4 Port Direct Operated Poppet Solenoid Valve

Series VQD1000

High speed coil with stable response times

ON: 4ms, OFF: 2ms,
Dispersion accuracy: ±1ms
(With light and surge voltage suppressor at a supply pressure of 0.5MPa, subject to clean, dry air)

Compact and lightweight (34g) with large flow capacity

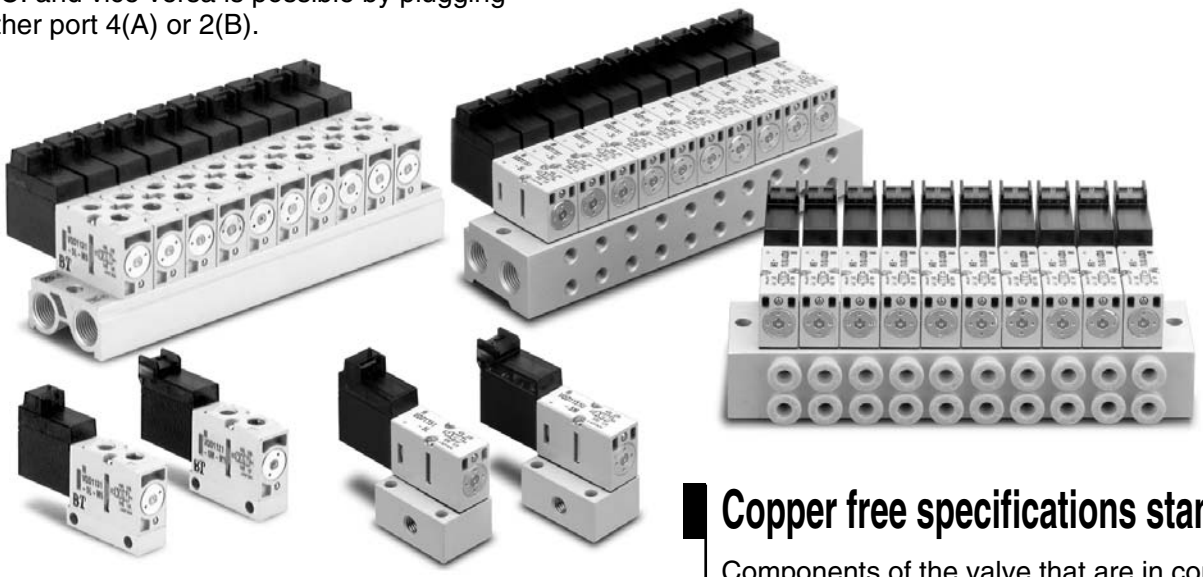
Body width of 10mm, N*ℓ*/min (49.08) 2W (Standard)
N*ℓ*/min (78.52) 4W (U type: Large flow)

Vacuum applications possible (up to –100kPa)

(Valve leakage: 0.03cm^3/s He or less)
Can be used for vacuum and vacuum release circuits. When used as a 3 port valve, conversion from N.O. to N.C. and vice versa is possible by plugging either port 4(A) or 2(B).

Clean room specifications available as special.

Main valve has no sliding seals or grease and air is not exhausted to the atmosphere.



Body ported **Base mounted**

Copper free specifications standard

Components of the valve that are in contact with fluid are all copper free.

Cylinder Speed

Port size / Effective area mm² (N*ℓ*/min)	Cylinder speed (mm/s)	Cylinder bore size (mm)						
		Series CJ2 Pressure: 0.5MPa Load ratio: 50% Cylinder stroke: 60mm			**Series CM2** Pressure: 0.5MPa Load ratio: 50% Cylinder stroke: 300mm			
		ø6	ø10	ø16	ø20	ø25	ø32	ø40
VQD1151U (Large flow capacity) M5 1.5 (78.52)	150							
	300							
	450							
	600							
	750							

Note 1) Cylinder speed varies depending on piping and air component equipment used. Use the table as a guideline for selection.
Note 2) Cylinder speed of "CJ2" and "CM2" is limited by the fixed orifice built-in.
Note 3) Cylinder speed: when the cylinder is extended.

Characteristic values mentioned in the catalog are typical values and are not to be guaranteed.

