

Integrated Fittings/Threaded Ports/Manual Operation (Integrated Fittings/Threaded Ports)

# High Purity Chemical Liquid Valve



## Air Operated Integrated Fitting Type **LVC Series** ▶ P.7

- N.C./N.O./Double acting with same configuration
- Compatible with 100°C fluid temperature

Body material: **New PFA**



## Air Operated Threaded Type **LVA Series** ▶ P.18

- Diaphragm material PTFE, EPDM, NBR are selectable

Body material: **New PFA/Stainless steel/PPS**



## Manually Operated **LVH Series** ▶ P.36 Integrated Fitting Type/Threaded Type

- Locking and non-locking types available

Body material: **New PFA/Stainless steel/PPS**



## Organic Solvents Compatible

### **New** Air Operated **LVA Series** ▶ P.32

Body: **Stainless steel**  
Actuator section: **ADC**  
Buffer: Choose from **FKM/EPDM**



### **New** Manually Operated **LVH Series** ▶ P.45

Body: **Stainless steel**  
Actuator section: **ADC**  
Buffer: Choose from **FKM/EPDM**



# LVC/LVA/LVH Series



## Stable sealing surface Guide ring

A unique guide ring on the piston rod eliminates lateral motion of the poppet, greatly increasing seal life and reducing particle generation with a stable work surface.

## Prevents micro-bubbles Diaphragm (PTFE)

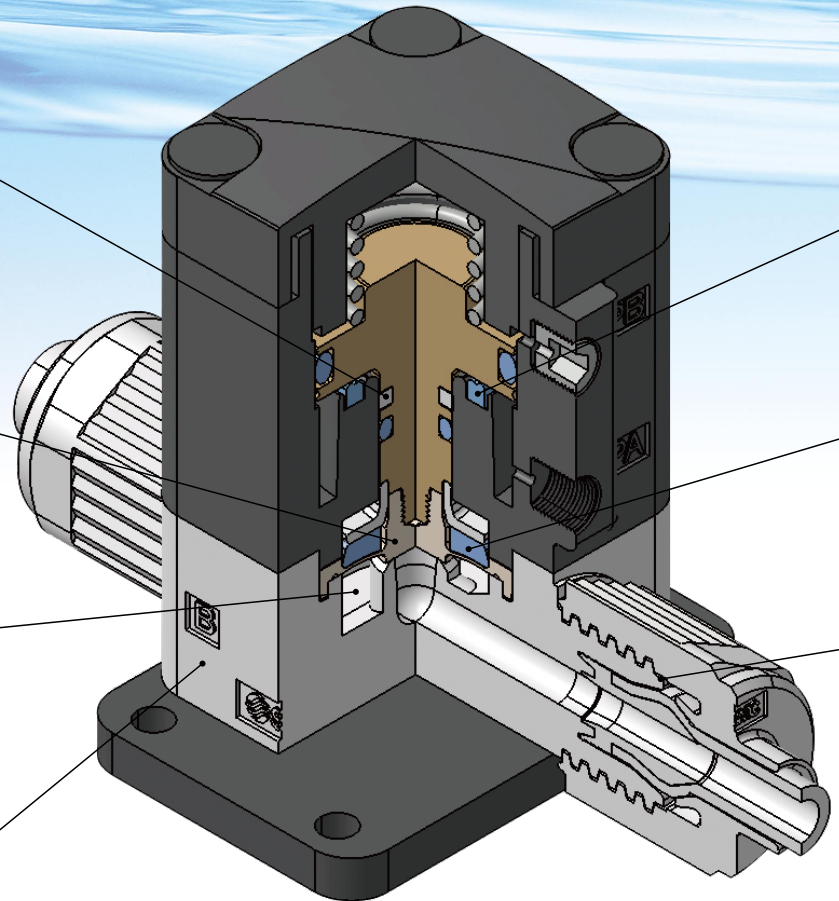
Special diaphragm construction ensures gentle opening and closing that prevents the generation of micro-bubbles.

## Minimal dead space

In addition to a body designed for smooth flow with minimal internal dead space, integrated fittings eliminate the possibility of residual liquid in pipe threads.

## Outstanding corrosion resistance (New PFA)

Compatible with chemicals such as acids, bases and ultrapure water.



## Organic Solvents Compatible RoHS

Air Operated

**LVA- $\frac{D}{T}$ - $\frac{AD}{ND}$  Series**

▶ P.32

Manually Operated

**LVH□M- $\frac{D}{T}$ - $\frac{AD}{ND}$  Series**

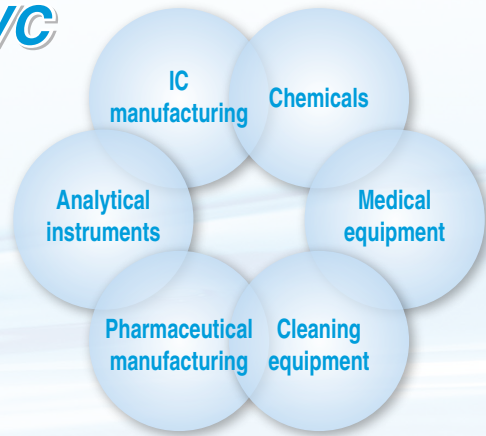
▶ P.45

- Body: **Stainless steel**, Actuator section: **ADC**, Buffer: **FKM/EPDM** (Select one)
- Fitting type: Double ferrule fittings, Metal gasket seal fittings, Integrated tubing
- Options: With flow rate adjustment, With indicator, High back pressure (0.5 MPa), Body wetted parts equivalent to EP grade
- Japan's Export Trade Control Order: Not applicable for list control

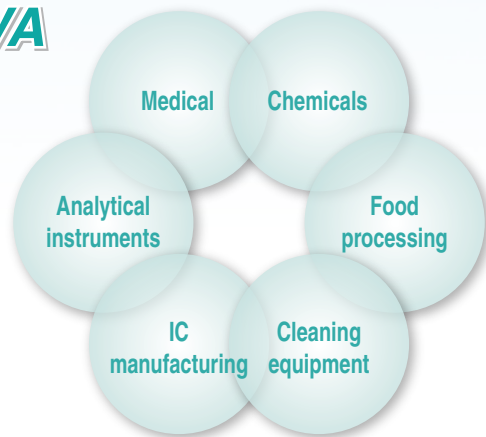


Main Applications and Fields

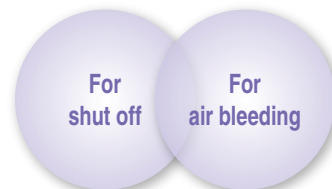
**LVC**



**LVA**



**LVH**



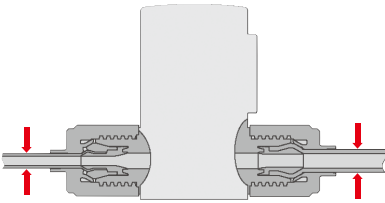
**Low particle generation Piston bumper**

A bumper absorbs piston momentum to minimize impact-induced particles.

**Back-pressure resistance and long life Buffer**

The diaphragm is supported by a buffer that minimizes deformation, which gives it long life and resistance to back pressure.

**Different tubing sizes can be selected Hyper fitting**



- No leak design (quadruple seal)
- Nut lock mechanism (sealing)
- High flexural strength (tubing supports)



**LVA30-D11-AD**  
Double ferrule fittings



**LVA50-G19-AD**  
Metal gasket seal fittings




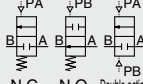

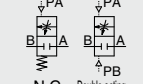

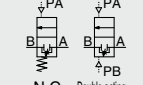

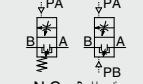

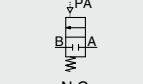
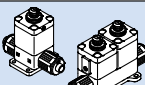
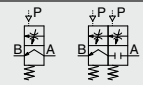
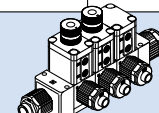
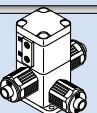
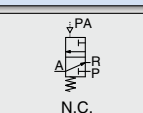
**LVA60-T25-AD**  
Integrated tubing



**LVH20M-D07-AD**  
Double ferrule fittings

**Air Operated** Series Variations

Integrated Fitting Type **LVC Series** ▶ P.7

Type	Symbol	Valve type	Model					
			Orifice diameter					
			LVC2□	LVC3□	LVC4□	LVC5□	LVC6□	
			ø4	ø8	ø10	ø16	ø22	
			Tubing O.D.					
			Metric					
			3, 4, 6	6, 8, 10	10, 12	12, 19	19, 25	
			Inch					
			1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	3/4, 1	
<b>Basic</b> 		N.C.	•	•	•	•	•	
			N.O.	•	•	•	•	•
			Double acting	•	•	•	•	•
<b>With flow rate adjustment</b> 		N.C.	•	•	•	•	•	
			Double acting	•	•	•	•	•
			N.C.	•	•	•	•	•
<b>With bypass</b> 		N.C.	—	•	•	•	—	
			Double acting	—	•	•	•	—
			N.C.	—	•	•	•	—
<b>With flow rate adjustment &amp; bypass</b> 		N.C.	—	•	•	•	—	
			Double acting	—	•	•	•	—
			N.C.	—	•	•	•	—
<b>With indicator</b> 		N.C.	•	•	•	•	•	
			N.C.	•	•	•	•	•
<b>Suck back</b> 		Single	•	—	—	—	—	
		Unit	•	—	—	—	—	
<b>Manifold</b> (Up to 5 stations) 								
<b>3 port</b> 		N.C.	•	—	—	—	—	



