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

How to Order

VP4 **1** **5** **0** – **10** **1** **T** – [ ] – [ ]

VP series
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 "VP4□70" series.

Body type

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)	
12	1 1/4 (32A)	VP4□70
14	1 1/2 (40A)	

* Only for the side ported type.

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

* Semi-standard
For other rated voltages, please consult with SMC.

Electrical entry

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

* Semi-standard

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Made to Order specifications
Refer to page 362.

Nil	Standard
X23	With surge voltage suppressor
X40	External pilot

How to Order Pilot Valve Assembly

VT3112 – 00 **1** **G**

Rated voltage

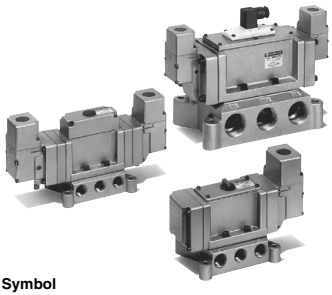
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz

* Semi-standard

Electrical entry Note)

G	Grommet

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".



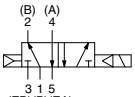
Specifications

Fluid	Air
Operating pressure range (MPa)	0.2 to 0.9
Ambient and fluid temperature (°C)	0 to 60 (No freezing.)
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/s²) (2)	150/50
Accessory (Standard equipment)	Silencer for pilot EXH ("AN101-01")

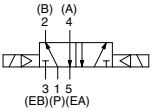
Note 1) This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32).
Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once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

Symbol

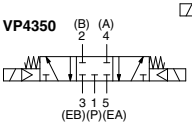
VP4150/4170



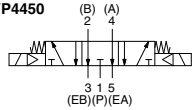
VP4250/4270



VP4350



VP4450



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)		100, 200, 110 *, 220 *, 240 *
	DC		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	30 or less
		OFF	50 or less	65 or less	30 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	40 or less
		OFF	40 or less	55 or less	40 or less	45 or less	30 or less	30 or less

Note) Based on dynamic performance test, JIS B 8419: 2010. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor.)

Made to Order Specifications (For details, refer to page 362.)

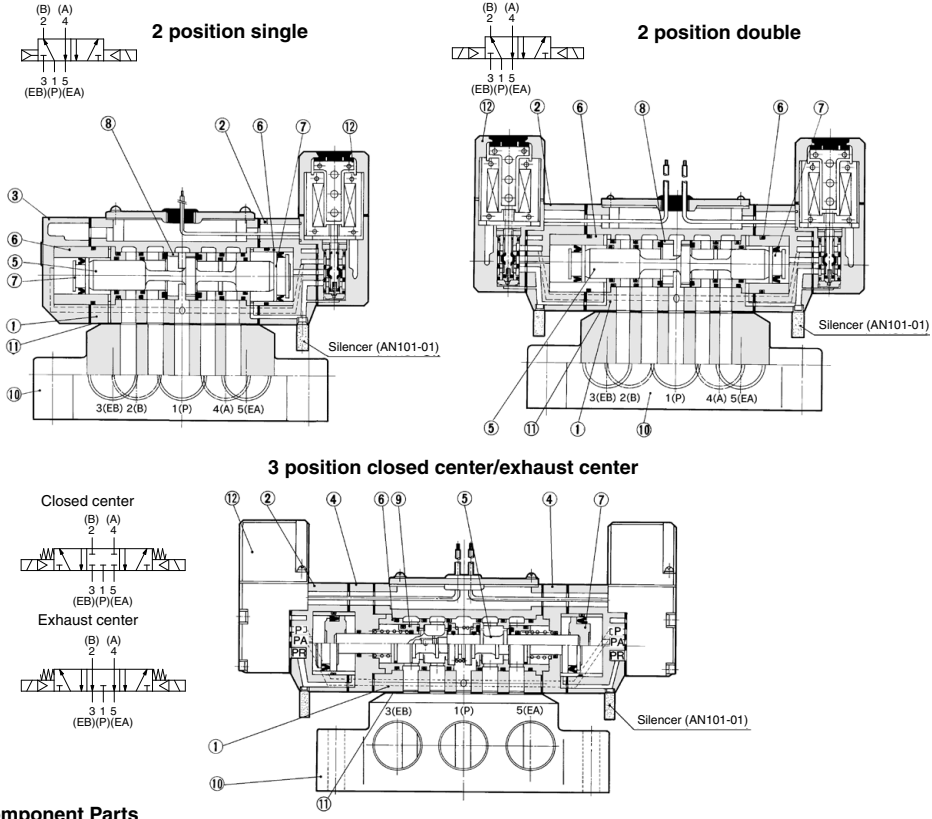
Flow Rate Characteristics/Weight

Type of actuation		Model	Port size	Flow rate characteristics						Weight (kg)
				1→4/2(P→A/B)			4/2→5/3(A/B→EA/EB)			
				C [dm³/(s·bar)]	b	Cv	C [dm³/(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	3.3
	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	3.8
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	4.4
	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)	4.4

( ): Denotes the normal position.

