3 Port Solenoid Valve
Direct Operated Poppet Type
Series VT317
Rubber Seal

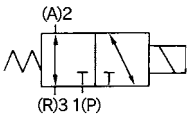
CE [Option]

Compact yet provides a large flow capacity
Dimensions (W x H x D)·····45 x 89.5 x 45
(Grommet)
C: 2.6 $dm^3/(s \cdot bar)$
(Passage 2 → 3)

Suitable for use in vacuum applications
–101.2 kPa
(For vacuum specifications: VT/VO317V)

A single valve with 6 valve functions
(Universal porting type)
Selective porting can provide 6 valve functions, such as N.C. valve, N.O. valve, Divider valve, Selector valve etc.

JIS Symbol



How to Order

V | T | 317 | ☐ | - | 1 | G | ☐ | - | 02 | ☐ | - | ☐

Body type

T	Body ported
0	Manifold

Valve option

Nil	Standard type
E*	Continuous duty type
V*	For vacuum

* Option

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

* Option

Electrical entry

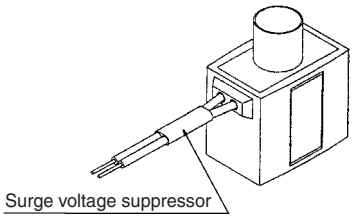
G	Grommet, 300 mm lead wire
H	Grommet, 600 mm lead wire
C	Conduit
T	Conduit terminal
D	DIN terminal

Light/Surge voltage suppressor

Symbol \ Electrical entry	G	H	C	T	D
Nil	—	—	—	—	—
S	● Note)	● Note)	● Note)	●	●
Z	—	—	—	●	●

S: With surge voltage suppressor
Note) Refer to the figure below.
Z: With light/surge voltage suppressor
* As to the case of rated voltage [Others (9)], please contact SMC.

Surge voltage suppressor mounting part (For "G")



CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D/DO only

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Port size

Nil	Without port (For manifold)
02	1/4 (8A)

Manifold

Model	Applicable manifold type	Accessory
VO317(-Q)	Common or individual exhaust	O-ring (P10, 4 pcs.) Note) Bolts (M4 x 0.7 x 20, 2 pcs.)

Note) It is not applied to "Continuous duty type". Refer to the accessories on page 1612.

Standard Specifications

Type of actuation			Direct operated type 2 position single solenoid
Fluid			Air
Operating pressure range			0 to 0.9 MPa
Ambient and fluid temperature			–10 to 50°C (No freezing. Refer to page 5.)
Response time (1)			30 ms or less (at the pressure of 0.5 MPa)
Max. operating frequency			10 Hz
Lubrication			Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)
Manual override			Non-locking push type
Mounting orientation			Unrestricted
Shock/Vibration resistance (2)			150/50 m/s^2
Enclosure			Dustproof
Electrical entry			Grommet, Conduit, Conduit terminal, DIN terminal
Coil rated voltage (V)	**AC (50/60 Hz)**		100, 200, 110 *, 220 *, 240 *
	DC		24, 12 *
Allowable voltage fluctuation			–15 to +10% of rated voltage
Apparent power (3)	**AC**	**Inrush**	19 VA (50 Hz), 16 VA (60 Hz)
		Holding	11 VA (50 Hz), 7 VA (60 Hz)
Power consumption (3)	**DC**		Without indicator light: 6 W, With indicator light: 6.3 W
Light/Surge voltage suppressor (Not applicable for grommet type)	**AC**		Varistor, Neon bulb
	DC		Varistor, LED (Neon bulb for 100 V or more)

* Option

Note 1) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge suppressor)

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)

Note 3) At rated voltage

Flow Characteristics/Mass

Valve model	Flow characteristics												Mass
	1 → 2 (P → A)			2 → 3 (A → R)			3 → 2 (R → A)			2 → 1 (A → P)			
	C [dm^3/(s·bar)]	b	Cv	C [dm^3/(s·bar)]	b	Cv	C [dm^3/(s·bar)]	b	Cv	C [dm^3/(s·bar)]	b	Cv	Grommet
VT317	2.4	0.26	0.62	2.6	0.34	0.67	2.8	0.25	0.67	2.5	0.37	0.66	0.29kg
VT317V (Vacuum spec. type)													
VT317E (Continuous duty type)													

Note) Values for a single valve unit. It differs in the manifold case. Refer to manifold specifications on page 1612.