⚠ Precautions

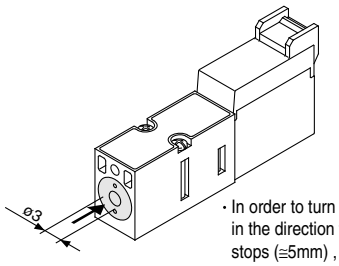
Be sure to read before handling. Refer to p.0-33 to 0-36 for Safety Instructions and common precautions.

Manual Operation

⚠ Warning

Connected actuator is started by manual operation. Use the manual override after confirming that there is no danger.

■ Non-locking push style (Flush)

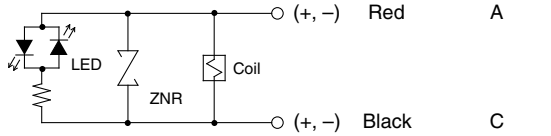


・In order to turn it ON, push down the manual override button in the direction the arrow (→) indicates until it stops (≅5mm) , and release it to turn it OFF.

Wiring Specifications

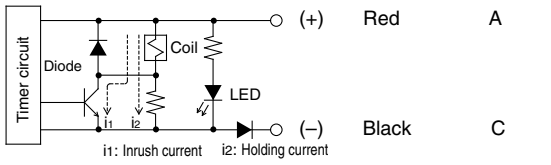
⚠ Caution

• Standard: 2W specification



Lead wire	Connector
Red	A
Black	C

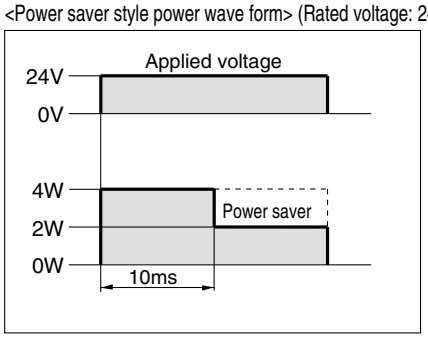
• Large flow capacity: 4W specification



Lead wire	Connector
Red	A
Black	C

For the 4W specification (power saver), power consumption at holding is reduced with the above circuit. Refer to the power wave form below.

<Power saver style power wave form> (Rated voltage: 24V DC)



How to Mount Valve

⚠ Caution

After confirming that the gasket is snug, tighten the mounting screws securely with the clamping torque shown in the table below.

Appropriate clamping torque (Nm)
0.18 to 0.25

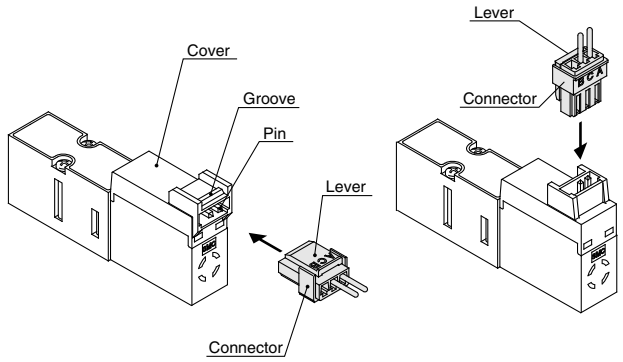
How to Use Plug Connector

⚠ Caution

Installation and removal of connector

- For installation of the connector, insert the connector straight on the pins of the solenoid, making sure that the lip of the lever is securely positioned in the groove of the cover and locked.
- To remove the connector, press the lever against the connector and pull connector away from the solenoid.

Note: To avoid contact failure and broken wires, do not pull out the lead wire with excessive force.



- How to order connector assembly

AXT661-14A-□

Lead wire length

—	300mm
6	600mm
10	1000mm
20	2000mm
30	3000mm

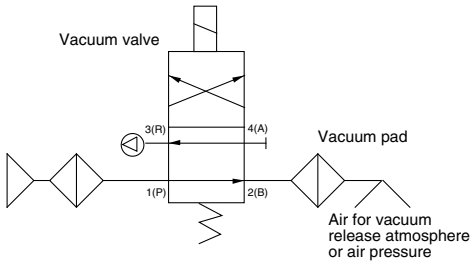
- Lead wire length of plug connector

Lead wire length of plug connector valve with lead wire is 300mm. When lead wire length of 600mm or longer is required, order a valve without connector and order connector assembly separately.

