

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



Low Particle Generation

Oil-free

Metal-free

* Fluid contact parts

Isolated structure

Direct operated rocker type/poppet type

The solenoid drive body is separated from the fluid area by a diaphragm.

Power consumption

(With power saving circuit)

1.0*1 W or less

*1 Refer to page 1.

Change in volume

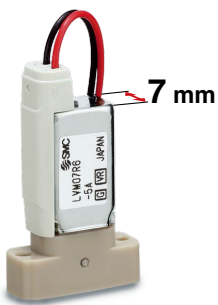
(Pumping volume)

0.01 μ L or less



New Variations/Options

7 mm width
LVM07 Series



Body ported
LVM09 Series



Plug connector, With light/surge
voltage suppressor



Plug connector



Light



With reverse
mounting prevention
pin



LVM Series



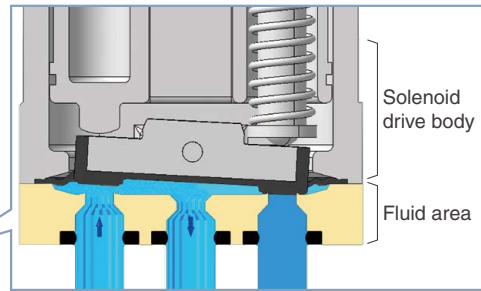
CAT.ES70-30C

Direct Operated Rocker Type

LVM07, 09/090, 10/100, 15/150, 20/200
 p. 7 p. 11 p. 17 p. 24 p. 29

Isolated structure

The solenoid drive body is separated from the fluid area by a diaphragm.



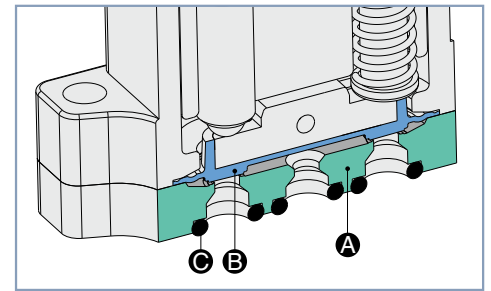
Fluid contact material (Metal-free)

Body/Plate

PEEK

Diaphragm

Choice of **EPDM, FKM, or Kalrez®**



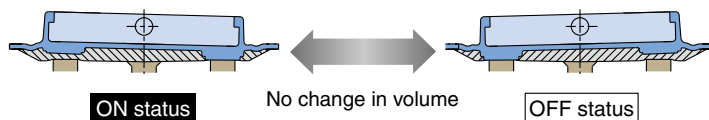
- A** Body/Plate material*1: PEEK
- B** Diaphragm material: EPDM, FKM, or Kalrez®
- C** Interface gasket/O-ring material: EPDM, FKM, or Kalrez®

*1 PFA can be selected for the plate material of the LVM10/100 base-mounted type.

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

Change in volume (Pumping volume)

0.01 μL or less



With a normal diaphragm valve, because the valve chamber volume varies depending on the ON or OFF status, the difference in volume is discharged into the outlet side of the valve when the valve is switched from ON to OFF.

However, with a rocker type valve, there is almost no change in volume, and thus **no fluid is discharged into the outlet side of the valve.**

Valve chamber volume

Residual liquid is reduced by suppressing the valve chamber volume.

Model	New LVM07	LVM09/090	LVM10/100	LVM15/150	LVM20/200
Valve chamber volume [μL]	8	18 (29)*1	20 (28)*1	50 (60)*1	84
Orifice diameter [mm]	0.8	1 (1.1)*2	1.4	1.6	2

*1 (): For R6

*2 (): For the base-mounted type

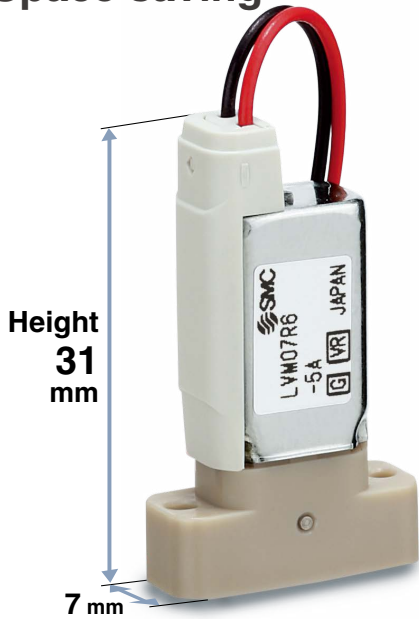
A type with a power saving circuit can be selected.

- Holding power consumption can be reduced substantially.
- Continuous energization for extended periods of time is possible.

Model		New LVM07	LVM09/090	LVM10/100	LVM15/150	LVM20/200
Power consumption [W]	Inrush	2.8	3.3	2.5	5.5	4
	Holding	0.8	0.9	1	1	0.6

Refer to 10 in "Design / Selection" on page 41 if the valve is to be energized continuously for extended periods of time or used with a manifold.

