

4 Port Direct Operated Poppet Solenoid Valve

Series VQD1000

High speed coil with stable response times

ON: 4ms, OFF: 2ms,
Dispersion accuracy: ± 1 ms
(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

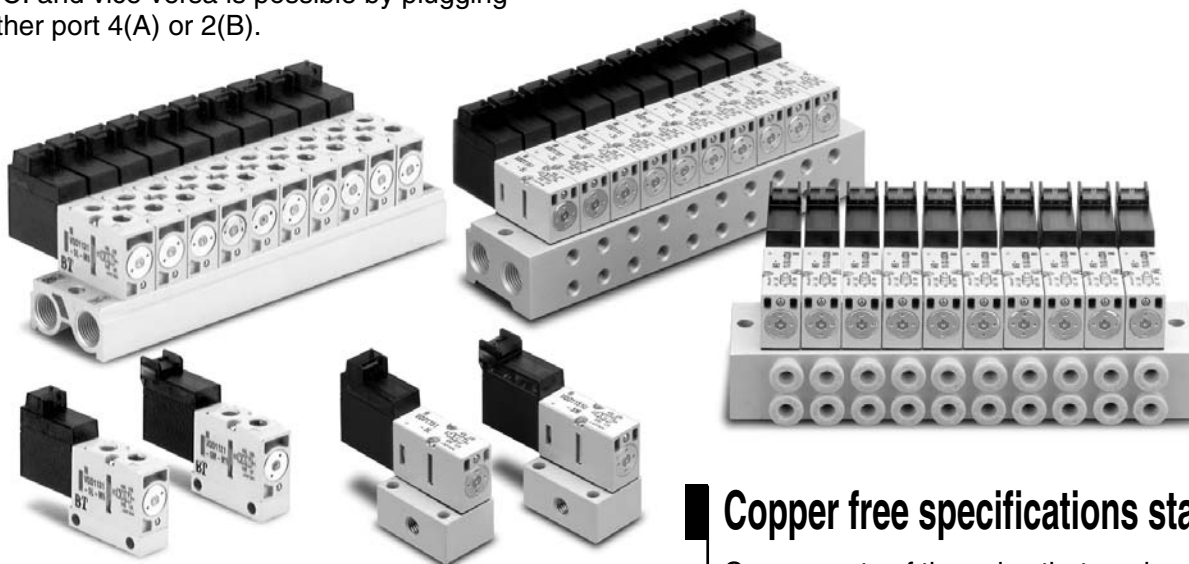
Body width of 10mm, N_l/min (49.08) 2W (Standard)
N_l/min (78.52) 4W (U type: Large flow)

Vacuum applications possible (up to -100kPa)

(Valve leakage: 0.03cm³/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 mm ² (N _l /min) | Cylinder speed (mm/s) | Cylinder bore size (mm) | | | | | | |
|---|--------------------------|--|-----|-----|---|-----|-----|-----|
| | | Series CJ2 | | | Series CM2 | | | |
| | | Pressure: 0.5MPa Load ratio: 50% Cylinder stroke: 60mm | | | Pressure: 0.5MPa Load ratio: 50% Cylinder stroke: 300mm | | | |
| | | ø6 | ø10 | ø16 | ø20 | ø25 | ø32 | ø40 |

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.

| | | | | | | | | |
|-----------------------------------|----------------------|-----|--|--|--|--|--|--|
| VQD1151U (Large flow capacity) | M5 1.5 (78.52) | 150 | | | | | | |
| | | 300 | | | | | | |
| | | 450 | | | | | | |
| | | 600 | | | | | | |
| | | 750 | | | | | | |

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

⚠ Precautions

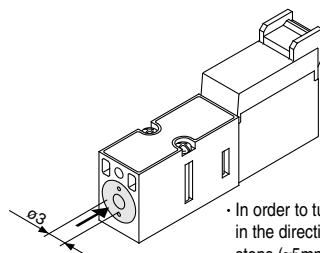
Be sure to read before handling. Refer to p.0-33 to 0-36 for Safety Instructions and common precautions.

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)

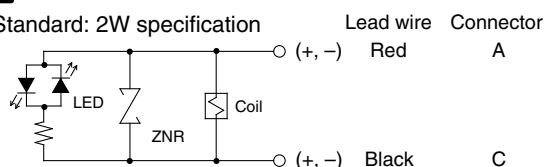


In order to turn it ON, push down the manual override button in the direction the arrow (→) indicates until it stops (≅5mm), and release it to turn it OFF.