How to Use the Valve for Vacuum Applications (When used as a 3 port valve)

⚠ Caution

Application example of "VQD1151 V/W" (Symbols used are typical.)



- Use a VQD1151V/W valve for vacuum applications. Connect the vacuum source to the 3(R) port.
  ∗Air pressure cannot be applied to the 3(R) port.
- When used as a 3 port valve, conversion from N.O. to N.C. and vice versa is possible by plugging either port 4(A) or 2(B).
  ∗Cannot be used as 2 port valve.

4 Port Direct Operated Poppet Solenoid Valve

Series VQD1000

How to Order

VQD11 5 1 — 5 L — Q

Body

2	Body ported (Single unit)
3	Body ported (Manifold)
5	Base mounted

Valve option

—	Standard (2W)
V	Vacuum (2W)
U (1)	Large flow (4W)
W (1)	Large flow, Vacuum (4W)

Note 1) Power saver type

Rated voltage

5	24V DC
6	12V DC
9	Less than 50VDC

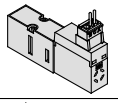
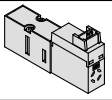
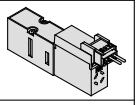
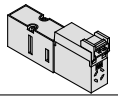
Order Made Contact SMC for other voltages (9)

Protective class class III (Mark: ⧫)

Sub-plate port size

Body ported	M5	M5 thread
Base mounted	–	Without sub-plate (Manifold)
	M5	M5 thread

Electrical entry

L: Plug lead L plug connector, With lead wire and light and surge suppressor	
LO: Plug lead L plug connector, Without lead wire and light and surge suppressor	
M: Plug lead M plug connector, With lead wire and light and surge suppressor	
MO: Plug lead M plug connector, Without lead wire and light and surge suppressor	

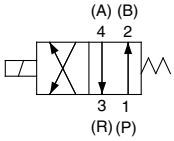
L plug connector
Base mounted

L plug connector
Body ported

M plug connector
Base mounted

M plug connector
Body ported

JIS Symbol



Standard Specifications

Item		Model	Standard (2W)	Large flow capacity (4W, Power Saver)
Valve specifications	Valve structure		4 port direct operated poppet valve	
	Fluid		Air, Inert gas	
	Max. operating pressure		0.7MPa	
	Min. operating pressure/Vacuum		0MPa/–100kPa	
	Effective area (Nℓ/min)		0.9mm² (Nℓ/min 49.08)	1.5mm² (Nℓ/min 78.52)
	Response time (1)		ON: 4ms, OFF: 2ms	
	Ambient and fluid temperature		–10 to 50°C (2)	
	Lubrication		Not required	
	Manual override		Non-locking push style	
	Shock/Vibration resistance		150/30m/s² (3)	
	Mounting orientation		Free	
	Enclosure		Dust proof	
	Weight		34g (Without sub-plate)	
Solenoid specifications	Coil rated voltage	DC	24V, 12V	
	Allowable voltage		±10% of rated voltage	
	Type of coil insulation		Class B or equivalent	
	Power consumption	DC	2W	4W (Power saving) (Inrush: 4W, Holding: 2W)
	Electrical entry		L plug connector, M plug connector (With light and surge voltage suppressor)	

Note 1) According to JISB8375-1981. Factor: With light and surge suppressor (Subject to clean air). Dispersion accuracy: ±1ms

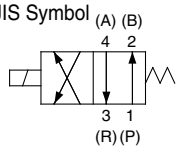
Note 2) Operating the valve at low temperatures may cause condensate to form, therefore dry air must be used.

