

# Compact Direct Operated 2/3 Port Solenoid Valve for Chemicals

## Series *LVM10/100*

### How to Order

| Symbol | Number of ports | Valve type    | Connection  |
|--------|-----------------|---------------|-------------|
| 11     |                 | N.C.<br>      | M5 thread   |
| 10R1   | 2               | N.C.<br>      | Tubing type |
| 10R2   |                 | N.O.<br>      |             |
| 102R   | 3               | Universal<br> |             |

| Symbol | Number of ports | Valve type    |
|--------|-----------------|---------------|
| 10R3   |                 | N.C.<br>      |
| 10R4   | 2               | N.O.<br>      |
| 10R6   |                 | N.C.<br>      |
| 105R   | 3               | Universal<br> |

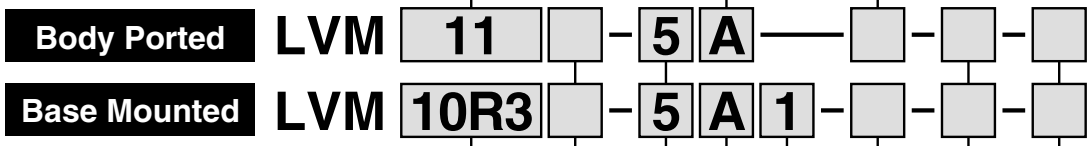
• **Wetted part material**

| Symbol | Plate | Diaphragm |
|--------|-------|-----------|
| A      | PEEK  | EPDM      |
| B      | PEEK  | FKM       |
| C      | PEEK  | Kalrez®   |

• **Option**

| Symbol | Option                   |
|--------|--------------------------|
| Nil    | None                     |
| 1      | Bracket                  |
| 2      | Manual override          |
| 3      | Bracket, Manual override |

\* Only Option 1 can be selected for the LVM11



• **Function**

| Symbol | Function                  |
|--------|---------------------------|
| Nil    | Standard                  |
| Y      | With power-saving circuit |

\* For the LVM11, the type with power-saving circuit is standard.

• **Coil voltage**

| Symbol | Voltage |
|--------|---------|
| 5      | 24 VDC  |
| 6      | 12 VDC  |

• **Wetted part material**

| Symbol | Plate | Diaphragm |
|--------|-------|-----------|
| A      | PEEK  | EPDM      |
| B      | PEEK  | FKM       |
| C      | PEEK  | Kalrez®   |
| E      | PFA   | EPDM      |
| F      | PFA   | FKM       |
| G      | PFA   | Kalrez®   |

• **CE compliant**

| Symbol | Option       |
|--------|--------------|
| Nil    | None         |
| Q      | CE compliant |

• **Lead wire length**

| Symbol | Length  |
|--------|---------|
| Nil    | 300 mm  |
| 6      | 600 mm  |
| 10     | 1000 mm |

• **Option**

| Symbol | Option                   |
|--------|--------------------------|
| Nil    | None                     |
| 1      | Bracket                  |
| 2      | Manual override          |
| 3      | Bracket, Manual override |

\* Without a sub-plate, a bracket cannot be attached.

• **Sub-plate material/Port size**

| Symbol | Material          | Port size |
|--------|-------------------|-----------|
| Nil    | Without sub-plate |           |
| 1*     | PVDF              | M6        |
| 1U*    | PVDF              | 1/4-28UNF |
| 2      | PFA               | M6        |
| 2U     | PFA               | 1/4-28UNF |

\* Combinations with wetted part materials E, F, G. are not available.

