Direct Operated Rocker Type

[Option]

RoHS

Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids

LVM09/090 Series

Without sub-plate
Body ported

Without sub-plate
Base mounted

How to Order

Body ported LVM 09R1 □ – 5 A – □ – □

Base mounted LVM 09R3 □ – 5 A □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Number of ports, Valve type

Symbol	Number of ports	Valve type	
09R1	2	N.C.	IN (Symbol 1) OUT (Symbol 2)
09R2		N.O.	IN (Symbol 3) OUT (Symbol 2)
092R	3	Universal	1 3 2

❷ Number of ports, Valve type

Symbol	Number of ports	Valve type	
09R3	2	N.C.	IN (Symbol 1) OUT (Symbol 2)
09R4		N.O.	IN (Symbol 3) OUT (Symbol 2)
09R6		N.C.	IN (Symbol 1) OUT (Symbol 3)
095R	3	Universal	1 3 2

❸ Power saving circuit

Nil	None (Standard type)
Y	Yes (Plug connector)
Y1	Yes (Grommet)

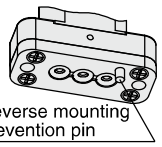
❹ Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

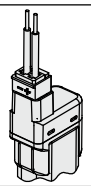
❺ Fluid contact material

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

❻ Reverse mounting prevention pin

Nil	None
P	Yes  Reverse mounting prevention pin

❼ Electrical entry, Lead wire length, Light/surge voltage suppressor

Symbol	Electrical entry, Lead wire length	Light/surge voltage suppressor	
Nil	Grommet, 150 mm	Cannot be selected	
3	Grommet, 300 mm		
6	Grommet, 600 mm		
K	Plug connector, 300 mm	None	
KO	Plug connector, Without connector		
KZ	Plug connector, 300 mm	Yes * Function "Y" is equipped with a light/surge voltage suppressor.	
KOZ	Plug connector, Without connector		

* "3" or "6" must be selected for function "Y1" (grommet). "Nil" cannot be selected.
* The plug connector is included but does not come assembled.
* If a lead wire length of 600 mm or more is required, select "KO□" (Without connector) and then add the connector part number shown below under the valve part number when ordering.

Plug connector part no.: SY100 – 30 – 4A – □

Lead wire length

6	600 mm
10	1000 mm
30	3000 mm

❽ CE-compliant

Nil	No
Q	CE-compliant

Mounting screws are included with the base-mounted type. (2 pcs.)
M2 x 11/With spring washer (Material: Stainless steel)

For other spare parts, refer to page 44.

* Kalrez® is a registered trademark of E. I. du Pont de Nemours and Company or its affiliates.

Specifications

Without sub-plate
Body ported

Without sub-plate
Body ported

Without sub-plate
Base mounted

Without sub-plate
Base mounted

Model			Body ported			Base mounted			
			LVM09R1	LVM09R2	LVM092R	LVM09R3	LVM09R4	LVM09R6	LVM095R
Valve construction			Direct operated rocker type						
Valve type			N.C.	N.O.	Universal	N.C.	N.O.	N.C.	Universal
Number of ports			2		3	2			3
Fluid*1			Air, Water, DI water (Pure water), Diluent, or Cleaning fluid						
Operating pressure range			–75 kPa to 0.2 MPa						
Orifice diameter			1 mm			1.1 mm			
Response time*7			10 ms or less (at pneumatic pressure)						
Leakage			Zero leakage, both internal or external (at water pressure)						
Proof pressure*2			0.3 MPa						
Ambient temperature*8			0 to 50°C						
Fluid temperature*8			0 to 50°C (No freezing)						
Volume of valve chamber*3			18 µL			18 µL		29 µL	18 µL
Mounting orientation*4			Free						
Enclosure			IP40 or equivalent						
Weight			22 g			20 g			
Rated voltage			12, 24 VDC						
Allowable voltage fluctuation*5			±10% of rated voltage						
Type of coil insulation			Class B						
Power consumption (When rated voltage is at 24 V)	Standard type		2 W (0.08 A)						
	With power saving circuit	Inrush	3.3 W (0.14 A)						
		Holding	0.9 W						
Coil switching noise*6			50 dB						