Space saving

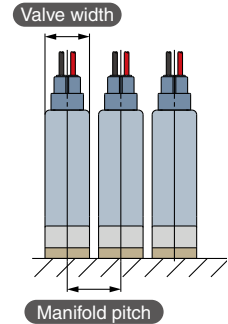


New LVM07 Series

- Valve width: 7 mm
- Compact & Lightweight
 - Volume: 3.9 cm³
 - Height: 31 mm
 - Weight: 7 g

Unit: mm

Model	Valve width	Manifold pitch
New LVM07	7	8
LVM09/090	9.5	10.5
LVM10/100	13	14
LVM15/150	16	17
LVM20/200	20	21



Required space reduced by 50%

Reduction in piping volume. Manifold can be designed to suit the space

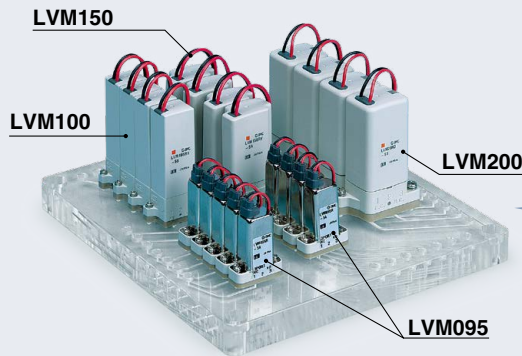
Weight reduced by 70%

Weight reduced by using resin material

No piping work required

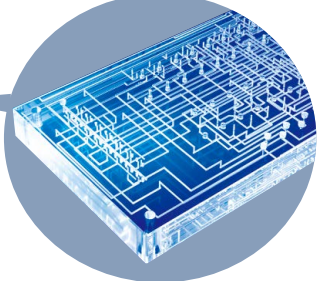
No piping work required between components

Composite Manifold (Made to order)



Flow passage style with high flexibility

Three-dimensional flow passage that cannot be created by machining or injection molding



New Options

Plug connector, With light/surge voltage suppressor

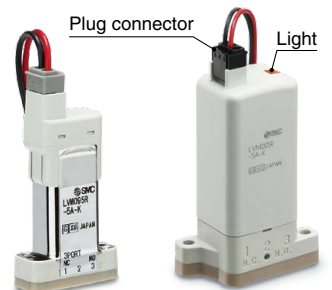
Applicable models

Model	LVM07	LVM09/090	LVM10/100	LVM15/150	LVM20/200
Plug connector	—	●	●	●	●
With light/surge voltage suppressor	—	●	●	●	●

With reverse mounting prevention pin












Applicable models

LVM07	LVM09/090	LVM10/100	LVM15/150	LVM20/200
●	●	●	●	●







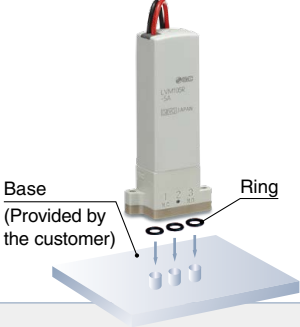






Direct Operated Rocker Type

Series Variations

	Model	Valve type			Operating pressure range	Orifice dia. [mm]	Volume of valve chamber [μ L]	Valve width [mm]	Weight [g]	Power consumption [W]	Options			
		N.C. (2-port)	N.O. (2-port)	Universal (3-port)							Reverse mounting prevention pin	Electrical entry Grommet	Plug connector	With light/surge voltage suppressor
Base mounted	 Without sub-plate p. 7 New LVM07R6	●			-75 kPa to 0.1 MPa	0.8	8	7	7	Holding: 0.8 (With power saving circuit)	●	●	—	—
Body ported	 p. 11 New LVM09R1	●			-75 kPa to 0.2 MPa	1	18	9.5	22	Standard: 2 Power saving option Holding: 0.9 (With power saving circuit)	—	●	●	●
	New LVM09R2		●											
	New LVM092R			●										
Base mounted	 Without sub-plate p. 11	●			-75 kPa to 0.2 MPa	1.1	18	9.5	20	Standard: 2 Power saving option Holding: 0.9 (With power saving circuit)	●	●	●	●
	LVM09R4		●											
	New LVM09R6	●												
	LVM095R			●										
Body ported	 p. 17	●			-75 kPa to 0.25 MPa	1.4	20	13	34	Standard: 1.5 Power saving option Holding: 1 (With power saving circuit)	—	●	●	●
	LVM10R2		●											
	LVM102R			●										
Base mounted	 p. 17 Without sub-plate	●			-75 kPa to 0.25 MPa	1.4	20	13	34	Standard: 1.5 Power saving option Holding: 1 (With power saving circuit)	●	●	●	●
	 With sub-plate		●											
	LVM10R6	●												
	LVM105R			●										
Base mounted	 p. 24 Without sub-plate	●			-75 kPa to 0.25 MPa [Max. 0.6 MPa]	1.6 [1]	50	16	45	Holding: 1 (With power saving circuit)	●	●	●	●
	 With sub-plate		●											
	New LVM15R6	●												
	LVM155R			●										
Body ported	 p. 29	●			-75 kPa to 0.25 MPa	2	84	20	80	Standard: 2.5 Power saving option Holding: 0.6 (With power saving circuit)	—	●	●	●
	LVM20R2		●											
	LVM202R			●										
Base mounted	 p. 29 Without sub-plate	●			-75 kPa to 0.3 MPa	2	84	20	80	Standard: 2.5 Power saving option Holding: 0.6 (With power saving circuit)	●	●	●	●
	 With sub-plate		●											
	LVM205R			●										

The [] indicate the values of the high-pressure type.

