

3 Port Solenoid Valve Direct Operated Poppet Type Series VT307 Rubber Seal

Compact yet provides a large flow capacity

Dimensions (W x H x D)---30 x 54.5 x 33
(Grommet)

C: 0.71 dm³/(s·bar)

{Rc 1/4 (Passage 2 → 3)}

Low power consumption

VT/VO307.....4.8 W DC/Standard type

VT/VO307Y).....2 W DC/Energy-saving type

Suitable for use in vacuum applications

~101.2 kPa

(For vacuum specifications type: VT/VO307V, VT/VO307W)

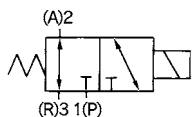
A single valve with 6 valve functions

(Universal porting type)

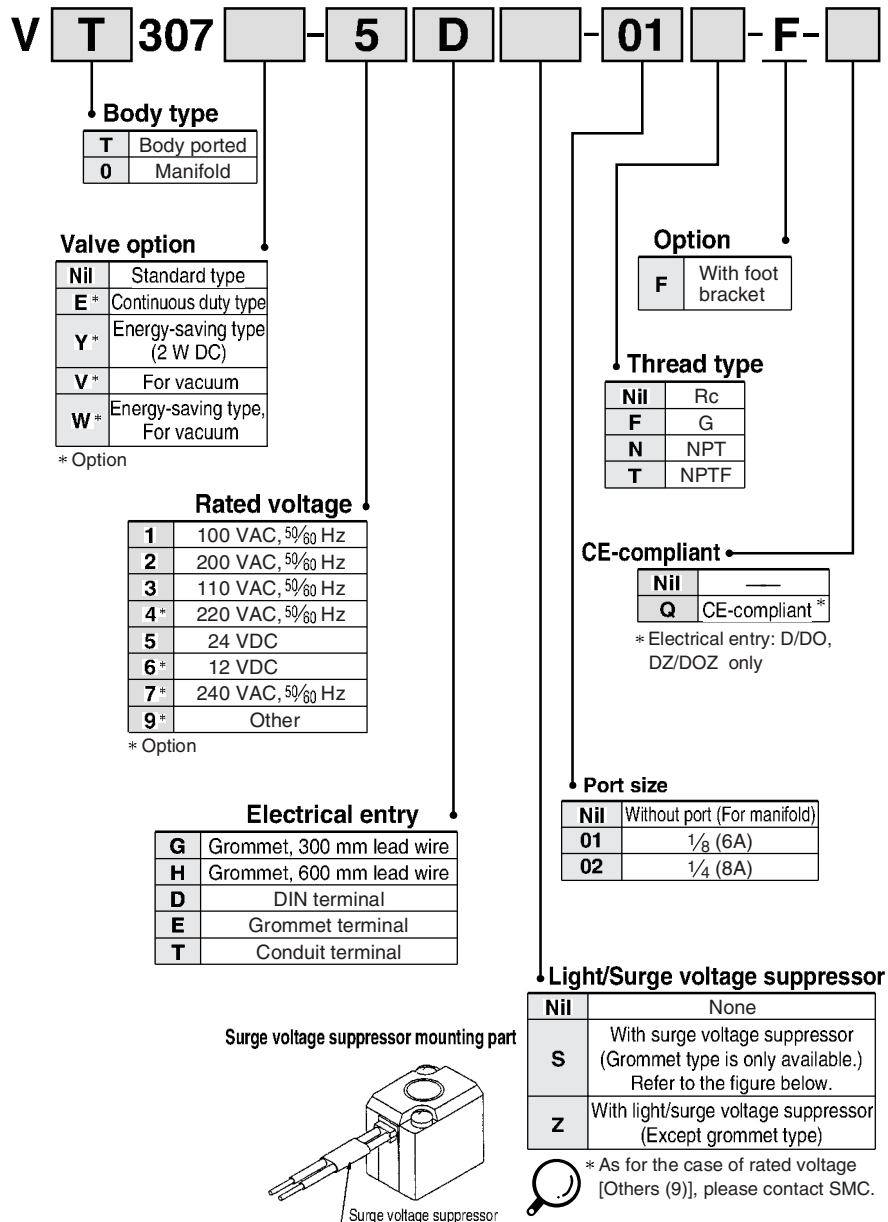
Selective porting can provide 6 valve functions, such as N.C. valve, N.O. valve, Divider valve, Selector valve, etc.



