3 Port Direct Operated Poppet Rubber Seal

Series VT307

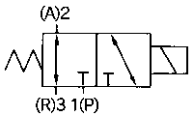
Large Flow Capacity, yet Compact Size.
Dimensions (W X H X D)·····30 X 54.5 X 33 (Grommet)
VT307·····Cv 0.21 or more, Rc(PT)1/4

Low Power Consumption
VT/VO307·····4.8W DC/Standard Style
VT/VO307Y / VT/VO307W ·····2W DC/Energy Saving Style

Suitable for Use in Vacuum Applications
–101.2kPa
(Vacuum Style: VT/VO307V, VT/VO307W)

1 Valve, 6 Functions.
(Universal Porting)
Selective porting can provide 6 valve functions, such as N.C. valve, N.O. valve, Divider valve, Selector valve etc.

JIS Symbol



Model

	Single unit	Manifold style
Standard	**VT307**	**VO307**
Continuous duty	**VT307E**	**VO307E**
Energy saving	**VT307Y**	**VO307Y**
Vacuum	**VT307V**	**VO307V**
Energy saving/Vacuum	**VT307W**	**VO307W**

Manifold

Model	Applicable manifold	Accessories
VO307□	Common or individual exhaust	Switching plate (DXT152-14-1A)* Mounting screw (NXT013-3)

*) Not applied to "Continuous Duty style"

Standard Specifications

Actuation			Direct operated 2 position single solenoid			
Fluid			Air			
Operating pressure range			0 to 0.9 MPa			
Ambient and fluid temperature			0 (No condensation) to 50°C			
Response time (1)			20ms or less (0.5MPa)			
Max. operating frequency			10Hz			
Lublication			Not required (If using a lubricant, use turbine oil class 1 ISO VG32.)			
Manual override			Non-locking push style			
Mounting orientation			Free			
Impact/Vibration resistance (2)			150/50m/s²			
Enclosure			Dust proof			
Effective area mm² (3) (Cv) (4)	Port size		P→A	A→R	A→P	R→A
	Rc(PT) 1/8		3.9 (0.21)	3.9 (0.21)	3.5 (0.19)	3.6 (0.20)
	Rc(PT) 1/4		3.9 (0.21)	4.0 (0.22)	4.2 (0.23)	3.8 (0.21)
Weight			0.14kg (Grommet style)			
Accessories(options)			Bracket (DXT152-25-1A) with screws			
Electrical entry			Grommet, Grommet terminal, Conduit terminal, DIN connector			
Voltage	AC(50/60Hz)		100, 200, 24*, 48*, 110*, 220*, 240*			
	DC		24, 6*, 12*, 48*, 100*			
Allowable voltage			–15% to +10% of rated voltage			
Apparent power (4) (5)	AC	Inrush	12.7VA (50Hz) 10.7VA (60Hz)			
		Holding	7.6VA (50Hz) 5.4VA (60Hz)			
Power consumption (4) (5)	DC		Without light: 4.8W, With light: 5W			
Indicator light and surge suppressor (Not applicable for grommet style)	AC		ZNR (Varister), Neon lamp			
	DC		Diode, LED (Neon lamp for 100V or more)			

* Option

Note 1) Based on dynamic performance test JIS B8374-1981. (Coil temperature 20C°, at rated voltage, without surge voltage suppressor.)

Note 2) Impact resistance: No malfunction resulted from the impact test using a drop impact tester. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states.
Viblation resistance: No malfunction occured in a one-sweep test between 45 and 1000 Hz. Test was performed at both energized and de-energized states to the axis and right angle directions of the main valve and armature. (Value in the initial stage.)

Note 3) This is the value for single valve. For manifolds, refer to "Manifold Specifications" on p.2.5-5.

Note 4) The value is different for continuous duty style (VT307E), and energy saving style (VT307Y/W).
Refer to "Option Specifications" on p.2.5-2.