**Air Operated Series Variations**

**Threaded Type LVA Series ▶ P.18**

Type	Symbol	Model	Orifice diameter		LVA1□		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□	
			Port size		□2		□4		□8		□12		□20		□22	
			Body material*1	Valve type	1/8	1/4	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	1	
Basic		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•	•	•	•	•
			PPS	•	•	—	•	—	•	—	•	—	•	—	•	—
			PFA	•	—	—	•	—	•	—	•	—	•	—	•	—
With flow rate adjustment		N.C.	Stainless steel 316	—	—	•	•	•	•	•	•	•	•	•	•	•
			PPS	—	—	•	•	•	•	•	•	•	•	•	•	•
			PFA	—	—	•	•	•	•	•	•	•	•	•	•	•
With bypass		N.C.	Stainless steel 316	—	—	—	—	—	•	—	•	—	•	—	—	
			PPS	—	—	—	—	—	•	—	•	—	•	—	—	
			PFA	—	—	—	—	—	•	—	•	—	•	—	—	
With flow rate adjustment & bypass		N.C.	Stainless steel 316	—	—	—	—	—	•	—	•	—	•	—	—	
			PPS	—	—	—	—	—	•	—	•	—	•	—	—	
			PFA	—	—	—	—	—	•	—	•	—	•	—	—	
With indicator		N.C.	Stainless steel 316	—	—	•	•	•	•	•	•	•	•	•	•	
			PFA	—	—	•	•	•	•	•	•	•	•	•	•	
Manifold (Up to 5 stations)																

\*1: Refer to page 18 for the applicable optional body materials.

Type	Symbol	Model	Orifice diameter		LVA1□		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□	
			Port size		□2		□4		□8		□12		□20		□22	
			1/8	1/4	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	1			
3 port		N.C.	—	—	—	• <sup>*2</sup>	—	—	—	—	—	—	—	—	—	

\*2: Only PFA is applicable as a body material.

**Organic Solvents Compatible Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing**

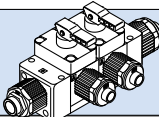
**LVA Series ▶ P.32**

Type	Symbol	Model	Orifice diameter		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□	
			Tubing O.D.		□4		□8		□12		□20		□22	
			Metric	Inch	6	10	12	19	—					
Basic		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•	•	
			PPS	•	•	•	•	•	•	•	•	•	•	
			PFA	•	•	•	•	•	•	•	•	•	•	
With flow rate adjustment		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•	•	
			PPS	•	•	•	•	•	•	•	•	•		
			PFA	•	•	•	•	•	•	•	•	•		
With indicator		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•		
			PFA	•	•	•	•	•	•	•	•			
High back pressure		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•	•	
			PPS	•	•	•	•	•	•	•	•	•		
			PFA	•	•	•	•	•	•	•	•			
High back pressure with flow rate adjustment		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•	•	
			PPS	•	•	•	•	•	•	•	•	•		
			PFA	•	•	•	•	•	•	•	•			
High back pressure with indicator		N.C.	Stainless steel 316	•	•	•	•	•	•	•	•	•		
			PFA	•	•	•	•	•	•	•				

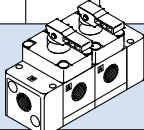
**Manually Operated** Series Variations

**LVH Series** ▶ P.36

**Integrated Fitting Type**

Type	Model	LVH20			LVH30			LVH40			
		Orifice diameter			Orifice diameter			Orifice diameter			
		Tubing O.D.			Tubing O.D.			Tubing O.D.			
Basic	Symbol	Metric	3, 4, 6			6, 8, 10			10, 12		
		Inch	1/8, 3/16, 1/4			1/4, 3/8			3/8, 1/2		
Basic	Symbol	Valve type	N.C.			●			●		
		Non-locking Locking	●			●			●		
Manifold (Up to 5 stations)											

**Threaded Type**

Type	Model	LVH20				LVH30				LVH40							
		Orifice diameter				Orifice diameter				Orifice diameter							
		Material				Material				Material							
Basic	Symbol	Stainless steel 316	PPS	PFA	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2
		Port size	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2	1/2
Basic	Symbol	Valve type	N.C.				●				●						
		Non-locking Locking	●				●				●						
Manifold (Up to 5 stations)																	

**Organic Solvents Compatible** Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing

**LVH□M Series** ▶ P.45

Type	Model	LVH20M		LVH30M		LVH40M		LVH50M		LVH60M		
		Orifice diameter		Orifice diameter		Orifice diameter		Orifice diameter		Orifice diameter		
		Tubing O.D.		Tubing O.D.		Tubing O.D.		Tubing O.D.		Tubing O.D.		
Basic	Symbol	Metric	6		10		12		19		—	
		Inch	1/4		3/8		1/2		3/4		1	
Basic	Symbol	Valve type	●		●		●		●		●	
		Non-locking Locking	●		●		●		●		●	

# CONTENTS

## Integrated Fittings/Threaded Ports/Manual Operation (Integrated Fittings/Threaded Ports) High Purity Chemical Liquid Valve *LVC/LVA/LVH Series*

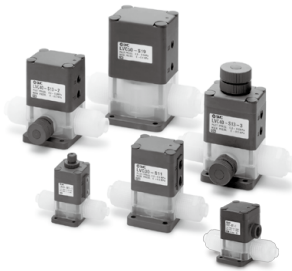
### <Series Variations>

#### ■ Air Operated

Insert Bushing Integrated Fitting Type <i>LVC Series</i> .....	P.3
Threaded Type <i>LVA Series</i> .....	P.4
Organic Solvents Compatible	
Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing	
<i>LVA Series</i> .....	P.4

#### Air Operated

Insert Bushing Integrated Fitting Type <i>LVC Series</i> .....	P.7
--	-----



How to Order Valve (Single Type) .....	P.7
Standard Specifications .....	P.8
Suck Back .....	P.9
Construction .....	P.10
Dimensions .....	P.11

Manifolds .....	P.14
3 Port .....	P.16

#### Air Operated

Threaded Type <i>LVA Series</i> .....	P.18
---------------------------------------	------



How to Order Valve (Single Type) .....	P.18
Standard Specifications .....	P.19
Construction .....	P.20
Dimensions .....	P.21

Manifolds .....	P.28
3 Port .....	P.30

#### Air Operated

#### Organic Solvents Compatible

Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing	
<i>LVA Series</i> .....	P.32



How to Order Valve .....	P.32
Standard Specifications .....	P.32
Dimensions .....	P.33

#### ■ Manually Operated

Integrated Fitting Type/Threaded Type <i>LVH Series</i> .....	P.5
Organic Solvents Compatible	
Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing	
<i>LVH□M Series</i> .....	P.5

#### Manually Operated

Integrated Fitting Type/Threaded Type <i>LVH Series</i> .....	P.36
---	------



How to Order Valve (Single Type) .....	P.36
Standard Specifications .....	P.37
Construction .....	P.38
Dimensions .....	P.38

Manifolds (Integrated Fitting Type) .....	P.41
Manifolds (Threaded Type) .....	P.43

#### Manually Operated

#### Organic Solvents Compatible

Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing	
<i>LVH□M Series</i> .....	P.45



How to Order Valve .....	P.45
Standard Specifications .....	P.45
Dimensions .....	P.46

Fittings and Special Tools .....	P.49
Applicable Fluids .....	P.50
High Purity Chemical Liquid Valve Precautions .....	P.51

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**



# Air Operated Insert Bushing Integrated Fitting Type LVC Series

## How to Order Valve (Single Type)

For N.C.

Body class: 2

LVC 2 0 - S 06 [ ] [ ] - [ ] [ ] - [ ] [ ] - Z

Valve type  
0 N.C.

Pilot port thread type

Symbol	Thread type
Nil	Rc
N	NPT
F	G

For N.O./Double acting

Body class: 2

LVC 2 1 - S 06 [ ] [ ] - [ ] [ ] - [ ] [ ] - [ ] [ ]

Body class  
Valve type  
1 N.O.  
2 Double acting

Pilot port thread size 1/8

Symbol	Body class	Orifice dia.
2	2	ø4

Body class:  
3, 4, 5, 6

LVC 3 0 - S 10 [ ] [ ] - [ ] [ ] - [ ] [ ] - V

Body class

Symbol	Body class	Orifice dia.
3	3	ø8
4	4	ø10
5	5	ø16
6	6	ø22

Valve type  
0 N.C.  
1 N.O.  
2 Double acting

\*: Refer to Variations for valve type combinations.

LQ2 integrated fitting

Applicable tubing size \*1\*2

Symbol	Connecting tubing size	Body class				
		2	3	4	5	6
<b>Metric size</b>						
03	3 x 2	●				
04	4 x 3	●				
06	6 x 4	○	●			
08	8 x 6		●			
10	10 x 8		○	●		
12	12 x 10			○	●	
19	19 x 16				○	●
25	25 x 22					○
<b>Inch size</b>						
03	1/8" x 0.086"	●				
05	3/16" x 1/8"	●				
07	1/4" x 5/32"	○	●			
11	3/8" x 1/4"		○	●		
13	1/2" x 3/8"			○	●	
19	3/4" x 5/8"				○	●
25	1" x 7/8"					○

○Basic size ●With reducer

\*1: Applicable fitting for body class 6 is LQ1.

\*2: Refer to page 52 for details of the applicable tubing sizes.

Port B (OUT) different dia. size

Symbol	Application
Nil	Ports A & B same size
	Different diameter tubing can be selected within the same body class. Refer to the applicable tubing table on the left.