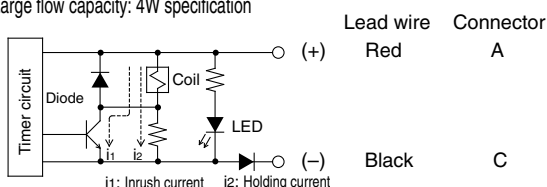
Wiring Specifications

⚠ Caution

- Standard: 2W specification

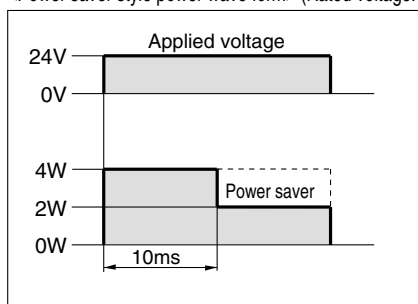


- Large flow capacity: 4W specification



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 |

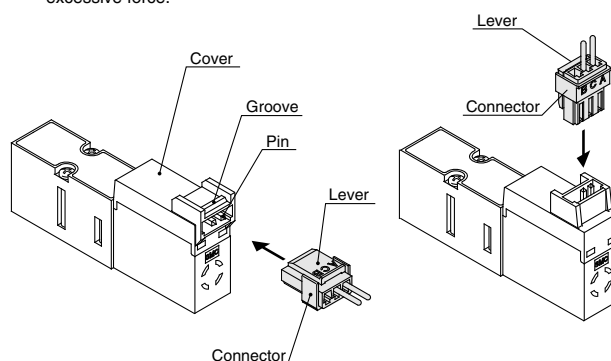
How to Use Plug Connector

⚠ 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

| Lead wire length | |
|------------------|--------|
| — | 300mm |
| 6 | 600mm |
| 10 | 1000mm |
| 20 | 2000mm |
| 30 | 3000mm |

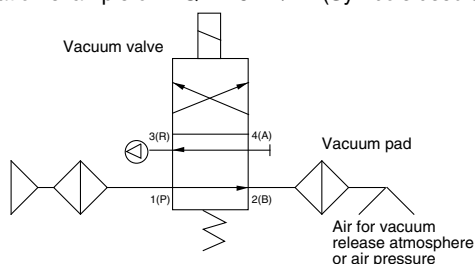
- Lead wire length of plug connector

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 |

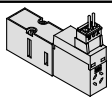
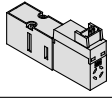
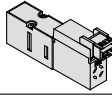
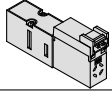
Order Made Contact SMC for other voltages (9)

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

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 (N/min) | | 0.9mm ² (N/min 49.08) | 1.5mm ² (N/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/s ² ⁽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

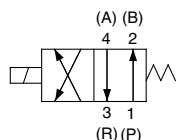
Note 2) Operating the valve at low temperatures may cause condensate to form, therefore dry air must be used.

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.

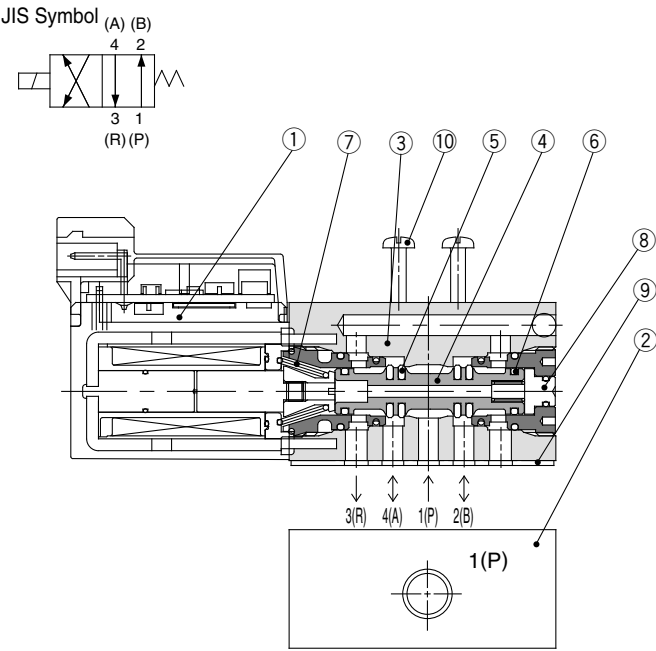
Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000Hz.

