

For Dry Air, Pilot Operated

2 Port Solenoid Valve

Series VQ20/30

Compact & lightweight with large flow capacity

| | Weight (g) | Effective area (mm ²) |
|------|------------|-----------------------------------|
| VQ20 | 46 | 9 (N ϕ /min 491) |
| VQ30 | 80 | 17.5 (N ϕ /min 981) |



Series VQ30



Series VQ20

High frequency operation possible and long operating life

High speed response 5ms or less (VQ20), 20ms or less (VQ30)

(Without indicator light and surge voltage suppressor, at 0.5MPa of supply pressure)

20 million cycles (subject to clean and dry air)

Easy piping with built-in One-touch fittings

Dust and jet proof enclosure available with DIN connector

Applications: Air-blow, Blow-off of work piece, etc.

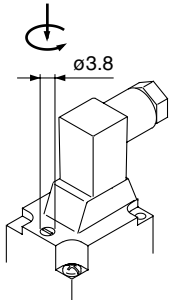
⚠️ Precautions

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

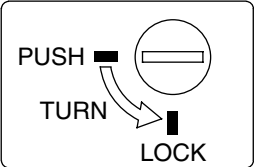
⚠️ Warning
Manual Override

Regardless of electric signals to the solenoid valve, the manual override is used for switching the main valve. (DIN connector only.)

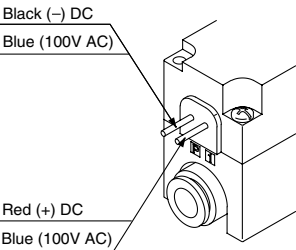
Locking slotted style



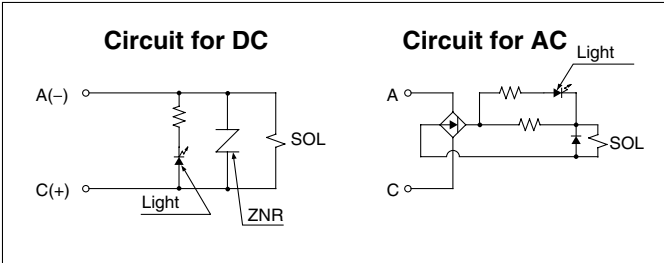
Push the manual override button with a small screw driver until it stops. Turn it in the counter-clockwise direction at 90°, and it is locked. Turn it right to release.



⚠️ Caution
Connection and Electrical Circuit



With indicator light and surge voltage suppressor



⚠️ Caution
How to Wire The DIN Connector

ISO#: Based on DIN 43650C (Pin gap 8mm) Connection

- ① Loosen the tightening screw and pull the connector off of the solenoid valve.
- ② After removing the tightening screw, divide the terminal block and housing by prying open the slot area of the lower part of the terminal block open with a screw driver.
- ③ Loosen the terminal screws of the block and insert stripped lead wires in accordance with the wiring diagram. Secure each wire by retightening the terminal screw.
- ④ Tighten the ground nut to secure the cable wire.

Change of electrical entry

Wire entry can be changed by mounting the housing in either direction (four directions at every 90°) after dividing the terminal block and the housing.
* For the indicator lighted style, be careful not to damage the light with the lead wire of the cable.

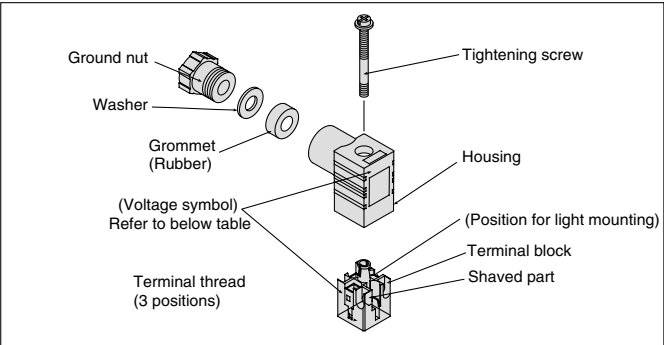
Precaution

Insert/remove the connector vertically, not at an angle.

Applicable cable

Cord O.D.: ø3.5 to ø7

(Reference) 0.5mm² 2-core and 3-core wires equivalent to JIS C 3306.



DIN connector part number (Based on DIN)

| | | |
|---------------|----------------|----------|
| Without light | K41 | |
| With light | | |
| Rated voltage | Voltage symbol | Part No. |
| 24V DC | 24V | K42 |
| 12V DC | 12V | K42 |
| 100V AC | 100V | K44 |

Manifold

⚠ Caution

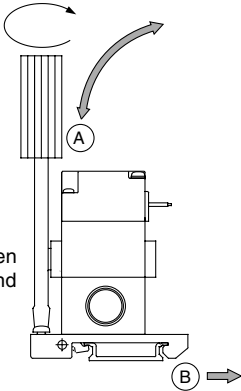
How to Mount/Remove from DIN Rail

To remove manifold from DIN rail:

- 1) Loosen the clamp screw on the "A" side of both ends of the manifold.
- 2) Lift the "A" side of the manifold off the DIN rail and slide it in the direction of the "B" side.

Mounting manifold to DIN rail:

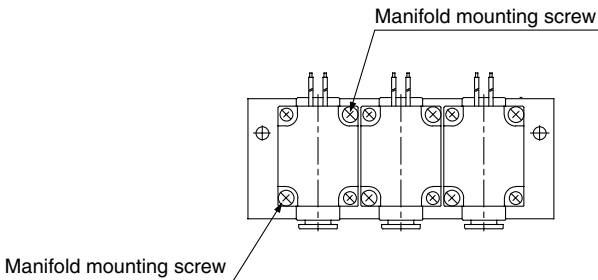
- 1) Hook the mounting hook on the "B" side of the manifold base to the DIN rail.
- 2) Push side "A" onto the DIN rail and tighten the clamp screw on the "A" side of the end plate. (Tightening torque: 0.3 to 0.4Nm)



⚠ Caution

Valve Mounting

After confirming the gasket is correctly placed under the valve, tighten the mounting screws with the appropriate torque (0.2 to 0.23Nm).



