowable Radial Load N	588			1176			1960			588			1176			1960								
Allowable Thrust Load N	44.1			88.2			147			44.1			88.2			147								
Mounted Solenoid Valve	4KB119 / 4KB129			4KB219 / 4KB229			4KB119 / 4KB129			4KB219 / 4KB229														
Weight kg	0.9	0.84	0.81	2.2	2.0	1.9	4.1	4.0	0.93	0.91	2.3	2.2	4.7	4.5										
Switch Unit Weight kg	Without Shock Absorber		0.1		0.14		0.18		0.1		0.14		0.18											
	With Shock Absorber	90°	0.16		0.27		0.58		0.16		0.27		0.50											
		100°	0.15		0.26		0.49		0.15		0.26		0.49											
		180°	0.16		0.27		0.50		0.16		0.27		0.50											
		270°	0.14		0.23		0.41		0.14		0.23		0.41											
280°	0.14		0.22		0.39		0.14		0.22		0.39													
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)												Not Required (When lubricating, use turbine oil ISO VG32)											

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.

*2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. [Allowable energy] ≥ (1/2) × I × ω² × 10³ (Refer to P. 1366 for details on calculation.) If the left formula is not satisfied, defects such as shaft breakage may occur.

*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition].

*4: Keys are included to Selex Rotary with keyway.

*5: Please consult us separately for non-standard specifications.

*6: Switch unit weight is the weight when 2 pcs. are included.

*7: For switch specifications, refer to P. 1359.

Swing/Rotary Type

Swing/Rotary Type

RRC

RRC

GRC

GRC

RV3□

RV3□

Cylinder Switch

Cylinder Switch

Ending

Ending

Valve specifications

Item	Specifications (4KB2 Series) *2			
Rated Voltage *1	V	100 VAC (50/60Hz)	200 VAC (50/60Hz)	24 VDC
Starting Current	A	0.056 / 0.044	0.028 / 0.022	0.075
Holding Current	A	0.028 / 0.022	0.014/0.011	
Power consumption W		1.8 / 1.4		1.8
Voltage fluctuation range		±10%		
Heat Resistance Class		Class B molded coil		

*1: 100 VAC / 200 VAC can be used at 110 VAC, 220 VAC (60 Hz).

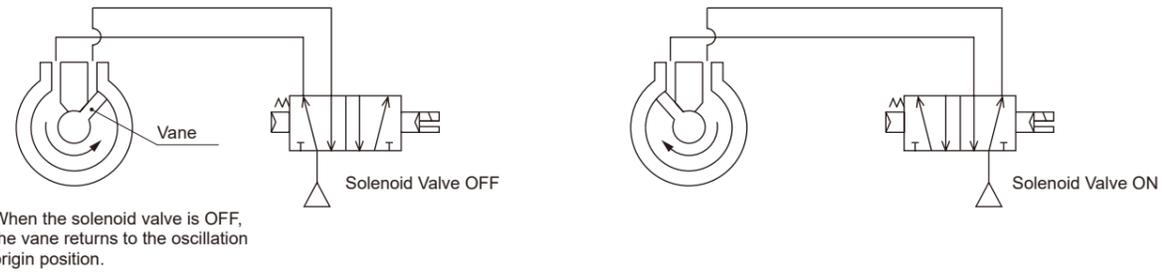
*2: Refer to P. 1307 for 4KB1 Series specifications.

*3: For details on the valve, refer to "Directional Control Valve ②" No. RJ-012AA.

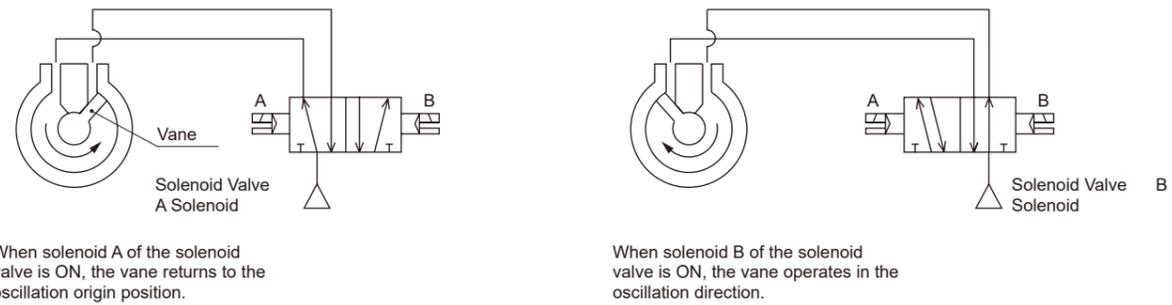
MEMO

Operational Principle

(1) Single Solenoid



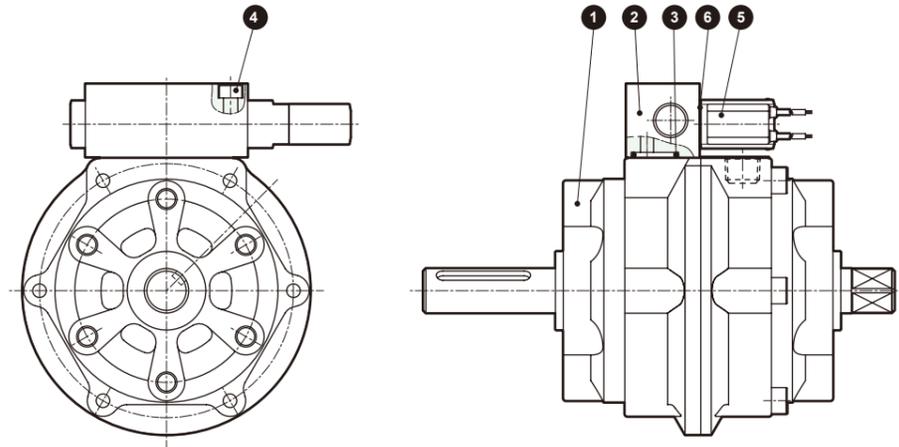
(2) Double Solenoid



For double solenoid type solenoid valves, if both A and B solenoids are OFF, a self-holding state is maintained, but please use in an energized state while the vane is moving.

Internal Structure Diagram/Material

● RV3SV/RV3SW/RV3DV/RV3DW Large



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Large Selex Rotary Vane Type		RV3 (CKD)	4	Hexagon Socket bolt	Alloy Steel	Zinc Chromate
2	Sub-base	Aluminum Alloy		5	Selex Valve		4KB (CKD)
3	O-ring	Nitrile Rubber		6	Gasket	Nitrile Rubber	

MEMO

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending



Large Selex Rotary Low Oil Pressure Type

RV3^SD^H Series

- Torque Size: 50, 150, 300, 800
- Oscillation Angle: 90°, 100°, 180°, 270°, 280°

Circuit Diagram Code



RV3^SD^H Series

Model No. Notation

Model No. Notation

● Large Selex Rotary (Low Oil Pressure Type) RV3□H



- 1 Model No.
- 2 Nominal Size
- 3 Oscillation Angle
- 4 Oscillation Origin
- 5 Switch Model No.
- 6 Number of Switches
- 7 Option

1 Model No.

Code	Content
RV3SH	Single Vane Type, Low Oil Pressure Type
RV3DH	Double Vane Type, Low Oil Pressure Type

2 Nominal Size

Code	Content	Model No.	
		RV3SH	RV3DH
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m
800		102 N·m	206 N·m

3 Oscillation Angle

Code	Content	Model No.	
		RV3SH	RV3DH
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
280	280° (With switch cannot be manufactured for type with shock absorber)	●	

4 Oscillation Origin

Code	Contents
40	40°
45	45°

Note: Refer to the table below for the relationship between oscillation angle and oscillation origin.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin	
	40°	45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

5 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
 1 m M2V □
 3 m M2V □
 5 m M2V □

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

6 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

7 Option

Code	Content	Model No.								
		RV3SH				RV3DH				
		Nominal Size								
		50	150	300	800	50	150	300	800	
Blank	No option	●	●	●	●	●	●	●	●	
*1 FA	With Flange Bracket	●	●			●	●			
*1 LS	With Foot Bracket	●	●	●	●	●	●	●	●	
*2 *3 C	With Shock absorber	●	●	●	●	●	●	●	●	

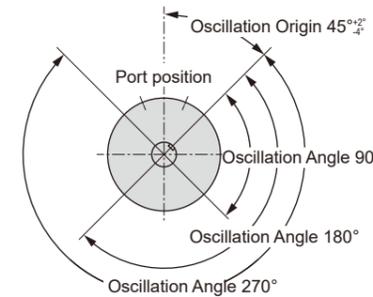
*1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1332.

*2: Refer to P. 1350 for details on Shock Absorbers (C).

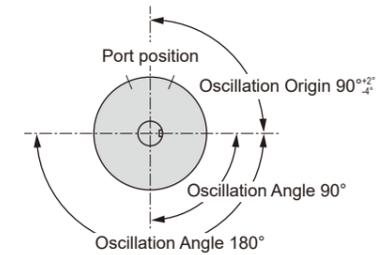
*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

Oscillation Origin Position

- Oscillation Origin 45°
RV3^S1 to 30



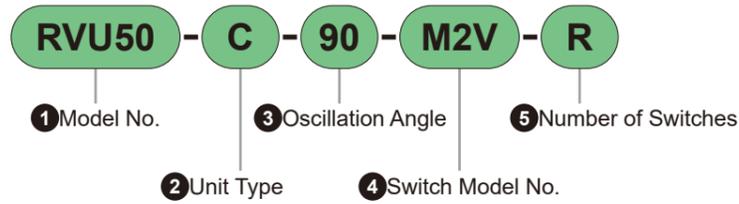
- Oscillation Origin 90°
RV3S1 to 20



*1: The tolerance of the oscillation origin is based on the mounting screw position.

*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

Switch Unit Model No. Notation



1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

Specifications

Item	RV3SH/RV3DH			
	50	150	300	800
Size	Hydraulic Operating Fluid			
Operating Fluid	Hydraulic Operating Fluid			
Max Operating Pressure MPa	1.0			
Min Operating Pressure MPa	0.2 *1			
Proof Pressure MPa	1.5			
Ambient Temperature °C	5 to 60			

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.
*2: Use hydraulic fluid of JIS turbine oil class 1 ISO VG32 or equivalent viscosity for lubricant. However, note that some are inapplicable with flame-resistant hydraulic oil. Hydraulic fluid of viscosity 40 mm²/s (40 cSt) is recommended at working oil temperature. For oil, use Fuji Kosan FUCHS Hydrol x22 or equivalent oils such as Mitsubishi Diamond Powerful Fluid 18, Showa Shell Tellus Oil 22, Esso Univas J26, Mobil Mobil DTE22, Cosmo Hydro HV22, Nisseki Mitsubishi Highland Wide 22, Idemitsu Daphne Super Hydro 22WR.