JIS Symbol



How to Order



Manifold

Model	Applicable manifold type	Accessory
VO307□(-Q)	Common or individual exhaust	Function plate (DXT152-14-1A) ^{Note} Mounting screw (NXT013-3)



^{Note} It is not applied to "Continuous duty type". Refer to the accessories on page 1605.

Option

Description	Part no.
Bracket	DXT152-25-1A (With thread)

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

How to Calculate the Flow Rate

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

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⁾	20 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, Grommet terminal, 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) (4)}	AC	12.7 VA (50 Hz) 10.7 VA (60 Hz)
	Inrush Holding	7.6 VA (50 Hz) 5.4 VA (60 Hz)
Power consumption ^{(3) (4)}	DC	Without indicator light: 4.8 W, With indicator light: 5 W
Light/Surge voltage suppressor (Not applicable for grommet type)	AC	Varistor, Neon bulb
	DC	Diode, 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

Note 4) The value is different for continuous duty type (VT307E), and energy-saving type (VT307Y/W). Refer to "Option" shown below.

Flow Characteristics/Mass

Valve model	Port size	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	
VT307	1/8	0.71	0.35	0.18	0.68	0.27	0.17	0.65	0.36	0.17	0.63	0.35	0.17	0.14 kg
VT307V (Vacuum spec. type)														
VT307E (Continuous duty type)														
VT307Y (Energy-saving type)														
VT307W (Energy-saving, Vacuum spec. type)														
VT307	1/4	0.71	0.31	0.19	0.71	0.25	0.17	0.68	0.33	0.17	0.71	0.26	0.18	
VT307V (Vacuum spec. type)														
VT307E (Continuous duty type)														
VT307Y (Energy-saving type)														
VT307W (Energy-saving, Vacuum spec. type)														

Note) Values for a single valve unit. It differs in the manifold case. Refer to manifold specifications on page 1605.

Option

Continuous duty type: VT307E

Exclusive use of VT307E 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.

Specifications different from standard are as follows.

Apparent power/AC	Inrush	7.9VA (50 Hz), 6.2VA (60 Hz)
	Holding	5.8VA (50 Hz), 3.5VA (60 Hz)
Power consumption/DC	2 W, 2.2 W (With indicator light)	
Response time ⁽¹⁾	30 ms or less (at the pressure of 0.5 MPa)	



Note 1) Refer to Note 1) of standard specifications.

Note 2) For the flow characteristics, refer to "Flow Characteristics".

Energy-saving type: VT307Y (VT307W)

If low power consumption is required for electronic control, "VY307Y(W)" (2 W DC) is recommended. Specifications different from standard are as follows.

Power consumption/DC	2 W, 2.2 W (With indicator light) *
Response time ⁽¹⁾	25 ms or less (at 0.5 MPa)



* 100 VDC: 2.4 W

Note 1) Refer to Note 1) of standard specifications.

Note 2) For the flow characteristics, refer to "Flow Characteristics".

Vacuum spec. type: VT307V (VT307W)