Note 5) At rated voltage.

Option Specifications

Continuous Duty Style: 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 rate, if energizing valve more than once a day, consult 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 (50Hz), 6.2VA (60Hz)		
		Holding	5.8VA (50Hz), 3.5VA (60Hz)		
Power consumption/DC		2W, 2.2W (With indicator light)			
Response time (1)		30ms or less (0.5MPa)			
Effective area mm² (Cv)	Port size	P→A	A→R	A→P	R→A
	Rc(PT)1/8	2.4 (0.13)	2.1 (0.11)	2.3 (0.12)	2.1 (0.11)
	Rc(PT)1/4	2.6 (0.14)	2.4 (0.13)	2.6 (0.14)	2.4 (0.13)

Note 1) Refer to p.2.5-1.

Energy Saving Style: VT307Y (VT307W)

If low power consumption is required for electronic control, "VY307Y"(2WDC) is recommended.

Specifications different from standard are as follows.

Power consumption/DC		2W*, 2.2W (With indicator light)			
Response time (1)		25ms or less (0.5MPa)			
Effective area mm² (Cv)	Port size	P→A	A→R	A→P	R→A
	Rc(PT)1/8	2.4 (0.13)	2.1 (0.11)	2.3 (0.12)	2.1 (0.11)
	Rc(PT)1/4	2.6 (0.14)	2.4 (0.13)	2.6 (0.14)	2.4 (0.13)

*100V DC: 2.4W
Note 1) Refer to p.2.5-1.

Vacuum Style: VT307V (VT307W)

This vacuum model has less air leakage than the standard model under low pressure.

⚠ Caution

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	–101.2kPa to 0.1MPa

How to Order

V T 307 □ – 5 D □ – 01 – F

Body

T	Body ported
O	For manifold

Valve specification

—	Standard
E*	Continuous duty
Y*	Energy saving (2WDC)
V*	Vacuum
W*	Energy saving/ Vacuum

*Option

Voltage

1	100V AC 50/60 Hz
2	200V AC 50/60 Hz
3*	110V AC 50/60 Hz
4*	220V AC 50/60 Hz
5*	24V DC
6*	12V DC
7*	240V AC 50/60 Hz
9*	Others

*Option

Electrical entry

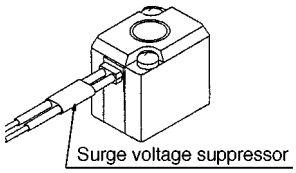
G	Grommet, 300mm lead wire
H	Grommet, 600mm lead wire
D	DIN connector
E	Grommet terminal
T	Conduit terminal

Indicator light and surge voltage suppressor

—	None
S	With surge voltage suppressor (Available only on grommet)
Z	W/indicator light and surge suppressor (Except for grommet)

*As to the case of rated voltage [Others (9)], please contact SMC.

Surge voltage suppressor mounting part



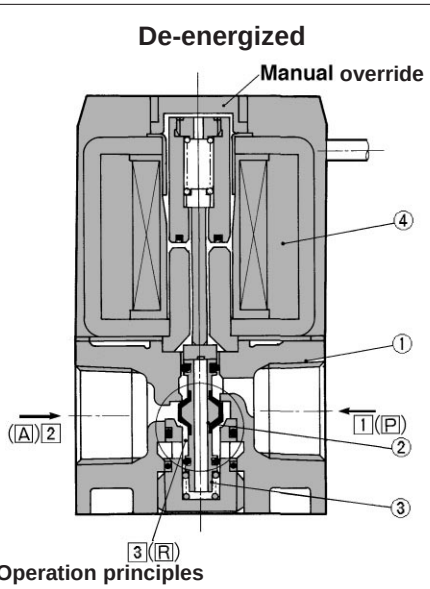
Port size Rc(PT)

—	Without port (for manifold)
01	1/8 (6A)
02	1/4 (8A)

Option

F	With foot bracket

Construction



Operation principles

<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 pole 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 pole ⑥, but the armature will be magnetically attracted to the pole ⑥.