*3: For information about weight, refer to P. 1327 on the weight of the standard large rotary actuator with a vane mechanism.

*4: Refer to P. 1359 for switch specifications.

Min Oscillation Time

Unit: S

Item		RV3□H50	RV3□H150	RV3□H300	RV3□H800	Number of Vanes
Oscillation Angle	90°	0.3	0.4	0.4	0.7	Single Vane
	180°	0.5	0.7	0.7	1.3	
	270°	0.7	0.9	1.0	1.8	
	90°	0.6	1.3	1.9	2.4	Double Vane
	100°	0.7	1.4	2.1	2.6	

Structure

●Basic structure is exactly the same as for pneumatic use.

Item		RV3□H50	RV3□H150	RV3□H300	RV3□H800
Port Size		Rc1/8	Rc1/4	Rc3/8	Rc1/2
Orifice diameter	Low Oil Pressure Specification	ø7	ø9.5	ø13	ø16
	For Pneumatic Use	ø2.8	ø4	ø4.5	ø6

Note: In the case of double vane, the orifice diameter of the shaft cannot be changed, so it is the same as for pneumatic use.

●Internal Volume

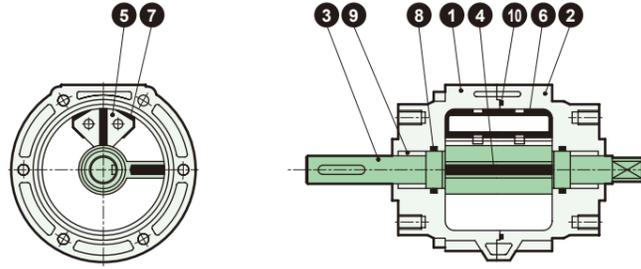
Model No.	Selex Rotary					Port Size
	Volumetric capacity (cm ³)					
	90°	100°	180°	270°	280°	
RV3SH50	51	-	51	61	62	Rc1/8
RV3DH50	42	43	-	-	-	
RV3SH150	146	-	146	179	185	Rc1/4
RV3DH150	127	123	-	-	-	
RV3SH300	244	-	283	352	365	Rc3/8
RV3DH300	244	271	-	-	-	
RV3SH800	754	—	869	1036	1046	Rc1/2
RV3DH800	754	754	—	-	—	

Dimensional Drawings

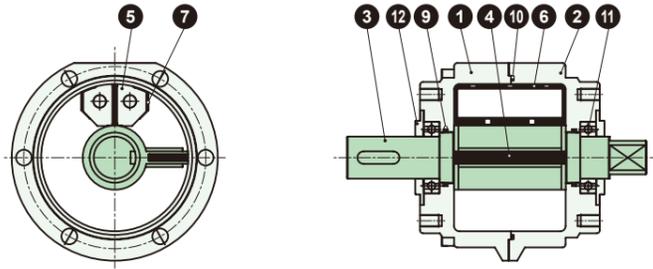
Same as Large Selex Rotary Vane Type, Standard Type RV3^S Series. Please refer to P. 1330.

Internal Structure Diagram/Material

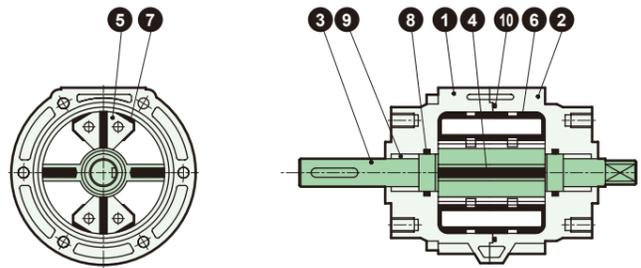
●RV3SH50, 150, 300



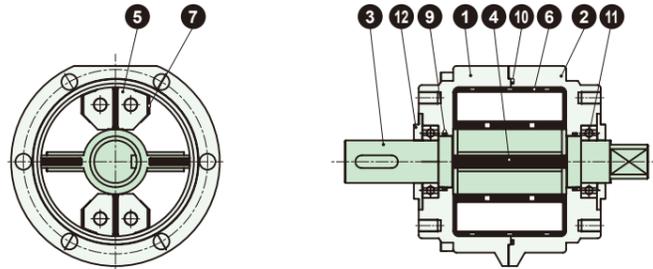
●RV3SH800



●RV3DH50, 150, 300



●RV3DH800



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body A	Aluminum Alloy		7	Damper	Urethane Rubber	
2	Body B	Aluminum Alloy		8	O-ring	Nitrile Rubber	
3	Vane Shaft	Steel		9	Bearing	Oil-Impregnated Bearing Alloy	
4	Vane Seal, Vane Shaft	Nitrile Rubber		10	O-ring	Nitrile Rubber	
5	Shoe	Zinc Alloy		11	Bearing	Steel	
6	Shoe Seal	Nitrile Rubber		12	Cover Plate	Steel	

*1: Vane seal and vane shaft are integrated.

*2: For the consumable parts list, refer to P. 1362.

Mounting Type Material

Mounting Style	Material	Remarks
Flange (FA)	Steel	Zinc Chromate
Foot (LS)	50, 150: Steel 300, 800: Cast Iron	Zinc Chromate

MEMO

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

Cylinder Switch

Ending

Cylinder Switch

Ending



Shock Absorber RVC Series

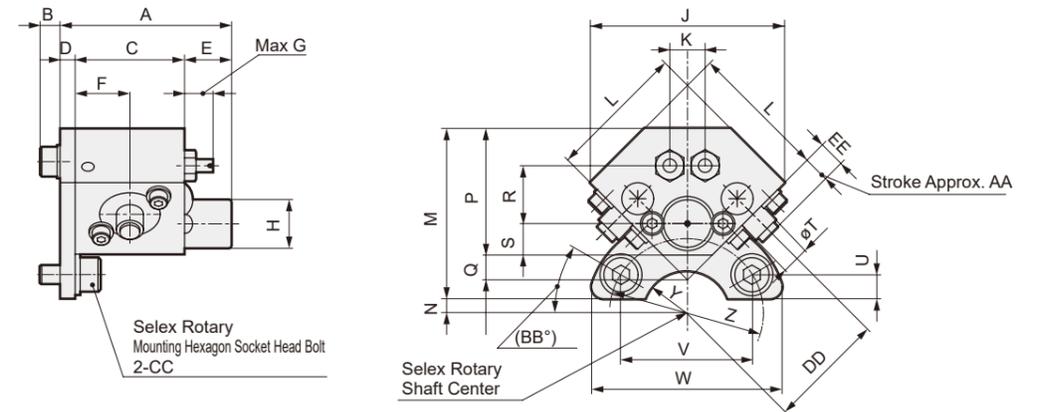
- Torque Size: 50, 150, 300, 800
- Absorption Energy: 2.9, 9.8, 19.6, 58.8J



Outline Dimension Drawing (RVC50, 150, 300)

(Unit: mm)

- RVC50, 150, 300



Model No. Notation

- Body

RVC50

1 Model No.

1 Model No.

Code	Applicable Selex Rotary
RVC50	RV3□50
RVC150	RV3□150
RVC300	RV3□300
*1 RVC800	RV3□800 (Without Switch)

*1: The shock absorber for RV3*800 (with switch) is the following model number.
For oscillation origin 40°: RVU800-A1-C-40
For oscillation origin 45°: RVU800-A1-C-45

- Pawl for shock absorber

RVC50 - 90 - T

1 Model No. 2 Oscillation Angle 3 Parts (Lever)

1 Model No.

Code	Applicable Selex Rotary
RVC50	RV3□50
RVC150	RV3□150
RVC300	RV3□300
RVC800	RV3□800

2 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

3 Parts (Lever)

Code	Content
T	Shock Absorber Lever

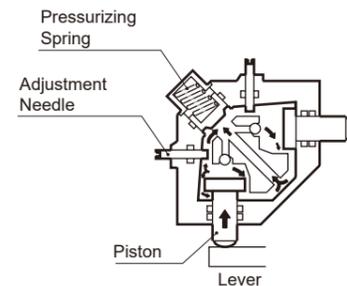
Specifications

Item	RVC			
	50	150	300	800
Size	50	150	300	800
Load Range kg/m ²	0.098	0.294	0.588	1.961
Allowable Absorbed Energy J	2.9	9.8	19.6	58.8
Max Impact Angular Velocity rad/s	14.8	13.0	11.3	9.6
Max Energy Capacity per Minute *1 J/min	20	72	140	350
Ambient Temperature °C	5 to 50			
Absorption Angle (One Side) rad	0.19	0.20	0.24	0.26
Weight kg	0.24	0.42	0.78	1.62
Lever Weight kg	90°	0.07	0.15	0.36
	100°	0.07	0.14	0.35
	180°	0.07	0.15	0.37
	270°	0.05	0.11	0.28
	280°	0.05	0.10	0.25 (36 psi)

*1: Energy capacity per minute = Absorption energy × n times/min n: Number of times lever hits cushion piston
*2: When using with shock absorber, ensure Selex Rotary Operating Pressure is 0.3 MPa or more.

Operational Principle

When the lever included with the Selex Rotary shaft collides with the piston, it is converted into pressure (hydraulic pressure) on the back of the piston. This pressure energy becomes thermal energy when passing through the clearance between the piston and cylinder bore and the adjustment needle part, is radiated from the main body surface to the atmosphere, and is consumed before the piston stops at the stroke end. The piston on the opposite side is pressurized by the spring force and always returns to the origin.



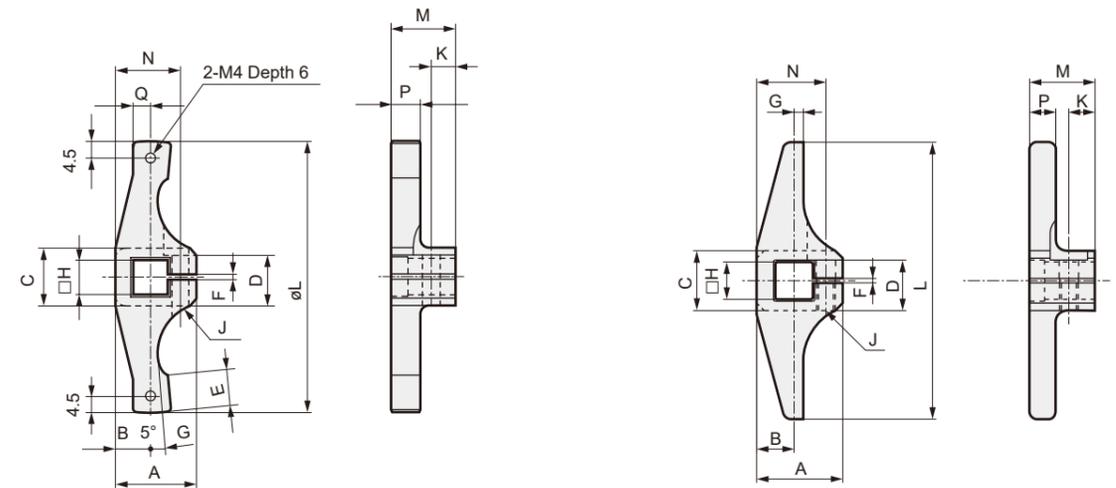
About Impact Energy

- Determine the moment of inertia from the load size and check if it is within the load range.
 $\omega_0 \approx 1.2\omega$
 ω_0 : Impact Angular Velocity (rad/s)
 ω : Average angular speed (rad/s)
- Determine the impact energy from the load and impact angular velocity.
 $E_1 = 1/2 I \omega_0^2$
I: Moment of Inertia (kg·m²)
 ω_0 : Impact Angular Velocity (rad/s)
- Determine the energy due to the torque of the Selex Rotary.
 $E_2 = 1/2 T \theta$
T: Selex Rotary Torque (N·m)
 θ : Shock Absorber Absorption Angle (One Side) (rad)
- Confirm that $E_1 + E_2$ is less than or equal to the Max absorption energy.
- Determine the energy per minute from the frequency.
 $E_m = (E_1 + E_2) \times n$
n: Cushion Piston No. of times jaws contact.
Confirm that E_m is less than or equal to the Max energy capacity per minute.