Option

Continuous duty type: VT317E

Exclusive use of VT317E is recommended for continuous duty with long time loading.

⚠ Caution

1. This model is for continuous duty, not for high cycle rates. But even in low cycle rates, if energizing the valve more than once a day, please consult with SMC.
2. Energizing solenoid should be done at least once in 30 days.

Vacuum spec. type: VT317V

This vacuum model has less air leakage than the standard model under low pressure. It is recommended for vacuum application.

⚠ Caution

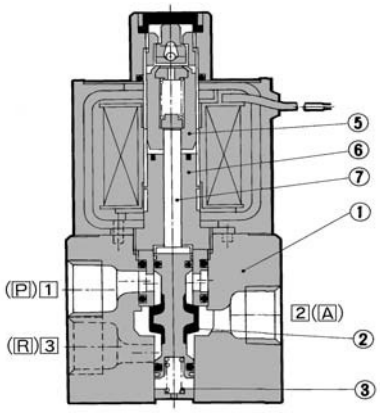
1. Since this valve has slight air leakage, it can not be used for vacuum holding (including positive pressure holding) in the pressure container.

Specifications different from standard are as follows.

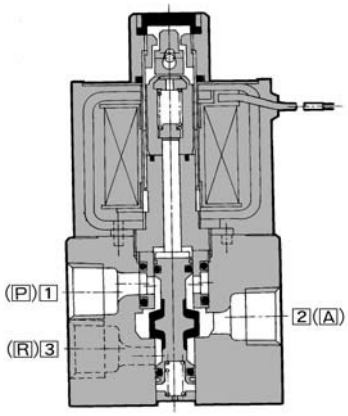
Operating pressure range	–101.2 kPa to 0.1 MPa

Construction

De-energized



Energized



Operation principles

<De-energized>

Spool valve ② is pushed upward by the return spring ③, port P is closed, and port A and port R are opened.

<Energized>

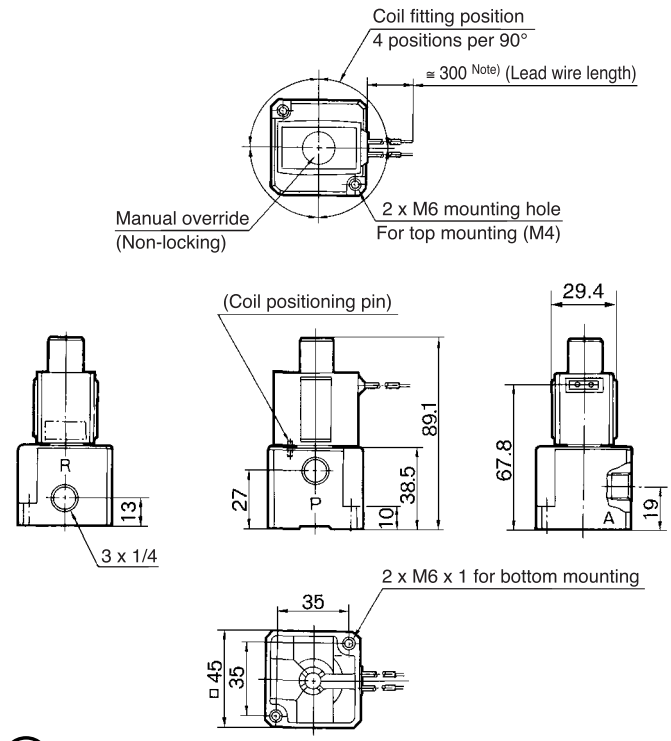
When an electric current is applied to the molded coil ④, the armature ⑤ is attracted to the core ⑥, and through the push rod ⑦, it pushes down the spool valve ②. Then, port P and port A are connected. At this time, there will be gaps between the armature ⑤ and the core ⑥, but the armature will be magnetically attracted to the core ⑥.

Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	Color: Platinum silver
2	Spool valve	Aluminum, NBR	

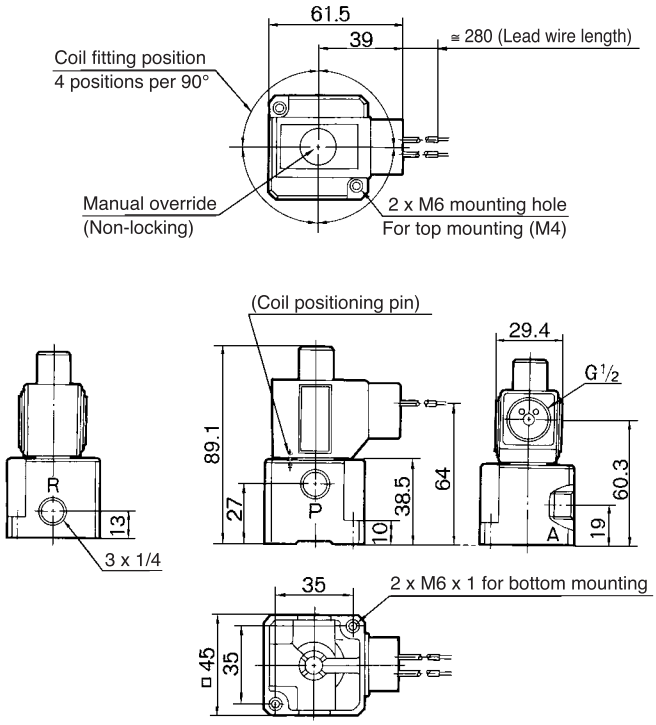
Dimensions

Grommet: VT317-□G

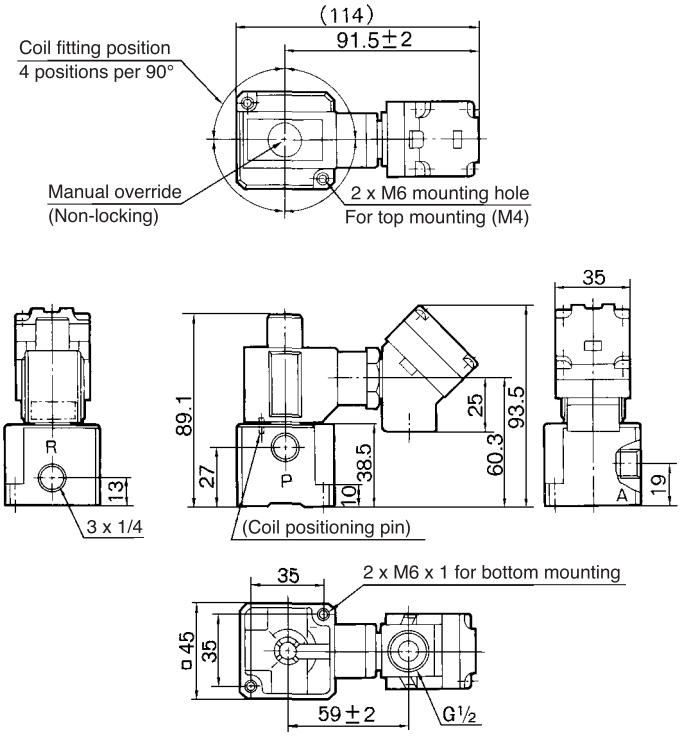


Note) There is also "VT317-□H" (Lead wire length: 600 mm).