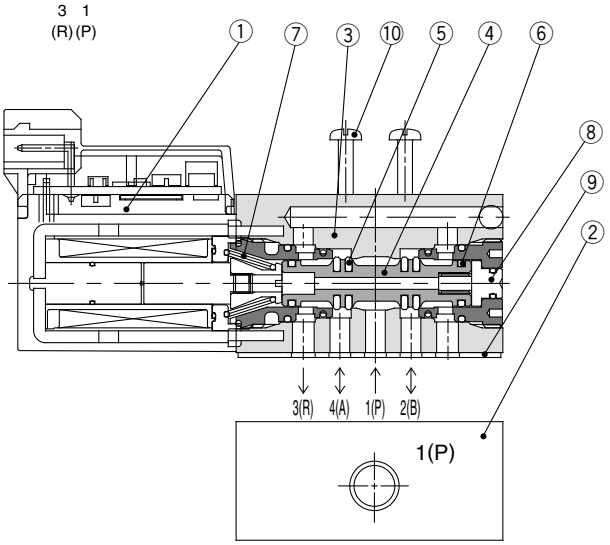
Note 3) Shock resistance: No malfunction resulted from the impact test using a drop impact tester. The test was performed on the axis and right angle direction of the main valve and armature, for both energized and de-energized states.

Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000Hz. Test was performed at both energized and de-energized states to the axis and right angle direction of the main valve and armature. (Value in the initial stage.)

Construction

JIS Symbol





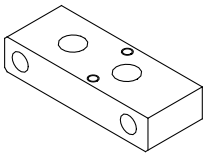
Component Parts

No.	Part name	Material	Note
①	**Solenoid coil assembly**	–	
②	**Sub-plate**	Aluminum	VQD1000-S-M5(Base mounted only)
③	**Body**	ZDC	
④	**Spool valve**	Aluminum	
⑤	**Poppet**	HNBR	
⑥	**Guide ring**	Resin	
⑦	**Return spring**	Stainless steel	
⑧	**Manual override**	Aluminum	
⑨	**Gasket**	NBR	VQD1000-9-1
⑩	**Round head screw**	Steel	AXT632-7-13(M1.7 X 18)

Note) Body cannot be disassembled.

Valve Single Unit Option

Piping plate assembly
VQD1000-20A



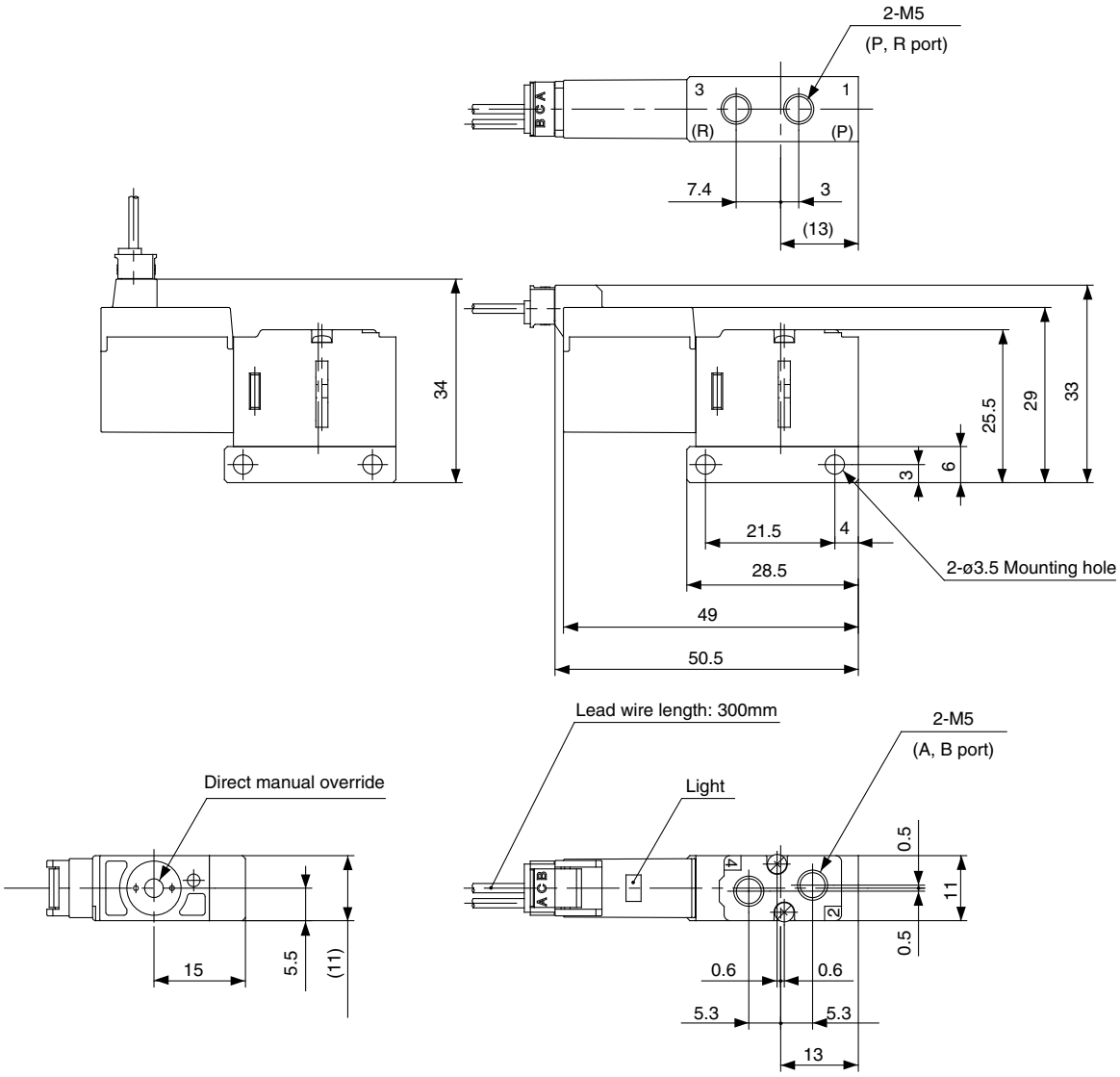
Manifold style (VQD1131) can be changed to single unit style (VQD1121) by mounting plate assembly.