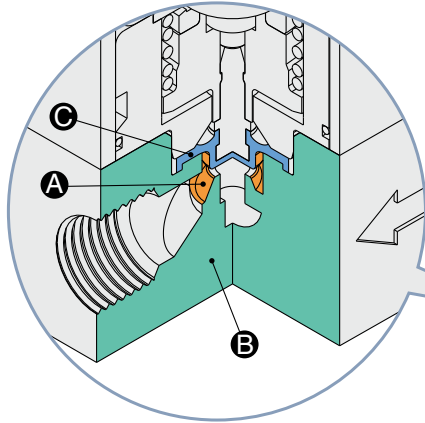
Piping/Mounting Variations

Piping/ Mounting Model	Body ported	Base mounted		Page
		Without sub-plate	With sub-plate	
LVM07	—		—	7
LVM09/090			—	11
LVM10/100	 <p>Manual override (Option)</p> <p>Tubing (Provided by the customer)</p> <p>Bracket</p>	 <p>Base (Provided by the customer)</p> <p>Ring</p>	 <p>Material: PFA or PVDF</p>	17
LVM15/150	—		 <p>Material: PVDF</p>	24
LVM20/200			 <p>Material: PVDF</p>	29

Direct Operated Poppet Type LVM11/13

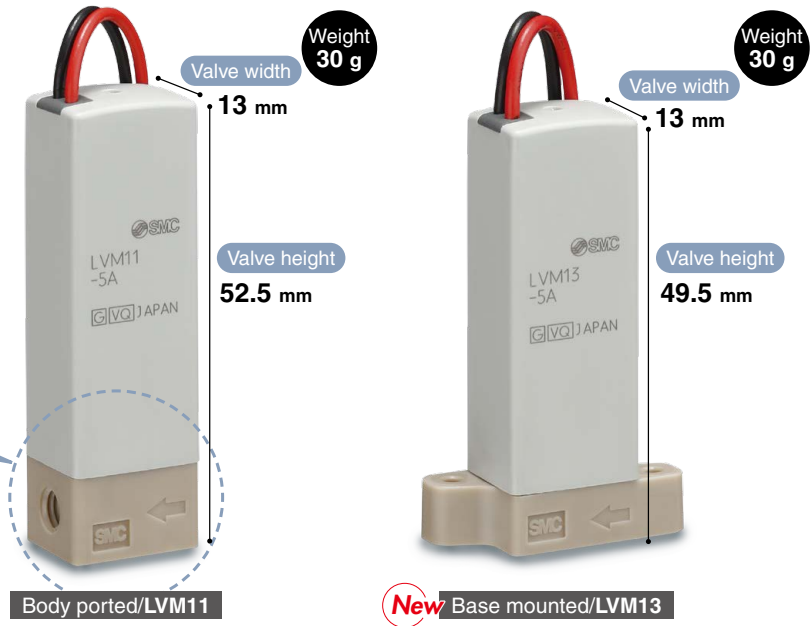
Less clogging due to the poppet construction

- Isolated structure
The solenoid drive body is separated from the fluid area by a diaphragm.
- Fluid contact material (Metal-free)

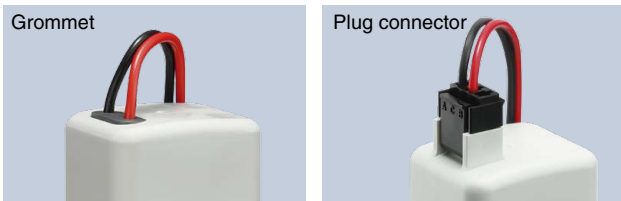


- A** Volume of valve chamber
- B** Body material: PEEK
- C** Diaphragm material: EPDM, FKM, or Kalrez®

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



Electrical entry



- Orifice diameter: 1.5 mm
- Volume of valve chamber Unit: μL

Model	LVM11	LVM13
Volume of valve chamber	11	13

Power saving circuit standardized

Holding power consumption can be reduced substantially. Continuous energization for extended periods of time is possible.

Model		LVM11	LVM13
Power consumption	Inrush	2.5	2.5
	Holding	1	1

Refer to 10 in "Design / Selection" on page 41 if the valve is to be energized continuously for extended periods of time or used with a manifold.

- With light/surge voltage suppressor
- With reverse mounting prevention pin (Option)
- Application: Liquid discharge, etc.

Series Variations

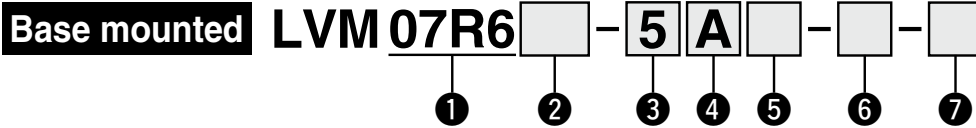
	Model	Valve type		Operating pressure range	Orifice dia. [mm]	Volume of valve chamber [μL]	Valve width [mm]	Weight [g]	Power consumption [W]	Options			Body ported	Base mounted		Page
		N.C. (2-port)	N.O. (2-port)							Reverse mounting prevention pin	Electrical entry	With light/surge voltage suppressor		Without sub-plate	With sub-plate	
Body ported	LVM11	●		0 to 0.25 MPa	1.5	11	13	30	Inrush: 2.5 Holding: 1	—	●	●	●	●	—	36
Base mounted	New LVM13	●		0 to 0.25 MPa	1.5	13	13	30	Inrush: 2.5 Holding: 1	●	●	●	●	—	—	

Direct Operated Rocker Type



Compact Direct Operated 2-Port Solenoid Valve for Chemical Liquids **LVM07 Series**

How to Order



Without sub-plate
Base mounted

1 Number of ports, Valve type

Symbol	Number of ports	Valve type	
07R6	2	N.C.	