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

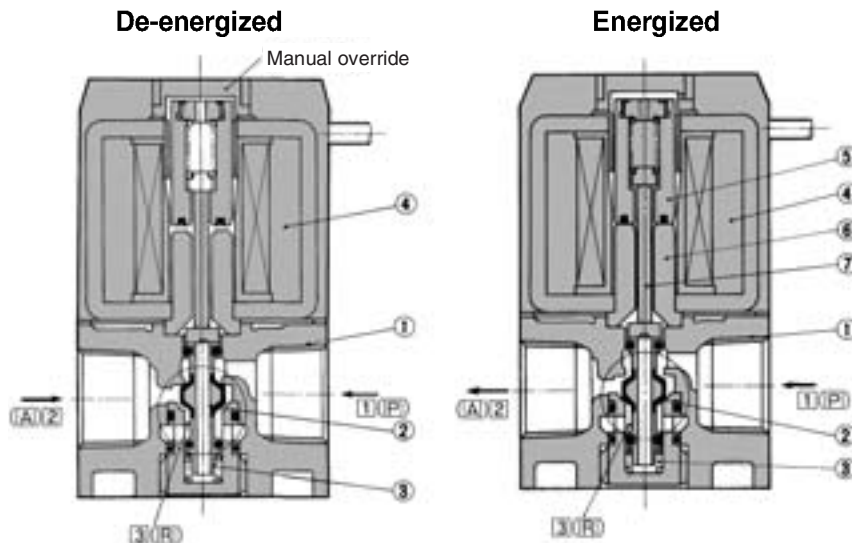
⚠ Caution

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
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Construction



Operation principle <De-energized>

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

Air flow direction:

Port P ↔ Block, A ↔ R

<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) and port R is closed. 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 (5) will be magnetically attracted to the core (6).

Air flow direction:

Port P ↔ Port A, Port R ↔ Block

Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	Color: Platinum silver
2	Spool valve	Aluminum, NBR	
3	Return spring	Stainless steel	
4	Molded coil	Resin	

How to Use DIN Terminal

1. Disassembly

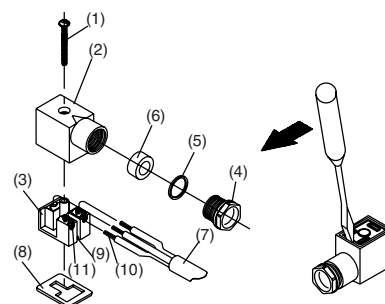
- After loosening the thread (1), then if the housing (2) is pulled in the direction of the thread (1), the connector will be removed from the body of equipment (solenoid, etc.).
- Pull the thread (1) out of the housing (2).
- On the bottom part of the terminal block (3), there's a cut-off part (9). If a small flat head screwdriver is inserted between the opening in the bottom, terminal block (3) will be removed from the housing (2). (Refer to "Figure 1".)
- Remove the cable gland (4) and plain washer (5) and rubber seal (6).

2. Wiring

- Passing through the cable (7), cable gland (4), plain washer (5), rubber seal (6) in this order, and then insert into the housing (2).
- From the terminal block (3), loosen the screw (11), then pass the lead wire (10) through, then again tighten the screw (11).
Note 1) Tighten within the tightening torque of 0.5 N·m ±15%.
Note 2) Cable (7) external: ø6 to ø8 mm
Note 3) Crimped terminal like round-shape or Y shape cannot be used.

3. Assembly

- Passing cable gland (4), washer (5), rubber seal (6), housing (2) in this order through cable (7) and connect to terminal block (3) and then set the terminal block (3) to the housing (2). (Push it down until you hear the click sound.)
- Putting rubber seal (6), plain washer (5), in this order into the cable introducing slit on the housing (2), then further tighten the cable gland (4) securely.
- Insert the gasket (8) between the bottom part of terminal block (3) and a plug attached to equipment, and then screw (1) in from the top of the housing (2) to tighten it.
Note 1) Tighten within the tightening torque of 0.5 N·m ±20%.
Note 2) Connector orientation can be changed by 180 degrees depending on how to assemble the housing (2) and the terminal block (3).



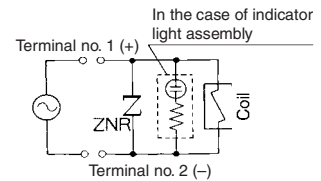
Connector for DIN Terminal

Description	Part no.
DIN connector	B1B09-2A(Standard) GM209NJ-B17(CE-compliant)

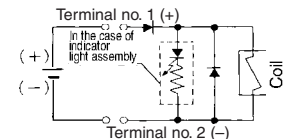
⚠ Caution

Light/Surge Voltage Suppressor

AC, 100 VDC or more



48 VDC or less

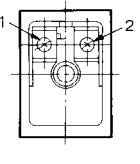
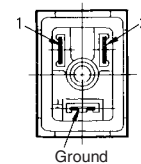


Electrical Connection

DIN terminal and terminal (with light/surge voltage suppressor) are connected inside as in the figure below. Connect to the corresponding power supply.