Shock Absorber Lever Outline Dimension Drawing

- For 90° Oscillation Angle (Oscillation Origin 45°)

- For 100° Oscillation Angle (Oscillation Origin 40°)



Material: S50C equivalent

Code Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
RVC50-90-T	23	10	16	13.7	10	1.2	2.5	10	M5	7	76	18	18.5	8	5
RVC150-90-T	28	12	24	19.5	12	1.2	3.9	13	M6	7.5	102	20	23	10	5
RVC300-90-T	40	18	35	30.5	14	1.2	5.4	19	M8	9	136	23.5	33.5	12	9

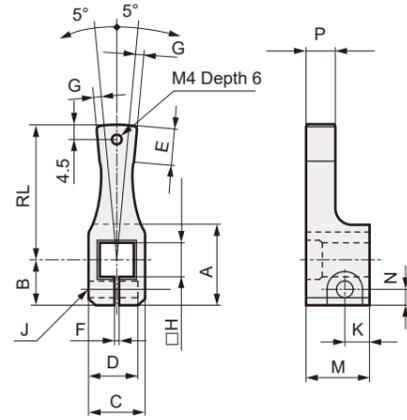
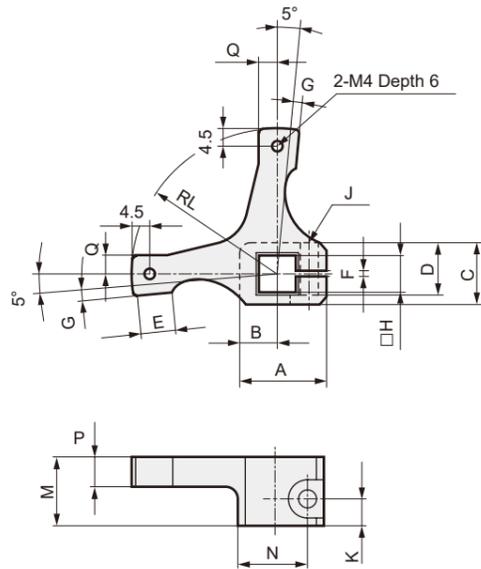
Material: S50C equivalent

Code Model No.	A	B	C	D	F	G	H	J	K	L	M	N	P
RVC50-100-T	23	10	16	13.5	1.2	2.5	10	M5	7	74	17.5	18.5	7
RVC150-100-T	28	12	24	19.5	1.2	4	13	M6	9	102	20	23	10
RVC300-100-T	40	18	35	30.5	1.2	5.5	19	M8	11	136	23.5	33.5	12

Shock Absorber Lever Outline Dimension Drawing (RVC50, 150, 300)

● For 180° Oscillation Angle (Oscillation Origin 45°)

● For 270° Oscillation Angle (Oscillation Origin 45°)



Material: Steel

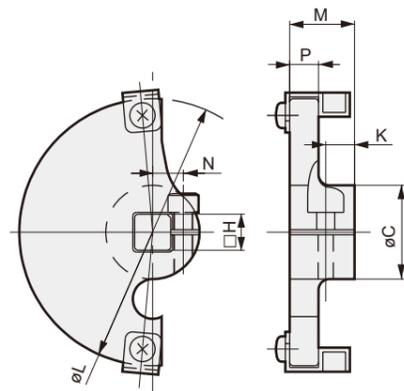
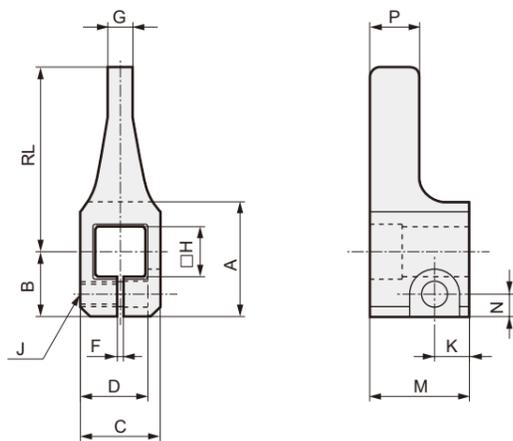
Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
RVC50-180-T	23	10	16	13.7	10	1.2	2.5	10	M5	7	38	18	18.5	8	5
RVC150-180-T	28	12	24	19.5	12	1.2	3.9	13	M6	9	51	20	23	10	5
RVC300-180-T	40	18	35	30.5	14	1.2	5.4	19	M8	11	68	23.5	33.5	12	9

Material: Steel

Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RVC50-270-T	23	13	16	13.7	10	1.2	2.6	10	M5	7	38	18	4.5	8
RVC150-270-T	28	16	24	19.5	12	1.2	4	13	M6	9	51	20	5	10
RVC300-270-T	40	22	35	30.5	14	1.2	5.5	19	M8	11	68	23.5	6.5	12

● For 280° Oscillation Angle (Oscillation Origin 40°)

● For 100° Oscillation Angle (With Magnet)



Material: Steel

Code	A	B	C	D	F	G	H	J	K	L	M	N	P
RVC50-280-T	23	13	16	13.5	1.2	5	10	M5	7	37	20	4.5	10
RVC150-280-T	28	16	24	19.5	1.2	8	13	M6	9	51	20	5	10
RVC300-280-T	40	22	35	30.5	1.2	11	19	M8	11	68	24	6.5	12.5

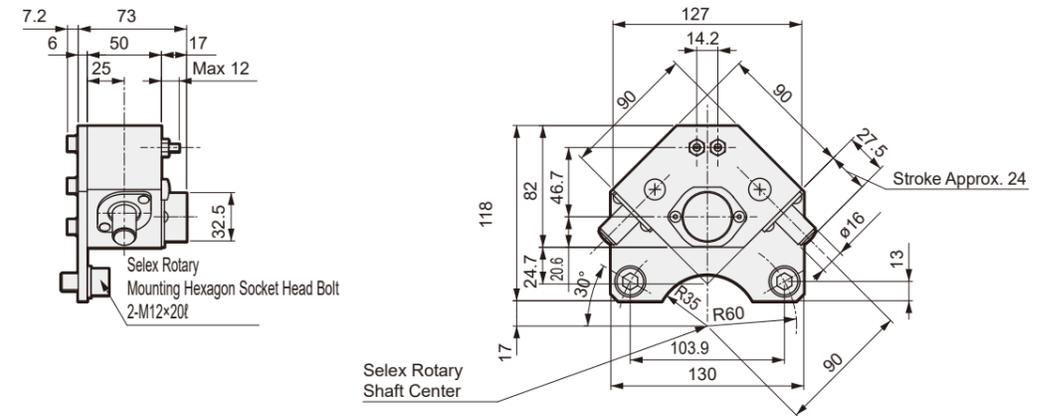
Material: Steel

Code	C	H	K	L	M	N	P
RVU50-100-A1-C	26	10	8	74	18	8.5	8
RVU150-100-A1-C	32	13	9	102	20	11	10
RVU300-100-A1-C	48	19	11	136	23.5	15	12

Note: Refer to P. 1363, 1364 for model No. of small parts with switch, valve, or Shock Absorbers, etc.

Outline Dimension Drawing (RVC800)

● RVC800

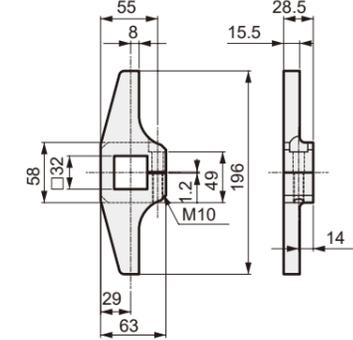
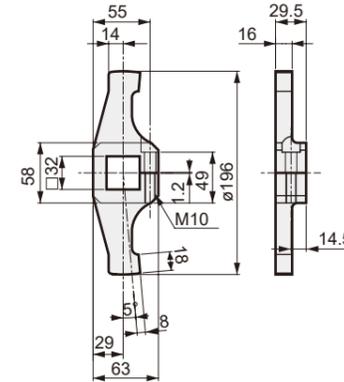


Note: Large Selex Rotary Vane Type Refer to P. 1330, 1331 for dimensions when equipped with RV3.