⚠ Caution

Maximum Number of Valves for Simultaneous Operation

| Series | P port one side supply | P port both side supply |
|--------|------------------------|-------------------------|
| VQ20 | 4 | 8 |
| VQ30 | 2 | 4 |

If the max. number of valves simultaneously operated exceeds the numbers above, the effective flow rates will be reduced.

For Dry Air,
Pilot
Operated

2 Port Solenoid Valve

Series VQ20/30

Single Unit

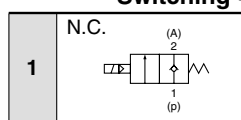
How to Order Valve

VQ 2 1 A 1 — 1 G — — C6 — — Q

Series/Orifice

| Symbol | Series | Effective orifice |
|--------|--------|-------------------|
| 2 | VQ20 | 3.4mm ø |
| 3 | VQ30 | 4.8mm ø |

Switching



Note) Consult SMC if N.O. is desired.

Body style

| | |
|-----------------|--|
| A: Single unit | |
| M: For manifold | |

Coil voltage

| | |
|-----|-----------------------|
| 1 * | 100V AC |
| 3 * | 110V AC |
| 5 | 24V DC |
| 6 | 12V DC |
| 9 * | Others (110V or less) |

* DIN is only available

Contact SMC for other voltages (9)

Protective class class I (Mark:)

Protective class class III (Mark:)

Option

| | |
|------------------------|--|
| —: None | |
| F: With bracket | |
| L: L style (VQ20 Only) | |

Note) If ordering both options, indicate "LF".

Port size

| Symbol | Port size | VQ20 | VQ30 |
|--------|---------------------------|------|------|
| C6 | One-touch fitting for ø6 | ○ | — |
| C8 | One-touch fitting for ø8 | ○ | — |
| C10 | One-touch fitting for ø10 | — | ○ |
| C12 | One-touch fitting for ø12 | — | ○ |

Manual override

| | |
|------------------|-------------------------|
| — | None |
| B ⁽¹⁾ | Locking style (Slotted) |

Note 1) Only normally closed DIN connector in-line style is possible.

Indicator light and surge voltage suppressor

| | |
|---|---|
| — | None |
| S | With surge voltage suppressor |
| Z | With indicator light and surge voltage suppressor |

Note) Coil voltage 100V AC: With surge voltage suppressor.

Note) "YOZ" is not available.

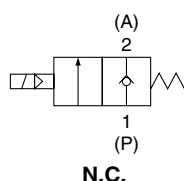
Electrical entry

| | |
|------------------------------------|--|
| G: Grommet | |
| Y: DIN connector | |
| YO: DIN terminal without connector | |

Standard Specifications



Symbol



| Valve | Series | | VQ20 | | VQ30 | |
|------------------|--|---|---|------------------------------------|--------------|--|
| | Valve structure | | 2 port poppet pilot operated | | | |
| | Fluid | | Air, Inert gas | | | |
| | Min. operating pressure | | 0.01MPa | | | |
| | Max. operating pressure | | 0.6MPa | | 0.5 MPa | |
| | Effective area (Cv/Effective orifice) | | C6 | 7.2mm ² (Nℓ/min 393/ø3) | C10 | 14.4mm ² (Nℓ/min 785/ø4.3) |
| | | | C8 | 9mm ² (Nℓ/min 491/ø3.4) | C12 | 17.5 mm ² (Nℓ/min 981/ø4.8) |
| | Body orifice | | ø6 | | ø13.8 | |
| | Response time ⁽¹⁾ | | 5ms or less | | 20ms or less | |
| | Max.operating frequency | | 100cps | | 30cps | |
| | Ambient and fluid temperature | | -10 to 50 °C ⁽²⁾ | | | |
| | Lubrication | | Not required | | | |
| | Manual override | | Locking style (Slotted) ⁽³⁾ | | | |
| | Shock resistance/Vibration resistance | | 150/ 30m/s ² ⁽⁴⁾ | | | |
| | Enclosure | | Dust proof ⁽⁵⁾ | | | |
| | Mounting position | | Free | | | |
| Weight | | 46g | | 80g | | |
| Solenoid | Coil rated voltage | | 12V DC, 24V DC, 100V AC, 110V AC, 200V AC | | | |
| | Allowable voltage | | ± 10% of rated voltage | | | |
| | Coil insulation | | Class B or equivalent | | | |
| | Power consumption (Current value) | 24V DC | 2.5W DC (104mA) | | | |
| | | 12V DC | 2.5W DC (208mA) | | | |
| 100V DC | | Inrush: 2VA (20mA) Holding: 2VA (20 mA) | | | | |
| Electrical entry | | Grommet, DIN terminal | | | | |



Note 1) According to JISB8375-1981. (Supply pressure: 0.5MPa, Without light and surge voltage suppresser)

Note 2) Use dry air to prevent condensation when operating at low temperatures.

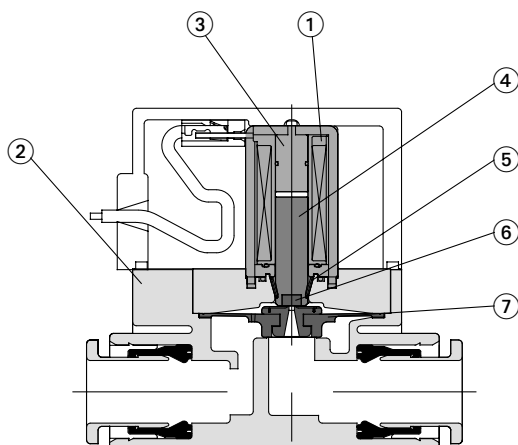
Note 3) Manual override is available only for DIN terminal style.

Note 4) Shock 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. (Valve in the initial stage.)

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 directions of the main valve and armature. (Value in the initial stage.)

Note 5) DIN connector style: Applicable to dust and jet proof (IP65).

