

Large Size 5 Port Solenoid Valve Rubber Seal

Series VP4 □ 50/4 □ 70

How to Order

VP4 **1** **5** **0** - **10** **1** **T** - □ - □

Series VP
5 port solenoid valve

Type of actuation

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center

Note) There is no 3 position type for Series "VP4□70".

Body style

5	3/4 Standard
7	1 1/4 Standard

Piping

0	Side ported
1*	Bottom ported
4	Without sub-plate

* Semi-standard

Port size

Symbol	Port size	Applicable valve model
00	Without sub-plate	VP4 □ 54 VP4 □ 74
03*	3/8 (10A)	VP4 □ 50
04	1/2 (15A)	
06	3/4 (20A)	
10*	1 (25A)	VP4 □ 70
12	1 1/4 (32A)	
14	1 1/2 (40A)	

* Only for the side ported type.

Thread type

NII	Rc
F	G
N	NPT
T	NPTF

Made to Order specifications
Refer to page 872.

NII	Standard
X23	With surge voltage suppressor
X40	External pilot

Electrical entry

G	Grommet
T	Conduit terminal
D	DIN terminal
TL*	Conduit terminal with indicator light
DL*	DIN terminal with indicator light

* Semi-standard

Rated voltage

1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

* Semi-standard

- SJ
- SY
- SY
- SV
- SYJ
- SZ
- VF
- VP4**
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQC4
- VQZ
- SQ
- VFS
- VFR
- VQ7

How to Order Pilot Valve Assembly

VT3112 - 00 **1** **G**

Rated voltage

1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

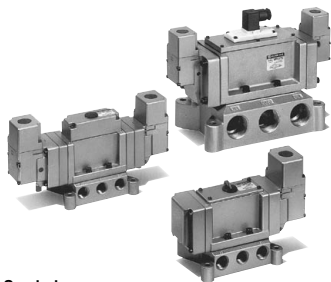
* Semi-standard

Electrical entry ^{Note)}

G	Grommet
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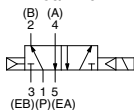
Note) Even if the electrical entry of the solenoid valve is "T", "D", "TL", or "DL", the electrical entry for pilot valve assembly is chosen for "G".

Series VP4□50/4□70

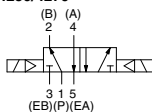


Symbol

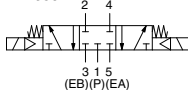
VP4150/4170



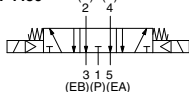
VP4250/4270



VP4350



VP4450



Made to Order Specifications
(For details, refer to page 872.)

Specifications

Fluid	Air
Operating pressure range (MPa)	0.2 to 0.9
Ambient and fluid temperature (°C)	0 to 60 (No freezing. Refer to page 5.)
Max. operating frequency (Hz)	3
Lubrication (1)	Required (Turbine oil Class 1 ISO VG32)
Manual override	Yes (Non-locking)
Mounting orientation	Unrestricted
Impact/Vibration resistance (m/s ²) (2)	150/50
Accessory (Standard equipment)	Silencer for pilot EXH ("AN101-01")

Note 1) This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32).
Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 1000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Solenoid Specifications

Electrical entry	Standard	Grommet (G) Conduit terminal (T) DIN terminal (D)
	Option	Conduit terminal with indicator light (TL) DIN terminal with indicator light (DL)
Coil rated voltage (V)	AC (50/60 Hz) DC	100, 200, 110*, 220*, 240* 12*, 24
Allowable voltage fluctuation		-15 to +10% of rated voltage
Apparent power (VA) (Note)	AC	Inrush 73 (50 Hz), 58 (60 Hz) Holding 28 (50 Hz), 17 (60 Hz)
Power consumption (W) (Note)	DC	12

* Semi-standard

Note) At rated voltage

Response Time (Note)

Model		VP4150	VP4170	VP4250	VP4270	VP4350	VP4450
Response time (ms) (at the pressure of 0.5 MPa)	AC	ON	30 or less	40 or less	30 or less	30 or less	30 or less
		OFF	50 or less	65 or less	30 or less	30 or less	30 or less
	DC	ON	40 or less	55 or less	40 or less	45 or less	40 or less
		OFF	40 or less	55 or less	40 or less	45 or less	30 or less

Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor.)