Air flow direction:

Port P ⟷ Port A, Port R ⟷ Block

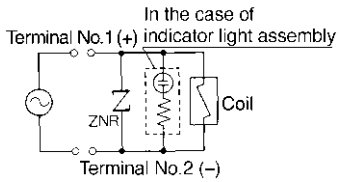
Component Parts

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

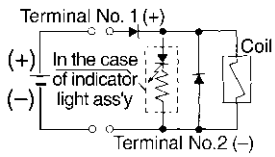
⚠ Caution

Indicator Light and Surge Voltage Suppressor

AC, 100VDC or more



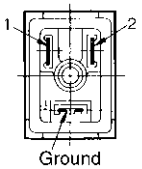
DC48V



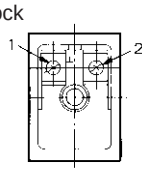
Wiring

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

DIN connector with terminal block



Terminal with terminal block



Terminal No.	1	2
DIN Terminal	+	–
Terminal	+	–

- Applicable cable O.D.
  Type T: ø4.5 to ø7mm
  Type E: ø2.3 to ø2.8mm
  Type D: ø4.5 to ø7mm
- Applicable crimp terminal
  Type E/T: 1.25-3, 1.25-3S
  1.25Y-3N, 1.25Y-3S

(Round or "Y" shaped crimped terminals can be not used for type "D".)

Lead Wire Color

Voltage	Color
100V AC	Blue
200V AC	Red
DC	Red (+), Black (–)
Others	Gray

⚠ Precautions

Be sure to read before handling.
Refer to p.0-33 to 0-36 for Safety Instruction and common precautions.

⚠ Caution

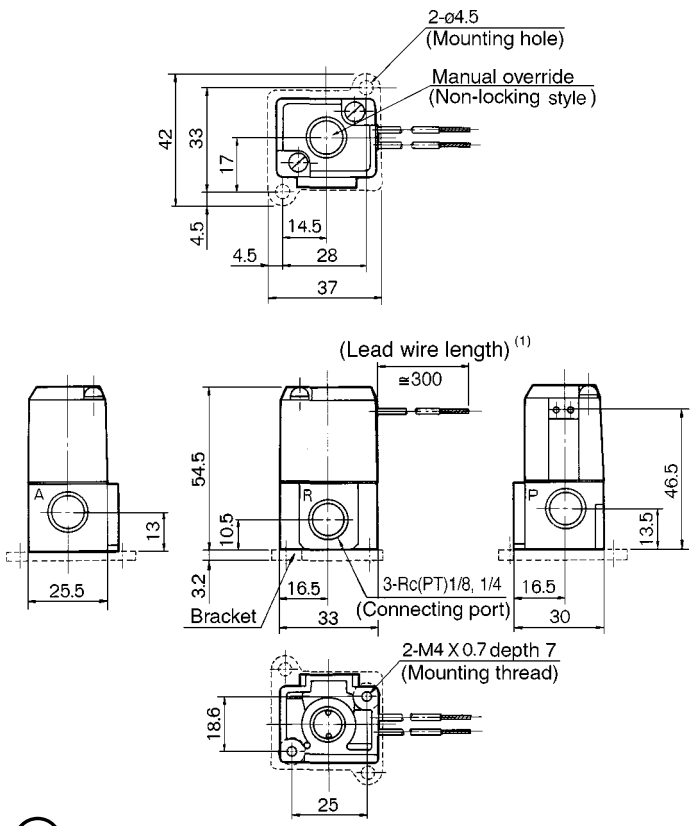
1. Make sure that dust and/or other foreign materials should not enter the valve from the unused port such as exhaust port. Also, since there is a bleed port for the armature in the manual override part, do not allow accumulation of dust and/or other foreign materials to block bleed port.