Construction



Component Parts

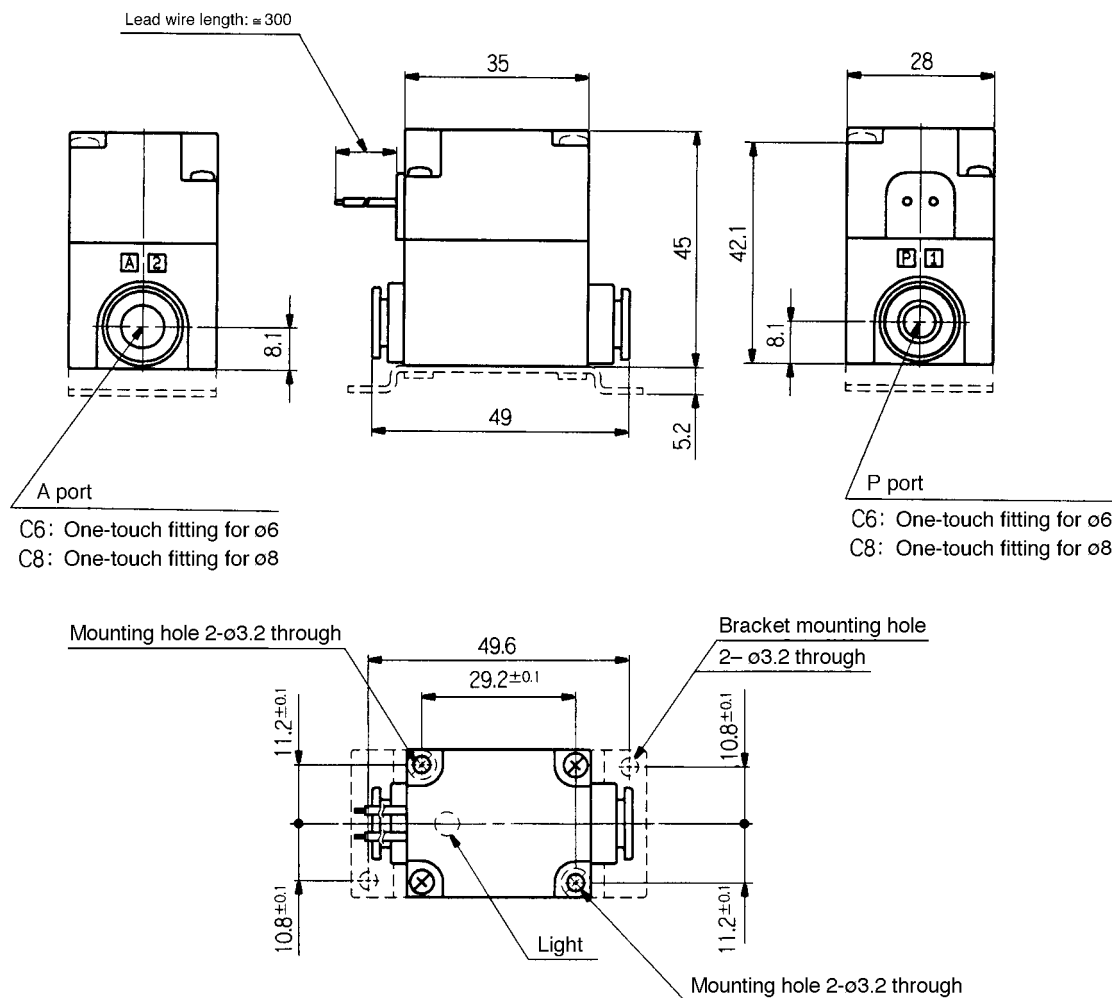
| No. | Description | Material |
|-----|--------------------|-----------------|
| ① | Solenoid coil | — |
| ② | Body | Resin |
| ③ | Fixed armature | Stainless Steel |
| ④ | Armature | Stainless Steel |
| ⑤ | Return spring | Stainless Steel |
| ⑥ | Poppet | NBR |
| ⑦ | Diaphragm assembly | NBR, Resin |

Series VQ20/30

Dimensions/Series VQ20

In-line style/Grommet(G)