2 Power saving circuit

Nil	None (Standard type)
Y1	Yes

3 Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

4 Fluid contact material

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

5 Reverse mounting prevention pin

Nil	None
	Yes

P

Reverse mounting prevention pin

6 Lead wire length

Nil	150 mm
3	300 mm
6	600 mm

7 CE-compliant

Nil	No
Q	CE-compliant

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

Mounting screws are included. (2 pcs.)
M1.6 x 8.5/With spring washer (Material: Stainless steel)
For other spare parts, refer to page 44.

Specifications



Without sub-plate
Base mounted

Model		Base mounted	
		LVM07R6	
Valve construction		Direct operated rocker type	
Valve type		N.C.	
Number of ports		2	
Fluid*1		Air, Water, DI water (Pure water), Diluent, or Cleaning fluid	
Operating pressure range		-75 kPa to 0.1 MPa	
Orifice diameter		0.8 mm	
Response time*8		10 ms or less (at pneumatic pressure)	
Leakage		Zero leakage, both internal or external (at water pressure)	
Proof pressure*2		0.15 MPa	
Ambient temperature*9		0 to 50°C (No condensation)	
Fluid temperature*9		0 to 50°C	
Volume of valve chamber*3		8 μL	
Mounting orientation*4		Free	
Enclosure		IP40 or equivalent	
Weight		7 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	2.8 W (0.12 A)*6	
	With power saving circuit	Inrush	2.8 W (0.12 A)
		Holding	0.8 W
Coil switching noise*7		50 dB	

*1 Select an appropriate fluid contact material according to the fluid to be used. Additionally, check the chemical resistance beforehand.

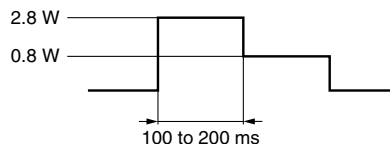
*2 Indicates the pressure which does not generate breakage or cracks after a one-minute airtight test

*3 Indicates the volume of clearance inside the valve chamber after the volume of the diaphragm is subtracted

*4 When residual liquid needs to be taken into consideration, 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 LVM07R6 (standard type) requires power saving control. Conduct power saving control according to the figure below.



*7 The value is based on SMC's measurement conditions. The noise level will vary according to the actual conditions.

*8 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.

*9 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).

Flow Rate Characteristics

Water		Air	
Kv	Cv	C	b
0.004	0.005	0.02	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.

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

LVM07

LVM09/090

LVM10/100

LVM15/150

LVM20/200

LVM11/13

Specific Product
Precautions

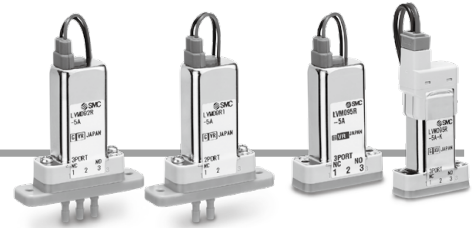
Spare Parts

Direct Operated Rocker Type



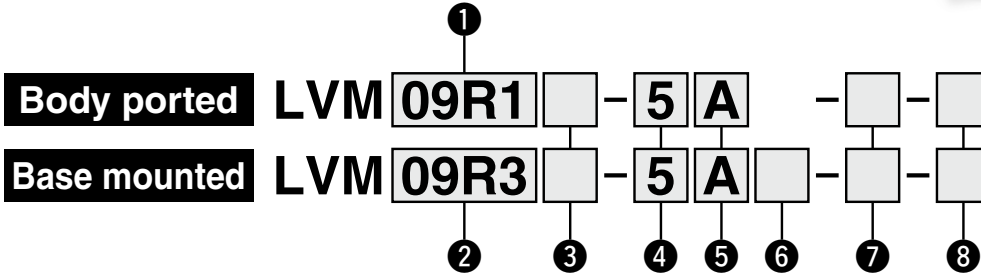
Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids LVM09/090 Series

How to Order



Without sub-plate
Body ported

Without sub-plate
Base mounted



1 Number of ports, Valve type

Symbol	Number of ports	Valve type	
09R1	2	N.C.	
		N.O.	
09R2	2	N.O.	
092R	3	Universal	

3 Power saving circuit

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

4 Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

5 Fluid contact material

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

6 Reverse mounting prevention pin

Nil	None
P	Yes

2 Number of ports, Valve type

Symbol	Number of ports	Valve type	
09R3	2	N.C.	
09R4		N.O.	
09R6		N.C.	
095R	3	Universal	

7 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 * Power saving circuit "Y" is equipped with a light/surge voltage suppressor.	
KOZ	Plug connector, Without connector		

- * "3" or "6" must be selected for power saving circuit "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

8 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

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						



Without sub-plate
Body ported



Without sub-plate
Body ported



Without sub-plate
Base mounted



Without sub-plate
Base mounted

- *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.