Type of actuation		Model	Port size	Effective area (mm²)	Weight (kg)
2 position	Single	VP4150	1	120	3.3
		VP4170	1 1/4	280	9.5
			1 1/2	300	
	Double	VP4250	1	120	3.8
		VP4270	1 1/4	280	10
			1 1/2	300	
3 position	Closed center	VP4350	1	110	4.4
	Exhaust center	VP4450	1	110	4.4

Construction



Component Parts

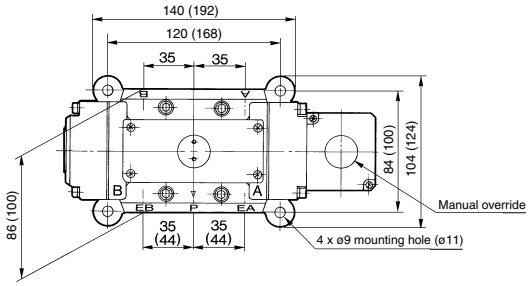
No.	Description	Material	Note
1	**Body**	Aluminum alloy	Platinum silver
2	**Plate**	Aluminum alloy	Platinum silver
3	**Cap**	Aluminum alloy	Platinum silver
4	**Spacer**	Aluminum alloy	Platinum silver
5	**Spool**	Stainless steel/Aluminum alloy	
6	**Sleeve**	2 position: Aluminum alloy 3 position: Brass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

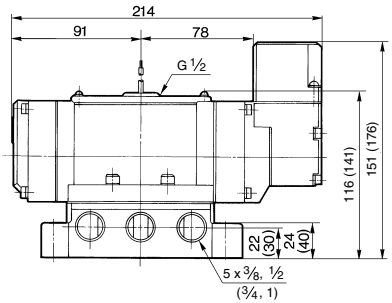
Replacement Parts

No.	Description	Part no.			Note
10	**Sub-plate**	AXT021-1-1-㊐	3/8	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㊐	1 1/4	VP4□70	
		DXT132-15-2P-14㊐	1 1/2		
11	**Gasket**	XT021-9	VP4□50		
		DXT132-16	VP4□70		
	Hexagon socket head screw	M6 x 25 with washer	VP4□50		Thread for mounting valve. A spring washer will be required separately for VP4□70.
		M8 x 35	VP4□70		
12	**Pilot valve assembly**	VT3112-00□G	Refer to "How to Order Pilot Valve Assembly" on page 353.		