VQ21A1-□G□-□□-□-Q

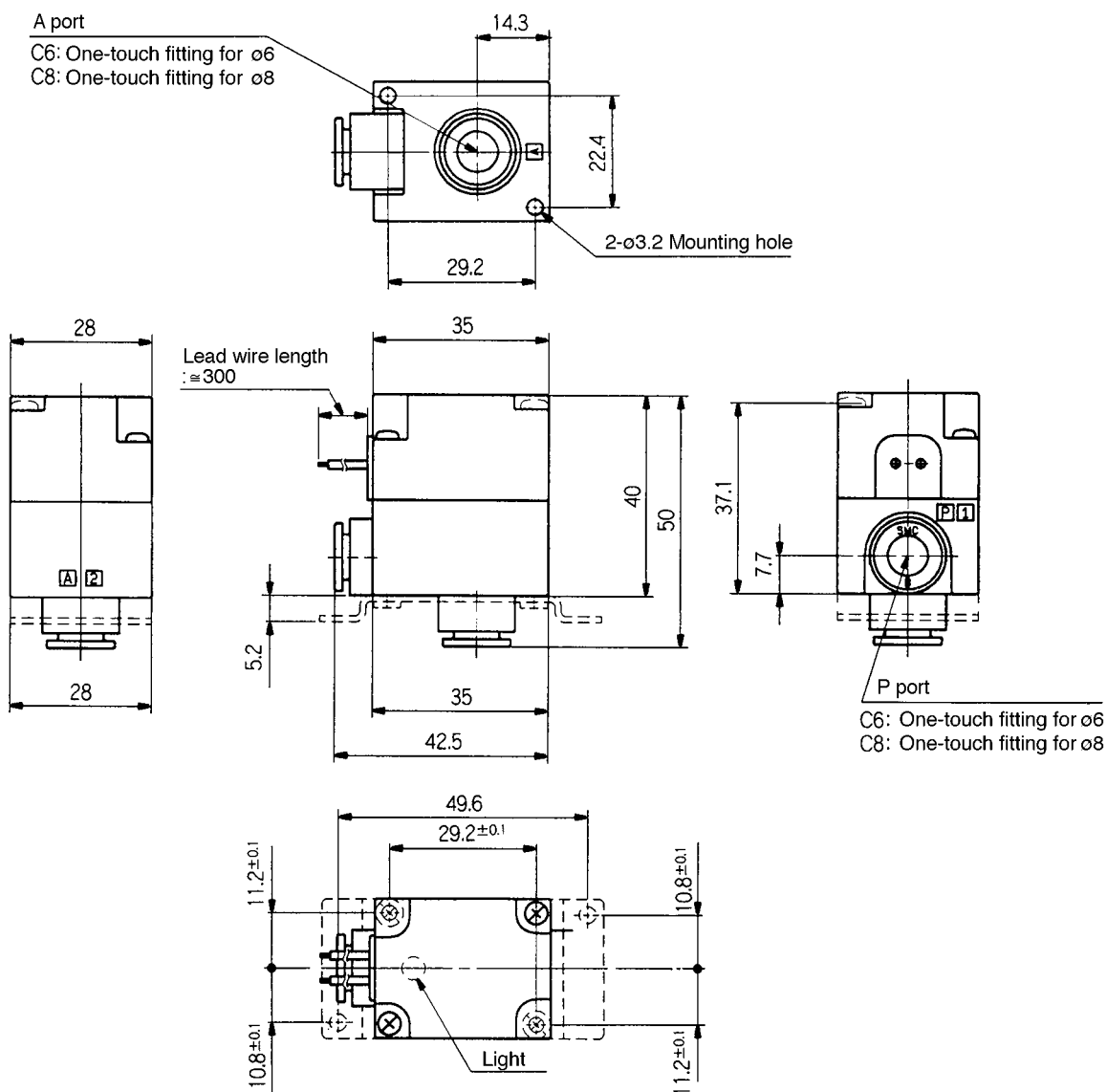


 Dotted line: Bracket mounting style (-F)

Dimensions/Series VQ20

L style/Grommet (G)

VQ21A1-□G□-□-L□-Q



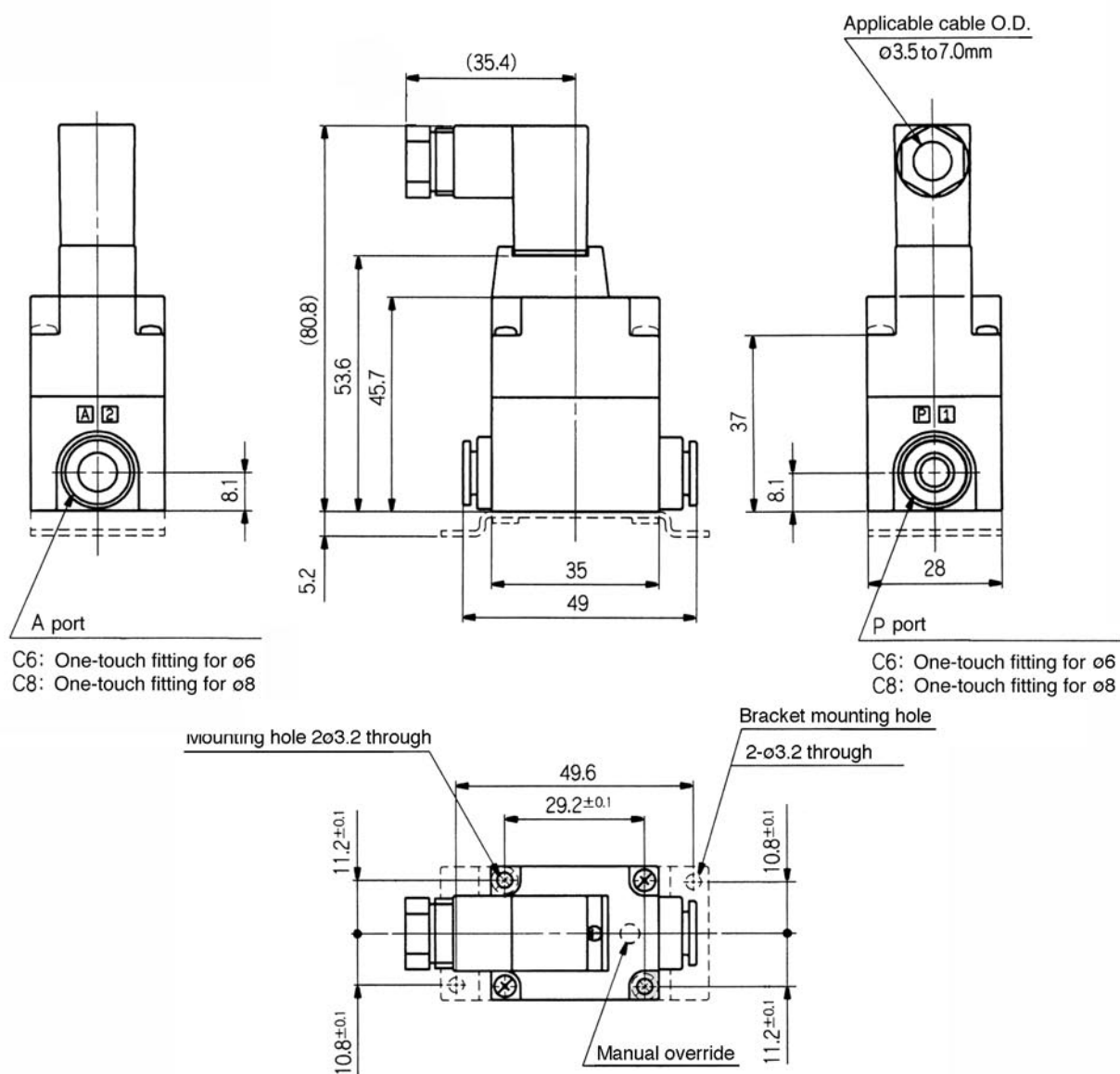
Dotted line: Bracket mounting style (-LF)


Series VQ20/30

Dimensions/Series VQ20

In-line/DIN connector (Y)