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

LVM07

LVM09/090

LVM10/100

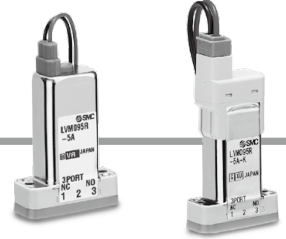
LVM15/150

LVM20/200

LVM1 1/13

Specific Product
Precautions

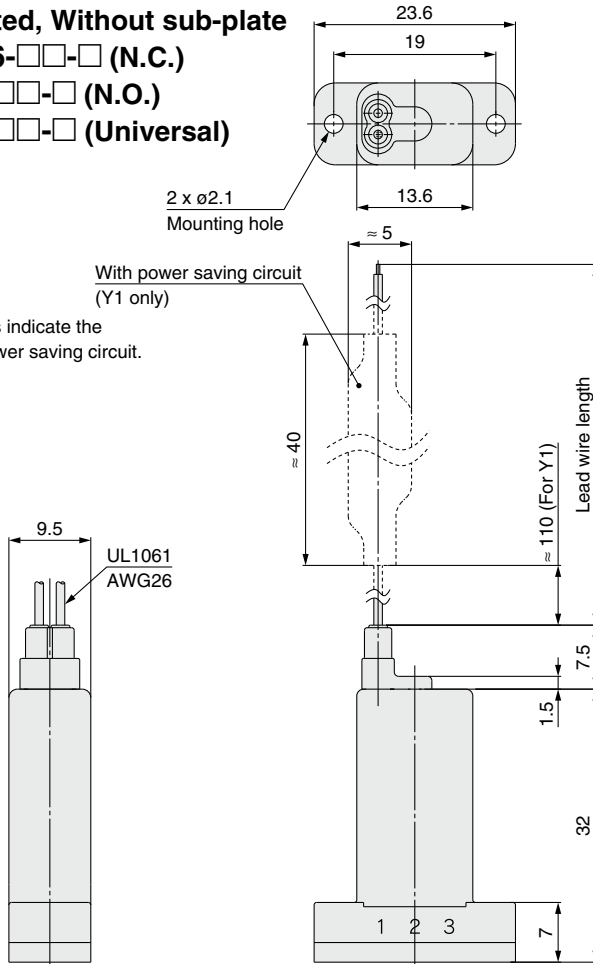
Spare Parts



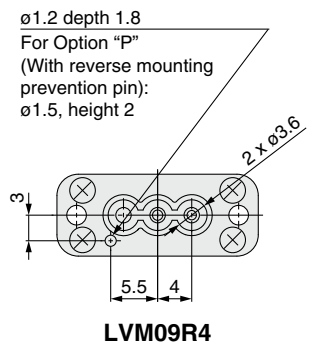
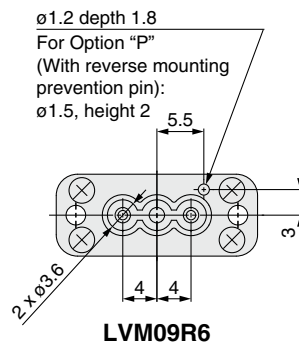
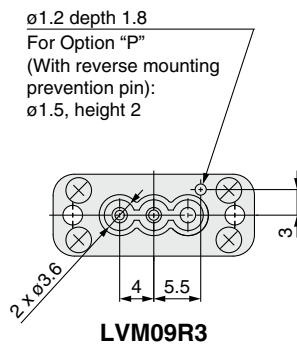
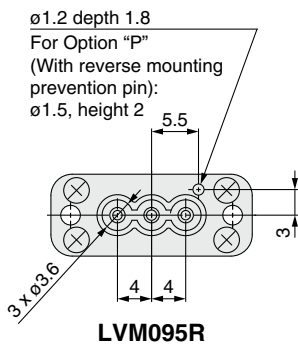
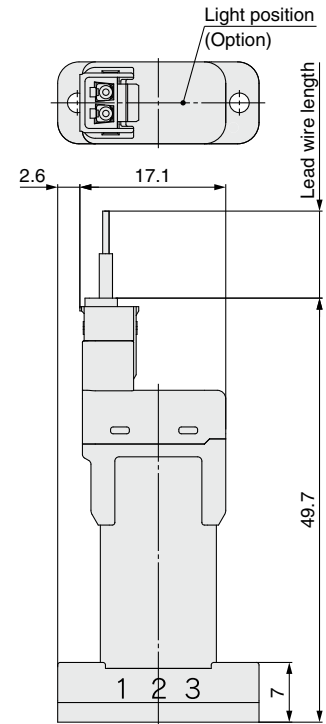
Dimensions

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

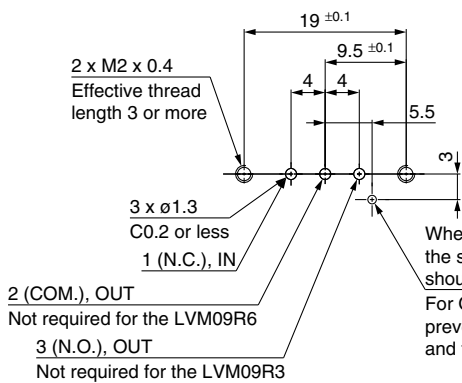
* The broken lines indicate the model with a power saving circuit.



Plug connector type

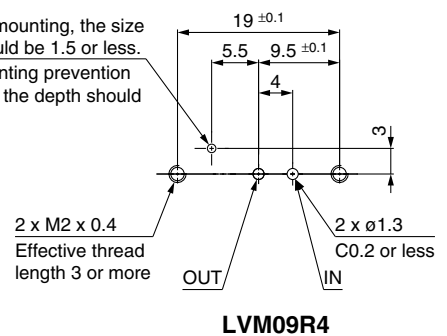


Recommended interface dimensions * Surface roughness = Rz3.2 or less



When using a positioning pin for mounting, the size should be $\phi 1$, and the height should be 1.5 or less.
 For Option "P" (With reverse mounting prevention pin), the size should be $\phi 1.7$, and the depth should be 2.3 or more.

When using a positioning pin for mounting, the size should be $\phi 1$, and the height should be 1.5 or less.
 For Option "P" (With reverse mounting prevention pin), the size should be $\phi 1.7$, and the depth should be 2.3 or more.