How to Calculate Flow Rate

Refer to p.0-36 for the calculation of flow rate.

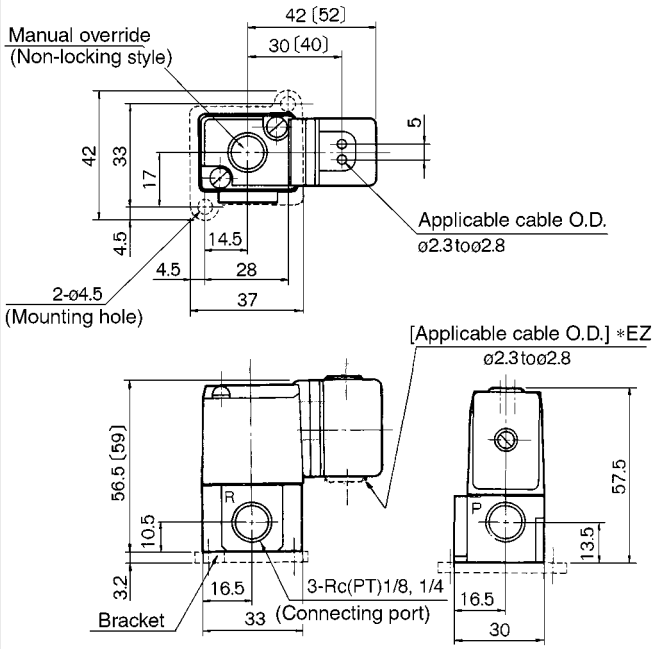
Dimensions (Interchangeable with “VT301” for mounting.)

Grommet: VT307-□G



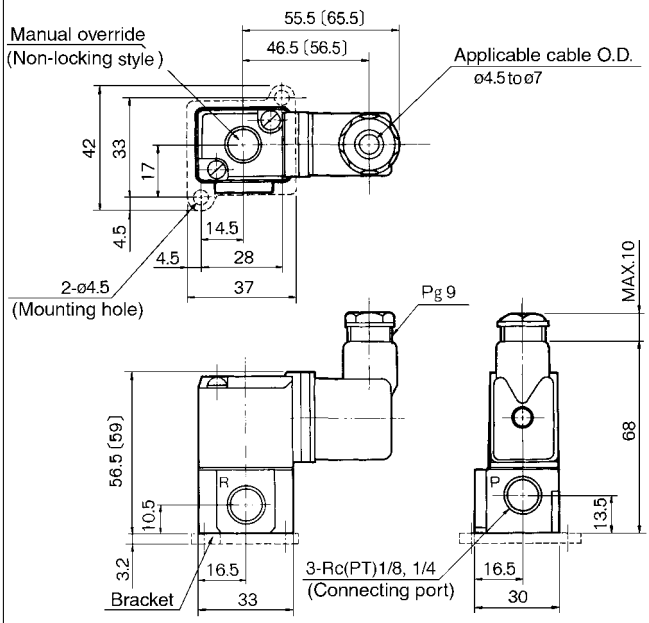
Note 1) There is also “VT307-□H” (lead wire length: 600 mm).

Grommet terminal: VT307-□E



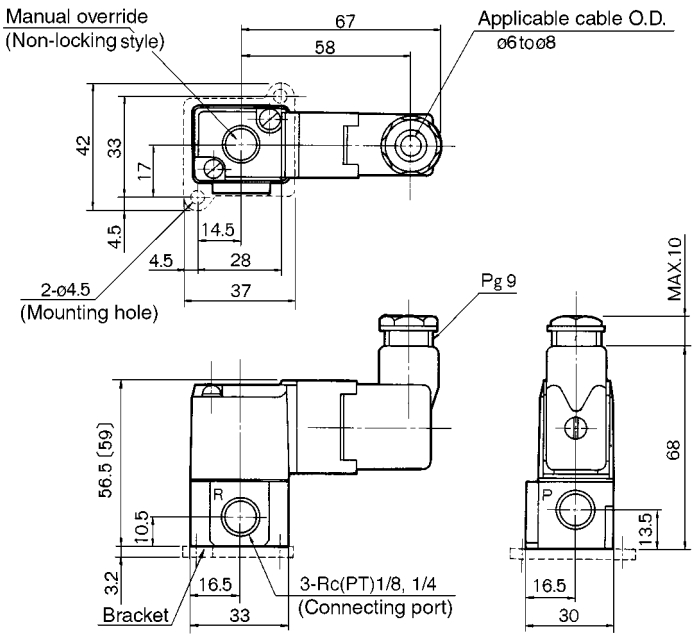
[ ]: With indicator light and surge voltage suppressor