VQ21A1-□Y□□-□□-□□-Q

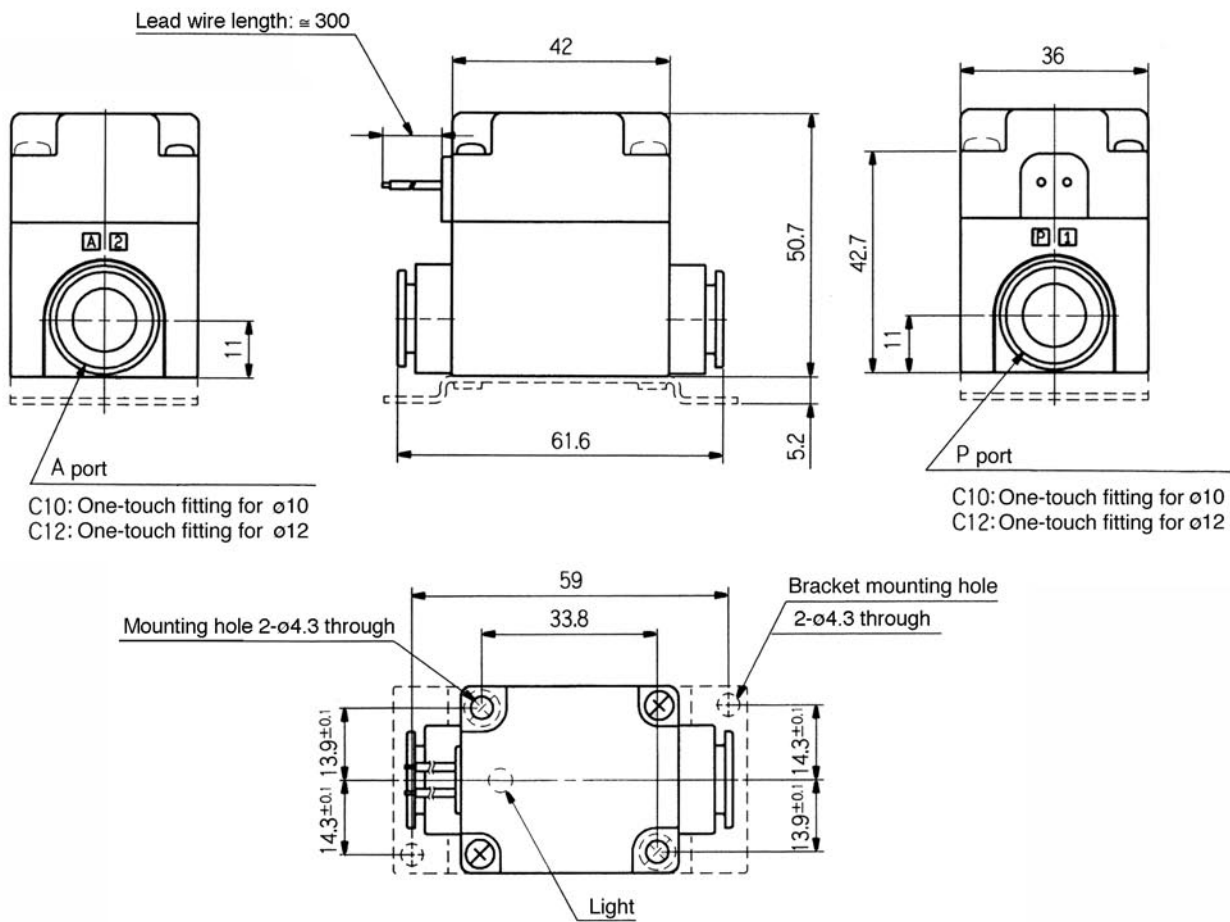


 Dotted line: Bracket mounting style (-F)

Dimensions/Series VQ30

In-line/Grommet (G)

VQ31A1-□G□-□□-□-Q



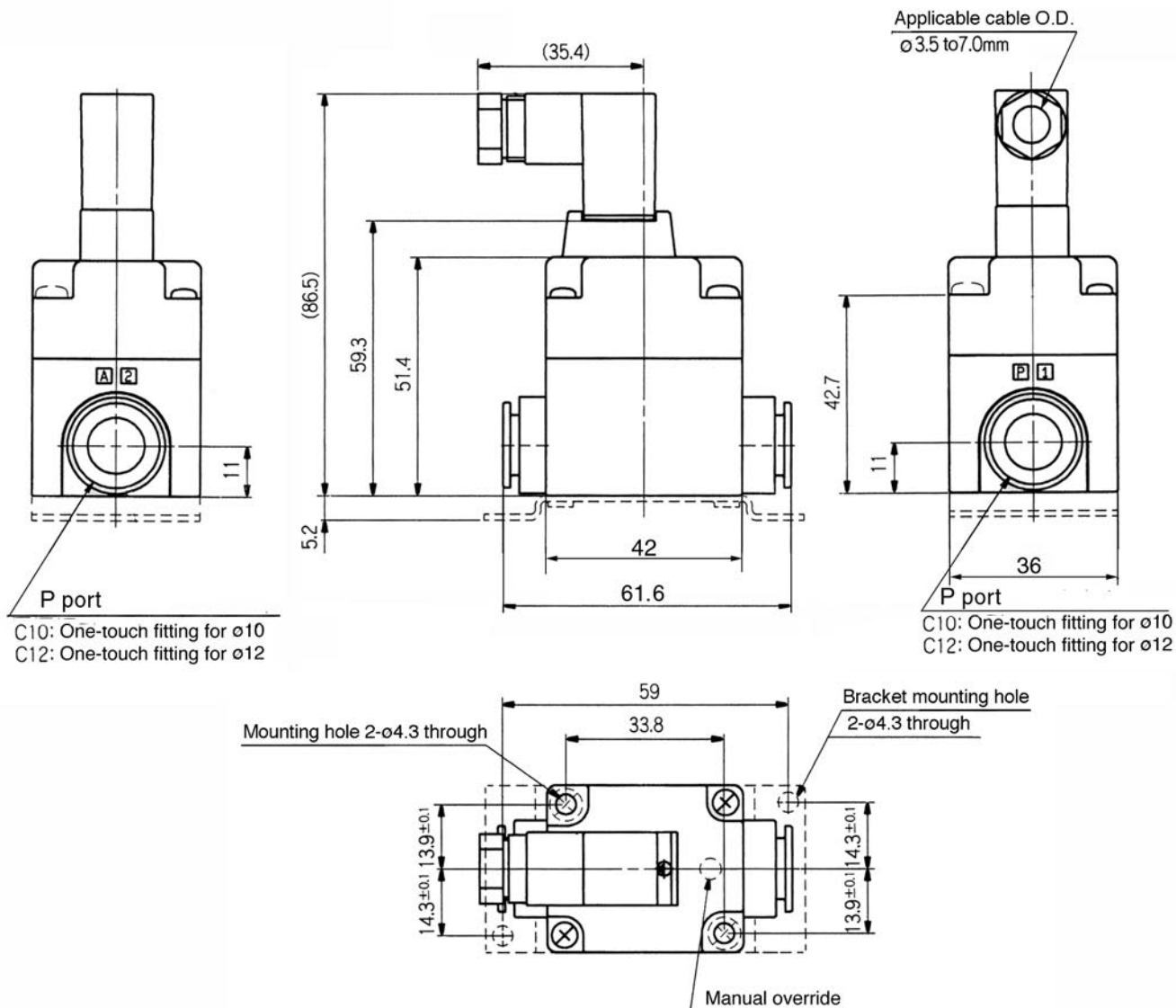
Dotted line: Bracket mounting style (-F)