Shock Absorber Lever Outline Dimension Drawing (RVC800)

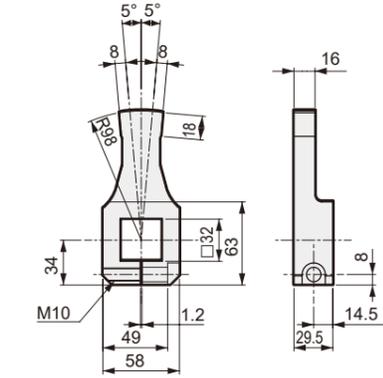
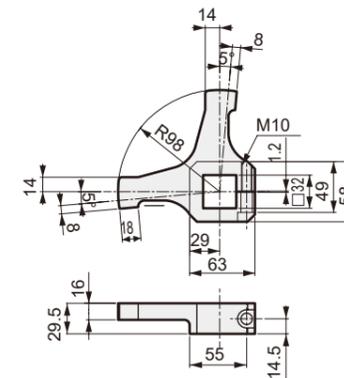
● For 90° Oscillation Angle (Oscillation Origin 45°)

● For 100° Oscillation Angle (Oscillation Origin 40°)



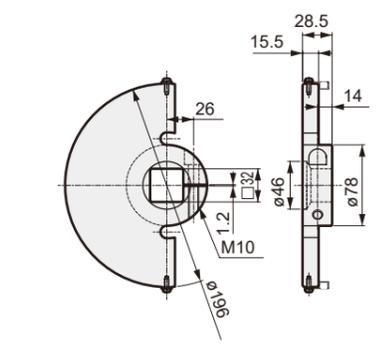
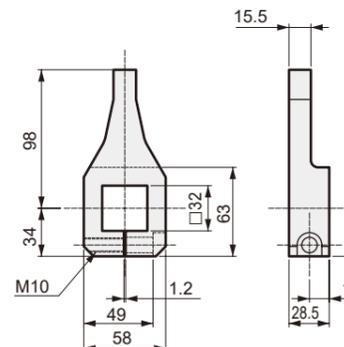
● For 180° Oscillation Angle (Oscillation Origin 45°)

● For 270° Oscillation Angle (Oscillation Origin 45°)



● For 280° Oscillation Angle (Oscillation Origin 40°)

● Oscillating angle 100° (with magnet)



Swing/Rotary Type

RRC

GRC

RV3

Swing/Rotary Type

RRC

GRC

RV3

Cylinder Switch

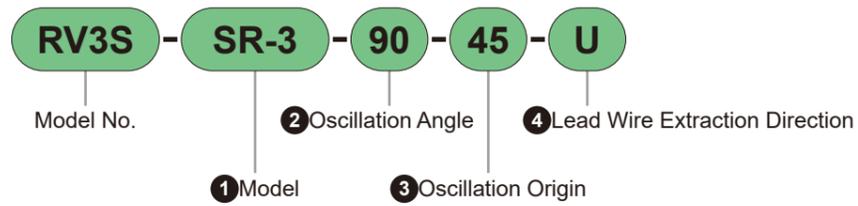
Ending

Cylinder Switch

Ending

Model No. Notation

● Switch Unit



1 Model

Code	Content
SR-3	Applicable Actuator: RV3 ^S _D 3
SR-10	Applicable Actuator: RV3 ^S _D 10
SR-20	Applicable Actuator: RV3 ^S _D 20
SR-30	Applicable Actuator: RV3 ^S _D 30

2 Oscillation Angle

Code	Content
90	90°
180	180°
270	270°

3 Oscillation Origin

Code	Content
45	45°
90	90°

*1 For oscillation origin "90", SR-30 cannot be selected.

4 Lead Wire Extraction Direction

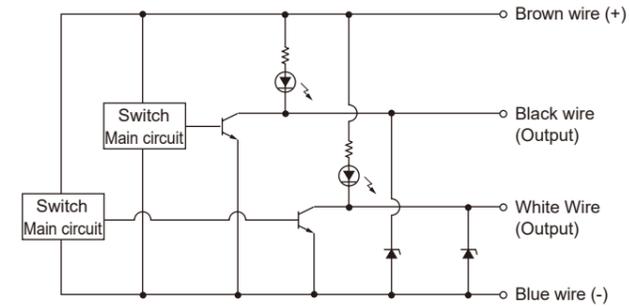
Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Switch Unit Compact Type Standard/with valve Specifications

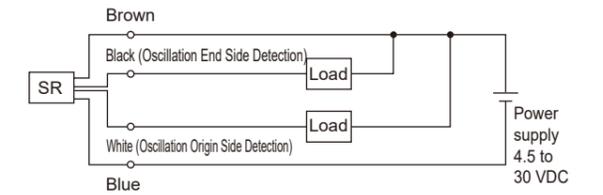
Item	Solid state switch
	SR-□(-U)
Applications	For Programmable Controller, Relay, IC Circuit, Compact Solenoid Valve
Power supply voltage	5 to 30 VDC
Load Voltage/Current	5 to 30 VDC, 200 mA or less
Current consumption	20 mA or less at 24 VDC
Internal voltage drop	1.5 V or less
Indicator LED	LED (Lights up when ON)
Leakage current	10 μA or less
Lead Wire Length	1 m (oil resistant vinyl cabtyre cable 4-conductor 0.2 mm ²)
Shock Resistance	490 m/s ²
Insulation resistance	100 MΩ or more at 500 V Megger
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute
Ambient Temperature	5 to 60°C
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)

* mark indicates the size of the Selex Rotary. (3, 10, 20)

Switch internal circuit diagram

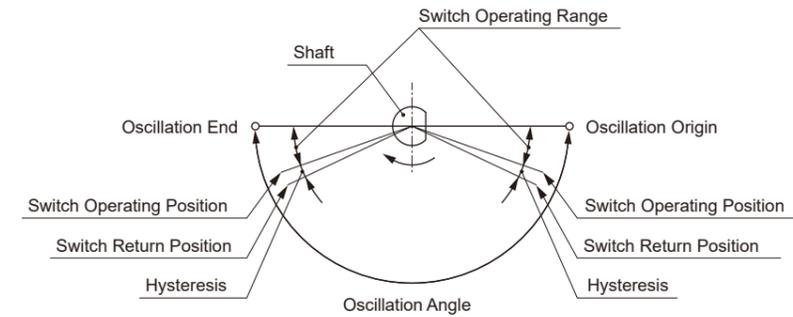


Switch Wiring Procedure



Note: Use the same power supply for the switch and the load.

Switch Hysteresis and Operating Range



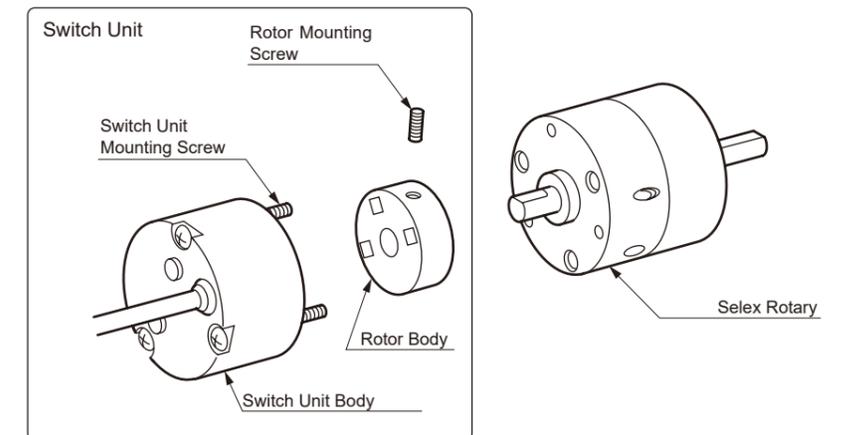
Selex Rotary Body	Operating Range	Hysteresis
RV3 ^S _D -3	15°±7°	3° or less
RV3 ^S _D -10		
RV3 ^S _D -20		

Since the switch is fixed, position adjustment is not possible.

Switch Unit Parts Configuration

Parts Configuration

- Rotor Mounting Screw
- Rotor Body
- Switch Unit Mounting Screw
- Switch Unit Body



*By attaching a switch unit to a Selex Rotary without a switch, it becomes a Selex Rotary with a switch. RV3S1 with switch cannot be manufactured.

Swing/Rotary Type

Swing/Rotary Type

RRC

RRC

GRC

GRC

RV3□

RV3□

Cylinder Switch

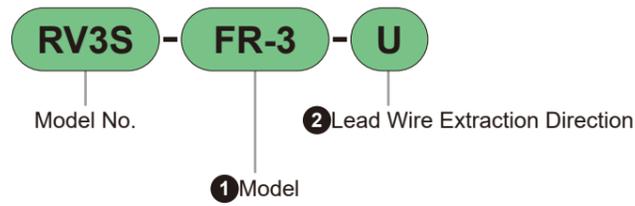
Cylinder Switch

Ending

Ending

Model No. Notation

● Switch Unit



① Model

Code	Content
FR-3	Applicable Actuator: RV3 [□] A3
FR-10	Applicable Actuator: RV3 [□] A10
FR-20	Applicable Actuator: RV3 [□] A20
FR-30	Applicable Actuator: RV3 [□] A30

② Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Switch Unit Compact Type Oscillation Angle Variable specifications

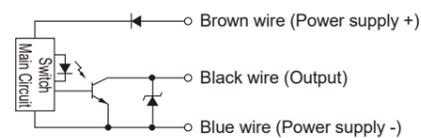
Item	Solid state switch	
	FR-□(-U)	
Applications	Programmable Controller, Relay, IC Circuit	
Power supply voltage	5 to 30 VDC	
Load voltage	5 to 30 VDC	
Load current	5 to 200 mA	
Current consumption	20 mA or less at 24 VDC, 10 mA or less at 12 VDC, 4 mA or less at 5 VDC	
Internal voltage drop	1.5 V or less	
Indicator LED	LED (Lights up when ON)	
Leakage current	10 μA or less	
Lead Wire Length	1.0 m (Oil-resistant black 3-core cord)	
Shock Resistance	490m/s ²	
Insulation resistance	100 MΩ or more at 500 V Megger	
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute	
Ambient Temperature	5 to 60°C	
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)	

* mark indicates the size of the Selex Rotary. (3, 10, 20, 30)

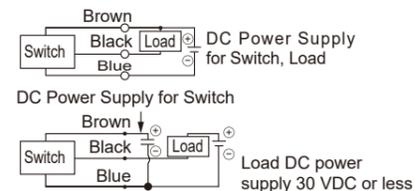
Switch Hysteresis and Operating Range

Switch Type	Operating Range	Hysteresis
CT-3	23° ±7°	Approx. 2°

Switch internal circuit diagram



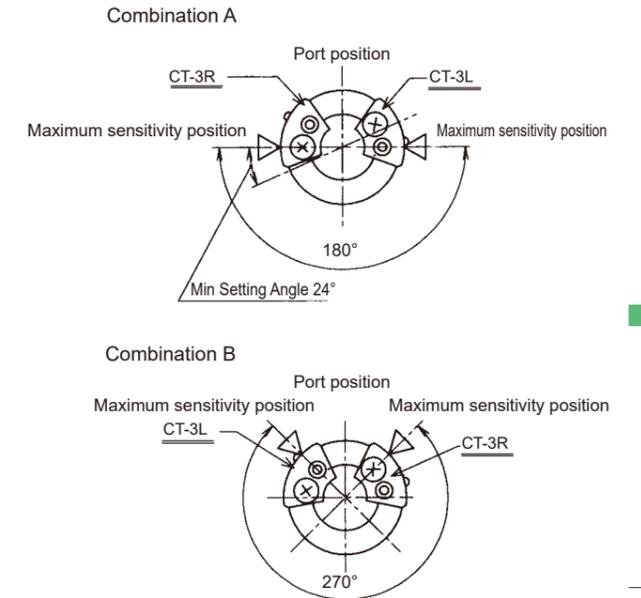
Switch Wiring Procedure



Oscillation Angle and Switch Mounting Position

● When ordering variable oscillation angle type RV3□A series with switch, the switch unit will be shipped included. Install the angle setting stopper to the set angle, and after adjustment, install the switch according to the combination in the table below.