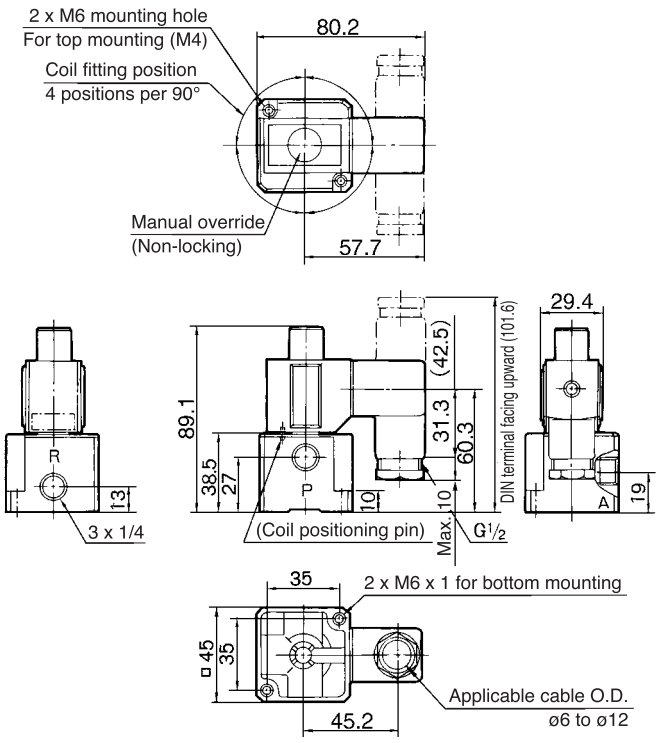
Conduit: VT317-□C



Conduit terminal: VT317-□T



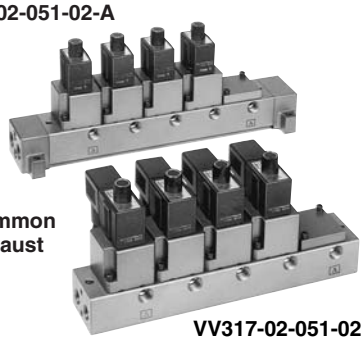
DIN terminal: VT317-□D



Series VT317
Manifold Specifications

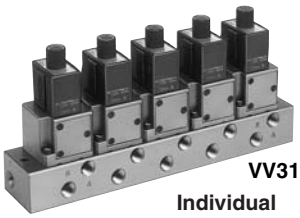
VT317 manifold is B mount style and available both as a common exhaust and individual exhaust model.

VV317-02-051-02-A



Common exhaust

VV317-02-051-02



VV317-02-053-02

Individual exhaust

How to Order Manifold

VV317 - 02 - 05 1 - 02 - A

VT317 manifold
* Please indicate manifold base type, applicable manifold valve and blanking plate when ordering.

Ordering example:
VV317-02-051-02-A····· 1 pc.
(5-station manifold base)
VO317-1G····· 4 pcs.
PVT317-53-1A····· 1 pc.
(Blanking plate)

Base type: 1/4

Valve stations

02	2 stations
⋮	⋮
20	20 stations

Max. 20

Symbol

Symbol	Passage		Porting specifications
	P	R	A
1	Common	Common	Side
3	Common	Individual	Side

A port size (Base piping) 1/4

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Option

A	Mounting bracket *

* Common exhaust type only

Manifold Specifications

Manifold type	B mount
Max. number of stations	20 stations (1)
Applicable solenoid valve	VO317□-□□□(-Q) (3)

Exhaust port		Port location (Direction)/Port size		
Symbol	Type	P	A	R
1	Common (2)	Base (Side) 1/4 (3/8)	Base (Side) 1/4	Base (Side) 1/4 (3/8)
3	Individual	Base (Side) 1/4	Base (Side) 1/4	Base (Side) 1/4

Note 1) For more than 3 stations, supply air both sides of P port. The common exhaust type should exhaust from both of the R port.
Note 2) In the case of common exhaust type, R and P ports size can be Rc 3/8 by using a mounting adaptor.
Note 3) Can also be applied to Series VVT320 manifold.