Flow Characteristics/Weight

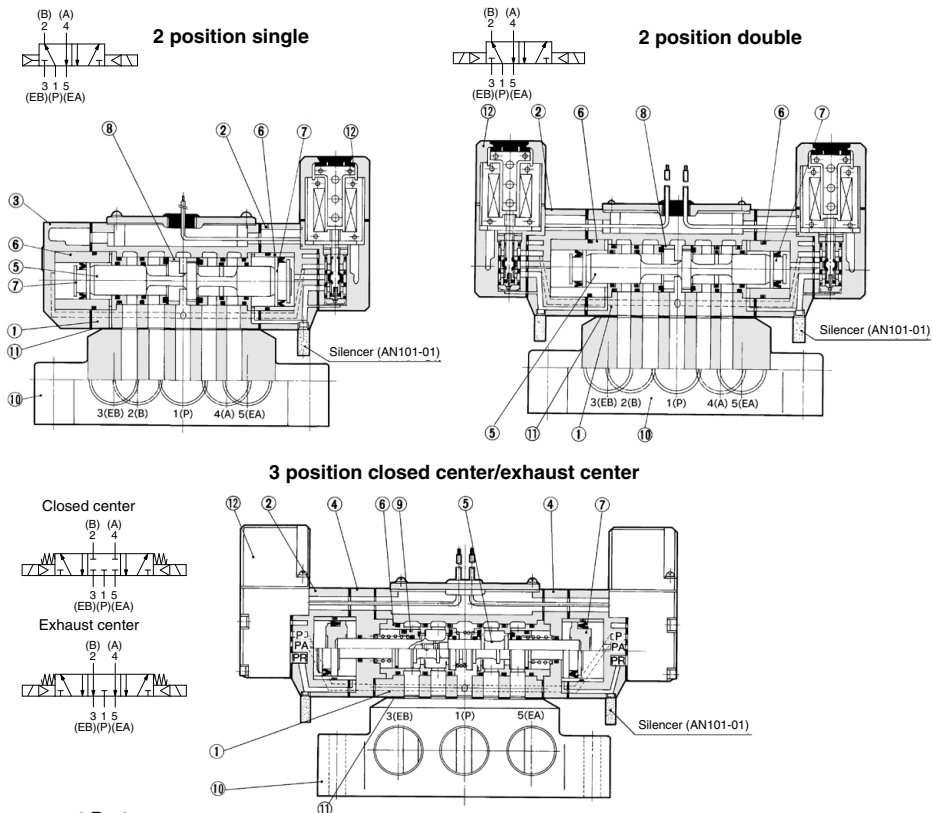
Type of actuation	Model	Port size	Flow characteristics						Weight (kg)	
			1 → 4/2(P → A/B)			4/2 → 5/3(A/B → EA/EB)				
			C [dm ³ /(s·bar)]	b	Cv	C [dm ³ /(s·bar)]	b	Cv		
2 position	Single	VP4150	3/8	15	0.22	3.6	16	0.33	4.5	2.5
			1/2	17	0.15	4.0	19	0.28	5.1	
			3/4	21	0.13	5.2	21	0.28	5.6	
	Double	VP4250	3/8	15	0.22	3.6	16	0.33	4.5	3.0
			1/2	17	0.15	4.0	19	0.28	5.1	
			3/4	21	0.13	5.2	21	0.28	5.6	
3 position	Closed center	VP4350	3/8	16	0.28	4.0	15	0.29	4.0	3.6
			1/2	18	0.27	4.7	18	0.23	4.5	
			3/4	22	0.19	5.3	20	0.23	5.0	
	Exhaust center	VP4450	3/8	16	0.28	3.9	16(15)	0.29(0.28)	4.2(4.0)	3.6
			1/2	18	0.24	4.5	19(16)	0.24(0.27)	4.8(4.5)	
			3/4	21	0.15	5.1	22(18)	0.23(0.30)	5.5(4.8)	

() : Denotes the normal position.