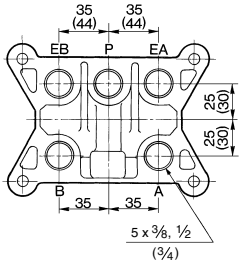
Dimensions: VP4150

Grommet: VP4150-□□G-□



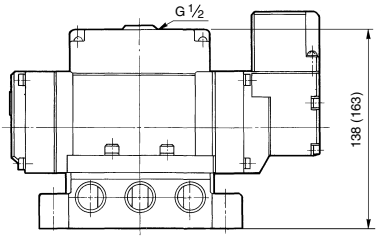


Bottom ported



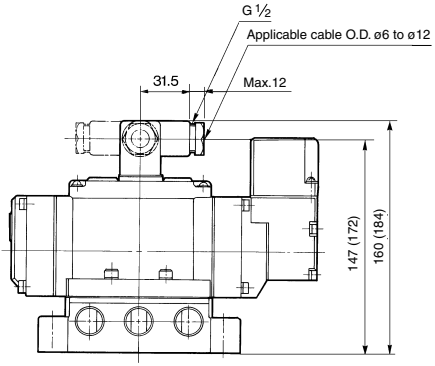
( ): Rc 3/4, 1

Conduit terminal: VP4150-□□T-□



( ): Rc 3/4, 1

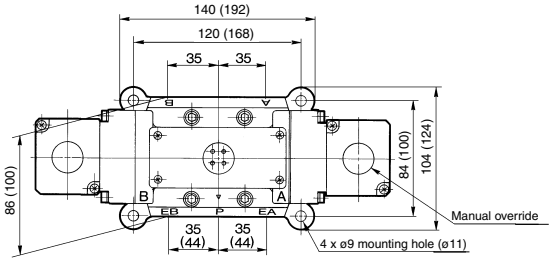
DIN terminal: VP4150-□□D-□



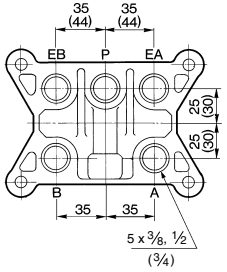
( ): Rc 3/4, 1

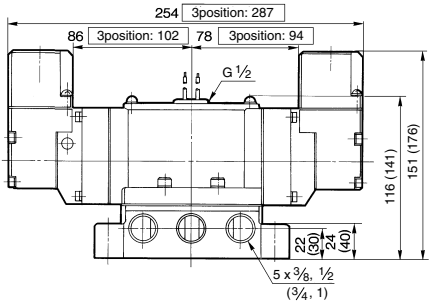
Dimensions: VP4250/4350/4450

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



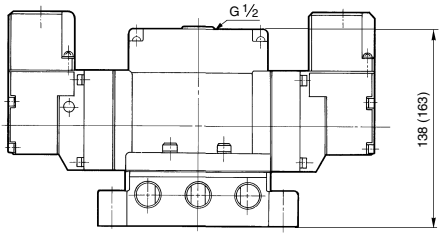
Bottom ported





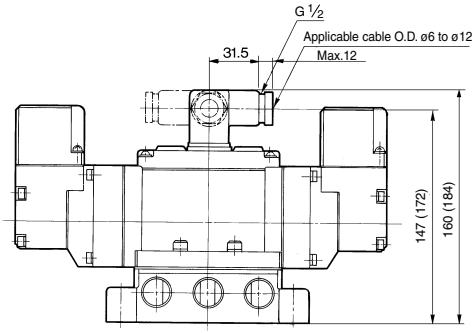
( ): Rc 3/4, 1

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



( ): Rc 3/4, 1

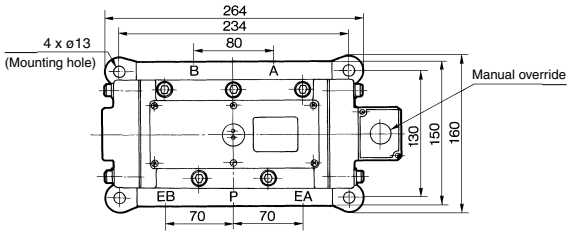
DIN terminal: VP4250-□□D-□
VP4350-□□D-□
VP4450-□□D-□