Note) Plate should be mounted with manifold mounting screws (M1.7 X 20).
Tightening torque: 0.18 to 0.25Nm

Dimensions

L plug connector: VQD1121□-□L-M5-Q

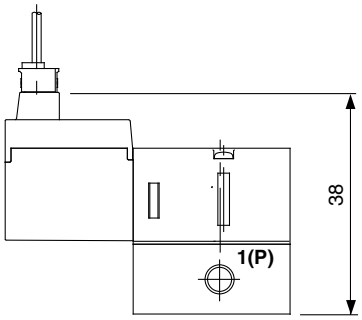
M plug connector: VQD1121□-□M-M5-Q



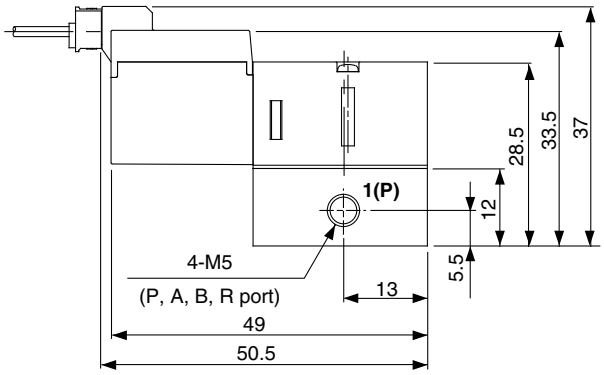
Dimensions

L plug connector: VQD1151□-□L-M5-Q

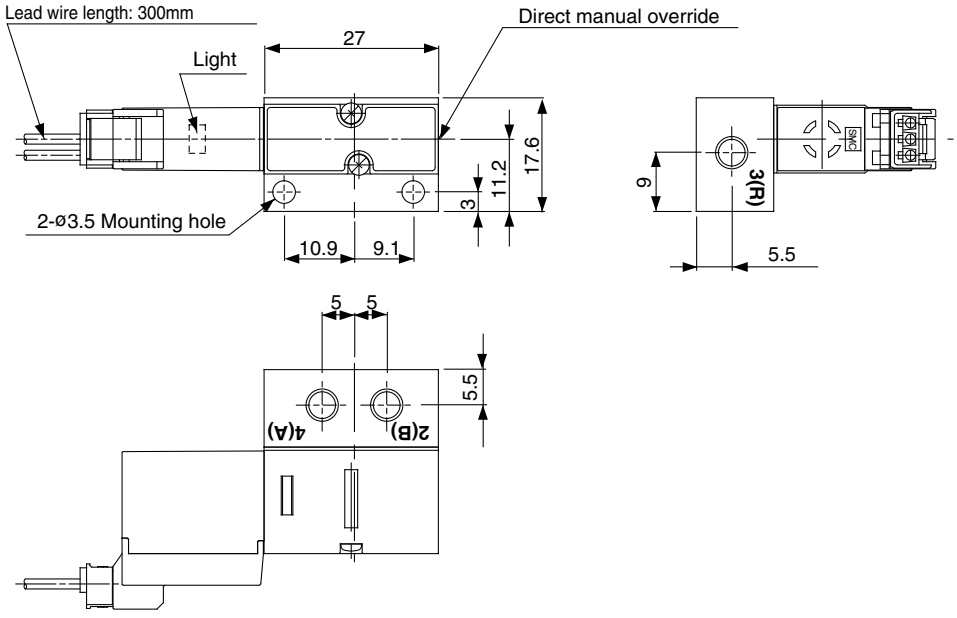
M plug connector: VQD1151□-□M-M5-Q



L plug connector (L)



M plug connector (M)



How to Order Manifold

Plug lead unit manifold

VV4QD1 5 □ □ □

Manifold

2	Body ported
5	Base mounted

Stations

02	2 stations
⋮	⋮
20	20 stations (Max.)

CE-compliant

—	—
Q	CE-compliant

Port size(Cylinder port)

—	Body ported	M5 thread
M5	Base mounted	M5 thread
C4		One-touch fitting for ø4

1(P), 3(R) port: Rc 1/8

How to Order Valve

VQD11 5 1 □ — 5 L — M5 — Q

Body

3	Body ported type
5	Base mounted type

Valve option

—	Standard (2W)
V	Vacuum (2W)
U*	Large flow (4W)
W*	Large flow, Vacuum (4W)

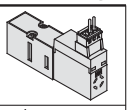
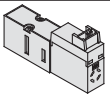
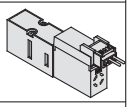