Type of actuation	Model	Port size	Effective area (mm ²)	Weight (kg)	
2 position	Single	VP4150	1	120	3.3
		VP4170	1 1/4	280	9.5
		VP4170	1 1/2	300	
	Double	VP4250	1	120	3.8
		VP4270	1 1/4	280	10
VP4270	1 1/2	300			
3 position	Closed center	VP4350	1	110	4.4
	Exhaust center	VP4450	1	110	4.4

Rubber Seal Large Size 5 Port Solenoid Valve *Series VP4* □ 50/4 □ 70

Construction



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Platinum silver
2	Plate	Aluminum alloy	Platinum silver
3	Cap	Aluminum alloy	Platinum silver
4	Spacer	Aluminum alloy	Platinum silver
5	Spool	Stainless steel/Aluminum alloy	
6	Sleeve	2 position: Aluminum alloy 3 position: Brass	
7	Piston	2 position: Resin 3 position: Stainless steel	
8	Center sleeve	Resin	
9	Side poppet	Brass, NBR	

Replacement Parts

No.	Description	Part no.	Note		
10	Sub-plate	AXT021-1-1-□	VP4□50	Aluminum alloy □ in part numbers are the same symbol for the thread type in "How to Order".	
		AXT021-1-2-□			1/2
		DXT131-15P-06□			3/4
		DXT131-15P-10□			1
		DXT132-15-2P-12□	VP4□70		1 1/4
		DXT132-15-2P-14□			1 1/2
11	Gasket	XT021-9	VP4□50	Thread for mounting valve. A spring washer will be required separately for VP4□70.	
		DXT132-16	VP4□70		
	Hexagon socket head screw	M6 x 25 with washer	VP4□50		
		M8 x 35	VP4□70		
12	Pilot valve assembly	VT3112-00□G	Refer to "How to Order Pilot Valve Assembly" on page 863.		

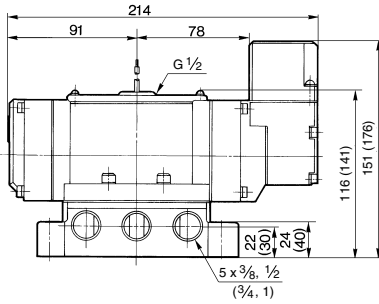
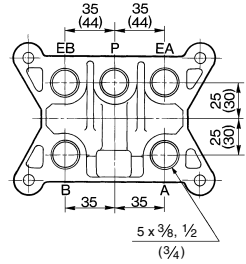
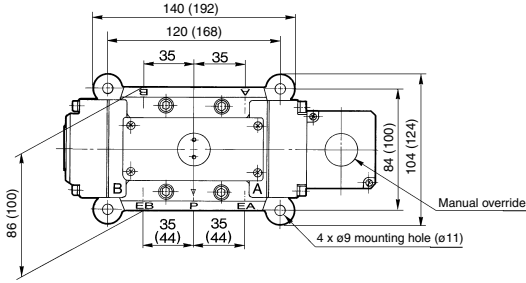
SJ
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SV
SYJ
SZ
VF
VP4
S0700
VQ
VQ4
VQ5
VQC
VQC4
VQZ
SQ
VFS
VFR
VQ7