Conduit terminal: VT307-□T



[ ]: With indicator light and surge voltage suppressor

DIN connector: VT307-□D



[ ]: With indicator light and surge voltage suppressor

Series VT307
Manifold

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

Manifolded valve can be easily converted from N.C. normally closed to N.O. normally open merely by turning over the switch cover.

VV307-01-052-F

VV307-01-063-□-F

Specifications

Manifold	B Mount
Max. number of stations	20 *
Applicable solenoil valve	VO307□-□□□

Exhaust port		Port location (piping)/Port size			Effective area (mm^2) (Cv)
Code	Style	P	A	R	
2	Common	Base (side) 1/8	Base (side) 1/8	Base (side) 1/8	1.7 (0.09) …VO307 (V)
3	Individual	Base (side) 1/4	Base (side) 1/8, 1/4	Base (top) 1/8	1.5 (0.08) …VO307Y (E)

* If operating with 6 valves or more, apply supply pressure to both of the P ports of the manifold. The common exhaust style should exhaust from both of the R ports.

Option

Description	Part No.
Blank plate (with gasket, screw) (1)	DXT060-51-13$^{A}_{B}$

Accessories

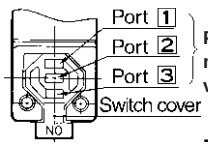
Description	Part No.
Switching plate (with gasket) (1)	DXT152-14-1$^{A}_{B}$
Mounting screw (2)	NXT013-3

Note 1) "DXT060-51-13B" and "DXT152-14-1B" are for long time loading.
Note 2) For mounting single solenoid valve for manifolds.

⚠ Caution

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 over the switching 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.



Port positions for manifold solenoid valve body.

Figure: N.C.

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

⚠ Precautions

Be sure to read before handling. Refer to p.0-33 to 0-36 for Safety Instruction and common precautions.

Mounting

⚠ Caution

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

Piping

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

How to Order Manifold Base

VV307 − 01 − 05 | 2 | 01 − F

VT307 manifold

Stations

02	2 stations
⋮	⋮
20	20 (Max)

Exhaust style

2	Common exhaust
3	Individual exhaust

A port size (base mounted)