*1 Select an appropriate fluid contact material according to the fluid to be used. Additionally, check the chemical resistance beforehand.
*2 Indicates the pressure which does not generate breakage or cracks after a one-minute airtight test
*3 Indicates the volume of clearance inside the valve chamber after the volume of the diaphragm is subtracted
*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 need not be taken into consideration, any mounting orientation is available.
*5 When response time is prioritized, control the voltage so that there is no fluctuation below the rated voltage.
*6 The value is based on SMC's measurement conditions. The noise level will vary according to the actual conditions.
*7 In compliance with JIS B 8419:2010
(Value at ambient and fluid temperatures of 25°C, rated voltage, max. operating pressure (air), and when the N.C. (IN) port is pressurized)
The response time will vary depending on the supply pressure, fluid, piping conditions, and ambient temperature.
*8 When the diaphragm material is Kalrez®, the valve changeover time will be significantly longer at ambient and fluid temperatures of 15°C or less when compared to the valve changeover time at room temperature (≈ 25°C).
* Refer to 10 in "Design / Selection" on page 41 if the valve is to be energized continuously for extended periods of time.

Flow Rate Characteristics

Water		Air	
Kv	Cv	C	b
0.015	0.018	0.06	0.2

* The values of Kv and Cv are based on JIS B 2005:1995; the values of C and b are based on JIS B 8390:2000.

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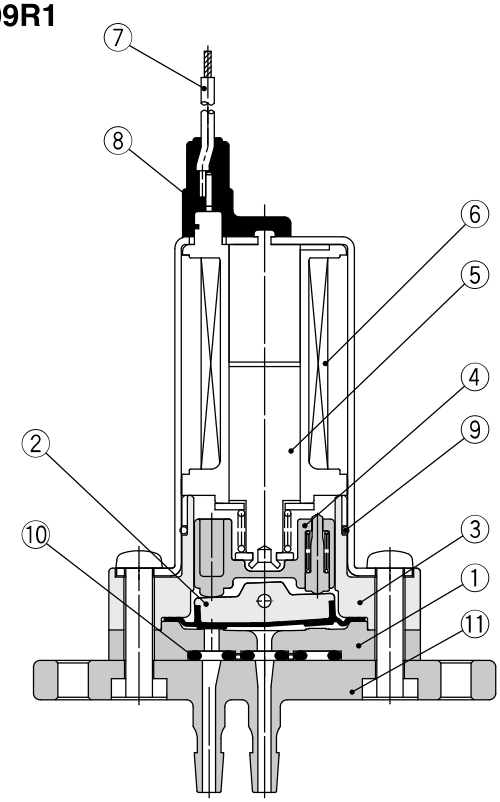
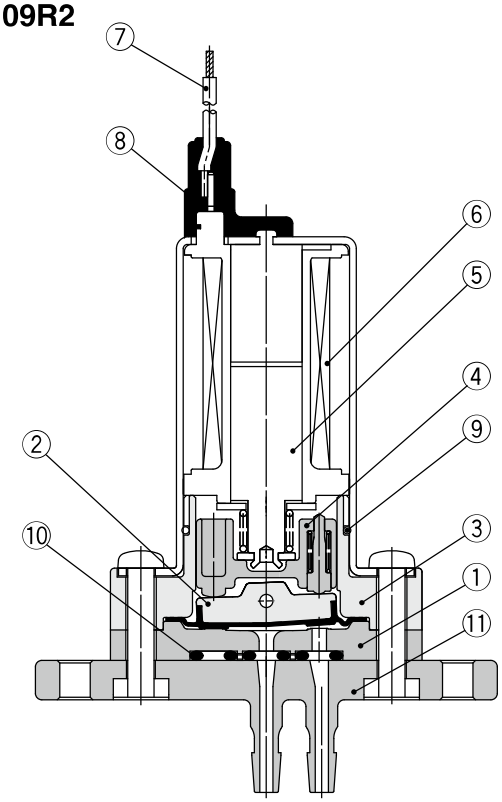
Construction