Oscillation Angle	Switch Combination
30° to 186°	Combination A
187° to 270°	Combination B



Switch Unit Assembly and Switch Adjustment Method

● Mounting of Switch Unit Body

Mount to the Selex Rotary body with the switch case mounting screws. Refer to the table below for tightening torque.

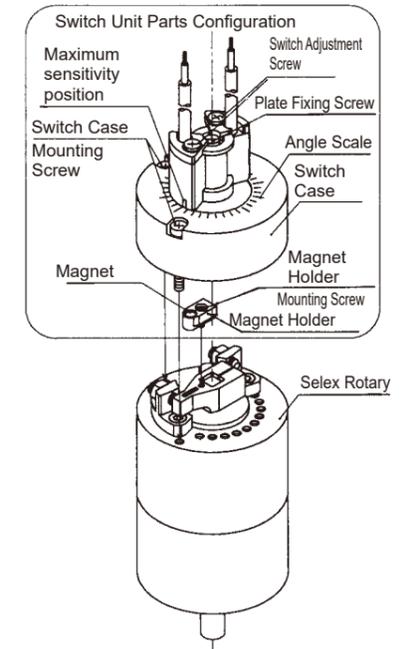
Model No.	Tightening Torque (N·m)
For RV3 [□] A3	0.06 to 0.2
For RV3 [□] A10	0.1 to 0.2
For RV3 [□] A20	0.2 to 0.3
For RV3 [□] A30	

● Switch Position Adjustment

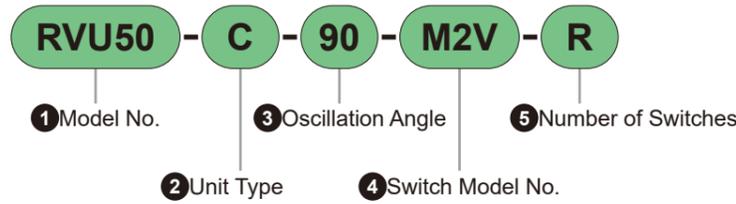
Loosen the switch adjustment screw, align the switch's Max sensitivity position with the angle scale corresponding to the Selex Rotary's set angle, and fix it. Tighten with a torque of 40 to 50 N·cm. The angle scale is a guideline, so check the LED lighting and perform final adjustment.

● Replacement of switch

Remove the switch adjustment screw and plate fixing screw to replace the switch. When fixing, tighten with 40 to 50 N·cm. Assemble in reverse order of removal, and be sure to adjust the switch position.



Switch Unit Model No. Notation



1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1
			AC	DC	AC	DC	L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M2V□
3 m M2V□₃
5 m M2V□₅

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

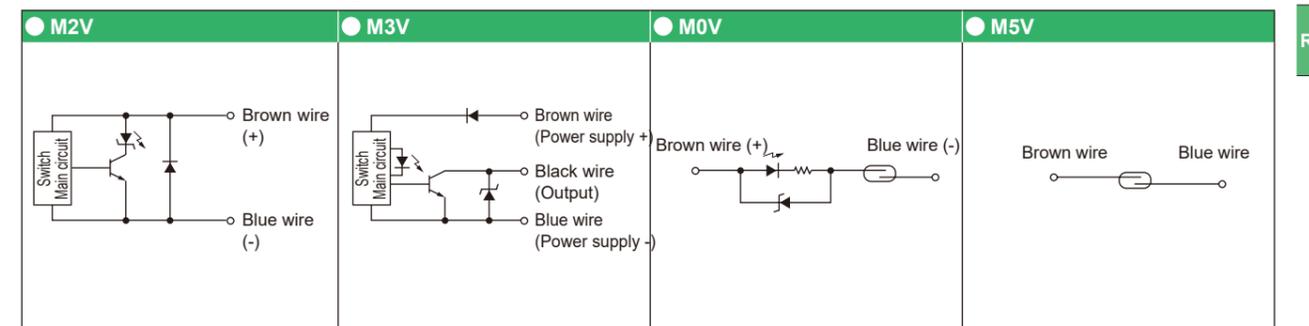
5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

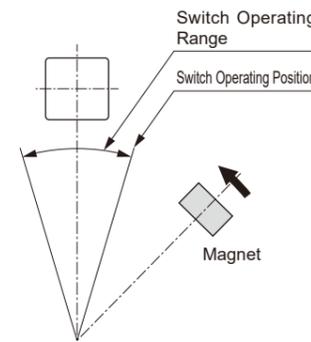
Switch Specifications

Item	Solid state 2-wire type	Solid state 3-wire type	Reed 2-wire type			
	M2V	M3V	M0V		M5V	
Applications	PLC Dedicated	For programmable controller, relay, IC circuit, small solenoid valve	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Output Method	—	NPN output	—			
Power supply voltage	—	4.5 to 28 VDC	—			
Load voltage	10 to 30 VDC	30 VDC or less	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 30 mA	100 mA or less	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	—	10 mA or less at 24 VDC	—			
Internal voltage drop	4 V or less	0.5 V or less	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)	
Indicator LED	Red LED (Lights up when ON)		Red LED (Lights up when ON)		No Indicator LED	
Leakage current	1 mA or less	10 μA or less	0 mA			
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm ²)	1 m (Oil-resistant vinyl cabtyre tire cable 3-conductor 0.15 mm ²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm ²)			
Shock Resistance	980m/s ²		294 m/s ²			
Insulation resistance	100 MΩ or more with 500 VDC megger					
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute					
Ambient Temperature	-10 to +60°C					
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)					
Contact protection circuit	—		None			
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g					

Switch internal circuit diagram

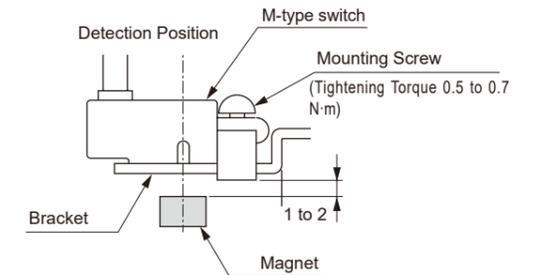


Switch Operating Range



Switch Adjustment Method

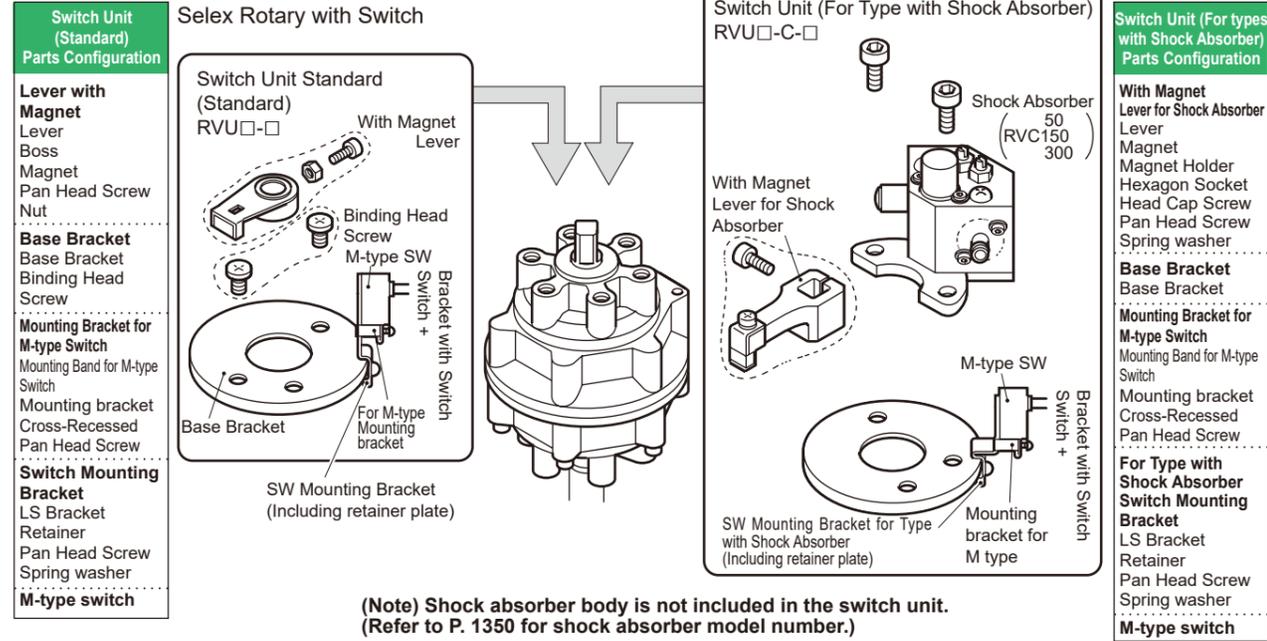
When retrofitting the switch unit, if the gap between the switch and magnet is not within the dimensions shown in the figure below, slightly bend the bracket to adjust.



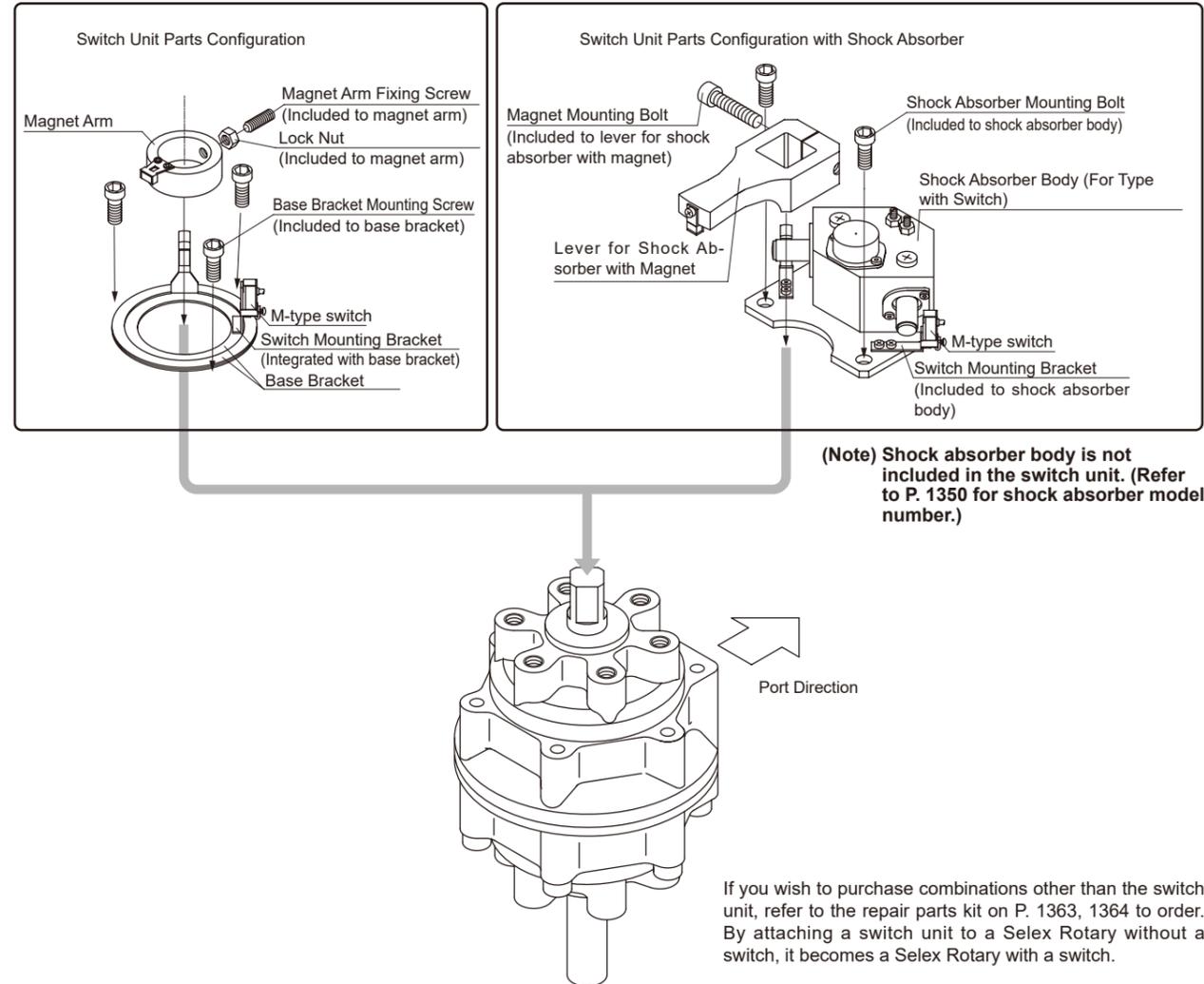
Item	Operating Range	
	M2V, M3V	M0V, M5V
RV3S50, RV3D50	Approx. 40°	Approx. 25°
RV3S150, RV3D150	Approx. 25°	Approx. 15°
RV3S300, RV3D300	Approx. 25°	Approx. 15°
RV3S800, RV3D800	Approx. 25°	Approx. 15°