Series VP4 □ 50/4 □ 70

Dimensions: VP4150

Grommet: VP4150-□□G-□

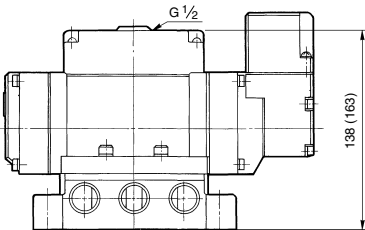
Bottom ported



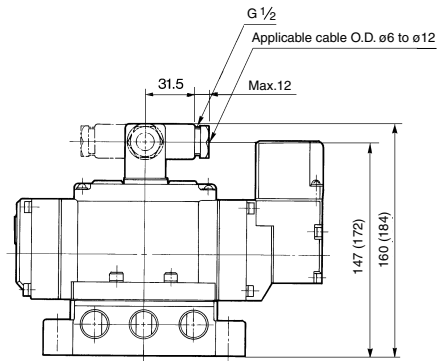
() : Rc 3/4, 1

Conduit terminal: VP4150-□□T-□

DIN terminal: VP4150-□□D-□



() : Rc 3/4, 1



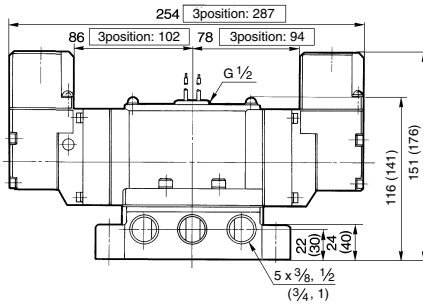
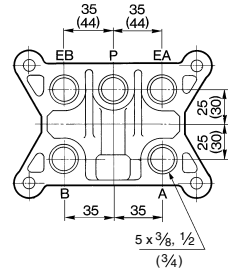
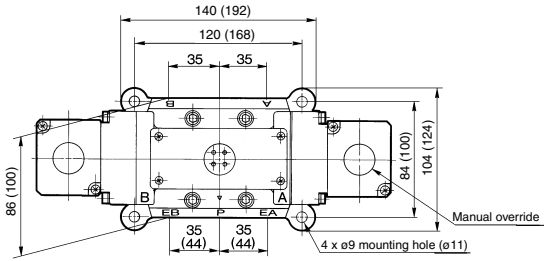
() : Rc 3/4, 1

Rubber Seal
Large Size 5 Port Solenoid Valve Series VP4 □ 50/4 □ 70

Dimensions: VP4250/4350/4450

Grommet: VP4250-□□G-□, VP4350-□□G-□
 VP4450-□□G-□

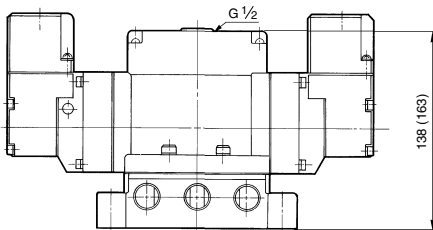
Bottom ported



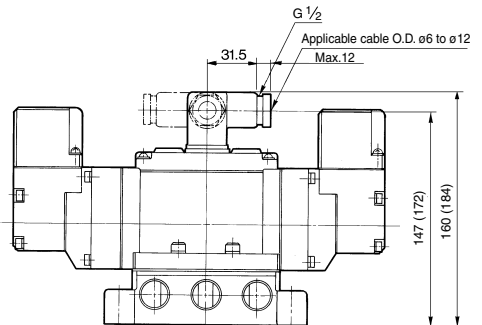
() : Rc 3/4, 1

Conduit terminal: VP4250-□□T-□
 VP4350-□□T-□
 VP4450-□□T-□

DIN terminal: VP4250-□□D-□
 VP4350-□□D-□
 VP4450-□□D-□



() : Rc 3/4, 1



() : Rc 3/4, 1

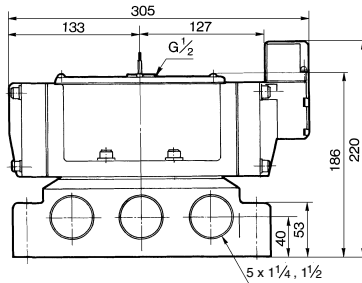
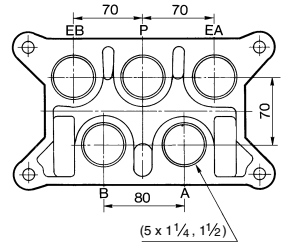
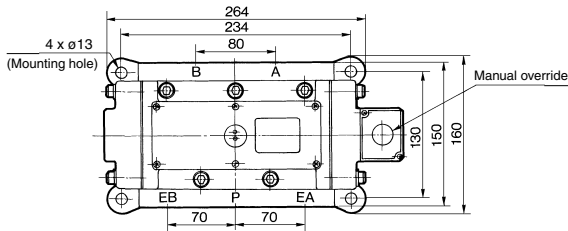
SJ
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SV
SYJ
SZ
VF
VP4
S0700
VQ
VQ4
VQ5
VQC
VQC4
VQZ
SQ
VFS
VFR
VQ7