Body ported

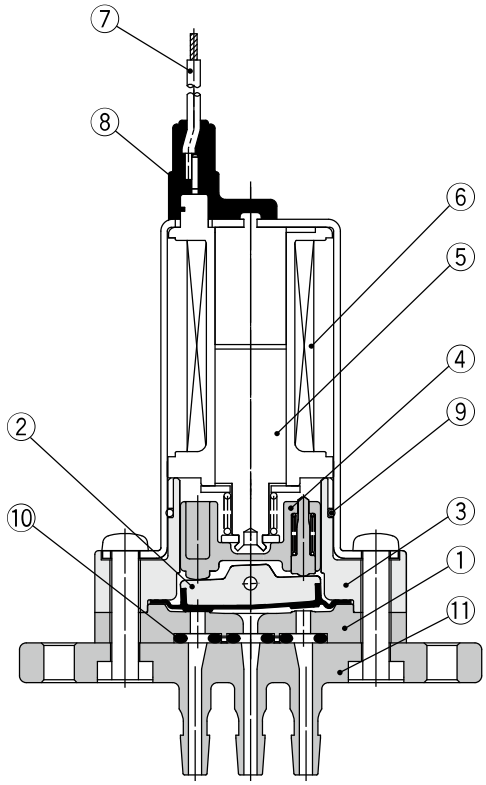
LVM09R1



LVM09R2



LVM092R



Component Parts: LVM09R1, 09R2, 092R

No.	Description	Material
1	**Plate**	PEEK
2	**Diaphragm assembly**	EPDM/FKM/Kalrez®
3	**Body**	PBT
4	**Slide bushing assembly**	PPS/Stainless steel
5	**Armature assembly**	—
6	**Coil assembly**	—
7	**Lead wire**	—
8	**Mold**	PET
9	**O-ring**	NBR
10	**Interface gasket**	EPDM/FKM/Kalrez®
11	**Piping plate**	PEEK

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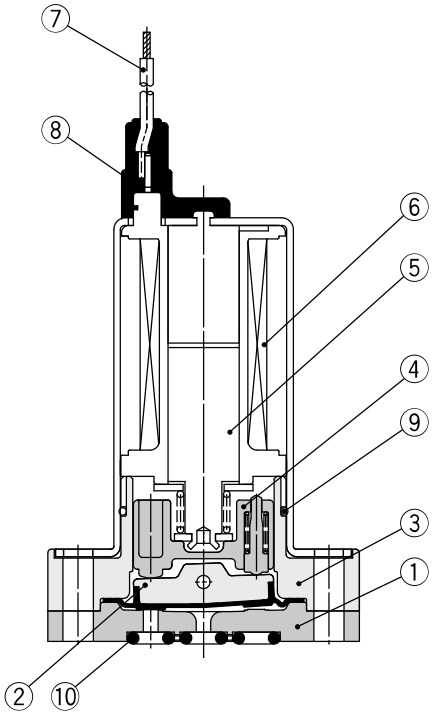
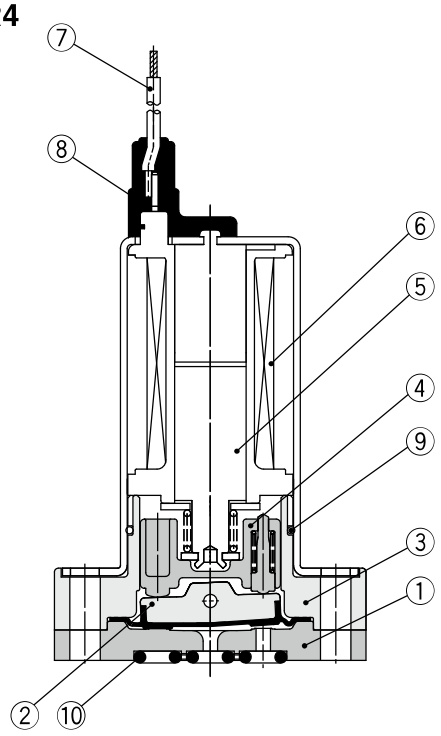
Construction