DIN terminal block

Terminal block



Terminal no.	1	2
DIN terminal	+	-
Terminal	+	-

• Applicable cable O.D.

Type T: ø4.5 to ø7 mm

Type E: ø2.3 to ø2.8 mm

Type D: ø6 to ø8 mm

• Applicable crimp terminal

Type E/T: 1.25-3, 1.25-3S

1.25Y-3N, 1.25Y-3S

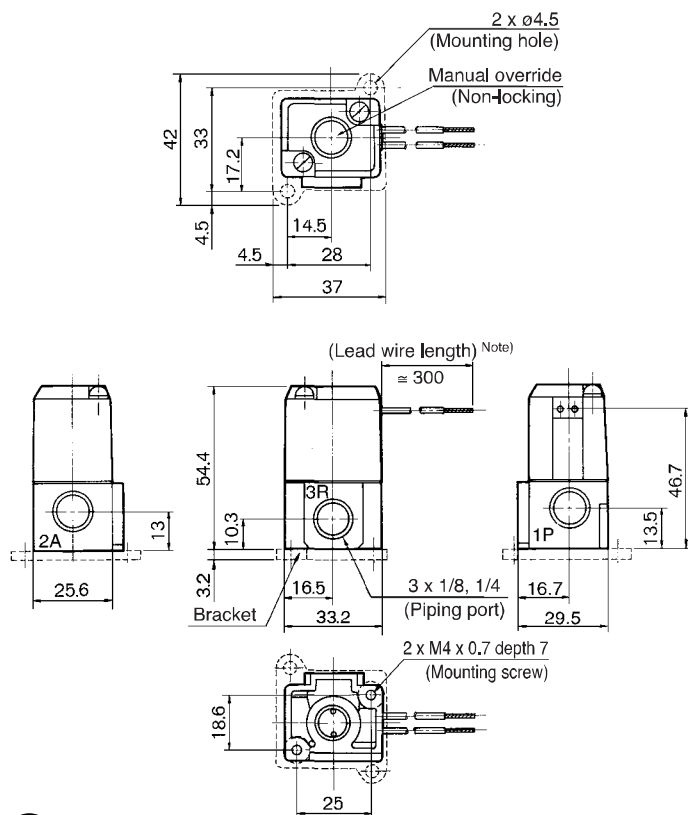
Lead Wire Color

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

Series VT307

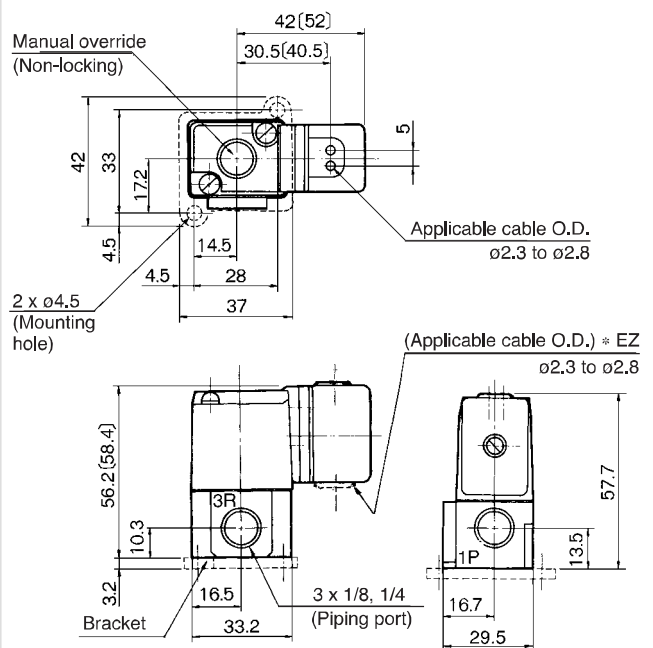
Dimensions (Interchangeable with "VT301" for mounting)