Pilot port thread type

Symbol	Body class	Thread type
Nil	2	M5
N	3, 4, 5, 6	Rc1/8
F	3, 4, 5, 6	NPT1/8
	3, 4, 5, 6	G1/8

Option

Nil	None
1	With flow rate adjustment
2	With bypass
3	With flow rate adjustment & bypass
4	With indicator

\*: Refer to Variations for option combinations. Options cannot be combined.

Specifications

Nil	None
V	Vacuum specification

\*: Applicable to only material symbol Nil.

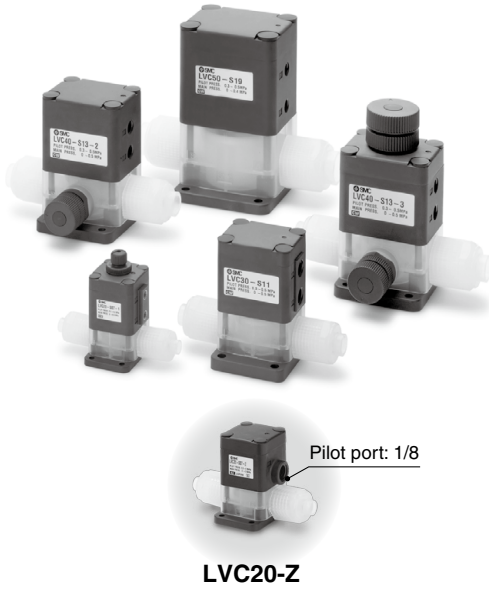
Material

Symbol	Body	Actuator section End plate	Diaphragm	Applicable option				Note
				1	2	3	4	
Nil	PFA	PPS	PTFE	●	●	●	●	—
F	PFA	PVDF	PTFE	—	—	—	—	Hydrofluoric acid compatible (Only LVC40, 50 type)
N	PFA	PPS	PTFE	●	●	●	●	Ammonium hydroxide compatible

## Variations

Type	Symbol	Model	Orifice diameter				
			LVC20	LVC30	LVC40	LVC50	LVC60
			ø4	ø8	ø10	ø16	ø22
			Metric				
			3, 4, 6	6, 8, 10	10, 12	12, 19	19, 25
			Inch				
			1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	3/4, 1
<b>Basic</b>		N.C.	○	○	○	○	○
		N.O.	○	○	○	○	○
		Double acting	○	○	○	○	○
<b>With flow rate adjustment</b>		N.C.	○	○	○	○	○
		Double acting	○	○	○	○	○
<b>With bypass</b>		N.C.	—	○	○	○	—
		Double acting	—	○	○	○	—
<b>With flow rate adjustment &amp; bypass</b>		N.C.	—	○	○	○	—
		Double acting	—	○	○	○	—
<b>With indicator</b>		N.C.	○	○	○	○	○

### Standard Specifications



Model		LVC20	LVC30	LVC40	LVC50	LVC60
Tubing O.D.*1	Metric size	6	10	12	19	25
	Inch size	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.4	2.1	5.1	6.8
	Cv	0.35	1.7	2.5	6	8
Withstand pressure [MPa]		1				
Operating pressure [MPa]	A → B	(-94 kPa)*2 0 to 0.5			(-94 kPa)*2 0 to 0.4	
	B → A	(-94 kPa)*2 0 to 0.2			(-94 kPa)*2 0 to 0.1	
Back pressure [MPa]	N.C./N.O.	0.3 or less			0.2 or less	
	Double acting	0.4 or less			0.3 or less	
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5				
Pilot port size	Standard	M5*3		Rc1/8, NPT1/8, G1/8		
	-Z type*4	Rc1/8, NPT1/8, G1/8		—		
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				
Weight [kg]		0.09	0.23	0.42	0.86	1.00

- \*1: Refer to page 52 for details of the applicable tubing sizes.
- \*2: When using for vacuum, select the product number ending in "-V". This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.
- \*3: Applicable for the LVC21 (N.O.) and LVC22 (double acting) types
- \*4: Applicable for the LVC20 (N.C.)-Z type
- \*: Please contact SMC if the manifold will be used with vacuum and B → A flow.

### Different Diameter Tubing Applicable with Reducer

Different diameter tubing can be selected (within a body class) by using a nut and insert bushing (reducer). ● With reducer

Body class	Tubing O.D.														
	Metric size							Inch size							
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

\*: Refer to page 49 for information on changing tubing sizes.

### ⚠ Precautions

Be sure to read this before handling the products. Refer to the back cover for Safety Instructions, and pages 51 and 52 for High Purity Chemical Liquid Valve Precautions.

### Piping

#### ⚠ Caution

1. Connect tubing with special tools.

Refer to the catalog "High-Purity Fluoropolymer Fittings Hyper Fittings/LQ1, 2 Series Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from the SMC website.)



#### ⚠ Caution

2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

#### Tightening Torque for Piping

Body class	Torque [N·m]
2	1.5 to 2.0
3	3.0 to 3.5
4	7.5 to 9.0
5	11.0 to 13.0
6	5.5 to 6.0

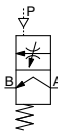
# LVC Series

## Suck Back

A change of volume inside the suck back valve pulls in liquid at the end of the nozzle to prevent dripping.

### Single type

#### Symbol



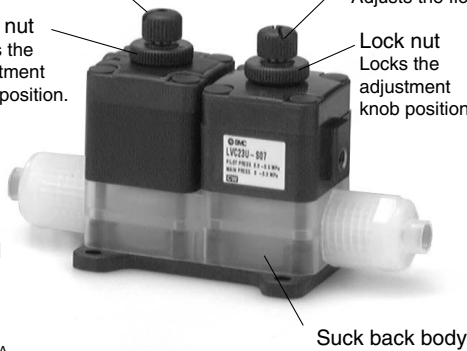
### Unit type

Adjustment knob  
Adjusts the amount of suck back.

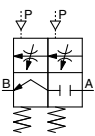
Lock nut  
Locks the adjustment knob position.

Adjustment knob  
Adjusts the flow rate.

Lock nut  
Locks the adjustment knob position.



#### Symbol



## Standard Specifications

Model		LVC23	LVC23U
Tubing O.D. *1 *2	Metric size	(3), (4), 6	
	Inch size	(1/8), (3/16), 1/4	
Orifice diameter		—	ø3
Flow rate characteristics	Kv	—	0.1
	Cv	—	0.2
Withstand pressure [MPa]		1	
Operating pressure [MPa]		0 to 0.2	
Maximum suck back volume [cm <sup>3</sup> ]		0.1	
Pilot air pressure [MPa]		0.3 to 0.5	
Pilot port size		M5	
Fluid temperature [°C]		0 to 100	
Ambient temperature [°C]		0 to 60	
Weight [kg]		0.08	0.16

\*1: Different diameter tubing shown in ( ) can be selected when used with a reducer. Refer to page 49 for details.

\*2: Refer to page 52 for details of the applicable tubing sizes.

## How to Order

LVC 2 3 □ -S 06 □

#### Body class

Symbol	Body class
2	2

#### Valve type

3	Suck back
---	-----------

#### Body type

Nil	Single
U	Unit type with 2 way valve

#### LQ2 integrated fitting

#### Port B (OUT) different dia. size

Symbol	Application
Nil	Ports A & B same size
Refer to the applicable tubing can be selected within the same body class.	

#### Applicable tubing size

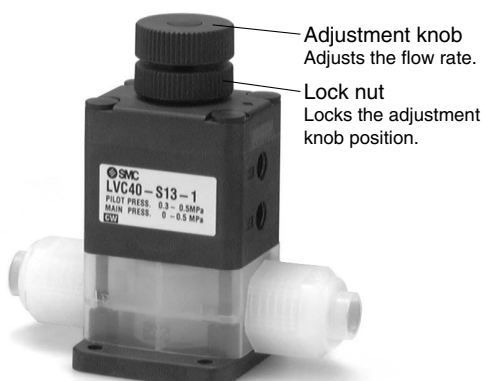
Symbol	Connecting tubing size	Body class
Metric size		
03	3 x 2	○
04	4 x 3	○
06	6 x 4	◎
Inch size		
03	1/8" x 0.086"	○
05	3/16" x 1/8"	○
07	1/4" x 5/32"	◎

◎ Basic size ○ With reducer

## Options

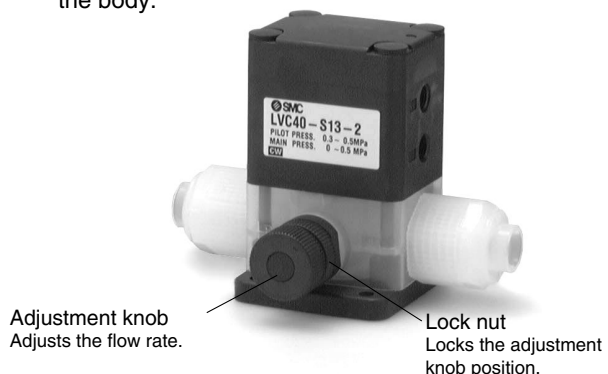
### ■ With flow rate adjustment

The flow rate is adjusted by controlling the diaphragm stroke.



### ■ With bypass

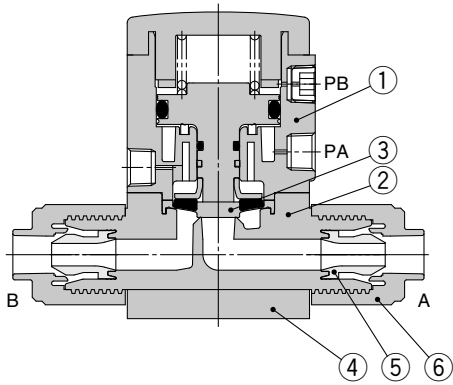
A small amount of fluid from the inlet side is allowed to flow continuously to the outlet side by providing a bypass inside the body.