Base mounted

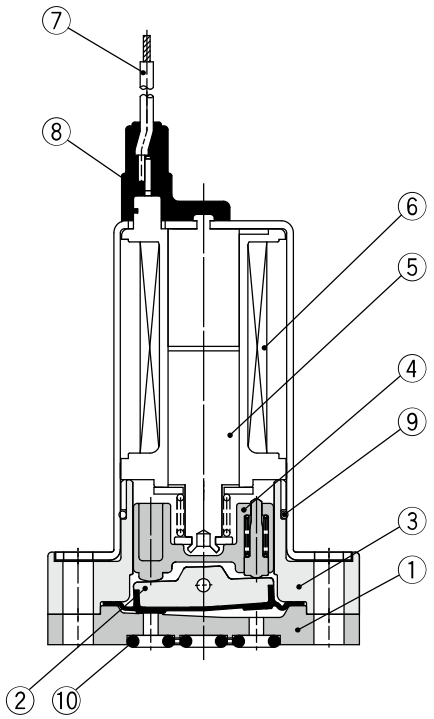
LVM09R3



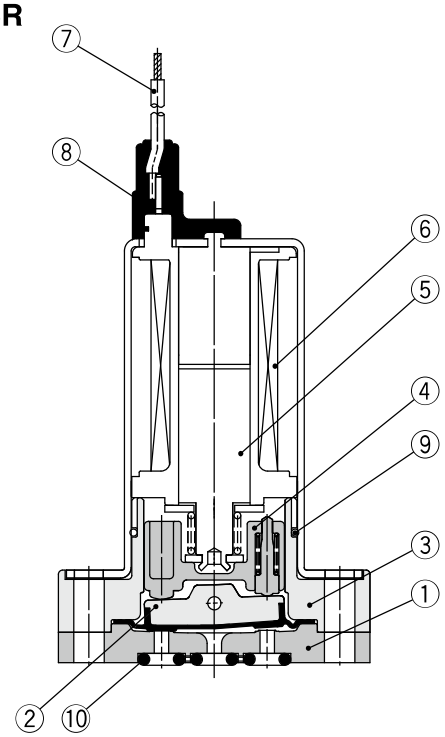
LVM09R4



LVM09R6



LVM095R



Component Parts: LVM09R3, 09R4, 09R6, 095R

No.	Description	Material
1	**Plate**	PEEK
2	**Diaphragm assembly**	EPDM/FKM/Kalrez®
3	**Body**	PBT
4	**Slide bushing assembly**	PPS/Stainless steel
5	**Armature assembly**	—

No.	Description	Material
6	**Coil assembly**	—
7	**Lead wire**	—
8	**Mold**	PET
9	**O-ring**	NBR
10	**Interface gasket**	EPDM/FKM/Kalrez®

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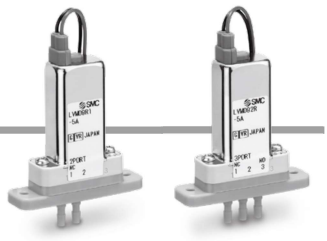
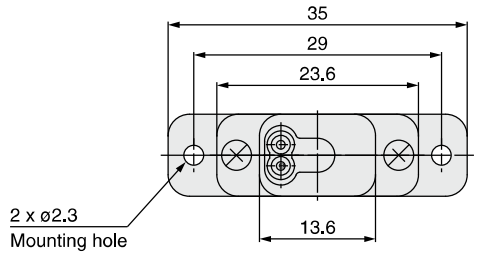
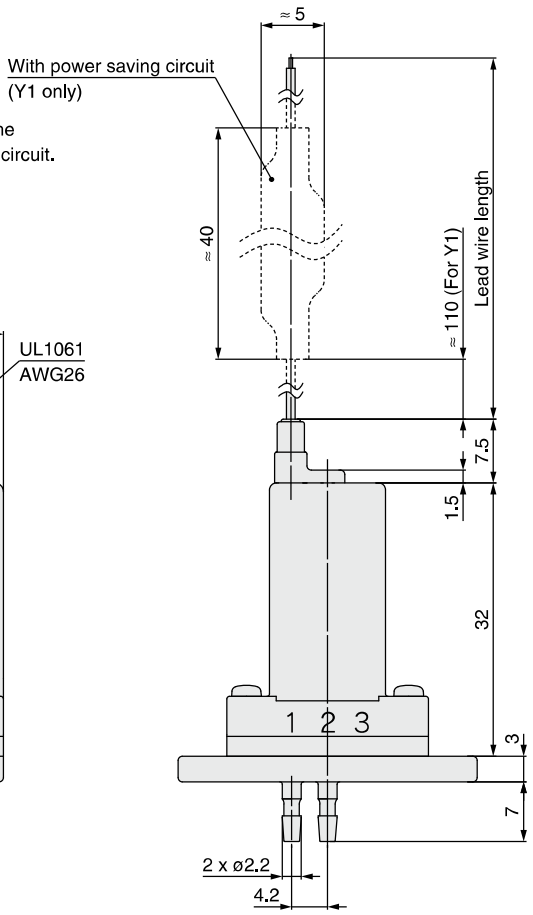