Grommet: VT307-□G



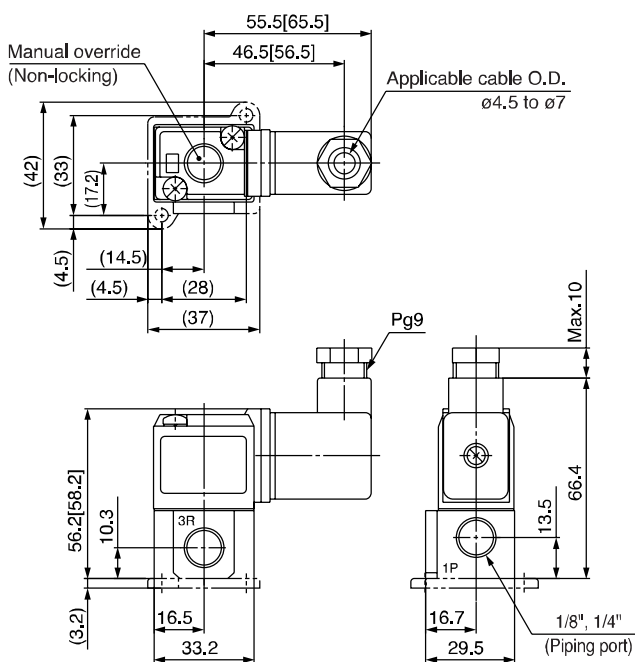
Note) There is also "VT307-□H" (lead wire length: 600 mm).

Grommet terminal: VT307-□E



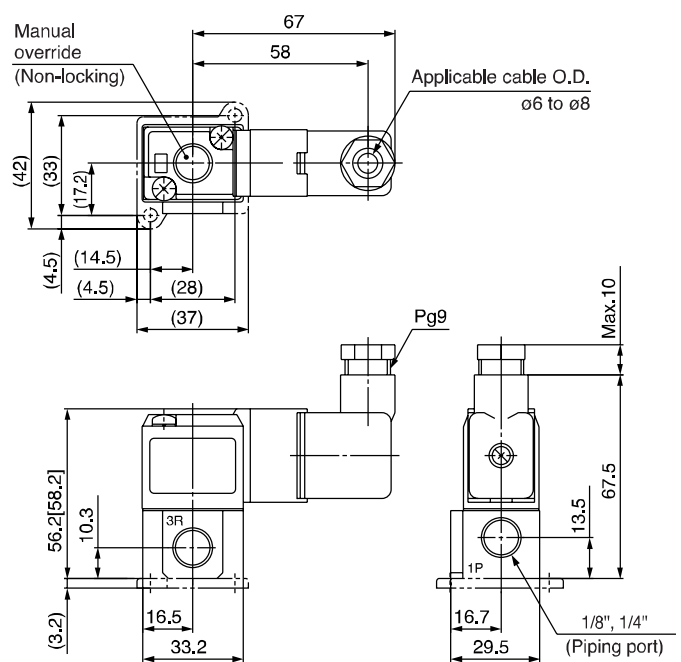
[] : With light/surge voltage suppressor

Conduit terminal: VT307-□T



[] : With light/surge voltage suppressor

DIN terminal: VT307-□D



[] : With light/surge voltage suppressor

Series VT307

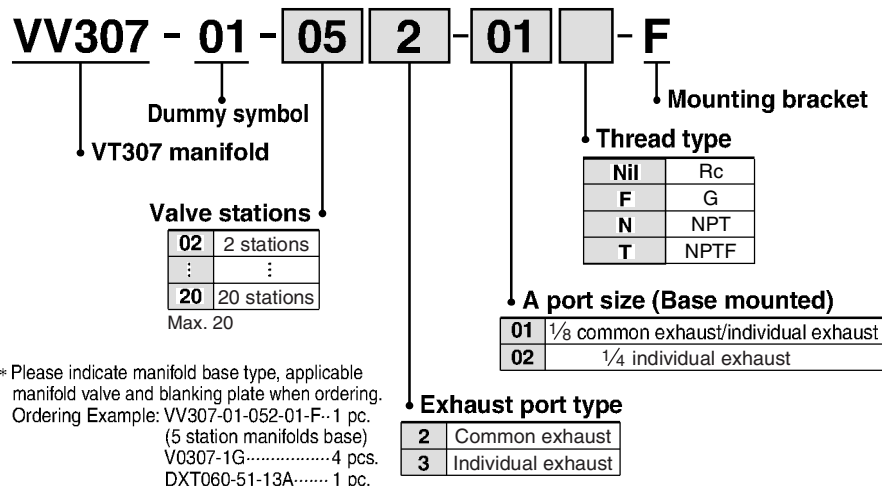
Manifold Specifications

VT307 manifold is B mount style and available both as a common exhaust and individual exhaust model.