LVM07

LVM09/090

LVM10/100

LVM15/150

LVM20/200

LVM11/13

Specific Product Precautions

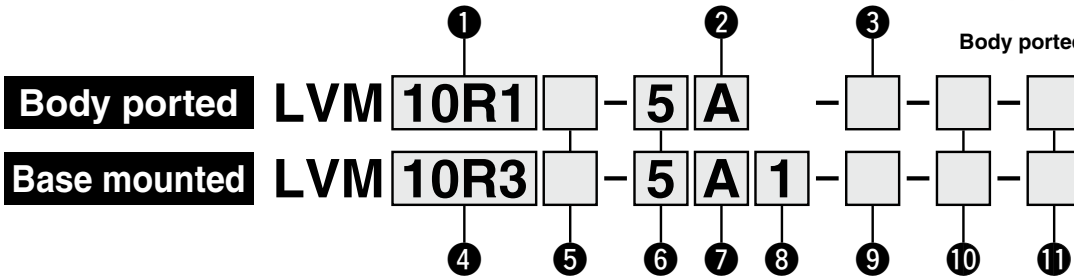
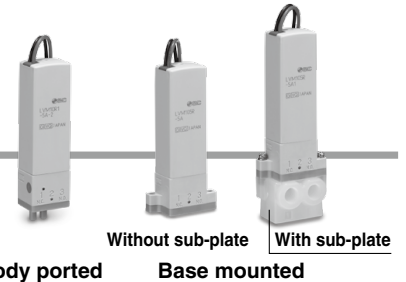
Spare Parts

Direct Operated Rocker Type



Compact Direct Operated 2/3-Port Solenoid Valve for Chemical Liquids LVM10/100 Series

How to Order



1 Number of ports, Valve type

Symbol	Number of ports	Valve type	
10R1	2	N.C.	
10R2		N.O.	
102R	3	Universal	

4 Number of ports, Valve type

Symbol	Number of ports	Valve type	
10R3	2	N.C.	
10R4		N.O.	
10R6	2	N.O.	
105R		3	Universal

5 Power saving circuit

Nil	None (Standard type)
Y	Yes

6 Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

11 CE-compliant

Nil	No
Q	CE-compliant

2 Fluid contact material

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

7 Fluid contact material

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

9 Option

Nil	None
1	Bracket
2	Manual override
3	Bracket, Manual override

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

3 Option

Nil	None
1	Bracket
2	Manual override
3	Bracket, Manual override

8 Sub-plate material/port size, Reverse mounting prevention pin

Symbol	Sub-plate		Reverse mounting prevention pin	
	Material	Port size		
Nil	None	None	None	
P			Yes	
			None	
1			PVDF	M6
1U	1/4-28UNF			
2	PFA	M6	None	
2U		1/4-28UNF		

* "P," "1," and "1U" cannot be selected if the wetted parts material is "E," "F," or "G."
* A sub-plate cannot be mounted for "P" (With reverse mounting prevention pin).

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

Symbol	Electrical entry, Lead wire length	Light/surge voltage suppressor
Nil	Grommet, 300 mm	Cannot be selected
6	Grommet, 600 mm	
10	Grommet, 1000 mm	
K	Plug connector, 300 mm	None
KO	Plug connector, Without connector	
KZ	Plug connector, 300 mm	Yes
KOZ	Plug connector, Without connector	

* 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.: AXT661 - 14A - □

Lead wire length

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

Mounting screws are included with the base-mounted type (without sub-plate). (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



Body ported



Without sub-plate
Base mounted



With sub-plate
Base mounted

Model	Body ported (Tube connection type)			Base mounted			
	LVM10R1	LVM10R2	LVM102R	LVM10R3	LVM10R4	LVM10R6	LVM105R
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 0.25 MPa						
Orifice diameter	1.4 mm						
Response time*7	10 ms or less (at pneumatic pressure)						
Leakage	Zero leakage, both internal or external (at water pressure)						
Proof pressure*2	0.38 MPa						
Ambient temperature*8	0 to 50°C						
Fluid temperature*8	0 to 50°C (No freezing)						
Volume of valve chamber*3	20 μL						
Mounting orientation*4	Free						
Enclosure	IP40 or equivalent						
Weight	34 g			34 g (Without sub-plate) 42 g (With sub-plate)			
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		1.5 W (0.06 A)				
	With power saving circuit	Inrush	2.5 W (0.1 A)				
		Holding	1 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
0.025	0.03	0.1	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.

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

LVM07

LVM09/090

LVM10/100

LVM15/150

LVM20/200

LVM11/13

Specific Product Precautions

Spare Parts

Direct Operated Rocker Type



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

LVM15/150 Series

How to Order

Base mounted LVM **15R3** **Y** - **5** **A** **1** - -

①
②
③
④
⑤
⑥
⑦



Without sub-plate With sub-plate

① Number of ports, Valve type

Symbol	Number of ports	Valve type	
15R3	2	N.C.	
15R4		N.O.	
15R6		N.C.	
155R	3	Universal	

② Max. operating pressure, Power saving circuit

Symbol	Max. operating pressure	Power saving circuit
Y	0.25 MPa (Standard type)	Yes
HY	0.6 MPa (High-pressure type)	Yes

③ Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

④ Fluid contact material

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

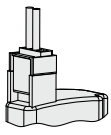
⑤ Sub-plate material/port size, Reverse mounting prevention pin

Symbol	Sub-plate		Reverse mounting prevention pin
	Material	Port size	
Nil	None	None	None
P			Yes
1	PVDF	M6	 Reverse mounting prevention pin
1U		1/4-28UNF	

* A sub-plate cannot be mounted for "P" (With reverse mounting prevention pin).