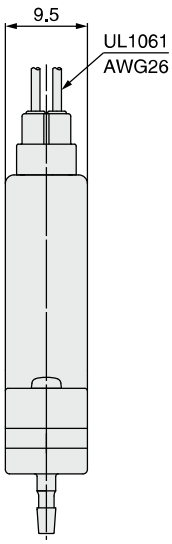
Dimensions

Body ported
LVM09R1
LVM09R2
LVM092R

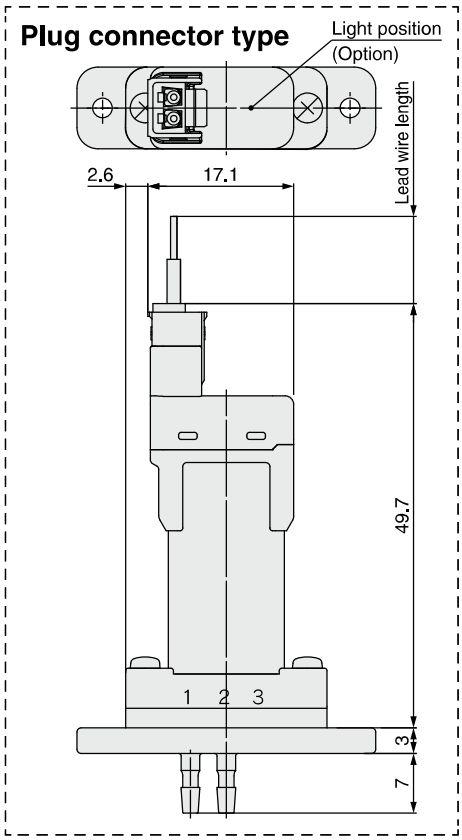


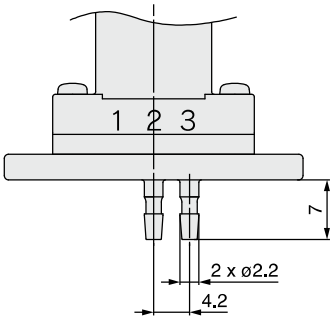


* The broken lines indicate the model with a power saving circuit.