# Series LVM10/100

## Specifications



Body ported



Body ported  
(Tubing type)



Base mounted  
(Without sub-plate)



Base mounted  
(With sub-plate)

| Model  | Body ported   | Body ported (Tubing type)                           |         |           | Base mounted      |         |         |           |
|--|---|---|---------|-----------|-------------------|---------|---------|-----------|
|  | LVM11   | LVM10R1   | LVM10R2 | LVM102R   | LVM10R3           | LVM10R4 | LVM10R6 | LVM105R   |
| Valve construction                                   | Diaphragm type direct operated poppet                         | Diaphragm type direct operated poppet (Rocker type) |         |           |                   |         |         |           |
| Valve type   | N.C.  | N.C.  | N.O.    | Universal | N.C.              | N.O.    | N.C.    | Universal |
| Number of ports                                      | 2   | 2   |         | 3         | 2                 |         | 3       |           |
| Fluid <sup>Note 1)</sup>                             | Air, Water, Pure water, Diluent, Cleaning solvent             |   |         |           |                   |         |         |           |
| Operating pressure range                             | 0 to 0.25 MPa   | -75 kPa to 0.25 MPa                                 |         |           |                   |         |         |           |
| Orifice diameter                                     | 1.5 mm  | 1.4 mm  |         |           |                   |         |         |           |
| Response time  | 10 ms or less (at pneumatic pressure)                         |   |         |           |                   |         |         |           |
| Leakage  | Zero leakage, either external or internal (at water pressure) |   |         |           |                   |         |         |           |
| Proof pressure <sup>Note 2)</sup>                    | 0.38 MPa  |   |         |           |                   |         |         |           |
| Ambient temperature                                  | 0 to 50°C   |   |         |           |                   |         |         |           |
| Fluid temperature                                    | 0 to 50°C (with no condensation)                              |   |         |           |                   |         |         |           |
| Volume of valve chamber                              | 11 μℓ   | 20 μℓ   |         |           |                   |         |         |           |
| Mounting orientation                                 | Free  |   |         |           |                   |         |         |           |
| Enclosure  | IP40 or equivalent  |   |         |           |                   |         |         |           |
| Weight   | 30 g  | 34 g (without sub-plate), 42 g (with sub-plate)     |         |           |                   |         |         |           |
| Rated voltage  | 12, 24 VDC  |   |         |           |                   |         |         |           |
| Allowable voltage fluctuation <sup>Note 5)</sup>     | ±10% of rated voltage   |   |         |           |                   |         |         |           |
| Type of coil insulation                              | Class B   |   |         |           |                   |         |         |           |
| Power consumption<br>(When rated voltage is at 24 V) | Standard  |   | —       |           | 1.5 W<br>(0.06 A) |         |         |           |
|  | With power-saving circuit                                     | In-rush   |         |           | 2.5 W<br>(0.1 A)  |         |         |           |
|  |   | Hold-ing  |         |           | 1 W               |         |         |           |
| Coil switching noise <sup>Note 5)</sup>              | 50 dB   |   |         |           |                   |         |         |           |

Note 1) Select an appropriate material for the wetted part when fluid such as a cleaning solvent is used. Also, be sure to confirm the fluid compatibility in advance.

Note 2) Indicates the pressure which does not generate breakage, cracks or external leakage after a one-minute airtight test.

Note 3) Indicates the volume of clearance inside the valve chamber after the volume of the diaphragm is subtracted.

Note 4) Since the body (orifice shape) is designed to eliminate residual liquid, mounting in a vertical direction with the coil at the top is recommended. When residual liquid is not considered, any mounting orientation is available.

Note 5) When the response speed is regarded as important, prevent negative fluctuation of the voltage by adequate regulation.

Note 6) The value is based on SMC's measurement conditions. The noise level will vary with conditions.

Note 7) Refer to 10 in "Design and Selection" on the back of page 2, if the valve is to be energized continuously for extended periods of time.

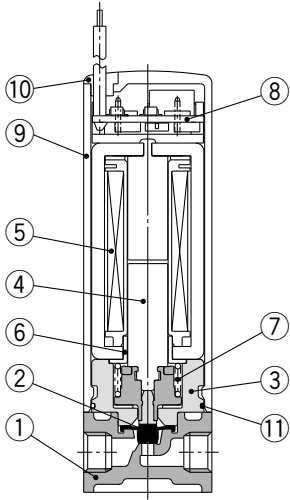
## Flow Characteristics

| Valve construction     | Water                   |      | Air  |      |
|------------------------|-------------------------|------|------|------|
|                        | Av                      | Cv   | C    | b    |
| Direct operated poppet | 0.96 x 10 <sup>-6</sup> | 0.04 | 0.13 | 0.22 |
| Rocker type            | 0.72 x 10 <sup>-6</sup> | 0.03 | 0.1  | 0.2  |

\* The values of Av and Cv are based on JIS B 2005:1995, C and b are based on JIB B 8390:2000.