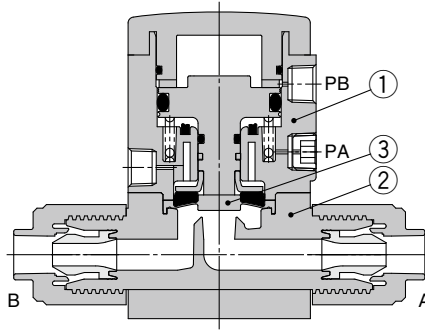


## Construction

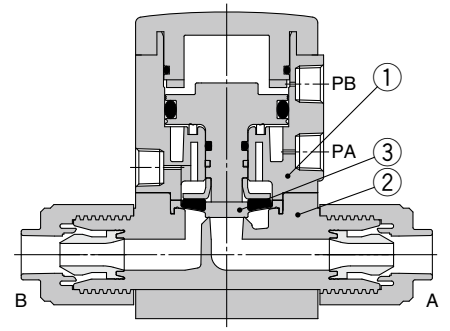
Standard type  
N.C. type



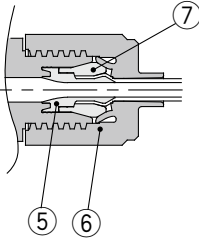
N.O. type



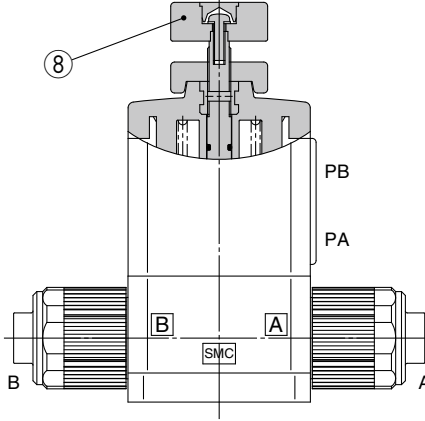
Double acting type



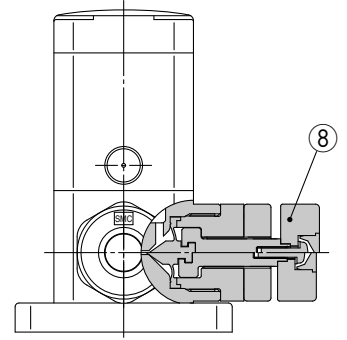
With reducer



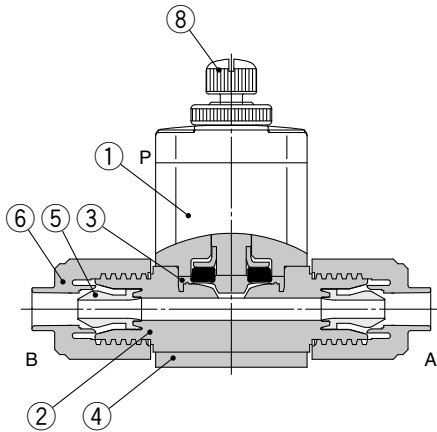
With flow rate adjustment



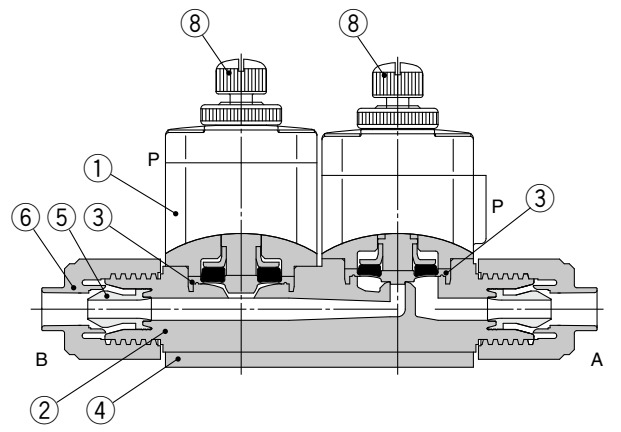
With bypass



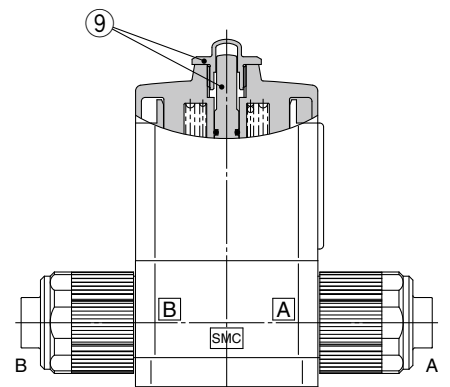
Suck back (Single type)



Suck back (Unit type)



With indicator



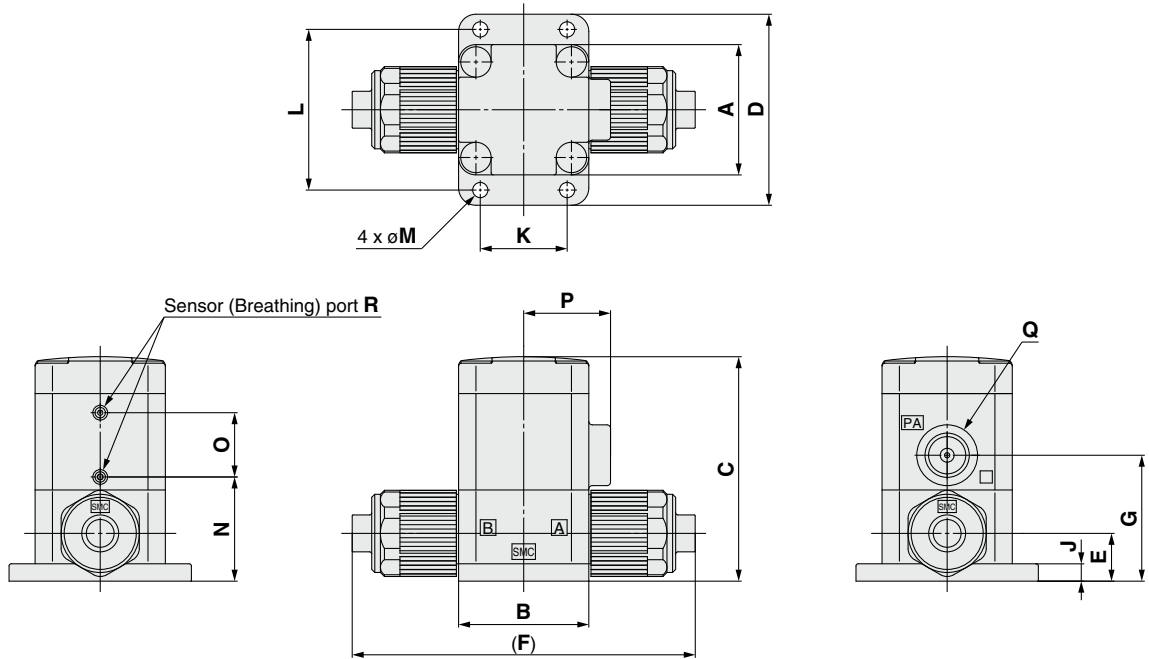
### Component Parts

No.	Description	Material	Option
1	Actuator section	PPS	PVDF
2	Body	PFA	—
3	Diaphragm	PTFE	—
4	End plate	PPS	PVDF
5	Insert bushing	PFA	—
6	Nut	PFA	—
7	Collar	PFA	—
8	Flow rate adjuster section	PPS	—
9	Indicator	PP	—