Series VQ20/30

Dimensions/Series VQ30

DIN connector (Y)

VQ31A1-□Y□□-□□-□-Q



 Dotted line: Bracket mounting style (-F)

How to Order Manifold

VV2Q **2** **2** — **08** — — — **Q**

Series

| | |
|---|------|
| 2 | VQ20 |
| 3 | VQ30 |

Stations

| | |
|----|-------------|
| 02 | 2 stations |
| : | : |
| 20 | 20 stations |

Option

| | |
|----|--------------------------------------|
| — | None |
| D | DIN rail mounting |
| DO | DIN rail mounting (Without DIN rail) |

P port/Thread

| | |
|-----|---------|
| — | Rc3/8 |
| 00N | NPT3/8 |
| 00T | NPTF3/8 |
| 00F | G3/8 |

How to Order Manifold Assembly

List valve and option part numbers under the manifold base part number.

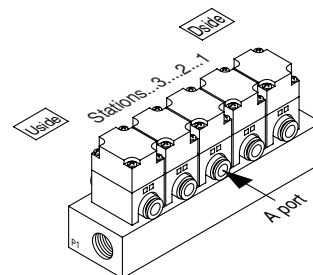
<Example>

VV2Q22-05-Q 1 set — Manifold part No.

VQ21M1-5G-C6-Q 4 sets — Valve part No.
(Stations 1 to 4)

VQ21M1-5G-C8-Q 1 set — Valve part No.
(Station 5)

Write sequentially
from the 1st station
on the D side

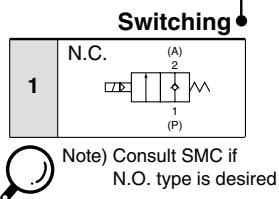


How to Order Valve

VQ **2** **1** **M** **1** — **1** **G** — — — **C6** — **Q**

Series/Orifice

| Symbol | Series | Effective orifice |
|--------|--------|-------------------|
| 2 | VQ20 | 3.4mm ø |
| 3 | VQ30 | 4.8mm ø |



Valve specification

| | |
|---|----------|
| M | Manifold |
|---|----------|

Coil voltage

| | |
|----|----------------------|
| 1* | 100V AC(50/60Hz) |
| 3* | 110V AC |
| 5 | 24V DC |
| 6 | 12V DC |
| 9 | Other (110V or less) |

* DIN is only available
Contact SMC for other voltages (9)

Port size

| Symbol | Port size | VQ20 | VQ30 |
|--------|---------------------------|------|------|
| C6 | One-touch fitting for ø6 | ○ | — |
| C8 | One-touch fitting for ø8 | ○ | — |
| C10 | One-touch fitting for ø10 | — | ○ |
| C12 | One-touch fitting for ø12 | — | ○ |

Manual override

| | |
|-------|----------------------------------|
| — | None |
| B (1) | Locking style (Slotted style) |

Note 1) Only normally closed DIN connector in-line style is applicable.

Indicator light and surge voltage suppressor

| | |
|---|--|
| — | None |
| S | With surge voltage suppressor |
| Z | Indicator light and surge voltage suppressor |

Note) Coil voltage 100V AC: With surge voltage suppressor
Note) "YOZ" is not available

Electrical entry

| | |
|----|----------------------------------|
| G | Grommet |
| Y | DIN connector |
| YO | DIN terminal (Without connector) |