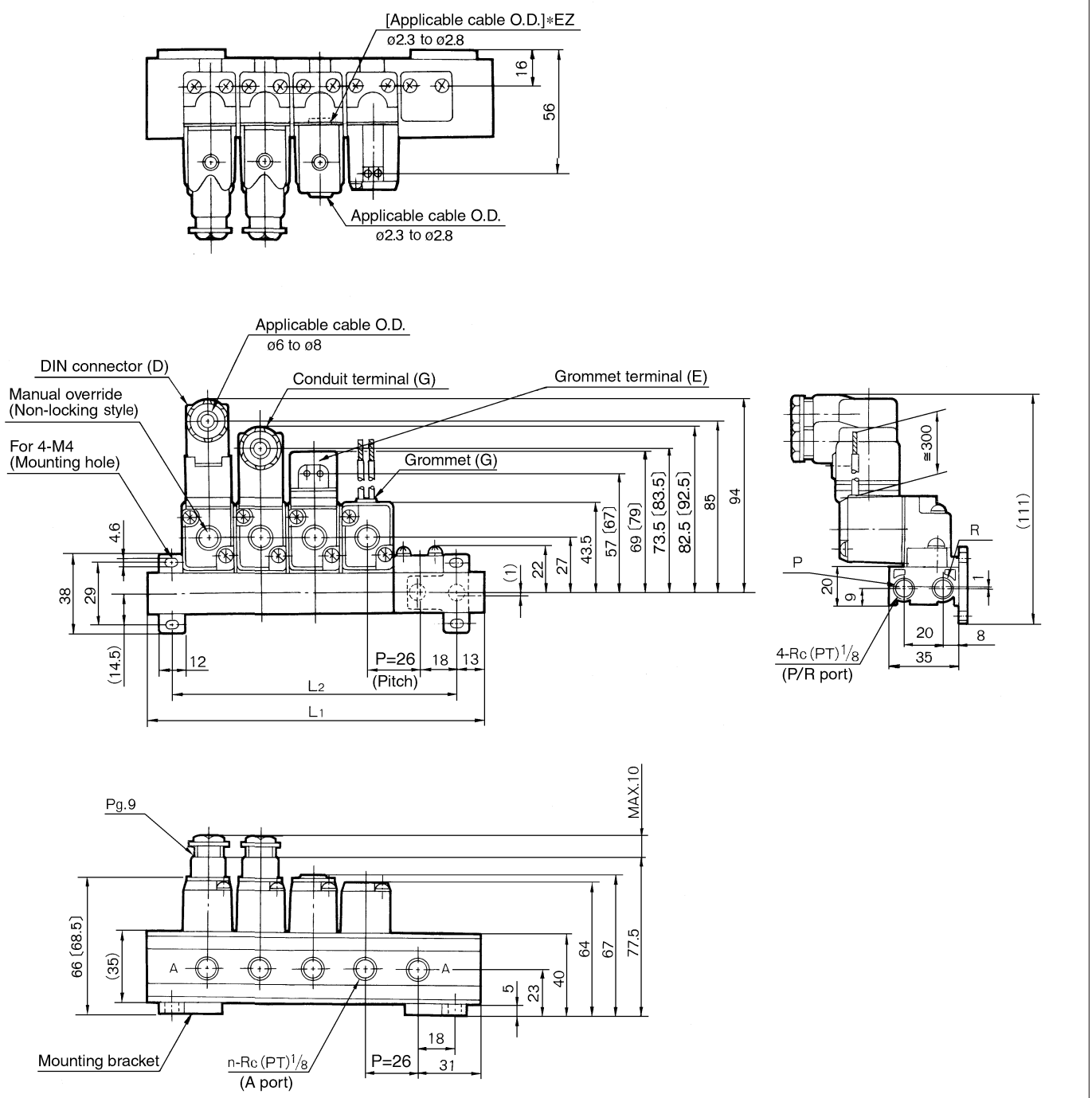
01	Rc(PT)1/8 Common exhaust style/Individual exhaust style
02	Rc(PT)1/4 Individual exhaust style

Mounting bracket

*Please indicate manifold base style, applicable manifold valve and blank plate when ordering.
Ordering Example:
VV307-01-052-01-F…1 pc. (5 station manifold base)
VO307-1G ……4 pcs.
DXT060-51-13A ……1 pc.

Common Exhaust/Dimensions (Interchangeable with VT301 for mounting.)