Switch Unit Parts Configuration

●RVU50, 150, 300



●RVU800



If you wish to purchase combinations other than the switch unit, refer to the repair parts kit on P. 1363, 1364 to order. By attaching a switch unit to a Selex Rotary without a switch, it becomes a Selex Rotary with a switch.

Replacement Parts List

● Compact Selex Rotary

Part No./Part Name	Part No.	3	1	8
Model	Kit No.	Vane Shaft	Shoe Seal	O-ring (2 pcs. each)
RV3S1	RV3S1-K	Approx. 10	Approx. 10	ø1×ø3.8 (W×ID)
RV3S3	RV3S3-K	Approx. 14	Approx. 14	ø1.42×ø6.8
RV3S10	RV3S10-K	Approx. 26	Approx. 26	ø1.5×ø8
RV3S20	RV3S20-K	Approx. 32	Approx. 32	ø2×ø10.5
RV3S30	RV3S30-K	Approx. 36	Approx. 36	P-14
RV3D1	RV3D1-K	Approx. 10	Approx. 10	ø1×ø3.8 (W×ID)
RV3D3	RV3D3-K	Approx. 14	Approx. 14	ø1.42×ø6.8
RV3D10	RV3D10-K	Approx. 26	Approx. 26	ø1.5×ø8
RV3D20	RV3D20-K	Approx. 32	Approx. 32	ø2×ø10.5
RV3D30	RV3D30-K	Approx. 36	Approx. 36	P-14

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

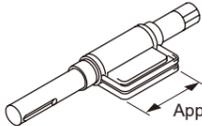
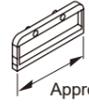
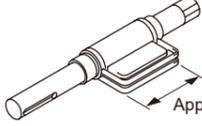
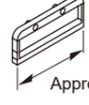
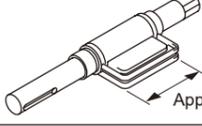
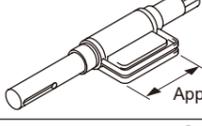
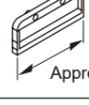
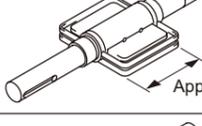
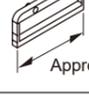
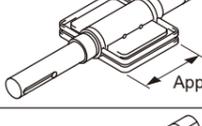
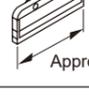
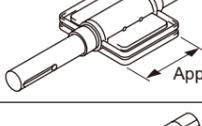
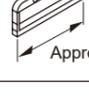
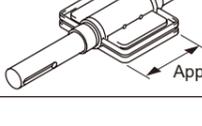
Cylinder Switch

Ending

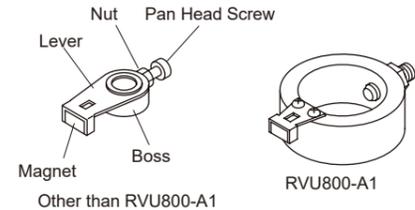
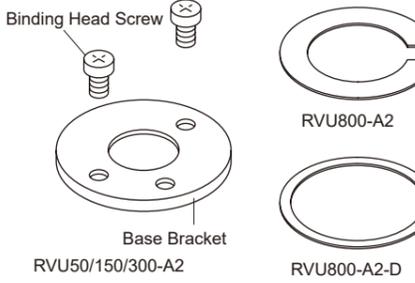
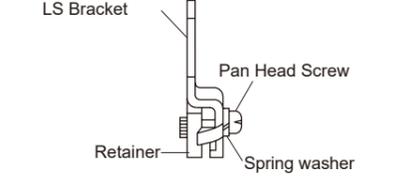
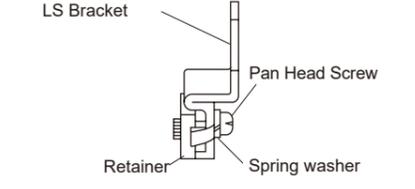
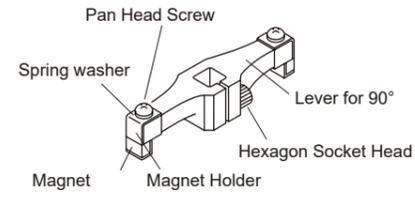
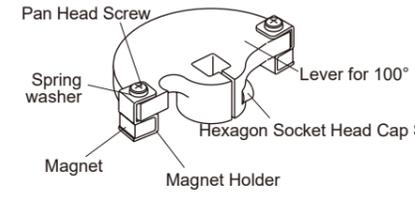
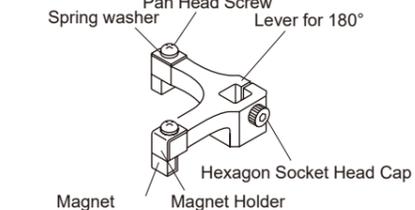
Cylinder Switch

Ending

● Large Selex Rotary

Part No./Part Name	Part No.	4	6	8	10
Model	Kit No.	Vane Shaft	Shoe Seal	O-ring (2 pcs. each)	O-ring
RV3S50	RVS50-K	 Approx. 46	 Approx. 46	P-16	ø1.8×ø56.2
RV3S150	RVS150-K	 Approx. 60	 Approx. 60	P-22	ø1.9×ø82
RV3S300	RVS300-K	 Approx. 71	 Approx. 71	P-31	ø3×ø105
RV3S800	RVS800-K	 Approx. 107	 Approx. 107	P-48	ø3.1×ø150
RV3D50	RVD50-K	 Approx. 46	 Approx. 46	P-16	ø1.8×ø56.2
RV3D150	RVD150-K	 Approx. 60	 Approx. 60	P-22	ø1.9×ø82
RV3D300	RVD300-K	 Approx. 71	 Approx. 71	P-31	ø3×ø105
RV3D800	RVD800-K	 Approx. 107	 Approx. 107	P-48	ø3.1×ø150

Repair Parts Kit

Part Name	Kit Number	Appearance	Part name	Quantity
Lever with Magnet	● RVU50-A1 RVU150-A1 RVU300-A1 RVU800-A1		Lever Boss Magnet Pan Head Screw Nut	1 1 1 1 1
Base Bracket	● RVU50-A2 RVU150-A2 RVU300-A2 RVU800-A2 *1 RVU800-A2-D *2 *1 For type with 1 switch *2 For the second switch of type with 2 switches Refer to P. 1360 for configuration with switch.		Base Bracket Binding Head Screw	1 2 *3 *3 RVU800-A2 is 3 pcs. RVU800-A2-D is None
Switch Mounting Bracket	● RVU50-A3 RVU150-A3 RVU300-A3		LS Bracket Retainer Pan Head Screw Spring washer	1 1 1 1
Switch Mounting Bracket for Type with Shock Absorber	● RVU50-A3-C RVU150-A3-C RVU300-A3-C RVU800-A3-C		LS Bracket Retainer Pan Head Screw Spring washer	1 1 1 1
Jaw with magnet for shock absorber (Outline Dimensions Refer to P. 1352 for types without switch.)	● RVU50-90-A1-C RVU150-90-A1-C RVU300-90-A1-C RVU800-90-A1-C		Lever for 90° Magnet Holder Magnet Spring washer Pan Head Screw Hexagon Socket Head Cap Screw	
	● RVU50-100-A1-C RVU150-100-A1-C RVU300-100-A1-C RVU800-100-A1-C		Lever for 100° Magnet Holder Magnet Spring washer Pan Head Screw Hexagon Socket Head Cap Screw	1 2 2 1 2 2
	● RVU50-180-A1-C RVU150-180-A1-C RVU300-180-A1-C RVU800-180-A1-C		Lever for 180° Magnet Holder Magnet Spring washer Pan Head Screw Hexagon Socket Head Cap Screw	

Swing/Rotary Type

RRC

GRC

RV3 □

Swing/Rotary Type

RRC

GRC

RV3 □

Cylinder Switch

Ending

Cylinder Switch

Ending

STEP 2 Confirmation of Oscillation Time

If the oscillation time is set outside the specification range, the actuator operation may become unstable or cause damage to the actuator. Be sure to use within the specified oscillation time adjustment range.