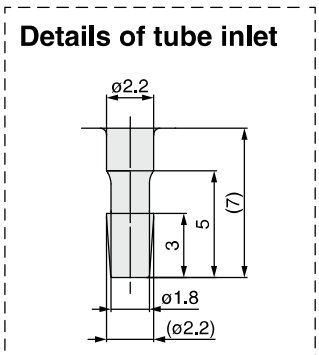


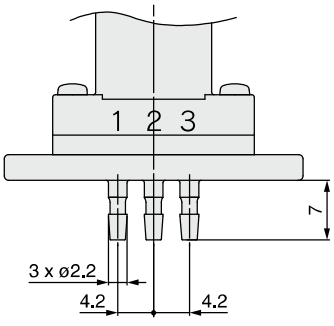
LVM09R1





LVM09R2

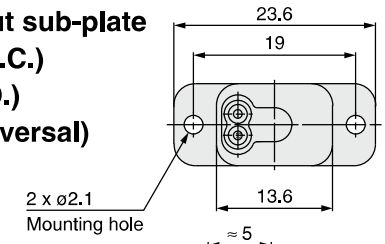


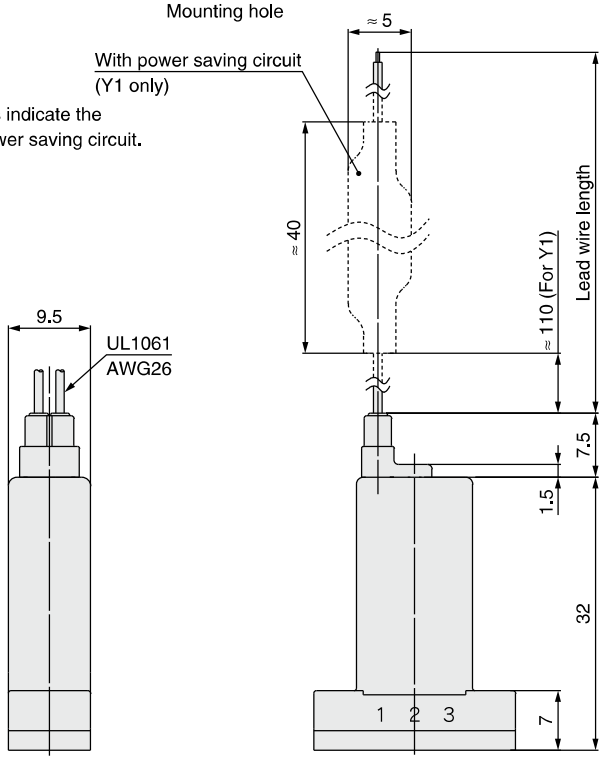


LVM092R

Dimensions

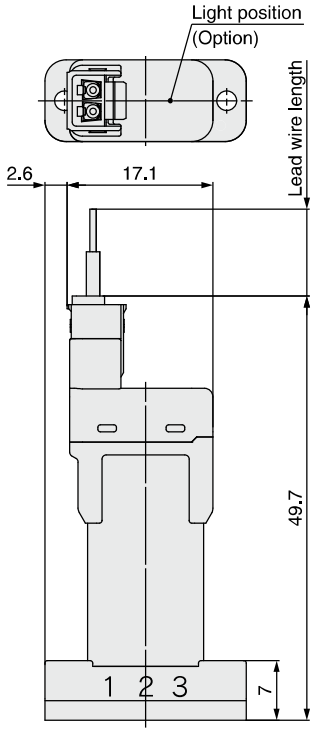
Base mounted, Without sub-plate
LVM09R3/6-□□-□ (N.C.)
LVM09R4-□□-□ (N.O.)
LVM095R-□□-□ (Universal)

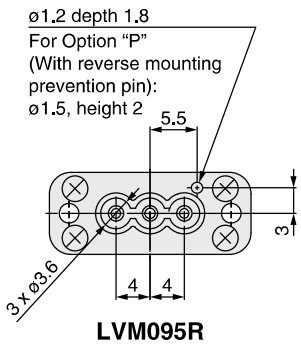




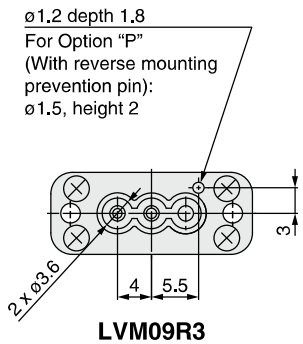
* The broken lines indicate the model with a power saving circuit.

Plug connector type

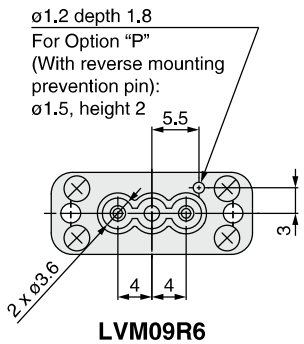




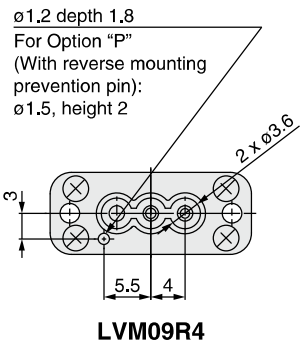
LVM095R



LVM09R3



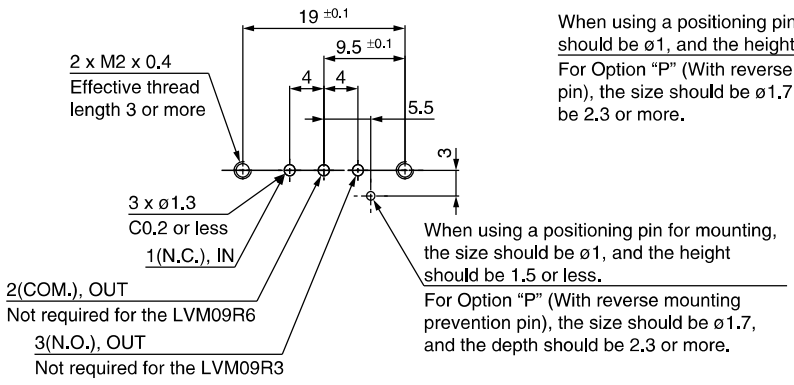
LVM09R6



LVM09R4

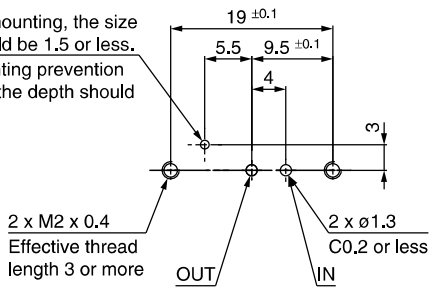
Recommended interface dimensions

* Surface roughness = Rz3.2 or less



LVM09R3, 09R6, 095R

When using a positioning pin for mounting, the size should be ø1, and the height should be 1.5 or less.
For Option "P" (With reverse mounting prevention pin), the size should be ø1.7, and the depth should be 2.3 or more.



LVM09R4