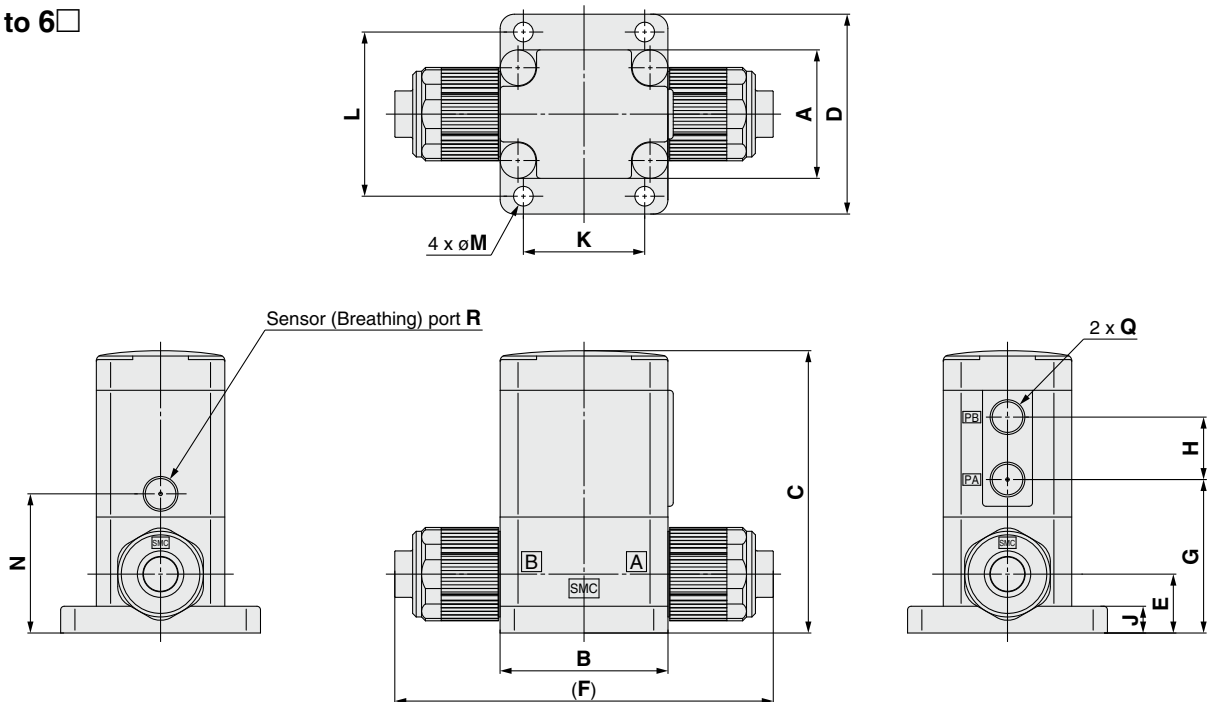
# LVC Series

## Dimensions

### LVC20



### LVC21/22 LVC3□ to 6□



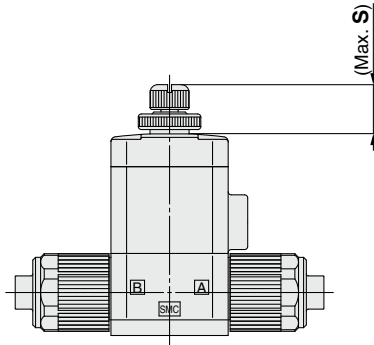
## Dimensions

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R
LVC20	30	30	51.7	44	11	79	29	—	4	20	37	3.5	24	14.8	20	Rc1/8 NPT1/8 G1/8	ø2.4
LVC2 <sub>1/2</sub>	30	30	54.5	44	11	79	28.5	13	4	20	37	3.5	23.5	—	—	M5 x 0.8	M3 x 0.5
LVC3□	36	47	79.1	56	16.5	106	43	17.5	7.5	34	46	5.5	39	—	—	Rc1/8 NPT1/8 G1/8	Rc1/8 NPT1/8 G1/8
LVC4□	46	60	95.9	68	22	131	55	18	8	42	57	5.5	48	—	—		
LVC5□	58	75	129	84	26	154	68	27.5	8	56	71	6.5	62	—	—		
LVC6□	58	75	137.8	84	32	164	76.8	27.5	8	56	71	6.5	70.8	—	—		

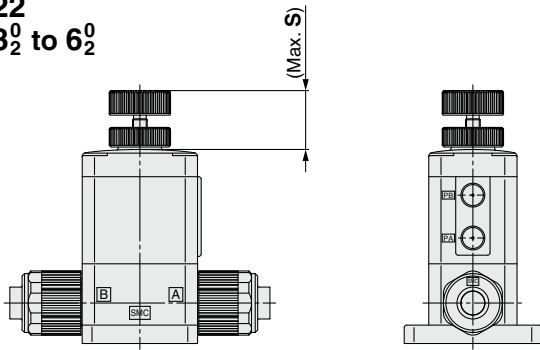
## Dimensions

With flow rate adjustment

**LVC20**



**LVC22**  
**LVC3<sub>2</sub><sup>0</sup> to 6<sub>2</sub><sup>0</sup>**

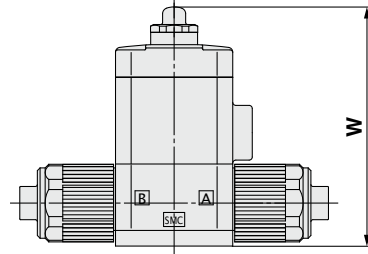


**Dimensions** [mm]

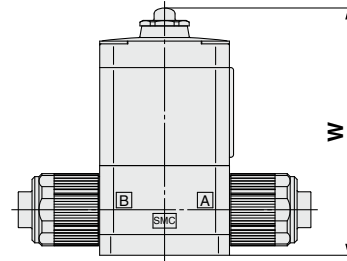
Model	S
<b>LVC2</b> □	14.5
<b>LVC3</b> □	24.4
<b>LVC4</b> □	29
<b>LVC5</b> □	34.5
<b>LVC6</b> □	36

With indicator

**LVC20**



**LVC30 to 60**

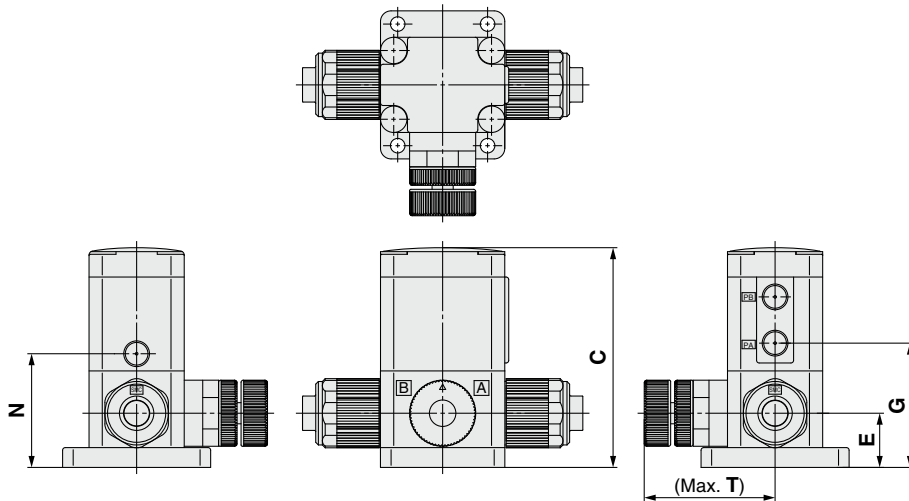


**Dimensions** [mm]

Model	W
<b>LVC20</b>	61.2
<b>LVC30</b>	89.6
<b>LVC40</b>	110.4
<b>LVC50</b>	147
<b>LVC60</b>	155.8

With bypass

**LVC3<sub>2</sub><sup>0</sup> to 5<sub>2</sub><sup>0</sup>**



**Dimensions** [mm]

Model	C	E	G	N	T
<b>LVC3</b> □	83.1	20.5	47	43	50.5
<b>LVC4</b> □	95.9	22	55	48	54.5
<b>LVC5</b> □	129	26	68	62	60

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVB**

Organic Solvents Compatible  
**LVB**

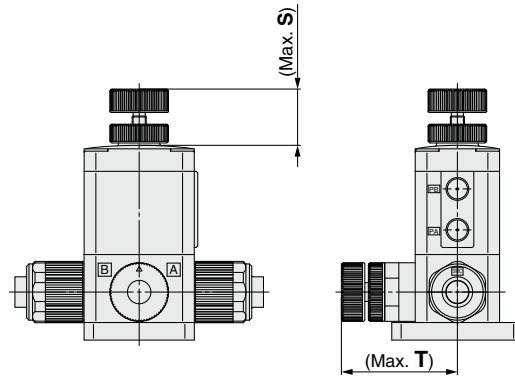


# LVC Series

## Dimensions

With flow rate adjustment & bypass

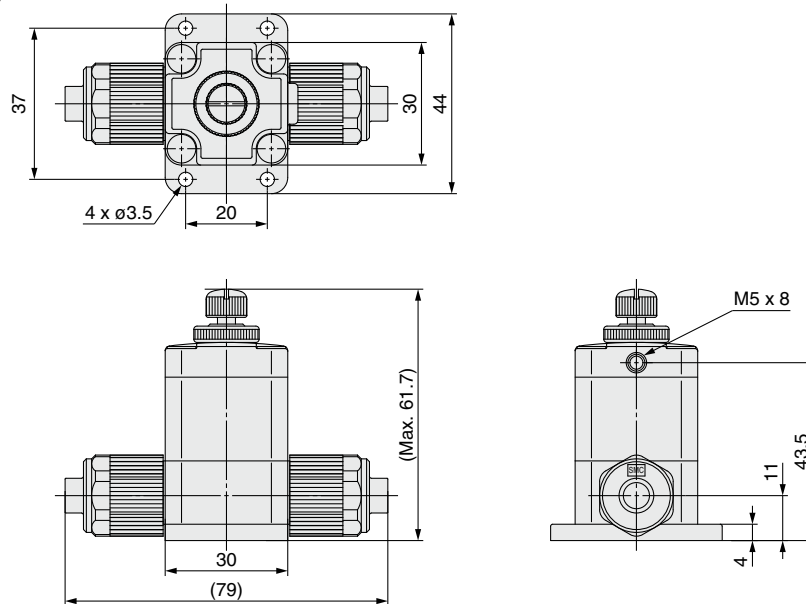
LVC3<sub>2</sub><sup>0</sup> to LVC5<sub>2</sub><sup>0</sup>