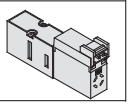
* Power saver

Rated voltage

5	24V DC
6	12V DC

Note) Consult SMC for other voltages.

Electrical entry

L: Plug lead L plug connector, With lead wire and light and surge voltage suppressor	
LO: Plug lead L plug connector, Without lead wire and light and surge voltage suppressor	
M: Plug lead M plug connector, With lead wire and light and surge voltage suppressor	
MO: Plug lead M plug connector, Without lead wire and light and surge voltage suppressor	

Port size (Body ported only)

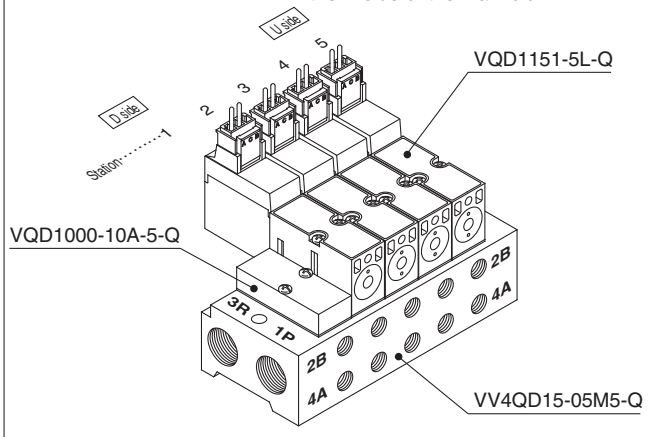
M5	M5 thread

How to Order Manifold Assembly

Specify the model numbers of valve and option together with the manifold base part number.

<Example>
Plug lead unit manifold
VV4QD15-05M5-Q·····1 set ——— Manifold base part number
* **VVQD1000-10A-5**····· 1 set — Blank plate part number (1st station)
* **VQD1151-5L-Q**·····4 sets — Valve part number (2 to 5th station)

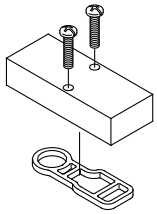
Specify part numbers in order from the first station starting from the D side of the manifold.