Series VP4 □ 50/4 □ 70

Dimensions: VP4170

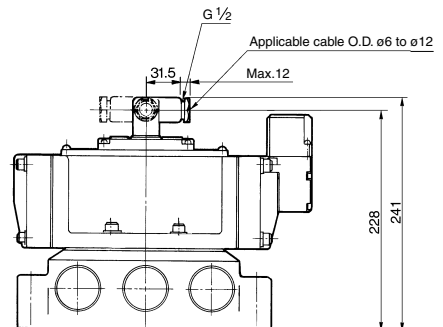
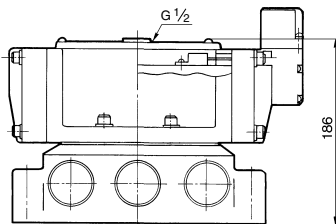
Grommet: VP4170- $\frac{12}{14}$ □ G-□

Bottom ported



Conduit terminal: VP4170- $\frac{12}{14}$ □ T-□

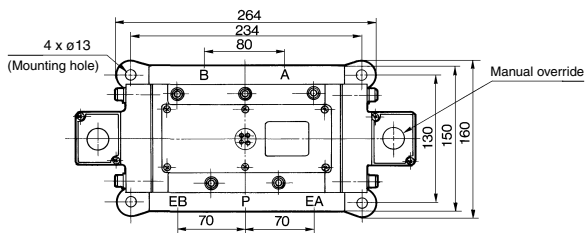
DIN terminal: VP4170- $\frac{12}{14}$ □ D-□



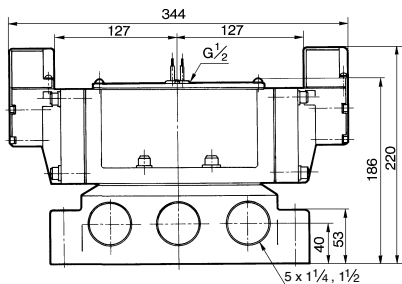
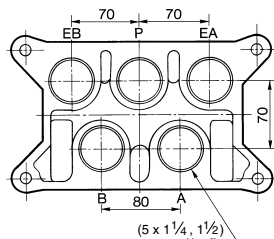
Rubber Seal
Large Size 5 Port Solenoid Valve **Series VP4** □ 50/4 □ 70

Dimensions: VP4270

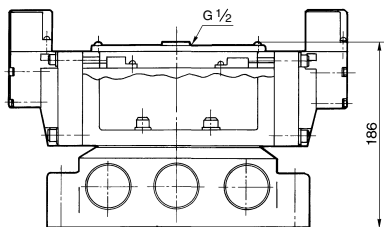
Grommet: VP4270- $\frac{12}{14}$ □ G-□



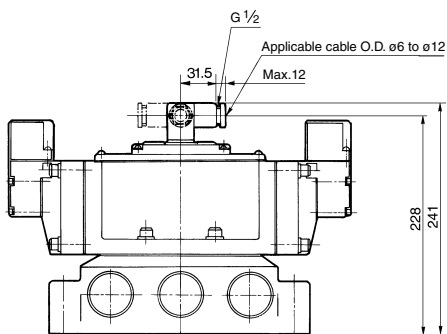
Bottom ported



Conduit terminal: VP4270- $\frac{12}{14}$ □ T-□



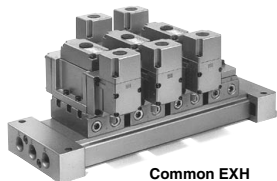
DIN terminal: VP4270- $\frac{12}{14}$ □ D-□



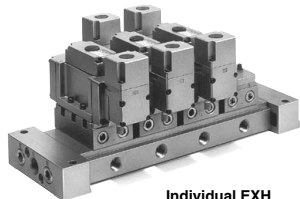
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S0700
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VFS
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VQ7

Series VP4□50

Manifold Specifications

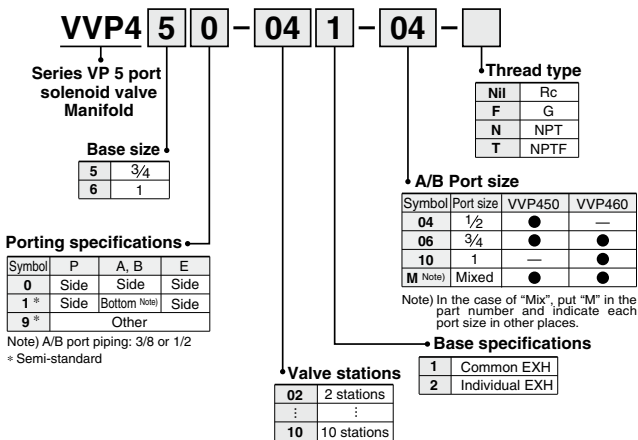


Common EXH



Individual EXH

How to Order



Precautions

No manifold is available for Series VP4□70.