VV307-01-□2-01-F



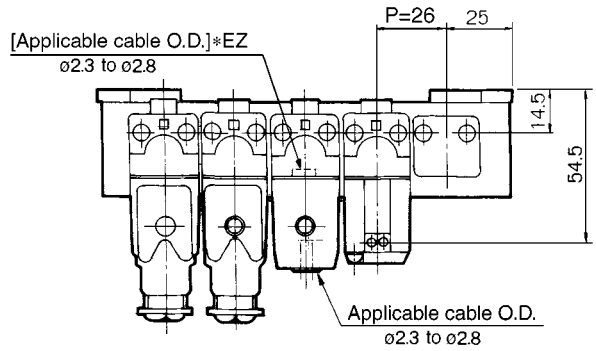
[ ]: With indicator light and surge voltage suppressor

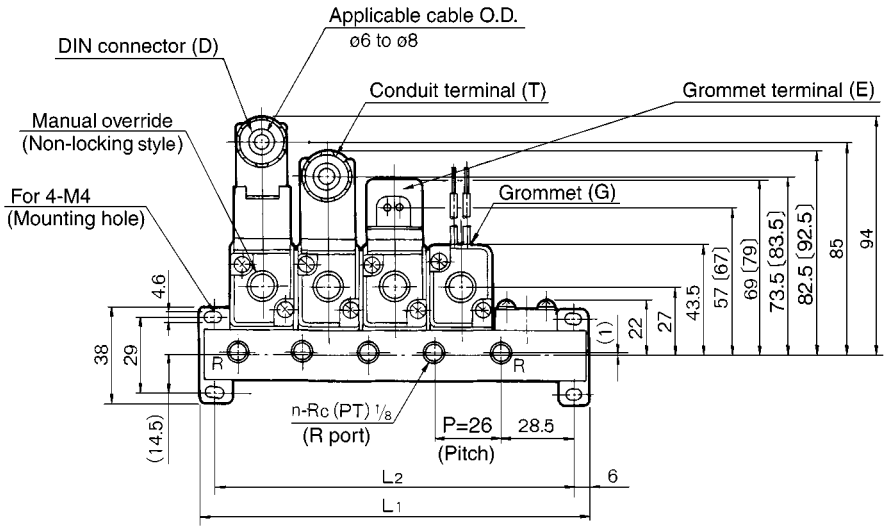
L: Dimensions (mm) n: Station

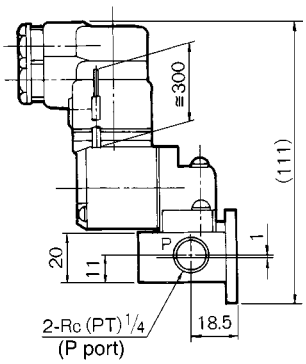
L \ n	2	3	4	5	6	7	8	9	10	Equation
L1	88	114	140	166	192	218	244	270	296	L1=26 X n+36
L2	62	88	114	140	166	192	218	244	270	L2=26 X n+10

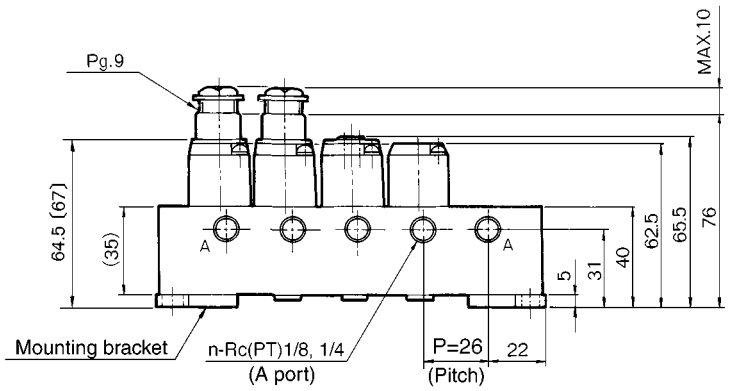
Individual Exhaust/Dimensions (Interchangeable with VT301 for mounting)

VV307-01-□3-□-F









L:Dimensions (mm) n: Station

L \ n	2	3	4	5	6	7	8	9	10	
L1	76	102	128	154	180	206	232	258	284	L1=26 X n+24
L2	64	90	116	142	168	194	220	246	272	L2=26 X n+12

[ ]: With indicator light and surge voltage suppressor