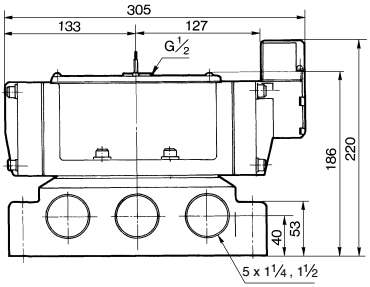


( ): Rc 3/4, 1

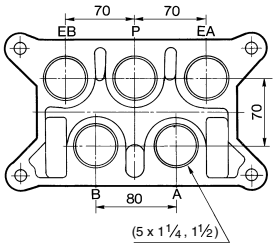
Dimensions: VP4170

Grommet: VP4170-$^{12}_{14}$□G-□

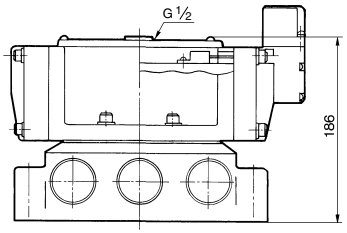




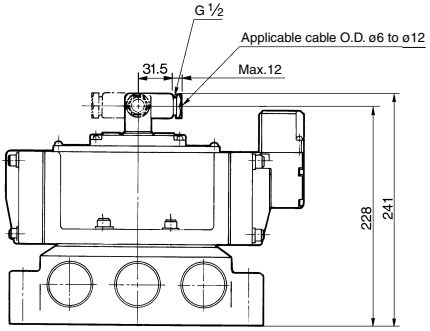
Bottom ported



Conduit terminal: VP4170-$^{12}_{14}$□T-□

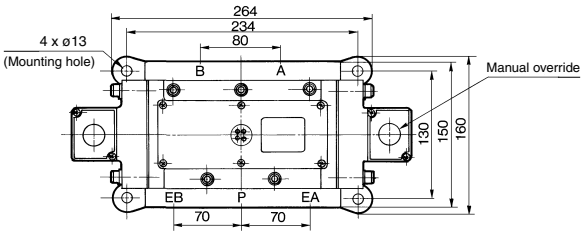


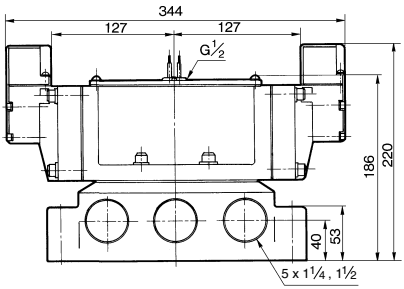
DIN terminal: VP4170-$^{12}_{14}$□D-□



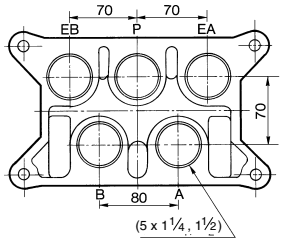
Dimensions: VP4270

Grommet: VP4270-$^{12}_{14}$□G-□

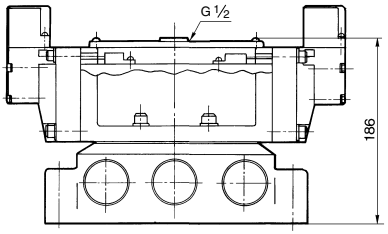




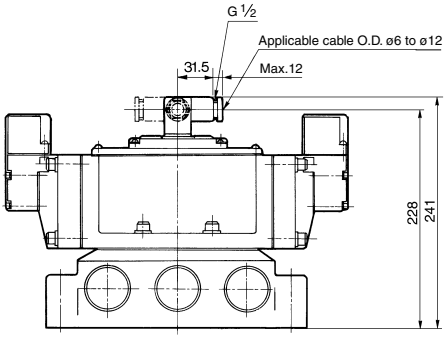
Bottom ported



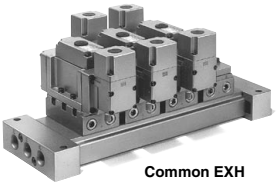
Conduit terminal: VP4270-$^{12}_{14}$□T-□



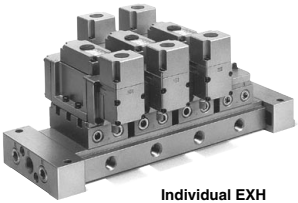
DIN terminal: VP4270-$^{12}_{14}$□D-□



VP4□50 Series
Manifold Specifications



Common EXH



Individual EXH

How to Order

VVP4 5 0 – 04 1 – 04 –

VP series 5 port solenoid valve Manifold

Base size

5	3/4
6	1

Porting specifications

Symbol	P	A, B	E
0	Side	Side	Side
1 *	Side	Bottom Note)	Side

Note) A/B port piping: 3/8 or 1/2
* Semi-standard

Valve stations

02	2 stations
⋮	⋮
10	10 stations

Base specifications

1	Common EXH
2	Individual EXH

A/B Port size

Symbol	Port size	VVP450	VVP460
04	1/2	●	—
06	3/4	●	●
10	1	—	●
M Note)	Mixed	●	●

Note) In the case of "Mix", put "M" in the part number and indicate each port size in other places.

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Precautions

No manifold is available for VP4□70 series.

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 type 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

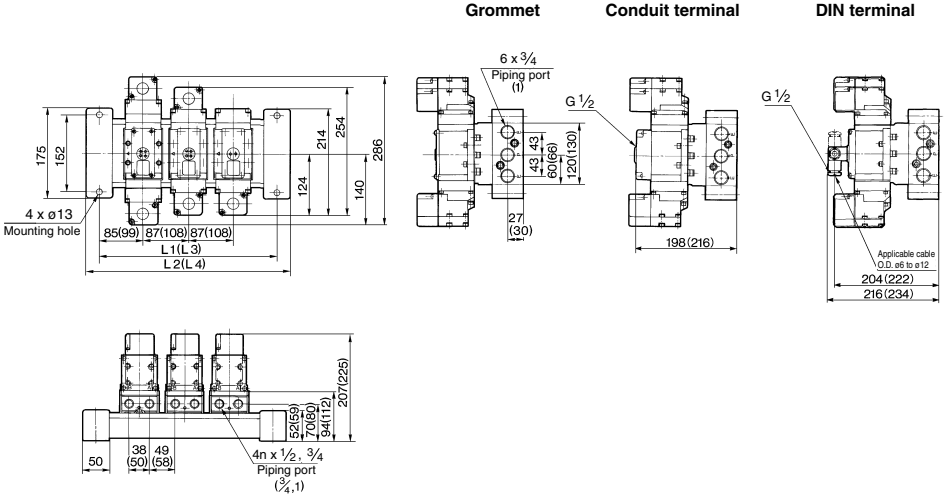
Series	Exhaust specifications	Port size			Applicable valve model
		P	A, B	E	
VVP450	Common	3/4	1/2 , 3/4	3/4	VP4154-00□□ VP4254-00□□
	Individual				
VVP460	Common	1	3/4 , 1	1	VP4354-00□□ VP4454-00□□
	Individual				