Accessory for Applicable Solenoid

Description	Part no.	Qty	Note
O-ring	P10	4	Standard type vacuum specifications type
	P10F		Continuous duty type
Hexagon socket head screw	Max. 0.7 x 20	2	

Option

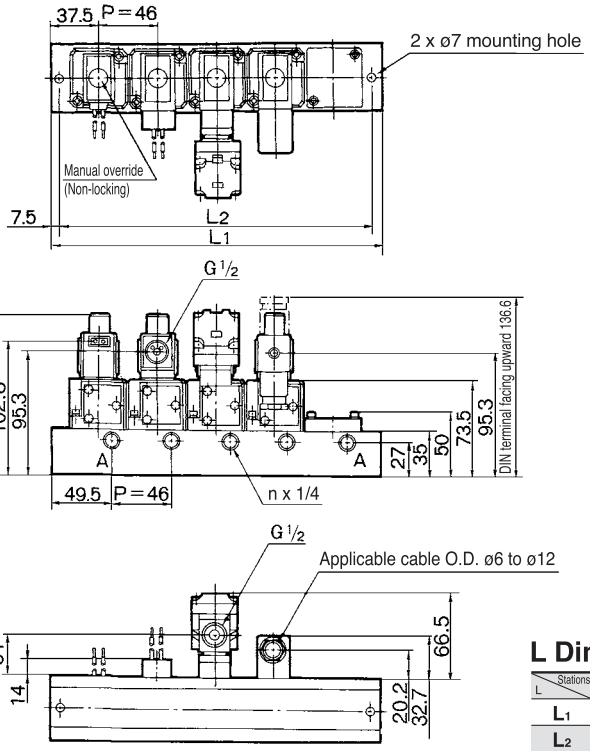
Description	Part no.
Blanking plate (With screw, O-ring)	PVT317-53-1A
Mounting bracket (With screw)	DXT010-37-4 (For common exhaust)

Flow Characteristics/Mass

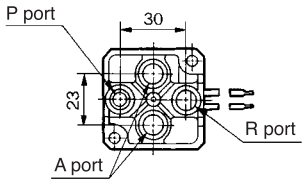
Valve model	Flow characteristics												Mass
	1 → 2 (P → A)			2 → 3 (A → R)			3 → 2 (R → A)			2 → 1 (A → P)			
	C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv	Grommet
VO317	2.0	0.11	0.47	2.2	0.12	0.49	2.0	0.14	0.45	2.1	0.14	0.48	0.32kg
VO317V (Vacuum spec. type)													
VO317E (Continuous duty type)													

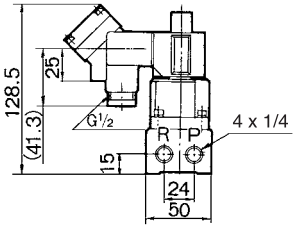
Dimensions: Common Exhaust (Interchangeable with VVT320 for mounting)