Compact Selex Rotary (s)				Large Selex Rotary (s)					
Model No.	Oscillation Angle			Model No.	Oscillation Angle				
	90°	180°	270°		90°	100°	180°	270°	280°
RV3 ^S ₁	0.03 to 0.6	0.06 to 1.2	0.09 to 1.8	RV3 ^S _D 50	0.08 to 0.8	0.09 to 0.9	0.16 to 1.6	0.24 to 2.4	0.25 to 2.5
RV3 ^S ₃	0.04 to 0.8	0.08 to 1.6	0.12 to 2.4	RV3 ^S _D 150	0.12 to 1.2	0.13 to 1.3	0.24 to 2.4	0.36 to 3.6	0.37 to 3.7
RV3 ^S ₁₀	0.045 to 0.9	0.09 to 1.8	0.135 to 2.7	RV3 ^S _D 300	0.16 to 1.6	0.17 to 1.7	0.32 to 3.2	0.48 to 4.8	0.49 to 4.9
RV3 ^S ₂₀	0.05 to 1.0	0.10 to 2	0.15 to 3	RV3□800	0.22 to 2.2	0.24 to 2.4	0.44 to 4.4	0.66 to 6.6	0.68 to 6.8
RV3 ^S ₃₀	0.07 to 0.7	0.14 to 1.4	0.21 to 2.1						

*For oscillation time of variable angle type, refer to P. 1316

STEP 3 Confirmation of Allowable Energy

For inertial load, if the kinetic energy of the load at the oscillation end exceeds the allowable value, it will cause damage to the actuator. Calculate the energy below and select so that it is within the allowable value. If the energy is too large, use a shock absorber, etc., to absorb the energy.

$$E = (1/2) \times I \times \omega_0^2 \times 10^3$$

$$\omega_0 \approx 1.2 \times \omega$$

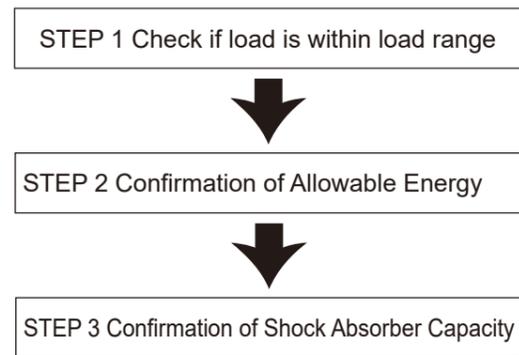
$$\omega = \theta / t$$

E : Kinetic Energy (mJ)
I : Moment of Inertia (kg·m²)
ω₀ : Colliding angular speed (rad/s)
ω : Average angular velocity (rad/s)
θ : Oscillating angle (rad)
t : Oscillation Time (s)

Calculation of Resistive Torque	Horizontal Load	Vertical load
Required	<p>With Resistive Load</p>	<p>With Resistive Load</p>
Not Required	<p>Without Resistive Load</p>	<p>Without Resistive Load</p>

Calculate the moment of inertia using the diagram for calculating moment of inertia on P. 1368.

Selection Method for Rotary Shock Absorber



STEP 1 Load Confirmation

Confirm that the load size is below the load range (refer to RVC specifications section).

STEP 2 Confirmation of Allowable Energy

Determine the kinetic energy of the load, and if its value exceeds the allowable energy of the Selex Rotary, install a shock absorber suitable for that Selex Rotary. For kinetic energy of the load, refer to Selex Rotary Selection Method STEP 3.

STEP 3 Confirmation of Shock Absorber Capacity

If the impact energy of the load at the oscillation end exceeds the allowable value, it will cause damage to the shock absorber. Calculate the energy below and select so that it is within the allowable value. If the energy is too large, consider a separate shock absorbing device with a large absorption capacity.

$$E = E_1 + E_2$$

$$E_1 = (1/2) \times I \times \omega_0^2$$

$$\omega_0 \approx 1.2 \times \omega$$

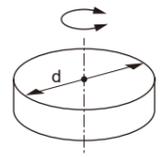
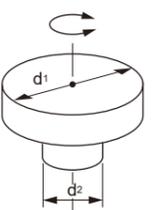
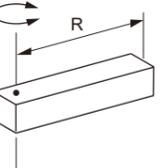
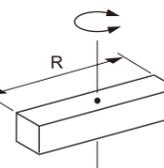
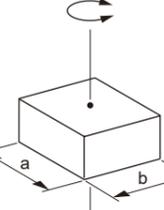
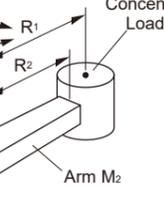
$$\omega = \theta / t$$

$$E_2 = (1/2) \times T \times \theta'$$

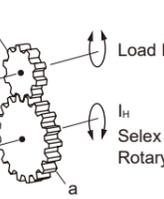
$$E_m = E \times n$$

E : Collision energy (J)
E₁ : Kinetic energy (J)
E₂ : Thrust energy (J)
ω₀ : Colliding angular speed (rad/s)
ω : Average angular velocity (rad/s)
I : Moment of Inertia (kg·m²)
θ : Oscillating angle (rad)
θ' : Shock Absorber Absorbing angle (rad)
t : Oscillation Time (s)
T : Selex Rotary Torque (N·m)
E_m : Energy per minute (J/min)
n : Operating Frequency times/min

Calculation of Moment of Inertia

Shape	Diagram	Required Items	Moment of Inertia I kg·m ²	Radius of gyration K ₁ ²	Remarks
Disk		<ul style="list-style-type: none"> ● Diameter d (m) ● Weight M (kg) 	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$	<ul style="list-style-type: none"> ● No particular mounting direction ● Consider separately when used by sliding
Stepped disk		<ul style="list-style-type: none"> ● Diameter d₁(m) ● Diameter d₂ (m) ● Weight d₁ section M₁ (kg) ● d₂ part M₂(kg) 	$I = \frac{1}{8}(M_1d_1^2 + M_2d_2^2)$	$\frac{d_1^2 + d_2^2}{8}$	<ul style="list-style-type: none"> ● If d₂ part is very small compared to d₁ part, it can be ignored
Rod (center of rotation is at the end)		<ul style="list-style-type: none"> ● Bar length R(m) ● Weight M (kg) 	$I = \frac{MR^2}{3}$	$\frac{R^2}{3}$	<ul style="list-style-type: none"> ● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Rod (center of rotation is at the center of gravity)		<ul style="list-style-type: none"> ● Bar length R(m) ● Weight M (kg) 	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$	<ul style="list-style-type: none"> ● No particular mounting direction
Rectangular / Method / Parallelepiped		<ul style="list-style-type: none"> ● Side length a (m) ● Side length b (m) ● Weight M (kg) 	$I = \frac{M}{12}(a^2 + b^2)$	$\frac{a^2 + b^2}{12}$	<ul style="list-style-type: none"> ● No particular mounting direction ● Consider separately when used by sliding
Concentrated load		<ul style="list-style-type: none"> ● Shape of concentrated load ● Length to center of gravity of concentrated load R₁ ● Arm Length R₂ (m) ● Weight of Concentrated Load M₁ (kg) ● Weight of Arm M₂ (kg) 	$I = M_1(R_1^2 + k_1^2) + \frac{M_2R_2^2}{3}$	k ₁ ² is calculated based on the shape of the concentrated load	<ul style="list-style-type: none"> ● Mounting direction is horizontal ● If M₂ is very small compared to M₁, calculate with M₂ = 0

Method of converting load J_L around the Selex Rotary shaft when mediated by gears

Gear		<ul style="list-style-type: none"> ● Gear Selex Rotary Side (Number of Teeth) a ● Load Side (Number of Teeth) b ● Inertia of Load Moment N·m 	<p>Moment of Inertia of Load around Selex Rotary Shaft</p> $I_H = \left(\frac{a}{b}\right)^2 I_L$	<ul style="list-style-type: none"> ● If the shape of the gear is large, it is necessary to consider the moment of inertia of the gear.
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MEMO

Swing/Rotary Type

RRC

GRC

RV3□

Swing/Rotary Type

RRC

GRC

RV3□

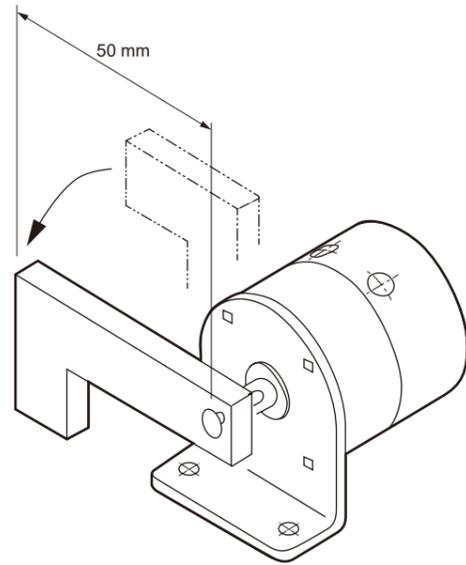
Cylinder Switch

Ending

Cylinder Switch

Ending

Selection Example 1 For Clamping



[Operating Conditions]	
Pressure:	0.5 MPa
Oscillation Angle	90°
Oscillation Time	0.3 s
Clamp Lever Weight	0.1 kg
Clamping Force	20 N
Clamp Position	50 mm

STEP 1 Size (Torque) Selection

Since it is a static load, calculate the required torque.

F_s = clamping force: 20 N
 R = Clamp position: 0.050 m

$$T_s = 20 \times 0.05 = 1.0 \text{ N}\cdot\text{m}$$

Temporarily select RV3S20-90 based on required torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.3 seconds for 90°, while the oscillation time adjustment range for RV3S20-90 is 0.05 to 1.0, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value.

Calculate the moment of inertia I of the clamp lever.

[Rod (Center of Rotation at End)]
 $I = M \times R^2 / 3 = 0.1 \times 0.05^2 / 3$
 $= 0.0000833 \text{ kg}\cdot\text{m}^2$

Calculate the impact angular velocity ω_0 .

$\theta = 90^\circ = \pi/2 \text{ (rad)}$
 $t = 0.3 \text{ s}$
 $\omega = \theta/t = (\pi/2)/0.3 = 5.236 \text{ (rad/s)}$
 $\omega_0 = 1.2 \times \omega = 6.283 \text{ (rad/s)}$

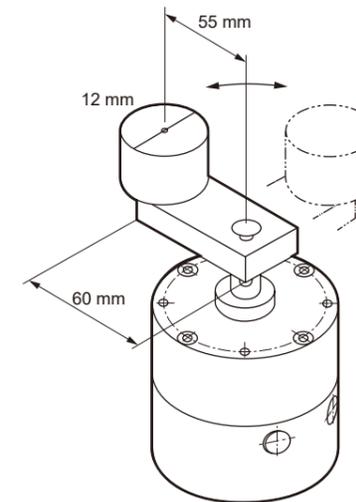
Therefore, the kinetic energy (E) is

$$E = (1/2) \times 8.33 \times 10^{-5} \times 6.283^2 \times 10^3$$

$$= 1.64 \text{ (mJ)}$$

Since the allowable energy is satisfied, RV3S20-90 can be selected.

Selection Example 2 When there is a disk-shaped load at the tip of the rod



[Operating Conditions]	
Pressure:	0.5 MPa
Oscillation Angle	90°
Oscillation Time	0.2 s
Rod Length	60 mm
Rod Weight	0.1 kg
Distance to Disk	55 mm
Disk Diameter	12 mm
Disk Weight	0.12 kg

STEP 1 Size (Torque) Selection

Since it is an inertial load, calculate the moment of inertia.

$$I = M_1 (R^2 + K_1^2) + M_2 R^2 / 3$$

$$= 0.12 \times (0.055^2 + (0.012^2/8)) + 0.1 \times 0.06^2 / 3$$

$$= 4.85 \times 10^{-4}$$

Next, calculate the angular acceleration ω .