How to Order Manifold Assembly

Specify the valves and blanking plate to be mounted on the manifold along with the manifold base model no.
<Example> Base (4 stations), Common EXH, 100 VAC, DIN terminal, A/B port: Rc 3/4
VVP460-041-06..... 1 pc.
*VP4154-001D..... 2 pcs.
*VP4254-001D..... 1 pc.
*XT038N-4A..... 1 pc.

↳ The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

Specifications

Manifold type	B mount
Exhaust type	Common EXH, Individual EXH ⁽¹⁾
Supply type	Common SUP
Valve stations	Max. 10 stations (VVP460: Max. 8 stations) ⁽²⁾

Note 1) If throttling exhaust air, use individual exhaust style so that backing pressure does not cause trouble.
Note 2) In the case of 4 stations or more, supply air pressure from both sides and exhaust from both sides.

Simultaneous Operation of Manifold Valves

Simultaneous operation of manifold valves can cause pressure drop.

Model

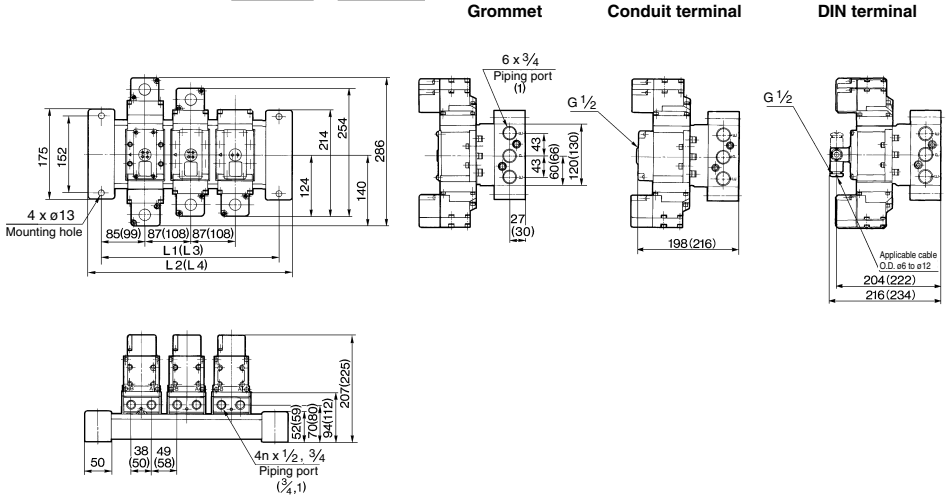
Series	Exhaust specifications	Port size			Applicable valve model
		P	A, B	E	
VVP450	Common	3/4	1/2, 3/4	3/4	VP4154-00□□ VP4254-00□□ VP4354-00□□ VP4454-00□□
	Individual				
VVP460	Common	1	3/4, 1	1	
	Individual				