Without mounting bracket: VV317-02-□1-02



A single valve unit port location



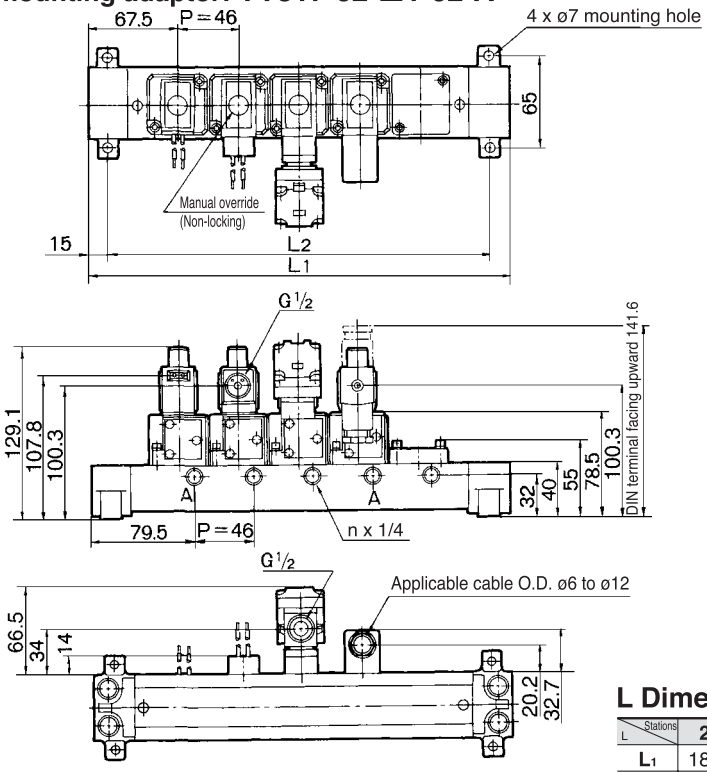


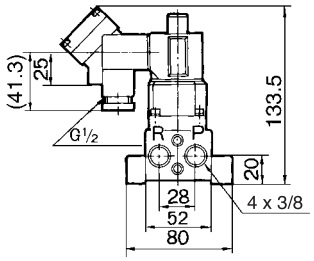
L Dimension

n: Stations

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	121	167	213	259	305	351	397	443	489	L1 = 46 x n + 29
L2	106	152	198	244	290	336	382	428	474	L2 = 46 x n + 14

With mounting adaptor: VV317-02-□1-02-A





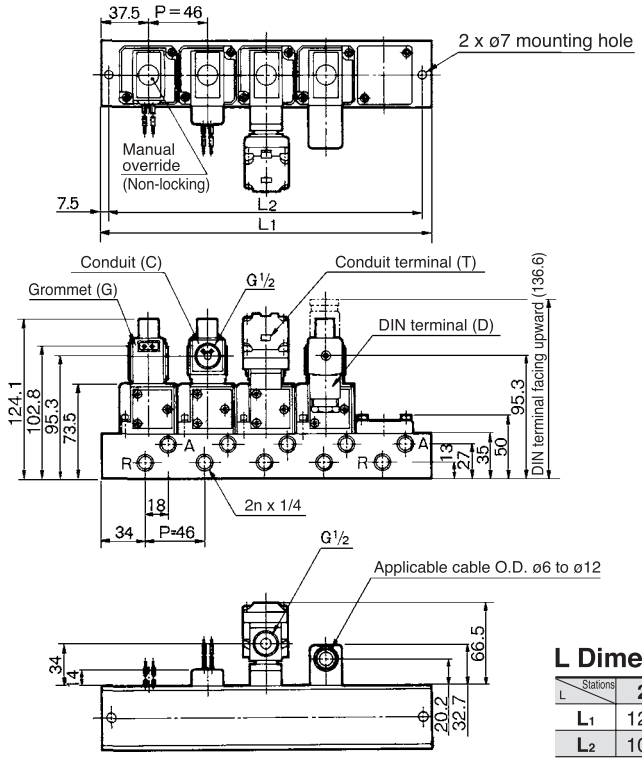
L Dimension

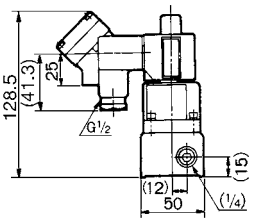
n: Stations

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	181	227	273	319	365	411	457	503	549	L1 = 46 x n + 89
L2	151	197	243	289	335	381	427	473	519	L2 = 46 x n + 59

Dimensions: Individual Exhaust

Without mounting bracket/VV317-02-□3-02





L Dimension n: Stations

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	121	167	213	259	305	351	397	443	489	L1 = 46 x n + 29
L2	106	152	198	244	290	336	382	428	474	L2 = 46 x n + 14

⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Mounting

⚠ Warning

1. When mounting valves on the manifold base, the mounting orientation is decided. If it is mounted in the wrong direction, connected equipment may malfunction. Mount it by referring to how to switch over from N.C. to N.O. specifications.