Manifold Option

Blank Plate Assembly/Body Ported

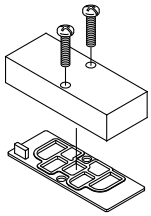
VVQD1000-10A-2



Blank plate assembly includes 2 screws and 1 gasket.

Blank Plate Assembly/Base Mounted

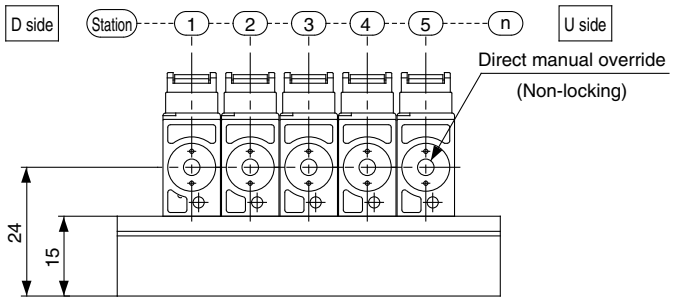
VVQD1000-10A-5

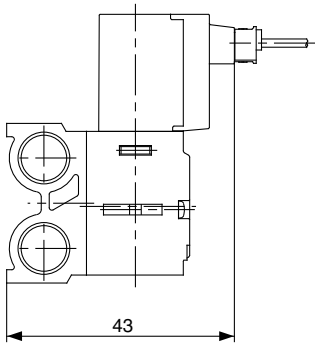


Blank plate assembly includes 2 screws and 1 gasket.

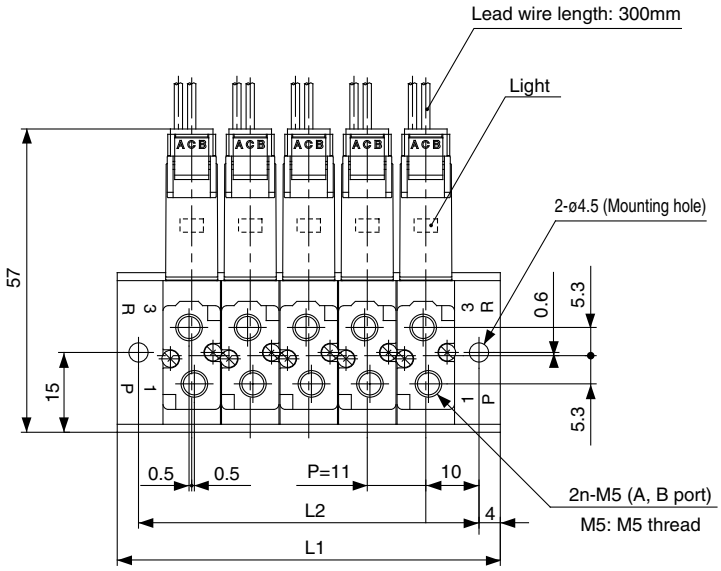
Dimensions

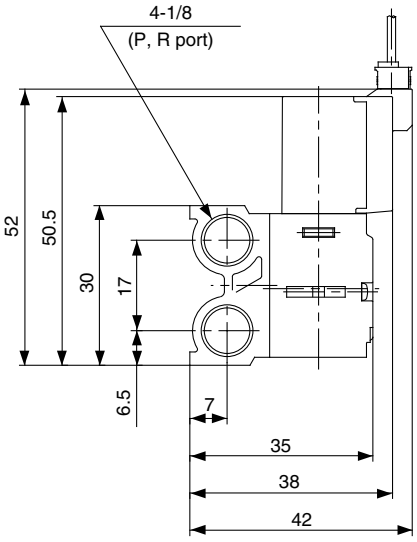
Plug lead unit manifold(VV4QD12-□-Q)





L plug connector (L)