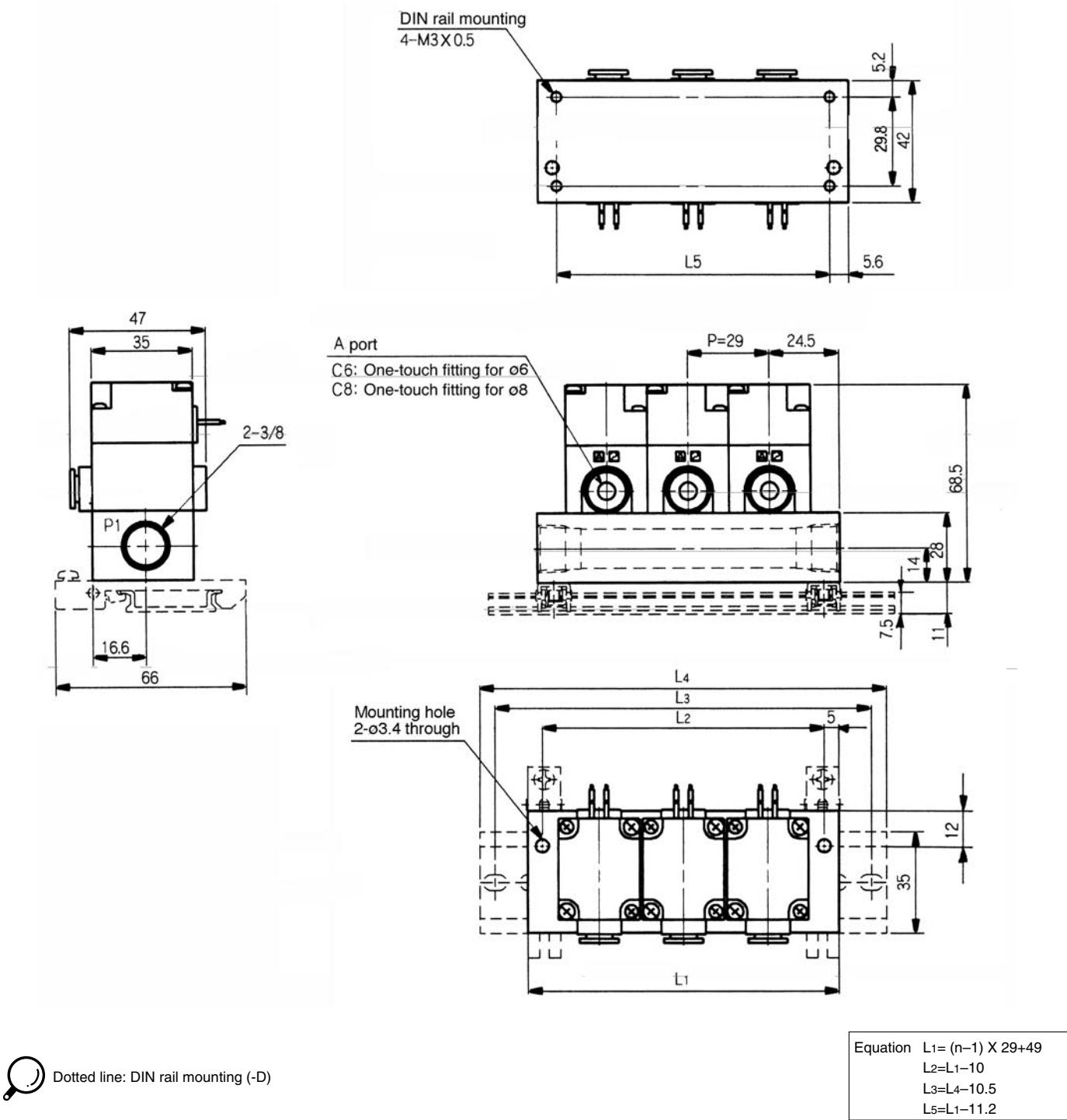
Protective class class III (Mark: ⚡)

Protective class class I (Mark: ⚡)

Series VQ20/30

Dimensions

Plug lead unit manifold (VV2Q22-□-Q)