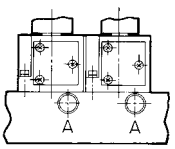
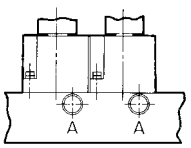
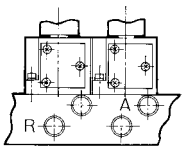
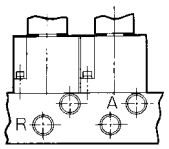
⚠ Caution

1. Each valve is fixed to the manifold base with two M4 mounting screws. Tighten the screws evenly when re-mounting. Tightening torque of the mounting screw (M4): 1.4 N·m
2. For mounting, tighten M4 or equivalent screws evenly into the mounting holes of the manifold base.

Changing from N.C. to N.O.

⚠ Caution

Universal porting permits convertibility N.C./N.O. by a simple 180 degree rotation. Mounting conditions for N.C. and N.O. is indicated as below figure.

Exhaust port type \ Valve	N.C.	N.O.
Common exhaust		
Individual exhaust		

∗ Changing from N.C. to N.O.
This product is delivered as N.C. valve. If N.O. valve is needed, remove mounting screws of the required valve and turn the valve at 180° degrees. (Make sure that there are O-rings fixed on 4 positions of the valve surface.) Then, tighten the mounting screws to fix the valve to the manifold base.

Series VT317
Specific Product Precautions

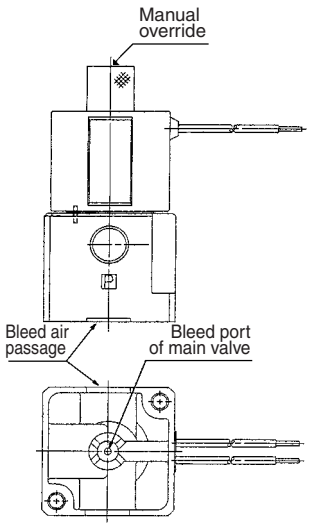
Be sure to read before handling. Refer to Front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

1. A bleed port for the main valve is located at the bottom of the solenoid valve. Since blocking it causes malfunction, do not block it.

∗ Ordinarily, when the solenoid valve is mounted on a metal surface, it can breathe through the breather hole, via the breather groove. However, in particular, if the surface to be mounted is made of the rubber, the rubber could deform and block the hole.

2. Make sure that dust and/or other foreign materials should not enter the valve from the unused port (e.g. exhaust port). Also, since there is a bleed port for the armature in the manual override, do not allow accumulation of dust and/or other foreign materials to block bleed port.



Bottom of the solenoid valve

How to Calculate the Flow Rate

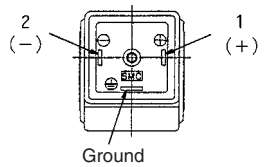
For obtaining the flow rate, refer to front matters 44 to 47.

Lead Wire Color (Grommet)

Voltage	Color
100 VAC	Blue
200 VAC	Red
DC	Red (+), Black (–)
Other	Gray

Electrical Connection

DIN terminal is connected inside as in the figure below. Connect to the corresponding power supply.

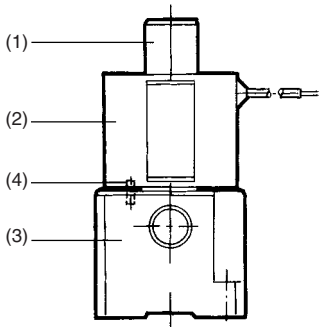


⚠ Caution

Change of Electrical Entry Angle

1. Series VT317 can change electrical entry angle. (4 positions)

2. How to change: Loosen the nut (1), remove the coil (2) from the body assembly (3), place the positioning pin (4) at the required place, put back the coil (2) to its place, and tighten sufficiently with lock nut (1).



Light/Surge Voltage Suppressor

		Grommet (G) Conduit (C)	Conduit terminal (T) DIN terminal (D)
Surge voltage suppressor (S)	AC	Varistor, Coil	Varistor, Coil
	DC	Diode, Coil	
Light/Surge voltage suppressor (Z)	AC	None	Neon bulb, Varistor, Coil
	DC		48 VDC or less: Varistor, Coil; 100 VDC: Neon bulb, Varistor, Coil

Protection circuit for light/surge voltage suppressor is not the polarity type.