**Construction: Body Ported**

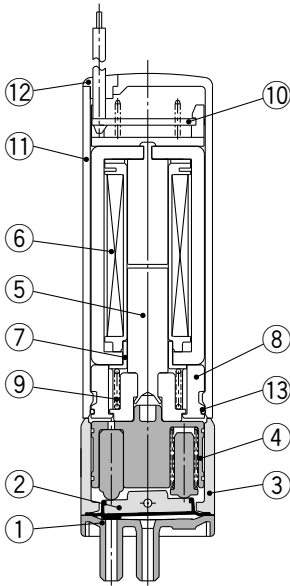
**LVM11**



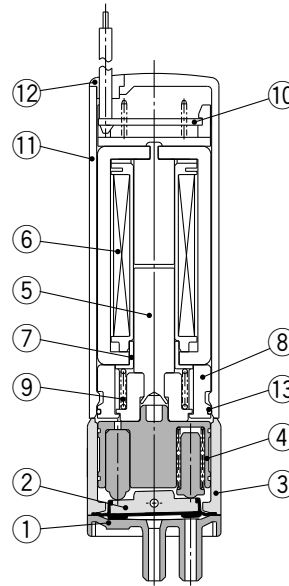
**Component Parts: LVM11**

| No. | Description               | Material            |
|-----|---------------------------|---------------------|
| 1   | <b>Body</b>               | PEEK                |
| 2   | <b>Diaphragm assembly</b> | EPDM/FKM/Kalrez®    |
| 3   | <b>Spacer</b>             | PBT                 |
| 4   | <b>Armature assembly</b>  | Stainless steel/POM |
| 5   | <b>Coil assembly</b>      | —                   |
| 6   | <b>Sleeve</b>             | SUY                 |
| 7   | <b>Return spring</b>      | Stainless steel     |
| 8   | <b>Board assembly</b>     | —                   |
| 9   | <b>Casing</b>             | PBT                 |
| 10  | <b>Plug</b>               | NBR                 |
| 11  | <b>O-ring</b>             | NBR                 |

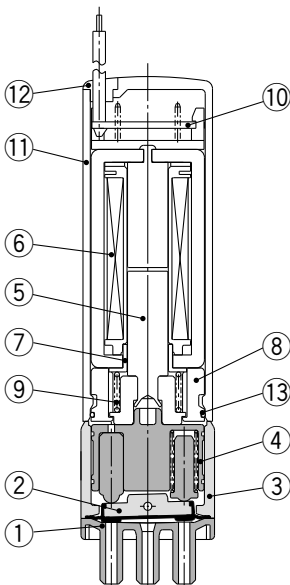
**LVM10R1**



**LVM10R2**



**LVM102R**



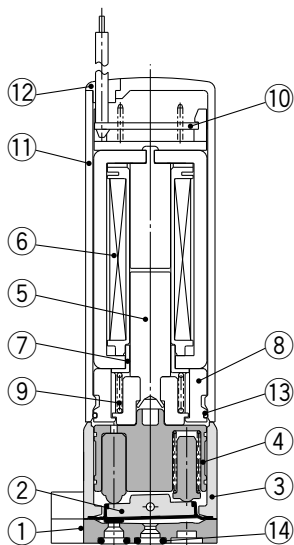
**Component Parts: LVM10R1, 10R2, 102R**