Option

Blanking plate assembly	XT038N-4A	With gaskets and bolts
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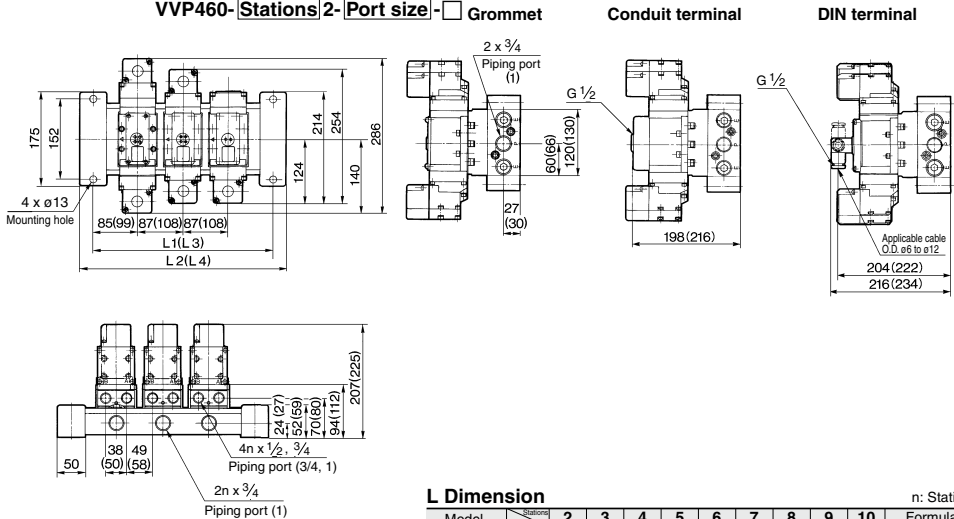
Dimensions: VVP450/460

Common EXH: VVP450- Stations 1- Port size - □
 VVP460- Stations 1- Port size - □



() : VVP460

Individual EXH: VVP450- Stations 2- Port size - □
 VVP460- Stations 2- Port size - □



() : VVP460

L Dimension

Model	Station	n: Station									
		2	3	4	5	6	7	8	9	10	Formula
VVP450	L ₁	257	344	431	518	605	692	779	866	953	L ₁ =87 x n+83
	L ₂	307	394	481	568	655	742	829	916	1003	L ₂ =87 x n+133
VVP460	L ₃	306	414	522	630	738	846	954	—	—	L ₃ =108 x n+90
	L ₄	356	464	572	680	788	896	1004	—	—	L ₄ =108 x n+140

- SJ
- SY
- SY
- SV
- SYJ
- SZ
- VF
- VP4**
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQC4
- VQZ
- SQ
- VFS
- VFR
- VQ7

Made to Order Specifications:

Series VP4□50/4□70

External Pilot/With Surge Voltage Suppressor



External Pilot

-X40

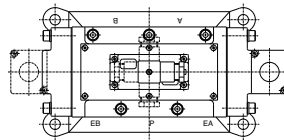
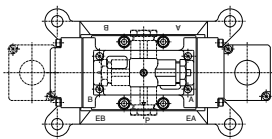
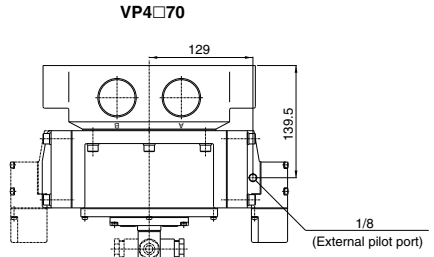
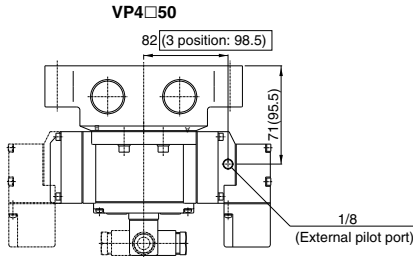
Model no.

VP4 □ □ □ - □ □ □ (- □) - X40

Entry is the same as standard products.

Dimensions

Same as those of standard models. For the external pilot port position, refer to the below.



Dimensions: Port size 3/8, 1/2
(): Port size 3/4, 1

With Surge Voltage Suppressor

-X23

Model no.

VP4 □ □ □ - □ □ □ (- □) - X23

Entry is the same as standard products.

Electrical entry

T	Conduit terminal
D	DIN terminal
TL	Conduit terminal with indicator light
DL	DIN terminal with indicator light

Dimensions

Same as those of standard models.



Series VP4□50/4□70

Specific Product Precautions

Be sure to read before handling.

Refer to front matter 53 for Safety Instructions and pages 3 to 8 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

1. Piping

Make P port piping so that supply air pressure does not become lower than operating pressure while operating. If throttling air flow of P port, or opening A/B ports in the atmosphere (or opening in almost the same conditions), pressure drop at operating can cause malfunction of the valve.