How to Use DIN Terminal

1. Disassembly

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

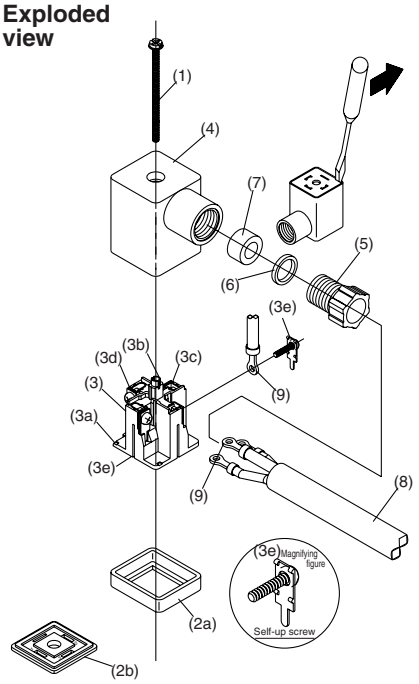
2. Wiring

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 as shown in the right figure. 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 right 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 The maximum size for the round terminal (9) is 1.25 mm^2—3.5 and for the Y terminal is 1.25 mm^2—4.
   c Cable (8) external: ø6 to ø12
   Note) For the one with the external external dimension ranged between ø9 to ø12 remove the inside parts of the rubber seal (7) before using.

3. Assembly

1) Terminal box (3) connected with housing (4) should be reinstated. (Push it down until you hear the click sound.)
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 box (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%.
   Note: The orientation of a connector can be changed arbitrarily, depending on the combination of a housing (4) and a terminal box (3).

Exploded view



Comparison between the Product Model No. and the Coil Part No.

Product model no.	Coil no.	Coil assembly with terminal part no.
VT/O317□-∗G(-02)	PVT317-001GB-∗∗	——
VT/O317□-∗GS(-02)	PVT317-∗G	——
VT/O317□-∗H(-02)	PVT317-001GB-∗∗L06	——
VT/O317□-∗HS(-02)	PVT317-∗G-06	——
VT/O317□-∗C(-02)	PVT317-001CB-∗∗	——
VT/O317□-∗CS(-02)	PVT317-∗C	——
VT/O317□-∗T(-02)	——	PVT317-001TBT-∗∗
VT/O317□-∗TS(-02)	——	PVT317-001TBTS-∗∗
VT/O317□-∗TZ(-02)	——	PVT317-001TBTZ-∗∗
VT/O317□-∗D(-02)	PVT317-001DB-∗∗	PVT317-001DBT-∗∗
VT/O317□-∗DS(-02)	PVT317-001DB-∗∗	PVT317-001DBTS-∗∗
VT/O317□-∗DZ(-02)	PVT317-001DB-∗∗	PVT317-001DBTZ-∗∗

Note 1) ∗ mark in the product model numbers denotes the rated voltage.
Note 2) □ mark denotes the valve option.
Note 3) ∗ mark and ∗∗ mark are for coil part number and coil assembly with terminal the rated voltage.
Example 1) In the case of ∗∗ VT317-001GB-05
Example 2) In the case of ∗ PVT317-5G
Note 4) In the case of CE-compliant products (-Q), coils are not shipped together.

⚠ Caution

When the rated voltage is AC and if it is assembled with the coil for DC, response may be delayed and occur malfunction. Also, for DC valves, when the coil for AC is assembled, it occurs malfunction. For AC valves, assemble the coil for AC, and for DC valves, assemble the coil for DC.

Connector for DIN Terminal

Rated voltage	Without light/surge voltage suppressor (D)	With surge voltage suppressor (DS)	Light/Surge voltage suppressor (DZ)
100 VAC	GDM2A	GDM2A-S1	GDM2A-Z1
200 VAC		GDM2A-S2	GDM2A-Z2
24 VDC		GDM2A-S5	GDM2A-Z5

For other rated voltages, please consult with SMC.