Dimensions		[mm]	
Model	S	T	
LVC3□	24.4	50.5	
LVC4□	29	54.5	
LVC5□	34.5	60	

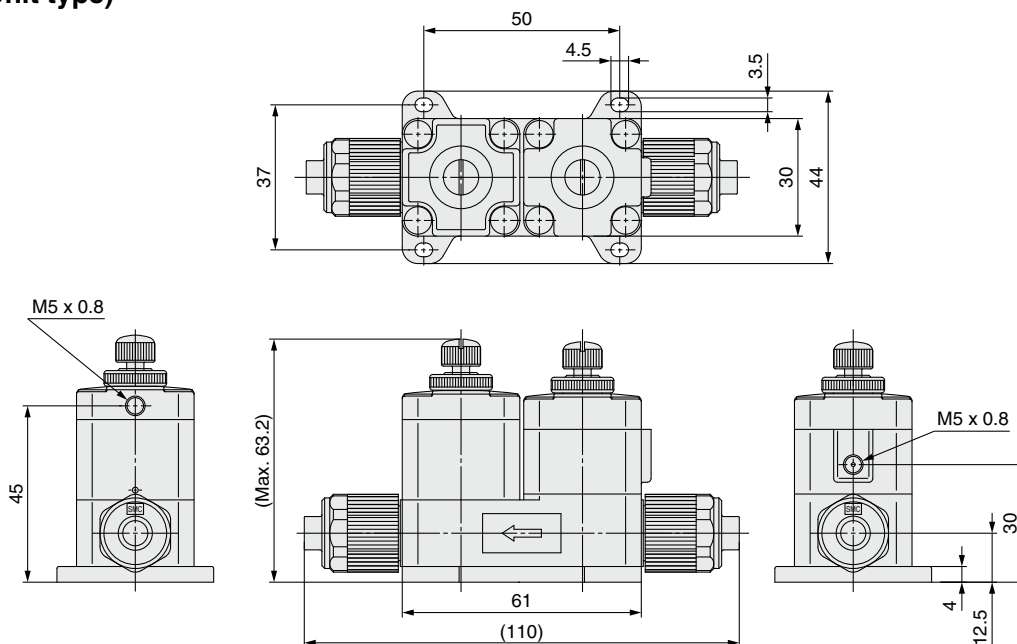
Suck back (Single type)

LVC23

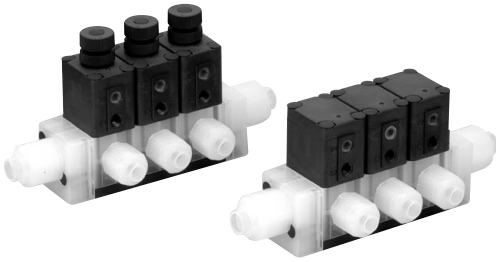


Suck back (Unit type)

LVC23U



# LVC Series Manifolds



## Manifold Specifications

Model	LLC2A	LLC3A	LLC4A	LLC5A
<b>Manifold type</b>	Stacking			
<b>P (IN), A (OUT) type</b>	Common IN/Individual OUT			
<b>Valve stations</b>	2 to 5 stations			
<b>Tubing size *1 (port P)</b>	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"	3/4" x 5/8"
<b>Tubing size (port A)</b>	1/4" x 5/32"	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"

\*1: Refer to page 52 for details of the applicable tubing sizes.

\*: Please contact SMC if the manifold will be used with A → P flow.

## How to Order Manifold Base

**LLC 2 A - 02 - S 11**

**Body class**

Symbol	Body class
2	2
3	3
4	4
5	5

**Base type**

A	Stacking

**Manifold stations**

02	2 stations
⋮	⋮
05	5 stations

**LQ2 integrated fitting**

**Tubing size for port P and L side connection \*1**

Symbol	Tubing size	Fittings	Body class
00	Plug	—	2 to 5
06	6 x 4	3	2
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8		
11	3/8" x 1/4"	4	3
10	10 x 8		
11	3/8" x 1/4"		
12	12 x 10		
13	1/2" x 3/8"	5	4
12	12 x 10		
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		
12	12 x 10	5	5
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 52 for details of the applicable tubing sizes.  
\*: Port P fitting of the manifold base is one size bigger than the body class. (except body class 5) When ordering plug only, refer to Blanking plug (LQ series) in the **WEB catalog** after checking the fitting size.

**Tubing size for port P and R side connection \*1**

Symbol	Tubing size	Fittings	Body class
Nil	L side, R side same size		
00	Plug	—	2 to 5
06	6 x 4	3	2
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8		
11	3/8" x 1/4"	4	3
10	10 x 8		
11	3/8" x 1/4"		
12	12 x 10		
13	1/2" x 3/8"	5	4
12	12 x 10		
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		
12	12 x 10	5	5
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 52 for details of the applicable tubing sizes.  
\*: Port P fitting of the manifold base is one size bigger than the body class. (except body class 5) When ordering plug only, refer to Blanking plug (LQ series) in the **WEB catalog** after checking the fitting size.

## How to Order Valve

**LVC 2 0 A - S 07**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø10
5	5	ø16

**Valve type**

0	N.C.
1	N.O.
2	Double acting

**Body type**

A	Stacking type for manifold

**LQ2 integrated fitting**

**Tubing size \*1**

Symbol	Tubing size	Fittings	Body class
03	3 x 2, 1/8" x 0.086"	2	2
04	4 x 3		
05	3/16" x 1/8"		
06	6 x 4		
07	1/4" x 5/32"	3	3
06	6 x 4		
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8	4	4
11	3/8" x 1/4"		
10	10 x 8		
11	3/8" x 1/4"		
12	12 x 10	5	5
13	1/2" x 3/8"		
12	12 x 10		
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 52 for details of the applicable tubing sizes.  
\*: When ordering plug only, refer to Blanking plug (LQ series) in the **WEB catalog** after checking the fitting size.

**Option**

Nil	None
1	With flow rate adjustment
4	With indicator

\*: Options cannot be combined.

**Material**

Symbol	Body	Actuator section End plate	Diaphragm	O-ring	Applicable option 1	Applicable option 4	Note
Nil	PFA	PPS	PTFE	FKM	●	●	—
F	PFA	PVDF	PTFE	FKM	—	—	Hydrofluoric acid compatible (Only LVC40, 50 type)
N	PFA	PPS	PTFE	EPDM	●	●	Ammonium hydroxide compatible

\*: An O-ring is in place for outlet sealing on the outside of the main sealing of the manifold body connection (wetted part). Refer to page 15 for details.

**Pilot port thread type**

Symbol	Body class	Thread type
Nil	2	M5
	3/4/5	Rc1/8
N	3/4/5	NPT1/8
F	3/4/5	G1/8

It is not possible to order single unit valves for the manifold. For details, refer to Maintenance 4. in the High Purity Chemical Liquid Valve Precautions 2 on page 52.

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

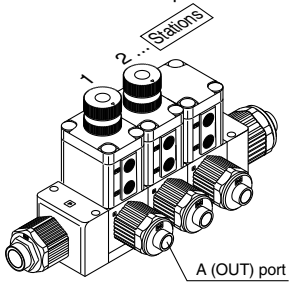
Manually Operated  
**LVB**

Organic Solvents Compatible  
**LVB**

# LVC Series

## How to Order Manifold Assembly (Example)

Enter the part number of the valves to be mounted together with the manifold base part number.



Stations are counted from station 1 on the left side, with the A (OUT) ports in front.

### <Example>

LLC2A-03-S11 ..... 1 set    Manifold base part no.

\* LVC20A-S07-1 ..... 2 sets    Valve part no. (Stations 1 & 2)

\* LVC20A-S07 ..... 1 set    Valve part no. (Station 3)

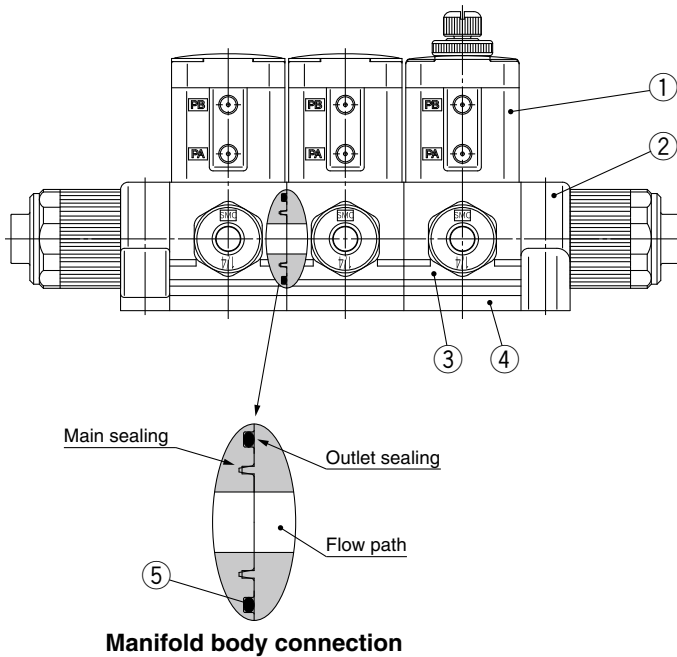
- Prefix the asterisk to the part no. of the valves, etc.

Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

## Manifold Variations

Type	Symbol	Model	LVC20A	LVC30A	LVC40A	LVC50A
		Manifold material	PFA			
		Tubing size	1/4	3/8	1/2	3/4
		Orifice diameter	ø4	ø8	ø10	ø16
		Valve type				
<b>Basic</b>	<p>N.C.    N.O.    Double acting</p>	N.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		N.O.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Double acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>With flow rate adjustment</b>	<p>N.C.    Double acting</p>	N.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Double acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Construction



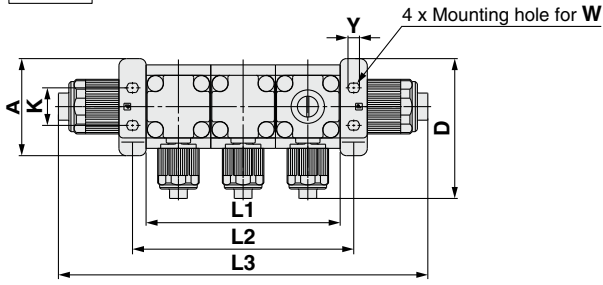
## Component Parts

No.	Description	Material
1	Actuator section	PPS
		PVDF
2	Manifold	PFA
3	Body	PFA
4	End plate	PPS
		PVDF
5	O-ring	FKM
		EPDM

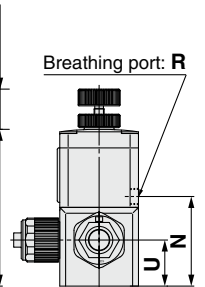
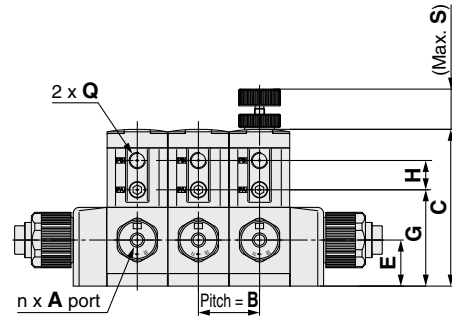
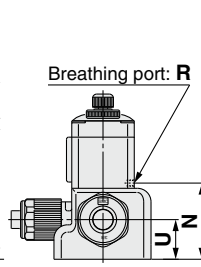
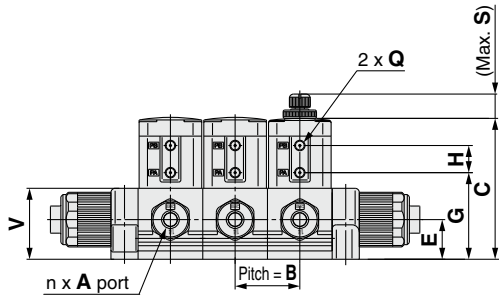
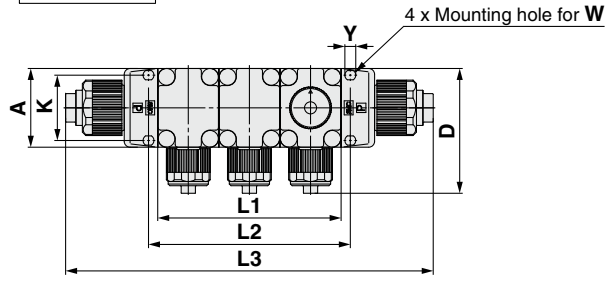
**Dimensions**

LLC□A- Stations -□□

Size 2



Size 3 to 5



**Dimensions**

Model	A	B	C	D	E	G	H	K	N	Q	R	S	U	V	W	Y
LLC2A	46.5	31	67.5	67	19	41.5	13	18	36.5	M5 x 0.8	M3 x 0.5	14.5	19	34	M4	5.5
LLC3A	47	36.5	93.6	76	27.5	57.5	17.5	39	53.5	Rc1/8	Rc1/8	24.4	27.5	47	M5	6.5
LLC4A	60	47	111.4	95	33.5	70.5	18	50	63.5	NPT1/8	NPT1/8	29	33.5	56	M6	7.5
LLC5A	75	59	131	114	33.5	70	27.5	62	64	G1/8	G1/8	34.5	27.5	56.5	M6	7.5

**Dimensions**

Model	Station Symbol	[mm]			
		2	3	4	5
LLC2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	146	177	208	239
LLC3A	L1	73	109.5	146	182.5
	L2	84	120.5	157	193.5
	L3	183	219.5	256	292.5
LLC4A	L1	94	141	188	235
	L2	109	156	203	250
	L3	219	266	313	360
LLC5A	L1	118	177	236	295
	L2	130	189	248	307
	L3	240	299	358	417

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**





# LVC Series 3 Port



## Standard Specifications

Model		LVC200
Orifice diameter		ø4
Flow rate characteristics	Kv	0.2
	Cv	0.3
Withstand pressure [MPa]		1
Operating pressure [MPa]		0 to 0.5
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)
Pilot air pressure [MPa]		0.4 to 0.5
Pilot port size		M5 x 0.8
Fluid temperature [°C]		0 to 100
Ambient temperature [°C]		0 to 60
Weight [kg]		0.120

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

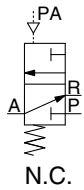
Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVB**

Organic Solvents Compatible  
**LVB**

## How to Order Valve

**LVC 2 0 0 - S 07**



Symbol	Body class	Orifice dia.
2	2	ø4

Symbol	Valve type
0	N.C.

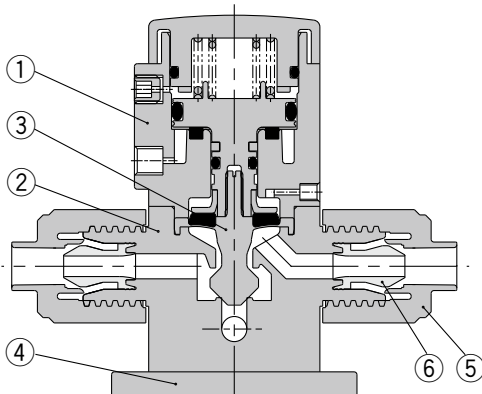
LQ2 integrated fitting

### Applicable tubing size

Symbol	Connecting tubing size	Body class
		2
<b>Metric size</b>		
03	3 x 2	●
04	4 x 3	●
06	6 x 4	○
<b>Inch size</b>		
03	1/8" x 0.086"	●
05	3/16" x 1/8"	●
07	1/4" x 5/32"	○

○ Basic size ● With reducer  
\*: Refer to page 52 for details of the applicable tubing sizes.

## Construction

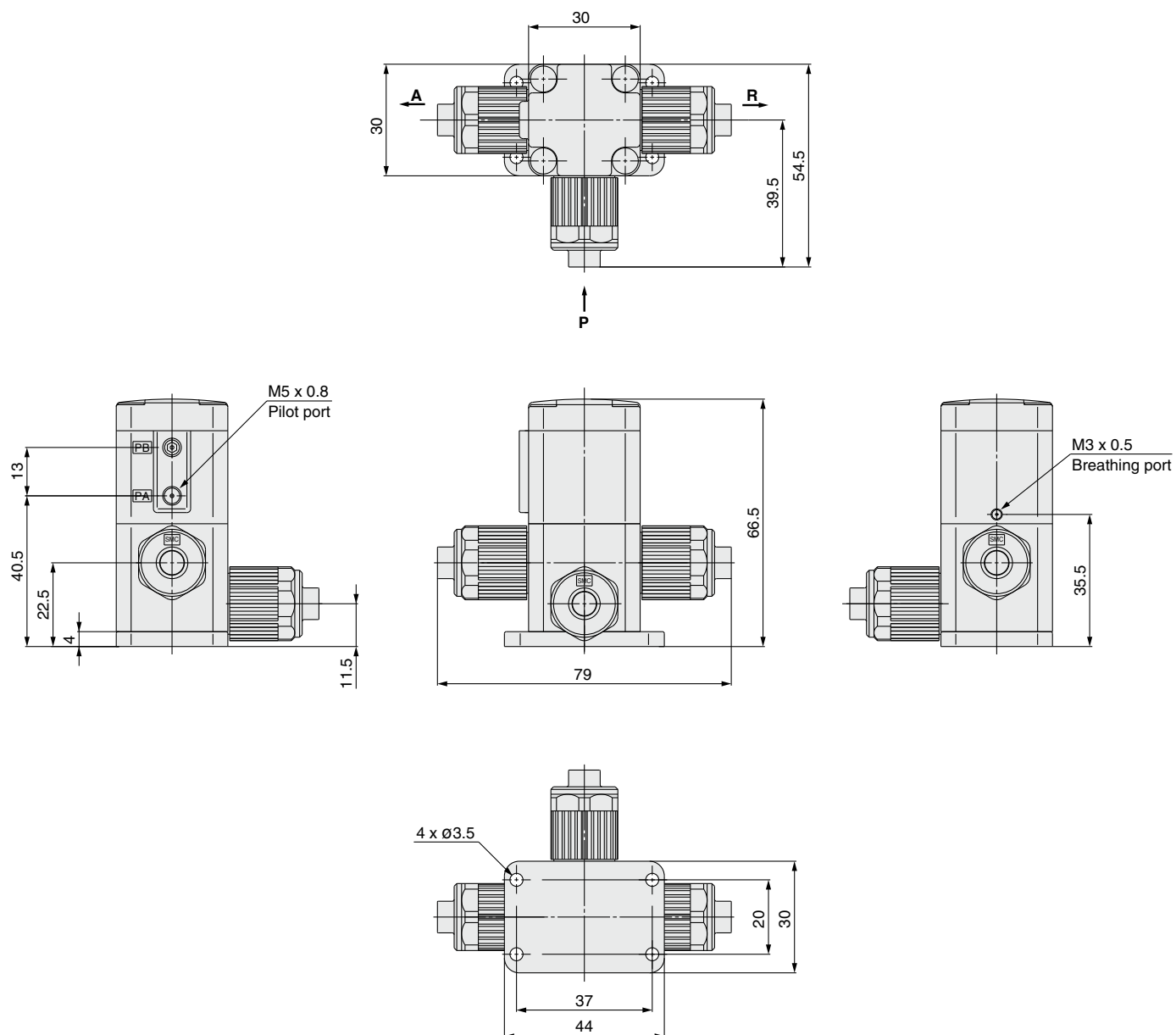


### Component Parts

No.	Description	Material
1	Actuator section	PPS
2	Body	PFA
3	Diaphragm	PTFE
4	End plate	PPS
5	Nut	PFA
6	Insert bushing	PFA

# LVC Series

## Dimensions



# Air Operated Threaded Type LVA Series

## How to Order Valve (Single Type)

For N.C.