| No. | Description                   | Material            |
|-----|-------------------------------|---------------------|
| 1   | <b>Plate</b>                  | PEEK                |
| 2   | <b>Diaphragm assembly</b>     | EPDM/FKM/Kalrez®    |
| 3   | <b>Body</b>                   | PBT                 |
| 4   | <b>Slide bushing assembly</b> | POM/Stainless steel |
| 5   | <b>Armature assembly</b>      | Stainless steel/PBT |
| 6   | <b>Coil assembly</b>          | —                   |
| 7   | <b>Sleeve</b>                 | SUY                 |
| 8   | <b>Spacer</b>                 | PBT                 |
| 9   | <b>Return spring</b>          | Stainless steel     |
| 10  | <b>Board assembly</b>         | —                   |
| 11  | <b>Casing</b>                 | PBT                 |
| 12  | <b>Plug</b>                   | NBR                 |
| 13  | <b>O-ring</b>                 | NBR                 |

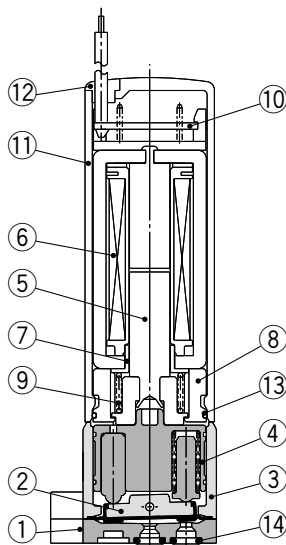
# Series LVM10/100

## Construction: Base Mounted

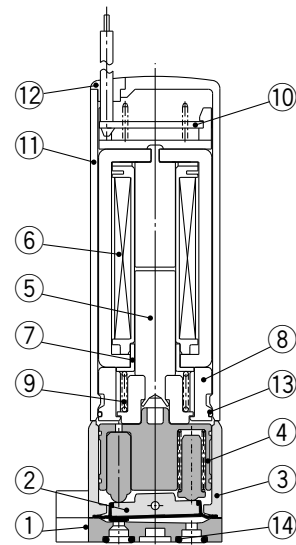
LVM10R3



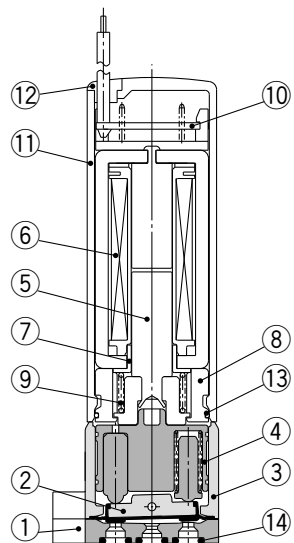
LVM10R4



LVM10R6



LVM105R