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.)

JIS Symbol



Construction



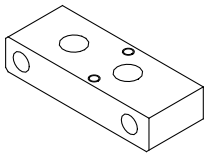
Component Parts

| 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



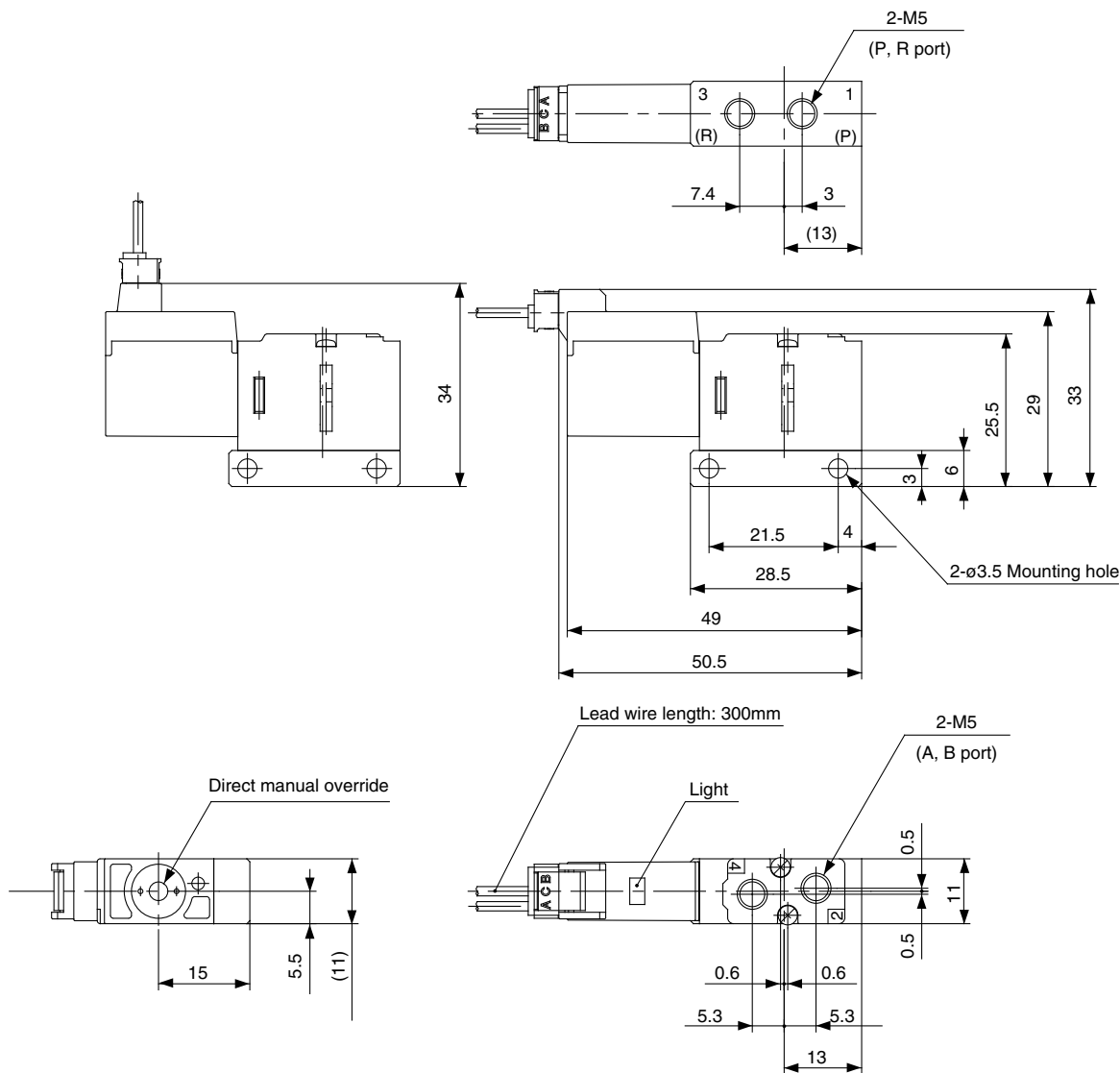
🔍 Manifold style (VQD1131) can be changed to single unit style (VQD1121) by mounting plate assembly.
Note) Plate should be mounted with manifold mounting screws (M1.7 X 20).
Tightening torque: 0.18 to 0.25Nm

Series VQD1000

Dimensions

L plug connector: VQD1121□-□L-M5-Q

M plug connector: VQD1121□-□M-M5-Q



Series **VQD1000**

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 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.