⑥ Electrical entry, Lead wire length, Light/surge voltage suppressor

Symbol	Electrical entry, Lead wire length	Light/surge voltage suppressor
Nil	Grommet, 300 mm	Cannot be selected
6	Grommet, 600 mm	
10	Grommet, 1000 mm	
KZ	Plug connector, 300 mm	Yes
KOZ	Plug connector, Without connector	



* The plug connector is included but does not come assembled.

* If a lead wire length of 600 mm or more is required, select "KOZ" (Without connector) and then add the connector part number shown below under the valve part number when ordering.

Plug connector part no.: AXT661 - 14A -

Lead wire length

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

⑦ CE-compliant

Nil	No
Q	CE-compliant

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

Mounting screws are included for models without sub-plate. (2 pcs.)
M2.5 x 14/With spring washer (Material: Stainless steel)

For other spare parts, refer to page 44.

LVM15/150 Series

Specifications



Without sub-plate



With sub-plate

Model		Base mounted			
		LVM15R3	LVM15R4	LVM15R6	LVM15R
Valve construction		Direct operated rocker type			
Valve type		N.C.	N.O.	N.C.	Universal
Number of ports		2			3
Fluid *1		Air, Water, DI water (Pure water), Diluent, or Cleaning fluid			
Operating pressure range	Standard type	-75 kPa to 0.25 MPa			
	High-pressure type	Max. 0.6 MPa*7			
Orifice diameter	Standard type	1.6 mm			
	High-pressure type	1 mm			
Response time *8		15 ms or less (at pneumatic pressure)			
Leakage		Zero leakage, both internal or external (at water pressure)			
Proof pressure *2	Standard type	0.38 MPa			
	High-pressure type	0.9 MPa			
Ambient temperature *9		0 to 50°C			
Fluid temperature *9		0 to 50°C (No freezing)			
Volume of valve chamber *3		50 μL		60 μL	50 μL
Mounting orientation *4		Free			
Enclosure		IP40 or equivalent			
Weight		45 g (Without sub-plate), 56 g (With sub-plate)			
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)	Inrush	5.5 W (0.23 A)			
	Holding	1 W			
Coil switching noise *6		60 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 The high-pressure type can also be used at a pressure level of up to -75 kPa. However, set the maximum operating pressure so that a difference in operating pressure becomes 0.6 MPa or less.

Example) When the valve is used at -50 kPa, the maximum operating pressure is up to 0.55 MPa.

*8 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.

*9 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 designed 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
0.034 [0.012]	0.04 [0.015]	0.13 [0.05]	0.22 [0.2]

The [] indicate the values of the high-pressure type.

* 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.

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

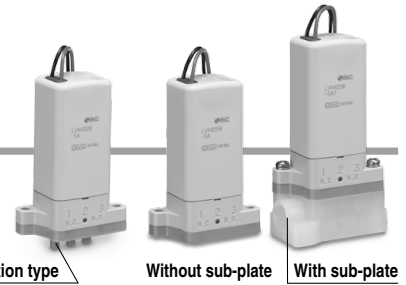
Direct Operated Rocker Type



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

LVM20/200 Series

How to Order

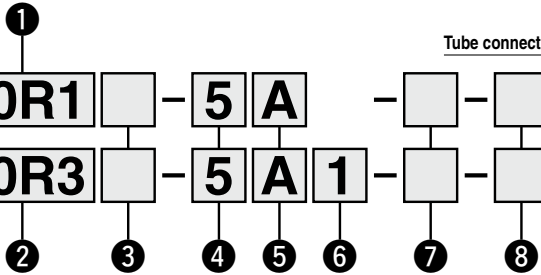


Body ported

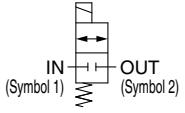
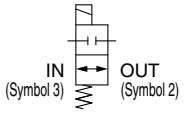
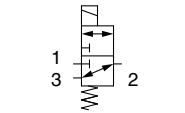
LVM **20R1** - **5** **A** - -

Base mounted

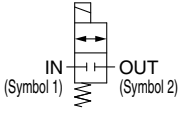
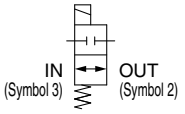
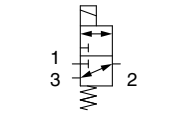
LVM **20R3** - **5** **A** **1** - -



1 Number of ports, Valve type

Symbol	Number of ports	Valve type
20R1	2	N.C. 
20R2		N.O. 
202R	3	Universal 

2 Number of ports, Valve type

Symbol	Number of ports	Valve type
20R3	2	N.C. 
20R4		N.O. 
205R	3	Universal 

3 Power saving circuit

Nil	None (Standard type)
Y	Yes

4 Coil voltage

Symbol	Voltage
5	24 VDC
6	12 VDC

5 Fluid contact material

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

6 Sub-plate material/port size, Reverse mounting prevention pin

Symbol	Sub-plate		Reverse mounting prevention pin	
	Material	Port size		
Nil	None		None	
P			Yes	
1			Rc1/8	None
1F			G1/8	
1N	NPT1/8			

* A sub-plate cannot be mounted for "P" (With reverse mounting prevention pin).