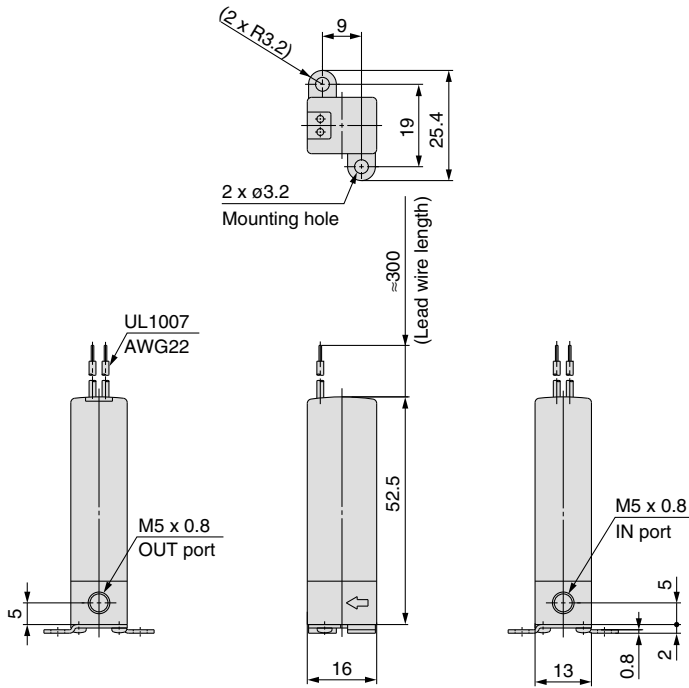


Component Parts: LVM10R3, 10R4, 10R6, 105R

| No. | Description            | Material            |
|-----|------------------------|---------------------|
| 1   | Plate                  | PEEK/PFA            |
| 2   | Diaphragm assembly     | EPDM/FKM/Kalrez®    |
| 3   | Body                   | PBT                 |
| 4   | Slide bushing assembly | POM/Stainless steel |
| 5   | Armature assembly      | Stainless steel/PBT |
| 6   | Coil assembly          | —                   |
| 7   | Sleeve                 | SUY                 |
| 8   | Spacer                 | PBT                 |
| 9   | Return spring          | Stainless steel     |
| 10  | Board assembly         | —                   |
| 11  | Casing                 | PBT                 |
| 12  | Plug                   | NBR                 |
| 13  | O-ring                 | NBR                 |
| 14  | O-ring                 | EPDM/FKM/Kalrez®    |

**Dimensions: Body Ported**

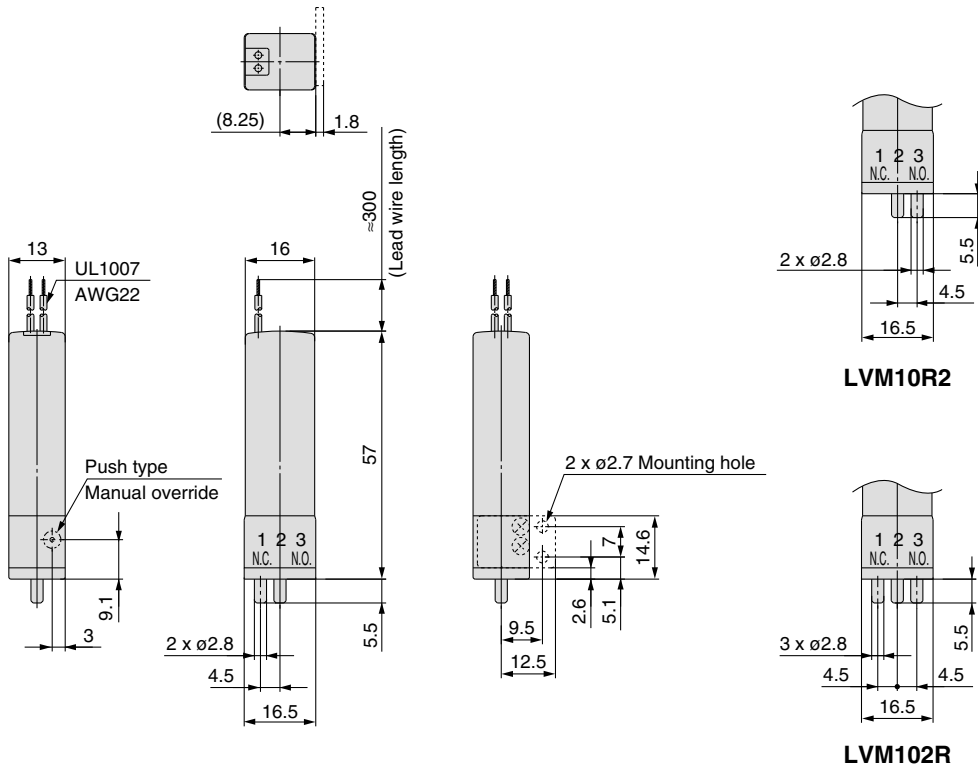
**LVM11-□□-□ (N.C.)**



**LVM10R1-□□-□ (N.C.)**

**LVM10R2-□□-□ (N.O.)**

**LVM102R-□□-□ (Universal)**



\* The broken lines indicate with bracket.