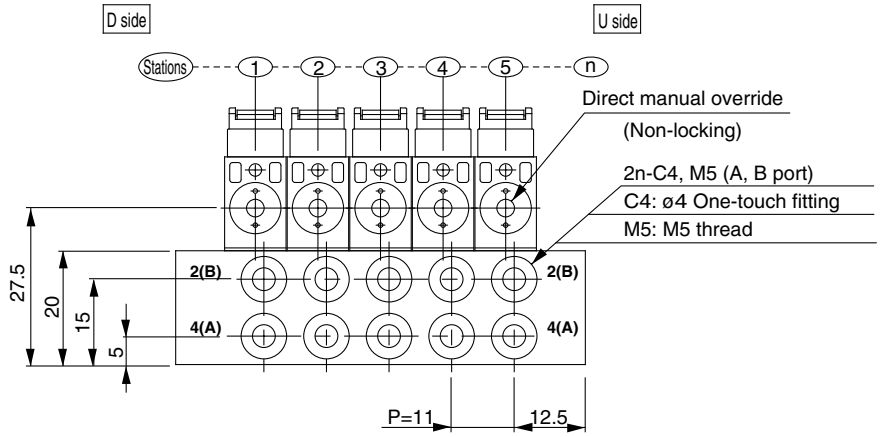
M plug connector (M)

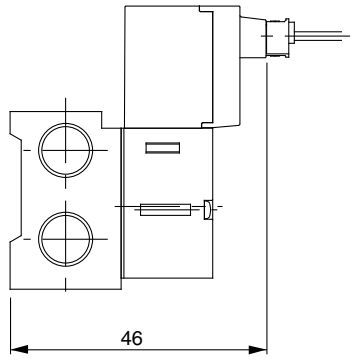
Dimensions n: Station

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	28	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215	226	237
L2	20	31	42	53	64	75	86	97	108	119	130	141	152	163	174	185	196	207	218	229

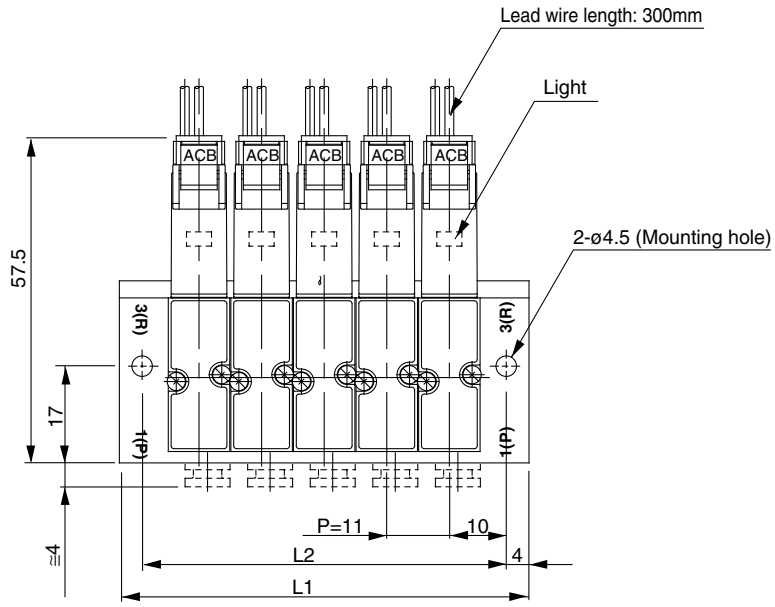
Dimensions

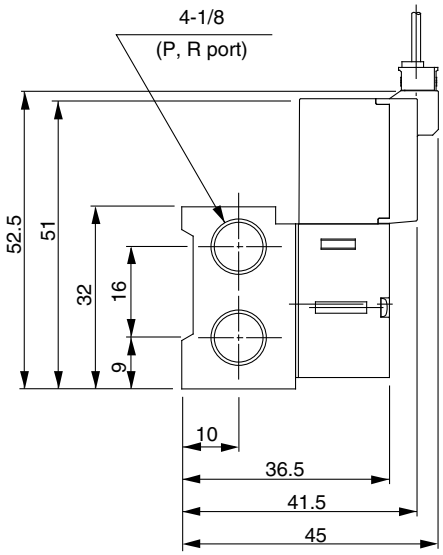
Plug lead manifold unit(VV4QD15-□□-Q)





L plug connector (L)





M plug connector (M)

Dimensions n: Station

L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215	226	237
L2	31	42	53	64	75	86	97	108	119	130	141	152	163	174	185	196	207	218	229