From the conditions
 $\theta = 90^\circ = \pi/2 \text{ (rad)}$
 $t = 0.2 \text{ s}$
 $\omega = \theta/t^2 = (\pi/2)/0.2^2$
 $= 39.27 \text{ (rad/s}^2\text{)}$

Therefore, the inertial torque (T_A) is
 $T_A = I \times \omega = 4.85 \times 10^{-4} \times 39.27$
 $= 0.095 \text{ (N}\cdot\text{m)}$

Temporarily select RV3S3-90 based on inertial torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.2 seconds for 90°, while the oscillation time adjustment range for RV3S3-90 is 0.04 to 0.8, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value.

Calculate the impact angular velocity ω_0 from the conditions.

$\theta = 90^\circ = \pi/2 \text{ (rad)}$
 $t = 0.2 \text{ s}$
 $\omega = \theta/t = (\pi/2)/0.2$
 $= 7.854 \text{ (rad/s)}$
 $\omega_0 = 1.2 \times \omega = 1.2 \times 7.854 = 9.425 \text{ (rad/s)}$

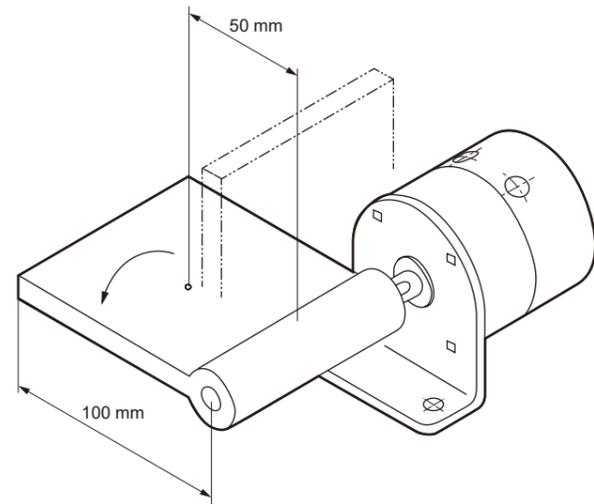
Therefore, the kinetic energy (E) is

$$E = (1/2) \times 4.85 \times 10^{-4} \times 9.425^2 \times 10^3$$

$$= 21.54 \text{ (mJ)}$$

Since the allowable energy is exceeded, select RV3S50 which is within the allowable range, or an external shock absorbing device must be installed.

Selection Example 3 When the rotating shaft is horizontal and there is a plate-shaped load



[Operating Conditions]
 Pressure: 0.5 MPa
 Oscillation Angle 90°
 Oscillation Time 0.15 s
 Plate Length 100 mm
 Plate Weight 1.5 kg
 Distance to Center of Gravity 50 mm
 Operating Frequency 5 times/min

STEP 1 Size (Torque) Selection

Calculate the resistive torque (TR) and inertial torque (TA) for resistive load due to gravity and inertial load.

[Resistive Torque]
 Resistive torque changes with rotation, so calculate the Max value.
 Resistor torque changes with rotation, so calculate the Max value.

$F_R = \text{gravity} = 1.5 \times 9.8 = 14.7 \text{ N}$
 $R = \text{distance to center of gravity: } 0.050 \text{ m}$
 $T_R = 5 \times 14.7 \times 0.05 = 3.675 \text{ N}\cdot\text{m} \text{ ①}$

[Inertial Torque]
 Rod (center of rotation is at the end)
 $I = 1.5 \times 0.1^2/3 = 0.005 \text{ (kg}\cdot\text{m}^2)$
 From the conditions
 $\theta = 90^\circ = \pi/2 \text{ (rad)}$
 $t = 0.15 \text{ s}$
 $\omega = \theta/t^2 = (\pi/2)/0.15^2 = 69.8 \text{ (rad/s}^2)$
 Therefore, the inertial torque (TA) is
 $T_A = 5 \times 0.005 \times 69.8 = 1.745 \text{ (N}\cdot\text{m)} \text{ ②}$
 Summing the resistive torque and inertial torque
 $T = T_R + T_A = 3.675 + 1.745 = 5.420 \text{ (N}\cdot\text{m)}$

Temporarily select RV3S150-90 based on required torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.15 seconds for 90°, while the oscillation time adjustment range for RV3S150-90 is 0.12 to 1.2, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value. Calculate the impact angular velocity from the conditions.

$\theta = 90^\circ = \pi/2 \text{ (rad)}$
 $t = 0.15 \text{ s}$
 $\omega = \theta/t = (\pi/2)/0.15 = 10.47 \text{ (rad/s)}$
 $\omega^0 = 1.2 \times \omega = 1.2 \times 10.47 = 12.57 \text{ (rad/s)}$
 Therefore, the kinetic energy (E) is
 $E = (1/2) \times 0.005 \times 12.57^2 \times 10^3 = 395 \text{ (mJ)}$

Consider shock absorber as allowable energy is exceeded

Shock Absorber Consideration

Shock Absorber STEP 1 Confirmation of Allowable Energy

Since the allowable energy of the Selex Rotary was exceeded, check the shock absorber capacity in the next STEP

Shock Absorber STEP 2 Confirmation of Shock Absorber Capacity

Impact Angular Velocity
 $\omega_0 = 12.6 \text{ (rad/S)}$
 Kinetic Energy
 $E1 = (1/2) \times 0.005 \times 12.6^2 = 0.395 \text{ (J)}$
 Torque of RV3S150 at 0.5 MPa: 14.7 (N·m)
 Shock absorber absorption angle: 0.2 (rad)
 Thrust Energy
 $E2 = (1/2) \times 14.7 \times 0.2 = 1.47 \text{ (J)}$
 Therefore, the impact energy (E) is
 $E = E1 + E2 = 0.395 + 1.47 = 1.86 \text{ (J)}$

Energy per minute (Em) is
 $E_m = 1.86 \times 5 = 9.32 \text{ (J)}$

Since all shock absorber specification values are satisfied, RV3S150 with shock absorber can be selected.

Swing/Rotary Type

Swing/Rotary Type

RRC

RRC

GRC

GRC

RV3□

RV3□

Cylinder Switch

Cylinder Switch

Ending

Ending



Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Selex Rotary Vane Type RV3 Series**Design / Selection****1. Common****Warning**

- Do not brake or hold the product by trapping it with pneumatic pressure.

If there is no external stopping device for the product, stopping midway by trapping air with a directional control valve may result in the inability to hold the stop position due to air leaks, etc., which may cause injury or damage to personnel, equipment, and devices.

- Consider load fluctuation, rising/lowering operation and changes in frictional resistance for safe design.

The operating speed of the rotary actuator will increase, which may cause damage to personnel or machinery.

- Do not use the rotary actuator as a shock absorbing structure. If abnormal pressure is applied or air leakage occurs, the deceleration effect will be significantly impaired, which may cause damage to personnel or machinery.

- Be sure to tighten very securely in order to prevent the fixed parts or connected sections from loosening.

When using a high rotor with high operating frequency or in places with much vibration, adopt a particularly secure fastening method.

- Rotary actuator modification
Do not modify the rotary actuator.

CAUTION

- Do not apply torque exceeding rated output to the product.

If an external force exceeding the rated output of the product is applied to the product, it will cause damage to the product.

- If repeatability is required for the oscillating angle, provide an external stopper to directly stop the load.

If stopped by the stopper provided on the rotary actuator, the oscillation angle may change from the initial setting.

- Always use the rotary actuator within the specified oscillation time range.

If used in a low-speed range below this range, it will not operate smoothly due to stick-slip phenomenon.

- Install a speed controller in order to control the oscillation speed of the rotary actuator.

Adjust gradually from the low speed side to the specified speed.

- Precautions for rotary actuator switch

Be careful about the proximity of rotary actuators to each other.

When using two or more rotary actuators with switches in close proximity, or when a magnetic body moves very close to a rotary actuator, the switches may malfunction due to mutual magnetic interference. Design so that the distance between rotary actuators is 40 mm or more. (If an allowable distance is indicated for each rotary actuator, follow it.)

At intermediate positions of the oscillation angle, pay attention to the switch ON time.

If the switch is set to an intermediate position of the oscillation angle and the load is driven when the magnet passes, be careful as if the oscillation speed is too high, the switch may turn ON, but the operating time may be short, and the load may not be able to complete its operation.

In that case, the oscillation speed will be:

$$V = \frac{\text{Switch Operating Range (°)}}{\text{Load Operating Time (ms)}} \times 1000 \text{ (°/s)}$$

- This rotary actuator is a no-lubrication actuator.

The actuator can be lubricated, but once it has been oiled, it must be maintained in an lubricated state. Lubrication may cause the pre-applied lubricant to be washed away, and interruption may lead to malfunction. When lubricating, use turbine oil Class 1 (non-additive) ISO VG32. Never use other oils (spindle oil, machine oil, etc.). Use will damage the seal part. Recommended lubricants are shown in the table below. Please refer to the weight listed in the switch specifications.

Manufacturer	Name
Idemitsu Kosan Co.,Ltd.	Diana Fresia S-32
Fuji Kosan Co., Ltd.	FUCHS Turbine 32
Mitsubishi Oil Co., Ltd.	Mitsubishi Turbine Oil 32
Showa Shell Sekiyu K.K.	Shell Vitrea 32
Mitsui & Co. Petroleum Ltd.	Mitsui Turbine Oil 32
Japan Energy Corporation	Turbine 32
Nippon Oil Corporation	Turbine Oil 32
Cosmo Oil Co., Ltd.	Cosmo Turbine 32
Esso Sekiyu K.K.	Stanol 43N
Kygnus Sekiyu K.K.	Turbine Oil 32

During Use**1. Common****CAUTION**

- Do not wipe items showing the model number, such as the nameplate, with organic solvents. This will cause the display to disappear.

2. Variable Oscillation Angle Type RV3^SA**Warning**

- Do not loosen the angle adjustment screws outside of the adjusting range for variable oscillation angle rotary actuators.

Loosening beyond the adjustment range may cause the angle adjustment screw to come off, which may cause injury or damage to personnel or machinery.

CAUTION

- Stopper
 - Operate the rotary actuator only after installing a stopper to serve both as a reference point stopper and angle setting device.
 - When the stopper is set to the oscillating origin or Max oscillating angle, if set to the positive side beyond the adjusting range, the vane could hit the internal stopper and cause damage. Always adjust the angle so that the jaw stops at the external stopper.
 - The reference point stopper is fixed in position and cannot be moved.
- The stopping angle is set by touching the fine adjusting screw of each stopper with the jaw. Stop angle accuracy does not include wear due to operation. If the stop angle changes due to wear, readjust with the fine adjustment screw.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → [Instruction Manual](#).