Station.....1

U side

VQD1000-10A-5-Q

VQD1151-5L-Q

VV4QD15-05M5-Q

3R 1P

2B

4A

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 | |

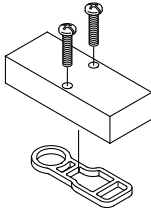
Port size (Body ported only)

| | |
|----|-----------|
| M5 | M5 thread |
|----|-----------|

Manifold Option

Blank Plate Assembly/Body Ported

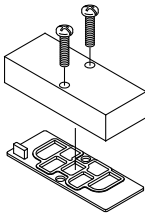
VVQD1000-10A-2



Blank plate assembly includes 2 screws
and 1 gasket.

Blank Plate Assembly/Base Mounted

VVQD1000-10A-5

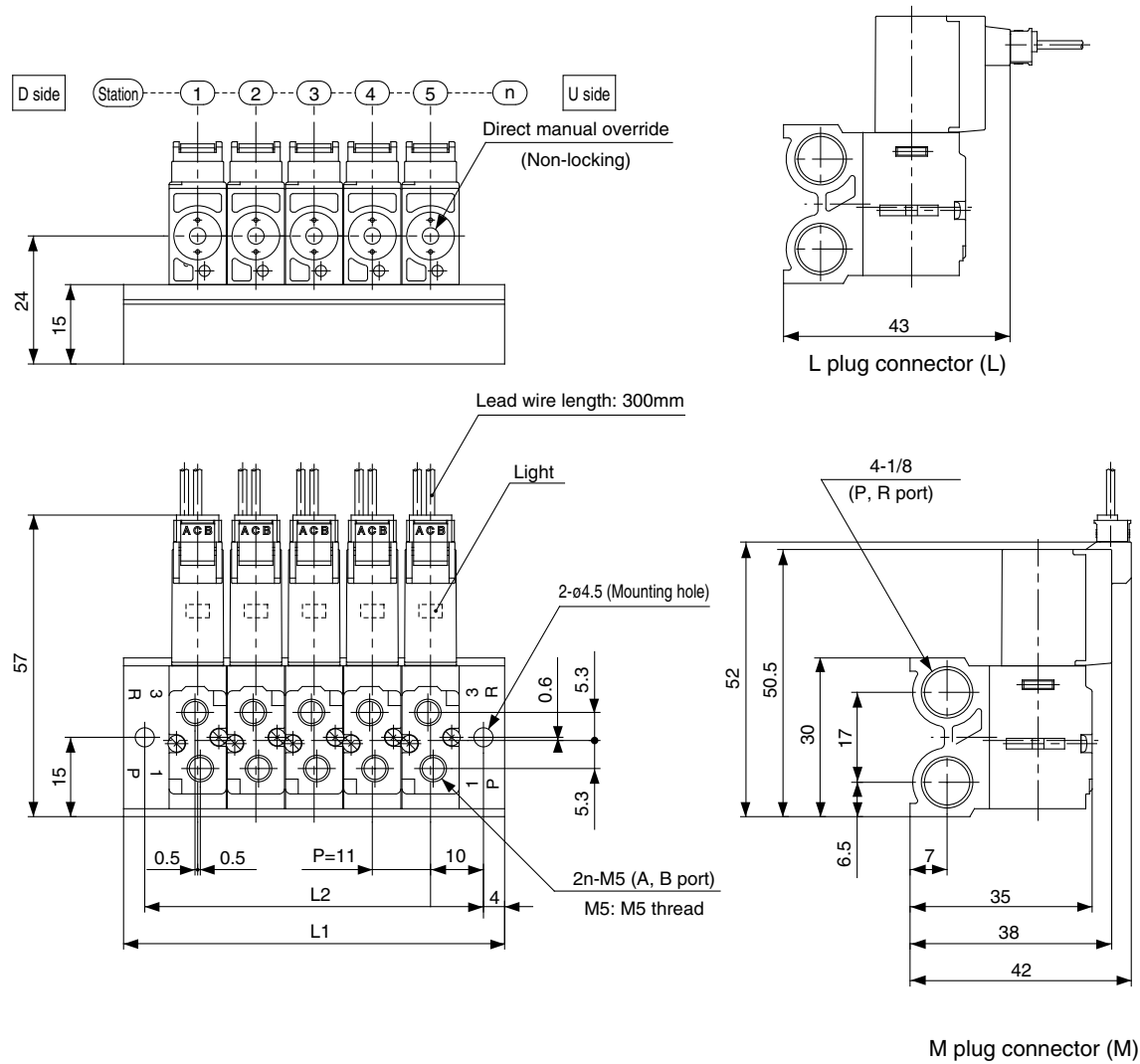


Blank plate assembly includes 2 screws
and 1 gasket.