2. Air quality

Install an air filter and a lubricator on the upstream side.

3. Lubrication

This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32). Besides that, for brands of each manufacturer, refer to SMC website.

4. Operating environment

Install silencer in EA/EB/Pilot EXH port to prevent dust from entering in the dusty ambient.

5. Operation at low temperature

If operating at 0°C or less, external pilot style solenoid valve is recommended. (Made to order; suffix "-X40" to the part number.)

6. Regarding VP435□ (3 position closed center type)

Be aware that when the cylinder is in an intermediate stop state, if the supply pressure to the P port is discharged or decreased, this valve is constructed so that the pressure in the cylinder will be discharged to the P port, causing the cylinder to move.

7. How to calculate the flow rate

For obtaining the flow rate, refer to front matters 42 to 45.

How to Use DIN Terminal

1. Disassembly

- 1) After loosening the screw (1), then if the housing (4) is pulled in the direction of the screw, the connector will be removed from the body of equipment (solenoid, etc.).
- 2) Pull the screw (1), and then remove gasket (2a) or (2b).
- 3) On the bottom part of the terminal block (3), there's a cut-off part (indication of an arrow). If a small flat head screwdriver is inserted between the opening in the (3a) bottom, terminal block (3) will be removed from the cover (4). (Refer to figure at right.)
- 4) Remove the cable gland (5) and plain washer (6) and rubber seal (7).

2. Wiring

- 1) Pass them through the cable (8) in the order of cable ground (5), washer (6), rubber seal (7), and then insert into the housing (4).
- 2) Dimensions of the cable (8) are the figure as below. Skin the cable and crimp the crimped terminal (9) to the edges.
- 3) Remove the screw with washer (3e) from the bracket (3e). (Loosen in the case of Y-shape type terminal.) As shown in the below figure, mount a crimped terminal (9), and then again tighten the screw (3e).
Note) Tighten within the tightening torque of 0.5 N·m ± 15%.

Note: a It is possible to wire even in the state of bare wire. In that case, loosen the screw with washer (3e) and place a lead wire into the bracket, (3d) and then tighten it once again.

- a Maximum size of crimped terminal (9) is up to 1.25 mm²-3.5 when O terminal. For Y terminal, it is up to 1.25 mm²-4.
- b Cable (8) outside diameter: ø 6 to ø 12 mm

Note) For the one with the outside diameter ranged between ø 9 to ø 12 mm, remove the inside parts of the rubber seal (7) before using.

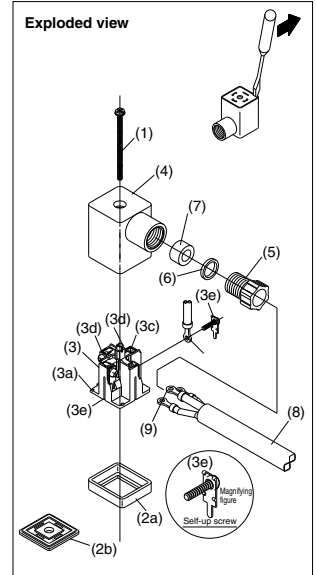
3. Assembly

- 1) Terminal block (3) connected with housing (4) should be reinstated.
- 2) Putting rubber seal (7), plain washer (6), in this order into the cable introducing slit on the housing (4), then further tighten the cable gland (5) securely.
- 3) By inserting gasket (2a) or (2b) between the bottom part of the terminal block (3) and a plug on an equipment, screw in (1) on top of the housing (4) and tighten it.

Note) Tighten within the tightening torque of 0.5 N·m ± 20%.

Changing the entry direction

The cable entry direction of a connector can be changed as desired (4 directions at 90° intervals), depending on the combination of a housing (4) and a terminal block (3).



DIN Terminal (Connection)

• Solenoid is wired with male thread terminals of DIN connector as follows. Connect with corresponding terminals of the connector.



Terminal	Polarity
1	A side
2	B side
3	COM

Can be used as either "+ COM" or "- COM".

SJ
SY
SY
SV
SYJ
SZ
VF
VP4
S0700
VQ
VQ4
VQ5
VQC
VQC4
VQZ
SQ
VFS
VFR
VQ7