Manifold valve can be easily converted from N.C. (Normally Closed) to N.O. (Normally Open) merely by turning over the switch cover.



How to Order Manifold



Manifold Specifications

Manifold type		B mount		
Max. number of stations		20 stations ^{Note)}		
Applicable solenoid valve		VO307□-□□□□ (-Q)		
Exhaust port		Port location (Direction)/Port size		
Symbol	Type	P	A	R
2	Common	<u>Base (Side)</u> 1/8	<u>Base (Side)</u> 1/8	<u>Base (Side)</u> 1/8
3	Individual	<u>Base (Side)</u> 1/4	<u>Base (Side)</u> 1/8, 1/4	<u>Base (Top)</u> 1/8



Note) For more than 6 stations, supply air both sides of P port. The common exhaust type should exhaust from both of the R port.

Option

Description	Part no.
Blanking plate (With gasket, screw) ^{Note)}	DXT060-51-13 ^A _B

Accessory for Applicable Solenoid

Description	Part no.	Qty.
Function plate (With gasket) ⁽¹⁾	DXT152-14-1 ^A _B	1 pc.
Mounting screw	NXT013-3	2 pcs.



Note 1) DXT060-51-13B, DXT152-14-1B are for energizing continuously.

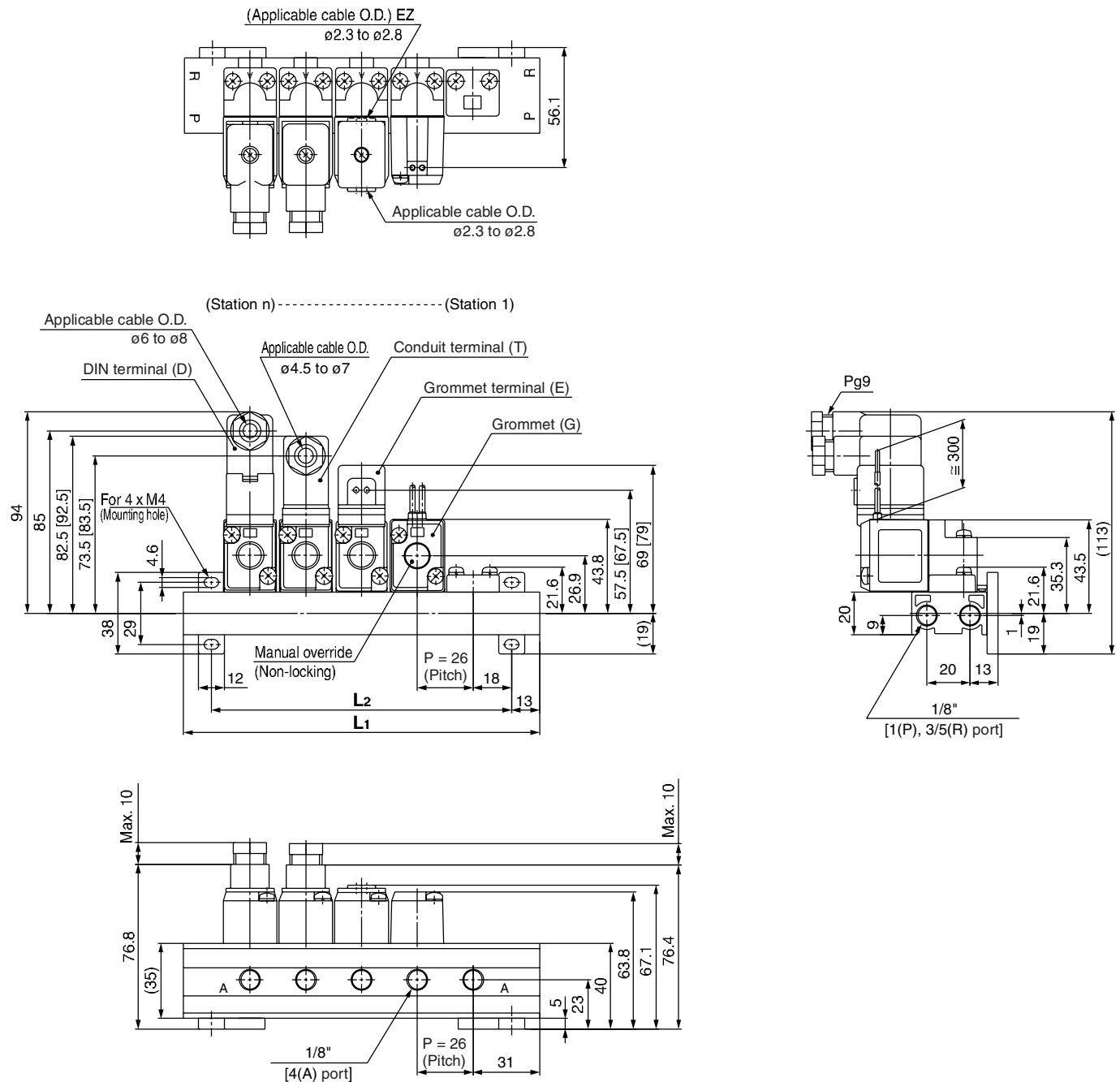
Flow Characteristics/Mass

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
VO307	0.34	0.28	0.089	0.34	0.22	0.082	0.36	0.28	0.091	0.34	0.18	0.080	0.14kg
VO307V (Vacuum spec. type)													
VO307E (Continuous duty type)	0.30	0.18	0.070	0.30	0.15	0.072	0.32	0.20	0.075	0.30	0.15	0.069	
VO307Y (Energy-saving type)													
VO307W (Energy-saving, Vacuum spec. type)													

Series VT307

Dimensions: Common Exhaust (Interchangeable with VT301 for mounting)