# Series LVM10/100

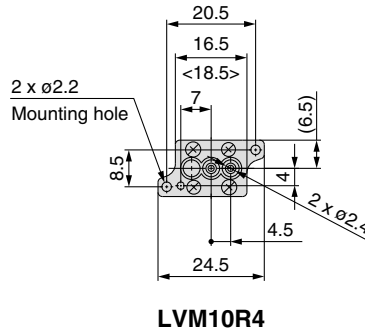
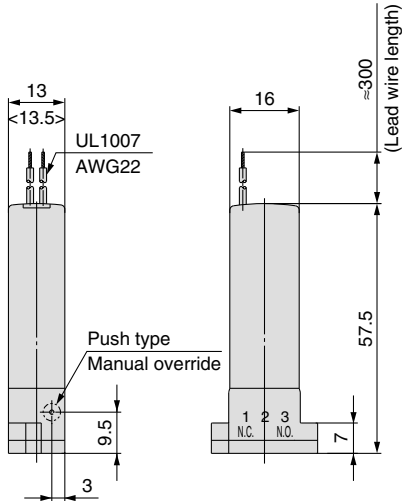
## Dimensions: Base Mounted

LVM10R3-□□-□ (N.C.)

LVM10R4-□□-□ (N.O.)

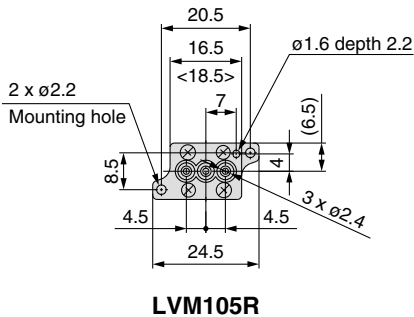
LVM10R6-□□-□ (N.C.)

LVM105R-□□-□ (Universal)

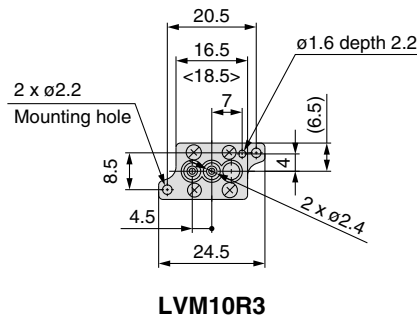


LVM10R4

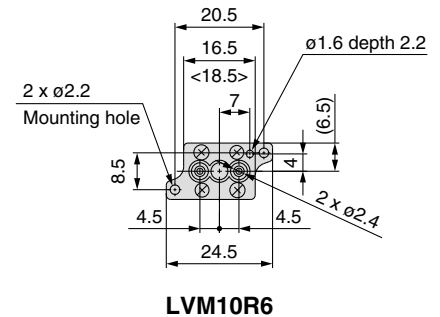
\* The figures in brackets < > indicate the values for PFA plate material (wetted part material "E, F, G"). In the case of PFA plate material (wetted part material "E, F, G"), there is no  $\phi 1.6$  positioning hole.



LVM105R



LVM10R3

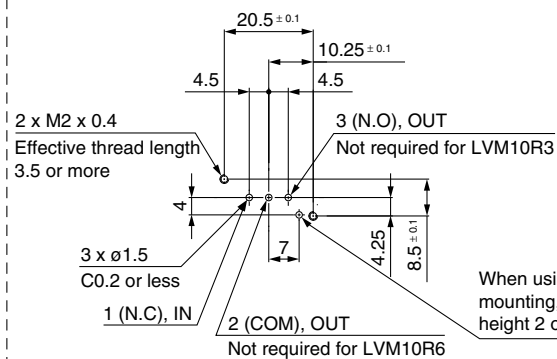


LVM10R6

### Recommended interface dimensions

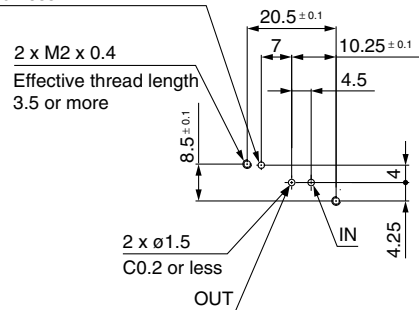
\* Surface roughness = Rz3.2 or less

\* Surface roughness = Rz3.2 or less



LVM10R3, LVM10R6, LVM105R

When using a positioning pin for mounting, please use  $\phi 1.5$  and height 2 or less.