Series VQD1000

Dimensions

Plug lead unit manifold(VV4QD12-□-Q)

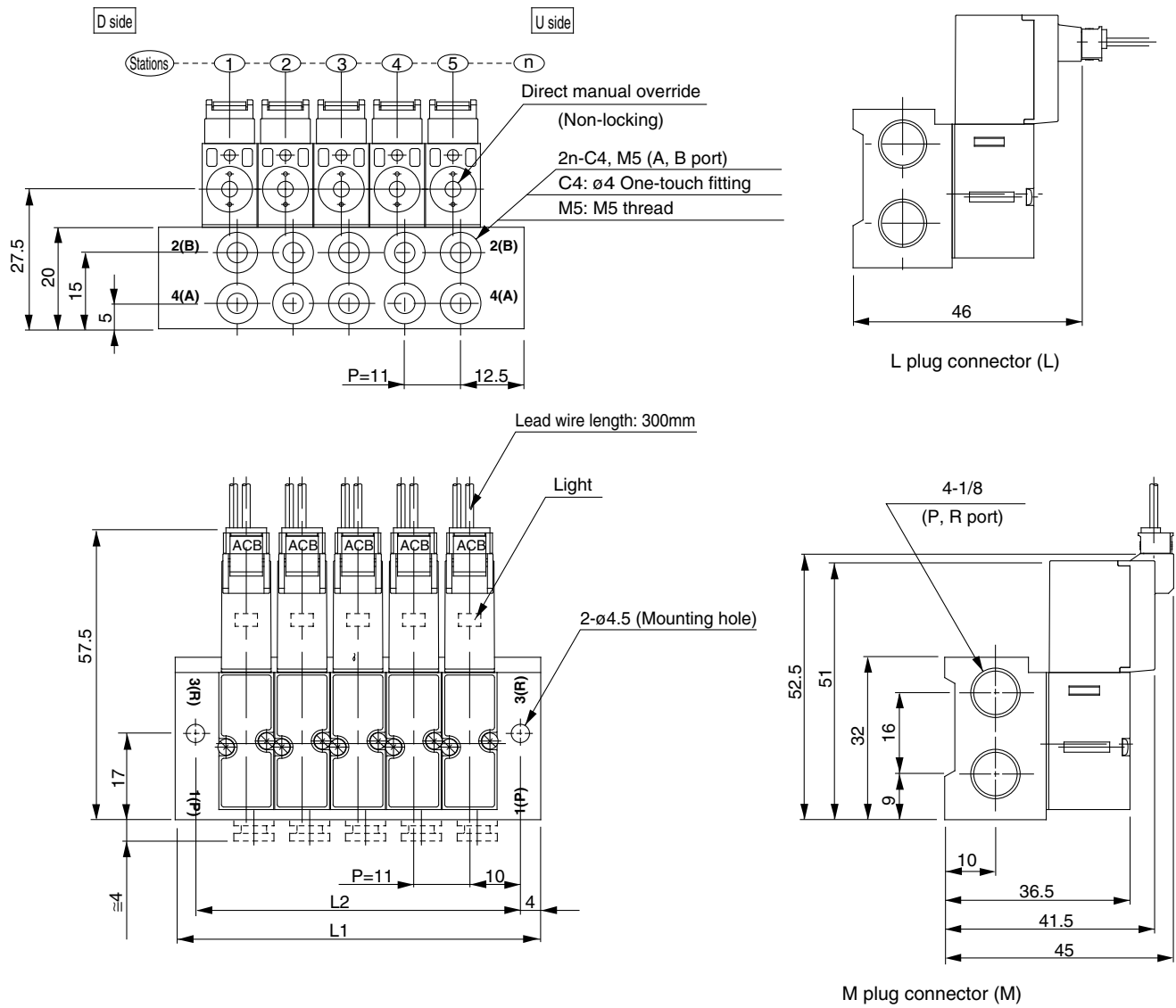


Dimensions

| | | 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)



Dimensions

| 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 |