VV307-01-□2-01-F



[] : With light/surge voltage suppressor

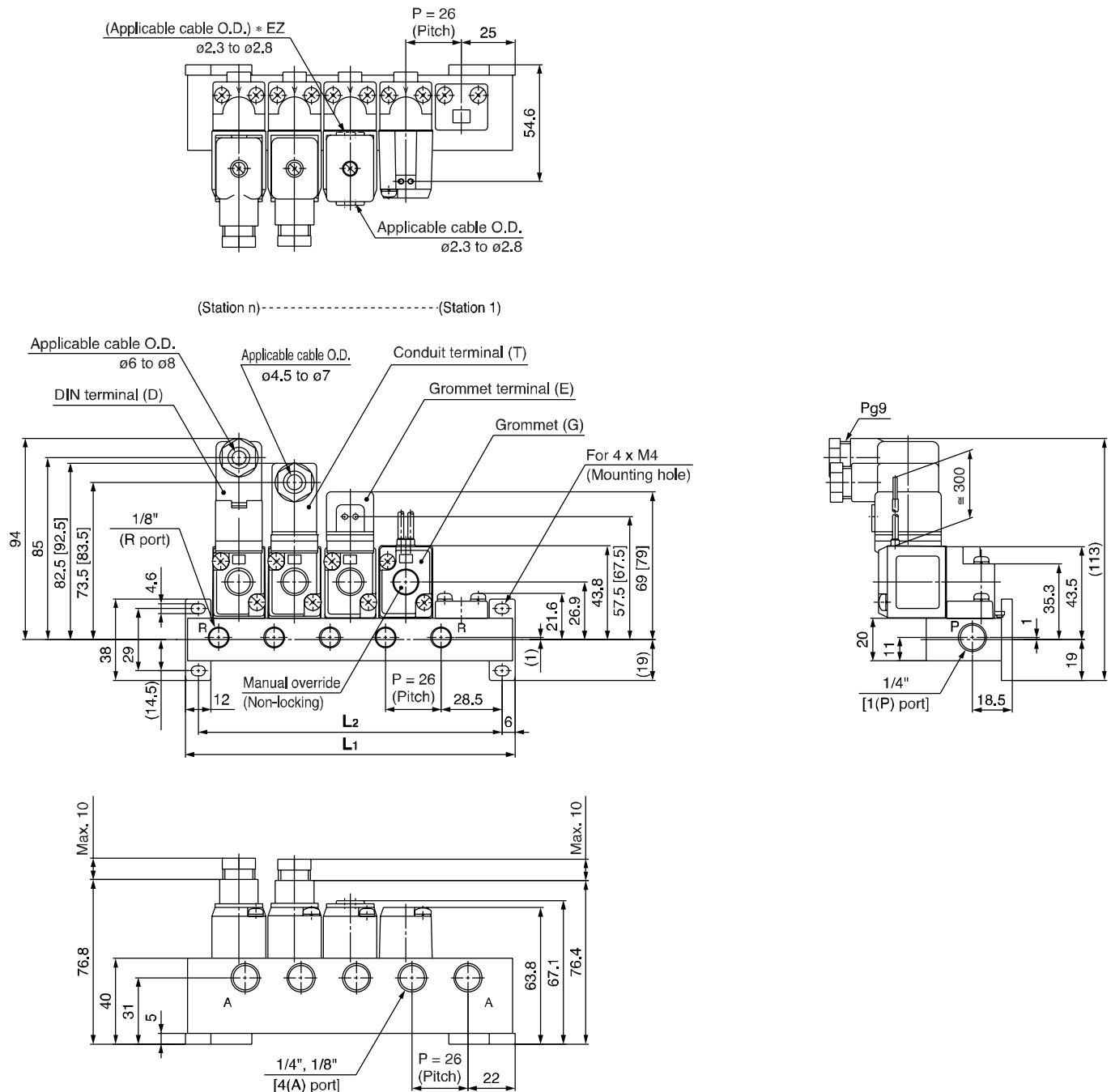
L Dimension

n: Stations

L	n	2	3	4	5	6	7	8	9	10	Formula
L ₁		88	114	140	166	192	218	244	270	296	L ₁ = 26 x n + 36
L ₂		62	88	114	140	166	192	218	244	270	L ₂ = 26 x n + 10

Dimensions: Individual Exhaust (Interchangeable with VT301 for mounting)

VV307-01-□3-□-F



[] : With light/surge voltage suppressor

L Dimension

n: Stations

Stations	2	3	4	5	6	7	8	9	10	Formula
L ₁	76	102	128	154	180	206	232	258	284	L ₁ = 26 x n + 24
L ₂	64	90	116	142	168	194	220	246	272	L ₂ = 26 x n + 12



Series VT307 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.

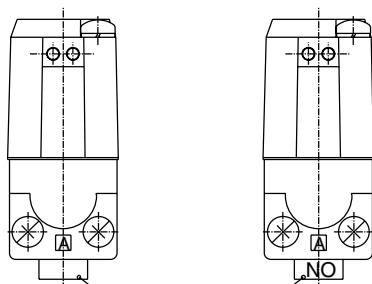
Mounting

⚠ Warning

When mounting a valve on the manifold base, N.C. and N.O. can be reversed by a function plate orientation. Also, since cylinder also acts reversely, confirm if the function plate is correctly mounted or not.

N.C.
specifications

N.O.
specifications



Function plate

⚠ Caution

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

Port Direction

⚠ Caution

1. For the common exhaust type, pressurization or evacuation of the R port can cause a malfunction.

Changing from N.C. to N.O.

⚠ Caution

This product is delivered as N.C. valve. If N.O. valve is needed, remove mounting screws of the required valve and turn over the function plate. (Make sure that there are gaskets on both sides of the plate.) Then, tighten the mounting screws to fix the valve to the manifold base.

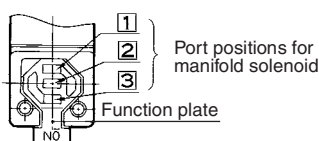


Figure: For N.C.

Specifications	Function plate
N.C.	No mark
N.O.	NO