LVM10R4

# Compact Direct Operated 2/3 Port Solenoid Valve for Chemicals *Series LVM10/100*

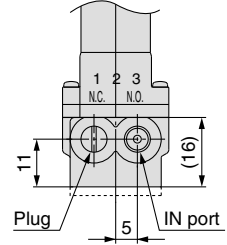
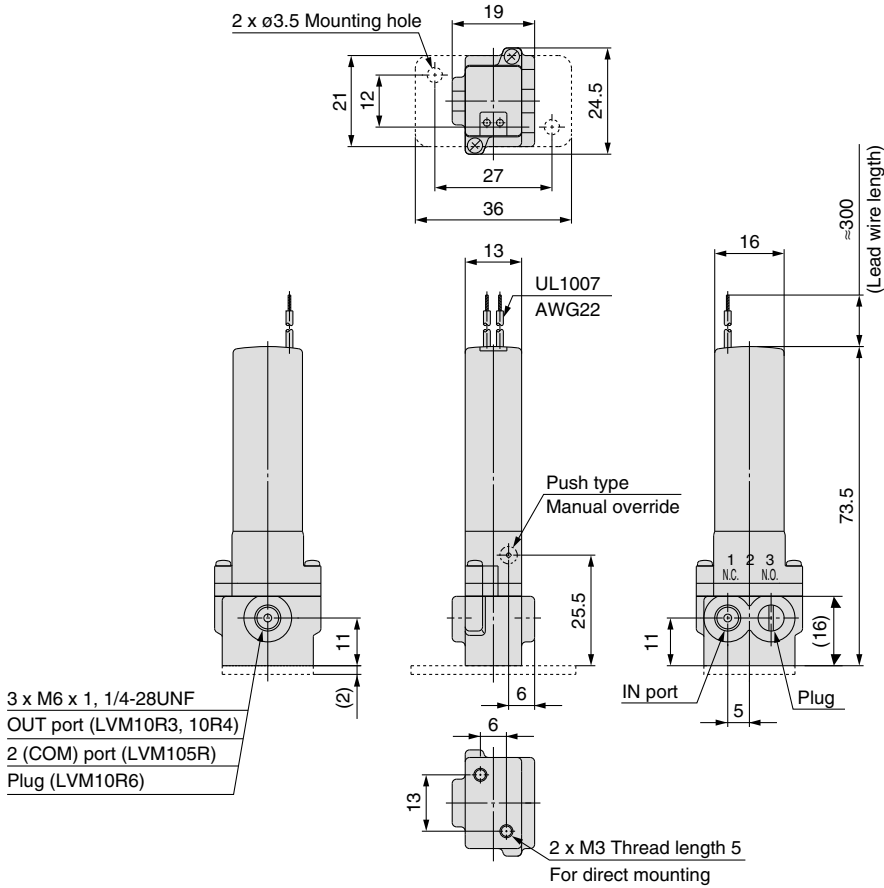
## Dimensions: Base Mounted

LVM10R3-□□□-□ (N.C.)

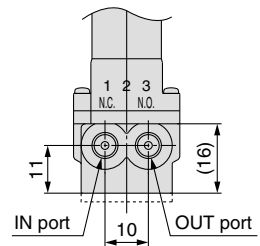
LVM10R4-□□□-□ (N.O.)

LVM10R6-□□□-□ (N.C.)

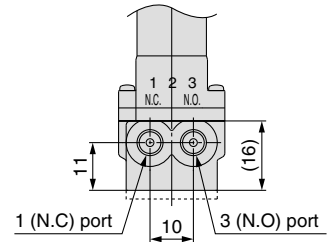
LVM105R-□□□-□ (Universal)



**LVM10R4**



**LVM10R6**



**LVM105R**

\* The broken lines indicate with bracket.