Option

Blanking plate assembly	XT038N-4A	With gaskets and bolts

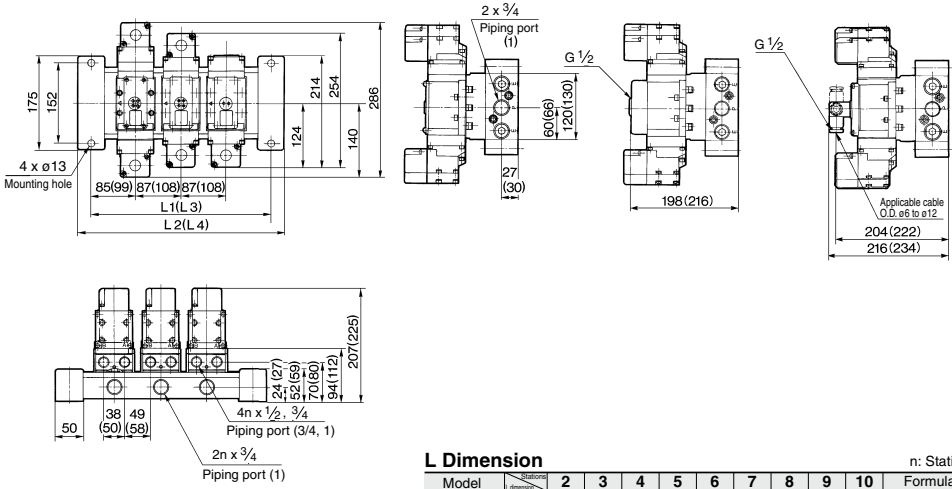
Dimensions: VVP450/460

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 n: Station

Model	L dimension / Stations	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

Made to Order Specifications: *VP4□50/4□70 Series* External Pilot/With Surge Voltage Suppressor

Made to Order

External Pilot -X40

Model no.

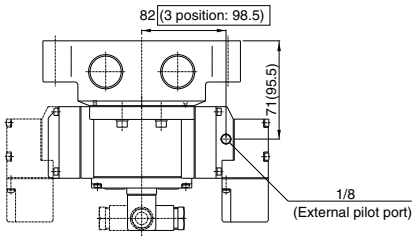
VP4□□□–□□□(–□)–X40

Entry is the same as standard products.

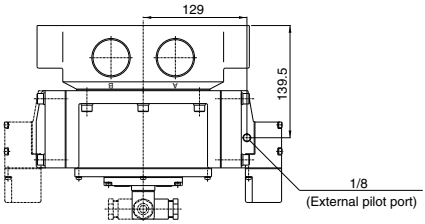
Dimensions

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

VP4□50



VP4□70



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.

SMC

VP4□50/4□70 Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 3 to 9 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 type 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.

How to Use DIN Terminal

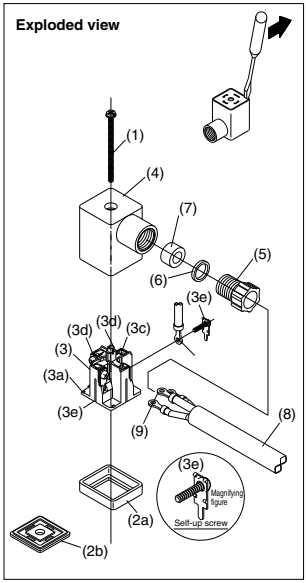
1. Disassembly
1) After loosening the screw (1), then if the housing (4) is pulled in the direction of the screw, the connector will be removed from the body of equipment (solenoid, etc.).
2) Pull the screw (1), and then remove gasket (2a) or (2b).
3) On the bottom part of the terminal block (3), there's 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.
b 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.
c 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".