8 CE-compliant

Nil	No
Q	CE-compliant

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

Symbol	Electrical entry, Lead wire length	Light/surge voltage suppressor
Nil	Grommet, 300 mm	Cannot be selected
6	Grommet, 600 mm	
10	Grommet, 1000 mm	
K	Plug connector, 300 mm	None
KO	Plug connector, Without connector	
KZ	Plug connector, 300 mm	Yes * Power saving circuit "Y" is equipped with a light/surge voltage suppressor.
KOZ	Plug connector, Without connector	

* 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.: AXT661 - 14A - □

Lead wire length ●

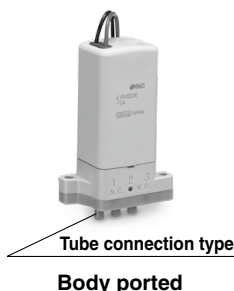
6	600 mm
10	1000 mm
20	2000 mm
30	3000 mm

Mounting screws are included with the base-mounted type (without sub-plate). (2 pcs.)
M3 x 14/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



Model	Body ported (Tube connection type)			Base mounted		
	LVM20R1	LVM20R2	LVM20R3	LVM20R3	LVM20R4	LVM20R5
Valve construction	Direct operated rocker type					
Valve type	N.C.	N.O.	Universal	N.C.	N.O.	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 0.25 MPa			-75 kPa to 0.3 MPa		
Orifice diameter	2 mm					
Response time*7	20 ms or less (at pneumatic pressure)					
Leakage	Zero leakage, both internal or external (at water pressure)					
Proof pressure*2	0.38 MPa			0.45 MPa		
Ambient temperature*8	0 to 50°C					
Fluid temperature*8	0 to 50°C (No freezing)					
Volume of valve chamber*3	84 μL					
Mounting orientation*4	Free					
Enclosure	IP40 or equivalent					
Weight	80 g			80 g (Without sub-plate), 94 g (With sub-plate)		
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		2.5 W (0.1 A)			
	With power saving circuit	Inrush	4 W (0.17 A)			
		Holding	0.6 W			
Coil switching noise*6	60 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
0.055	0.065	0.23	0.27

* 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.

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

LVM07

LVM09/090

LVM10/100

LVM15/150

LVM20/200

LVM11/13

Specific Product Precautions

Spare Parts

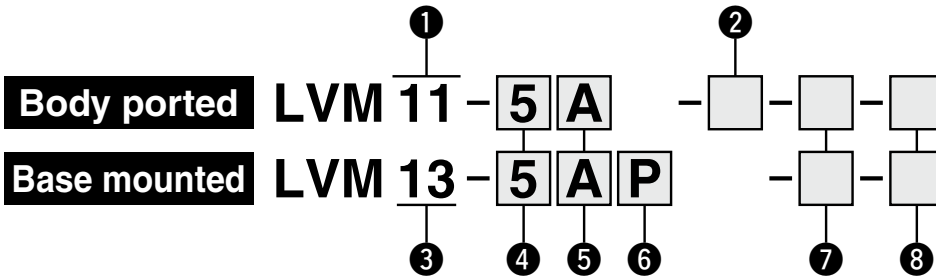
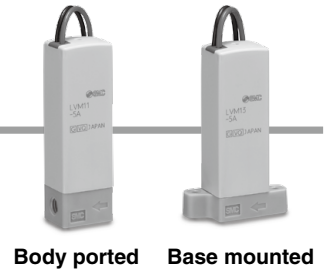
Direct Operated Poppet Type



Compact Direct Operated
2/3-Port Solenoid Valve for Chemical Liquids with Power Saving Circuit

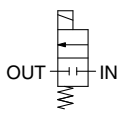
LVM11/13 Series

How to Order



1 Number of ports, Valve type

Symbol	Number of ports	Valve type
11	2	N.C.

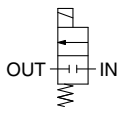


2 Option

Nil	None
1	Bracket

3 Number of ports, Valve type

Symbol	Number of ports	Valve type
13	2	N.C.



4 Coil voltage

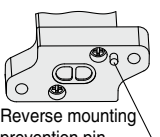
Symbol	Voltage
5	24 VDC
6	12 VDC

5 Fluid contact material

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

6 Reverse mounting prevention pin

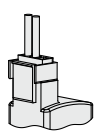
Nil	None
	Yes



Reverse mounting prevention pin

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

Symbol	Electrical entry, Lead wire length	Light/surge voltage suppressor
Nil	Grommet, 300 mm	Cannot be selected
6	Grommet, 600 mm	
10	Grommet, 1000 mm	
KZ	Plug connector, 300 mm	Yes
KOZ	Plug connector, Without connector	



* The plug connector is included but does not come assembled.

* If a lead wire length of 600 mm or more is required, select "KOZ" (Without connector) and then add the connector part number shown below under the valve part number when ordering.

Plug connector part no.: AXT661 - 14A - □

Lead wire length ●

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

8 CE-compliant

Nil	No
Q	CE-compliant

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

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.

LVM11/13 Series

Specifications



Body ported



Base mounted

Model	Body ported	Base mounted	
	LVM11	LVM13	
Valve construction	Direct operated poppet type		
Valve type	N.C.		
Number of ports	2		
Fluid*1	Air, Water, DI water (Pure water), Diluent, or Cleaning fluid		
Operating pressure range	0 to 0.25 MPa		
Orifice diameter	1.5 mm		
Response time*7	10 ms or less (at pneumatic pressure)		
Leakage	Zero leakage, both internal or external (at water pressure)		
Proof pressure*2	0.38 MPa		
Ambient temperature*8	0 to 50°C		
Fluid temperature*8	0 to 50°C (No freezing)		
Volume of valve chamber*3	11 μL	13 μL	
Mounting orientation*4	Free		
Enclosure	IP40 or equivalent		
Weight	30 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)	With power saving circuit	Inrush	2.5 W (0.1 A)
		Holding	1 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
0.034	0.04	0.13	0.22

- * 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.

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