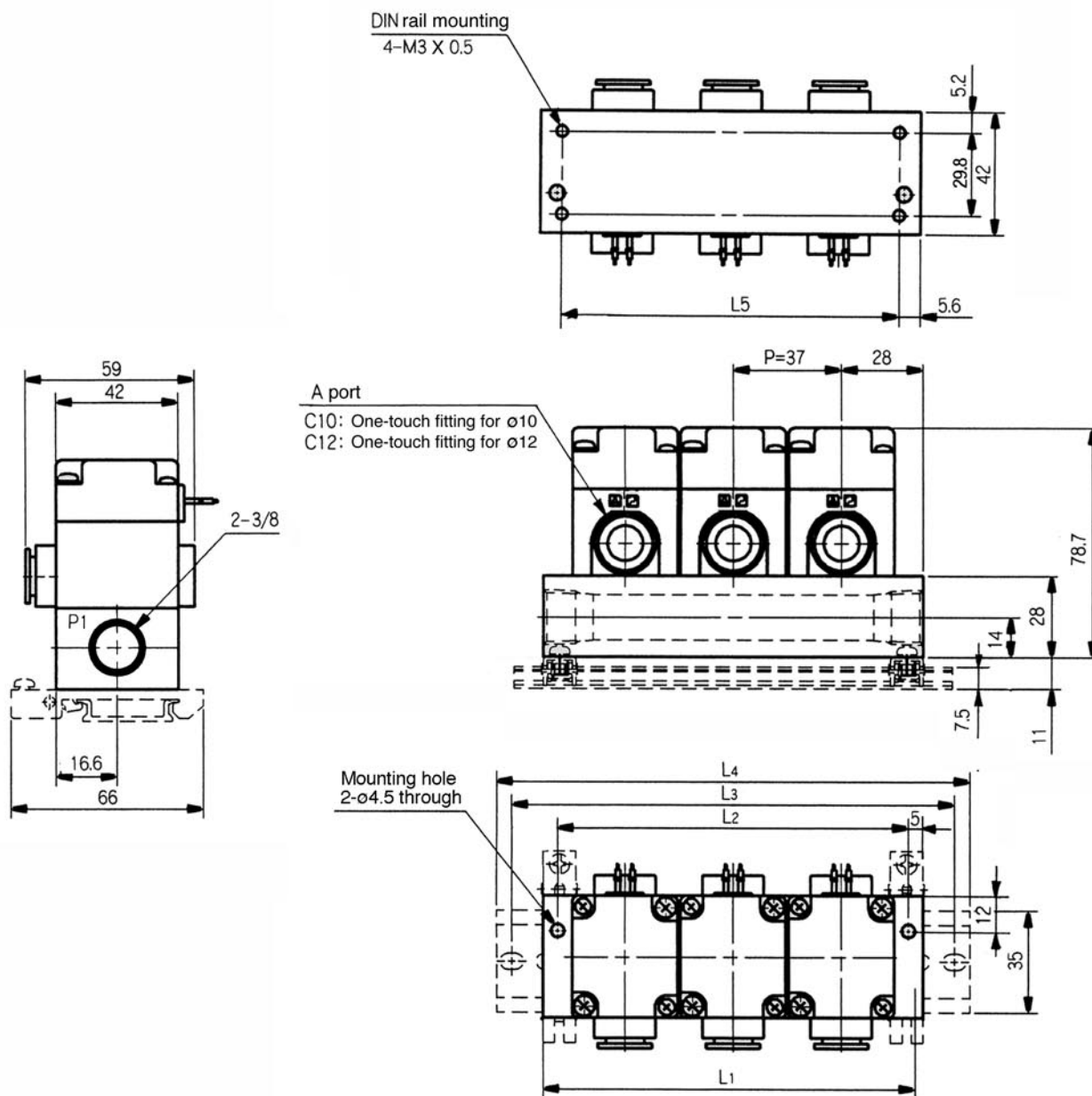


Dimensions

| L | | n: Station (Max.20) | | | | | | | | | | | | | | | | | | | |
|----------------|---|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| L | n | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| L ₁ | | 49 | 78 | 107 | 136 | 165 | 194 | 223 | 252 | 281 | 310 | 339 | 368 | 397 | 426 | 455 | 484 | 513 | 542 | 571 | 600 |
| L ₂ | | 39 | 68 | 97 | 126 | 155 | 184 | 213 | 242 | 271 | 300 | 329 | 358 | 387 | 416 | 445 | 474 | 503 | 532 | 561 | 590 |
| L ₃ | | 75 | 100 | 137.5 | 162.5 | 187.5 | 212.5 | 250 | 275 | 300 | 337.5 | 362.5 | 387.5 | 425 | 450 | 475 | 500 | 537.5 | 562.5 | 587.5 | 625 |
| L ₄ | | 85.5 | 110.5 | 148 | 173 | 198 | 223 | 260.5 | 285.5 | 310.5 | 348 | 373 | 398 | 435.5 | 460.5 | 485.5 | 510.5 | 548 | 573 | 598 | 635.5 |
| L ₅ | | 37.8 | 66.8 | 95.8 | 124.8 | 153.8 | 182.8 | 211.8 | 240.8 | 269.8 | 298.8 | 327.8 | 356.8 | 385.8 | 414.8 | 443.8 | 472.8 | 501.8 | 530.8 | 559.8 | 588.8 |

Dimensions

Plug lead unit manifold (VV2Q32-□-Q)



Equation $L_1 = (n-1) \times 37 + 56$
 $L_2 = L_1 - 10$
 $L_3 = L_4 - 10.5$
 $L_5 = L_1 - 11.2$

Dotted line: DIN rail mounting (-D)

Dimensions

n: Station (Max. 20)

| L | n | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|----|---|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| L1 | | 56 | 93 | 130 | 167 | 204 | 241 | 278 | 315 | 352 | 389 | 426 | 463 | 500 | 537 | 574 | 611 | 648 | 685 | 722 | 759 |
| L2 | | 46 | 83 | 120 | 157 | 194 | 231 | 268 | 305 | 342 | 379 | 416 | 453 | 490 | 527 | 564 | 601 | 638 | 675 | 712 | 749 |
| L3 | | 75 | 112.5 | 150 | 187.5 | 225 | 261.5 | 300 | 337.5 | 375 | 412.5 | 450 | 487.5 | 525 | 562.5 | 599.5 | 636.5 | 673.5 | 710.5 | 747.5 | 784.5 |
| L4 | | 85.5 | 123 | 160.5 | 198 | 235.5 | 273 | 310.5 | 348 | 385.5 | 423 | 460.5 | 498 | 535.5 | 573 | 610.5 | 648 | 685.5 | 723 | 760.5 | 798 |
| L5 | | 44.8 | 81.8 | 118.8 | 155.8 | 192.8 | 229.8 | 266.8 | 303.8 | 340.8 | 377.8 | 414.8 | 451.8 | 488.8 | 525.8 | 562.8 | 599.8 | 636.8 | 673.8 | 710.8 | 747.8 |

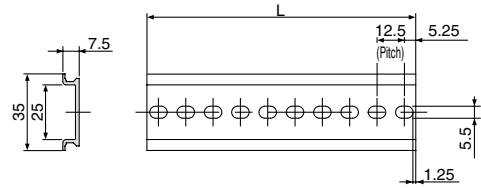
Series VQ20/30

Manifold Options

DIN rail AXT100-DR-□

*Suffix the number from DIN rail dimensions table below.
Refer to manifold dimensions drawings for L dimension.

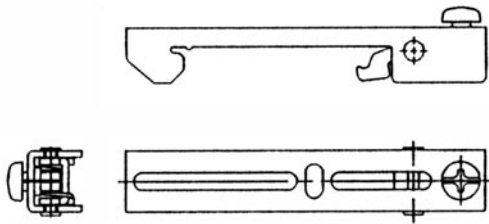
Each manifold can be mounted on a DIN rail.
Order with the option symbol “-D” to specify
DIN rail mounting style.
The DIN rail is approximately 30mm longer
than the length of manifold.



| L dimensions | | | | | | | | | | | | | | | | | | | | L=12.5n+10.5 | |
|--------------|------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-----|-------|-----|-------|-----|--------------|--|
| Station | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| No. | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 | 47 | 50 | 53 | 56 | 59 | 62 | |
| L | 85.5 | 123 | 160.5 | 198 | 235.5 | 273 | 310.5 | 348 | 385.5 | 423 | 460.5 | 498 | 535.5 | 573 | 598 | 635.5 | 673 | 710.5 | 748 | 785.5 | |

DIN rail mounting bracket VVQZ100-DB-5

This bracket is used for mounting the manifold on the DIN rail.
DIN rail mounting bracket is attached on the manifold.
1 set of DIN rail mounting brackets for 1 manifold
includes 2 brakets.



Blank plate AXT835-35A(For VQ20) AXT837-35A(For VQ30)

Mount a blank plate on valve manifold when a valve is
disassembled for maintenance purpose, or when spare
valve unit is supposed to be mounted in the future.