Body class: 2

LVA 2 0 - 01 [ ] - A [ ] - V - Z

Port size,  
Pilot port thread type

Symbol	Thread type
Nil	Rc
N	NPT
F	G

For N.O./Double acting

Body class: 2

LVA 2 1 - 01 [ ] - A [ ] - V

Pilot port  
thread size 1/8

Symbol	Body class	Orifice dia.
2	2	ø4

Body class

Valve type

0	N.C.
1	N.O.
2	Double acting

Specifications

Nil	None
V	Vacuum specification

\*: Applicable to only material symbols A, B, C, F and N. Vacuum specification is not available for LVA1□.

Body class:  
1, 3, 4, 5, 6

LVA 3 0 - 02 [ ] - A [ ] - V

Option

Nil	None
1	With flow rate adjustment
2	With bypass
3	With flow rate adjustment & bypass
4	With indicator

\*: Refer to Variations for option combinations. Options cannot be combined.

Body class

Symbol	Body class	Orifice dia.
1	1	ø2
3	3	ø8
4	4	ø12
5	5	ø20
6	6	ø22

Valve type

0	N.C.
1	N.O.
2	Double acting

\*: Refer to Variations for valve type combinations.

Material

Symbol	Body	Actuator section End plate	Diaphragm	Applicable option				Note
				1	2	3	4	
A	Stainless steel	PPS	PTFE	●	—	—	●	—
B	PPS	PPS	PTFE	●	—	—	●	Except LVA60
C	PFA	PPS	PTFE	●	●	●	●	—
D	Stainless steel	PPS	NBR	●	—	—	●	Except LVA20-Z, LVA60
E	Stainless steel	PPS	EPDM	●	—	—	●	Except LVA20-Z, LVA60
F	PFA	PVDF	PTFE	—	—	—	—	Hydrofluoric acid compatible (Only LVA40, 50 type)
G	PPS	PPS	NBR	●	—	—	●	Except LVA20-Z, LVA60
H	PPS	PPS	EPDM	●	—	—	●	Except LVA20-Z, LVA60
N	PFA	PPS	PTFE	●	●	●	●	Ammonium hydroxide compatible

Port size

Symbol	Port size	Body class
01	1/8	1
02	1/4	1
01	1/8	2
02	1/4	2
03	3/8	3
04	1/2	4
06	1/2	5
10	3/4	5
10	1	6

Thread type

Symbol	Body class	Port thread type	Pilot port thread type
Nil	1, 2	Rc	M5
	3, 4, 5, 6		Rc1/8
	—		—
N	1, 2	NPT	M5
	3, 4, 5, 6		NPT1/8
	—		—
F	1, 2	G	M5
	3, 4, 5, 6		G1/8
	—		—

## Variations

Type	Symbol	Model	Orifice diameter		Port size		Body material <sup>*1</sup>		Valve type		LVA10	LVA20	LVA30	LVA40	LVA50	LVA60				
			ø2	ø4	ø8	ø12	ø20	ø22	1/8	1/4	3/8	1/2	3/4	1	1/8	1/4	3/8	1/2	3/4	1
			Stainless steel 316	PPS	PFA	N.C.	N.O.	Double acting	—	—	—	—	—	—	—	—	—	—	—	—
Basic		N.C.	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
With flow rate adjustment		N.C.	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○			
			—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
With bypass		N.C.	—	—	—	—	—	○	—	○	—	○	—	○	—	○	—			
			—	—	—	—	—	—	○	—	○	—	○	—	○	—	○	—	○	
With flow rate adjustment & bypass		N.C.	—	—	—	—	—	○	—	○	—	○	—	○	—	○	—			
			—	—	—	—	—	—	○	—	○	—	○	—	○	—	○	—	○	
With indicator		N.C.	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○			
			—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○		

\*1: Refer to Material for the applicable optional body materials.

# LVA Series



Basic type



LVA-Z



With flow rate adjustment

## Standard Specifications

Model	LVA10	LVA20	LVA30	LVA40	LVA50	LVA60	
Orifice diameter	ø2	ø4	ø8	ø12	ø20	ø22	
Port size	1/8, 1/4	1/8, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	1	
Flow rate characteristics	Kv	0.06	0.3	1.4	2.8	5.1	6.8
	Cv	0.07	0.35	1.7	3.3	6	8
Withstand pressure [MPa]	1						
Operating pressure [MPa]	A → B	0 to 0.5	(-94 kPa) <sup>*3</sup> 0 to 0.5		(-94 kPa) <sup>*3</sup> 0 to 0.4		
	B → A	0 to 0.05	(-94 kPa) <sup>*3</sup> 0 to 0.2		(-94 kPa) <sup>*3</sup> 0 to 0.1		
Back pressure [MPa]	N.C./N.O. <sup>*2</sup>	0.15 or less	0.3 or less		0.2 or less		
	Double acting	0.3 or less	0.4 or less		0.3 or less		
Valve leakage [cm <sup>3</sup> /min]	0 (with water pressure)						
Pilot air pressure [MPa]	0.3 to 0.5						
Pilot port size	Standard	M5	M5 <sup>*4</sup>	Rc1/8, NPT1/8, G1/8			
	-Z type <sup>*5</sup>	—	Rc1/8, NPT1/8, G1/8	—			
Fluid temperature [°C]	0 to 100 <sup>*1</sup>						
Ambient temperature [°C]	0 to 60						
Weight [kg]	Stainless steel	0.12	0.18	0.44	0.86	1.67	1.96
	PPS	0.05	0.08	0.18	0.32	0.73	—
	PFA	0.05	0.09	0.20	0.35	0.78	0.90

\*1: 0 to 60°C when the diaphragm is NBR or EPDM.

\*2: The N.O. type is not available for LVA10.

\*3: When using for vacuum, select the product number ending in "-V". This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

\*4: Applicable for the LVC21 (N.O.) and LVC22 (double acting) types

\*5: Applicable for the LVC20 (N.C.)-Z type

## ⚠ Precautions

Be sure to read this before handling the products. Refer to the back cover for Safety Instructions, and pages 51 and 52 for High Purity Chemical Liquid Valve Precautions.

## Piping

## ⚠ Caution

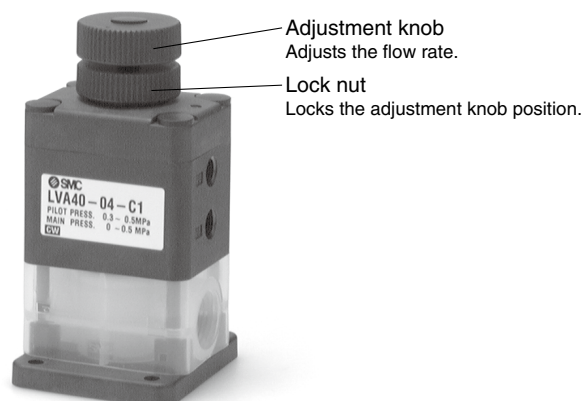
1. Avoid using metal fittings with a resin body (taper threads).

This can cause damage to the valve body.

## Option

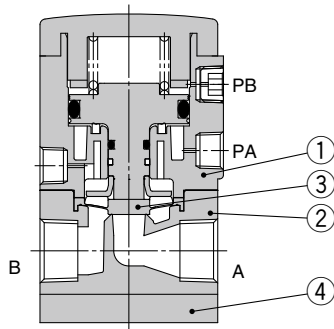
### ■ With flow rate adjustment

Adjusts the flow rate by controlling the diaphragm stroke.

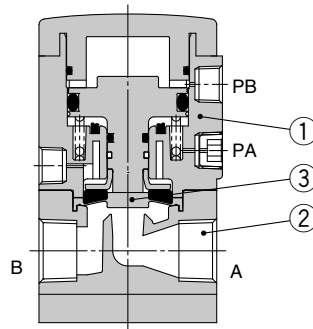


## Construction

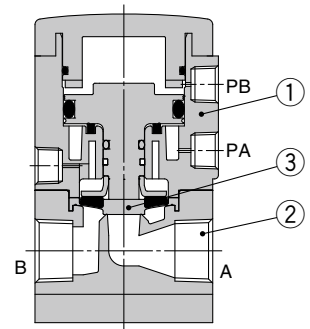
Standard type  
N.C. type



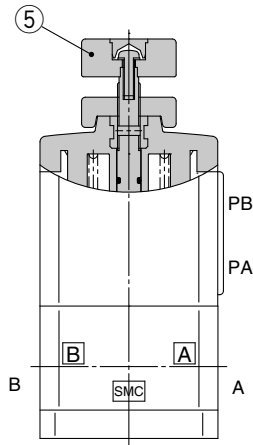
N.O. type



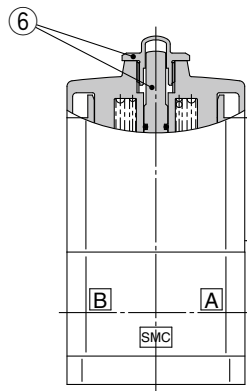
Double acting type



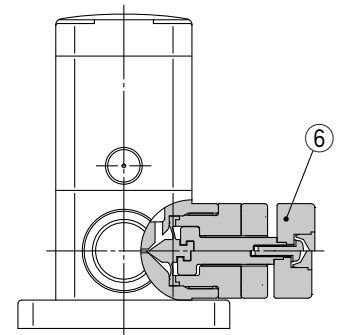
With flow rate adjustment



With indicator



With bypass (Body material: PFA)



### Component Parts

No.	Description	Material	Option
1	Actuator section	PPS	PVDF
2	Body	Stainless steel	—
		PPS	
3	Diaphragm	PFA	—
		PTFE	
		NBR	
4	End plate (PFA body only)	EPR	PVDF
5	Flow rate adjuster section	PPS	—
6	Indicator	PP	—

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

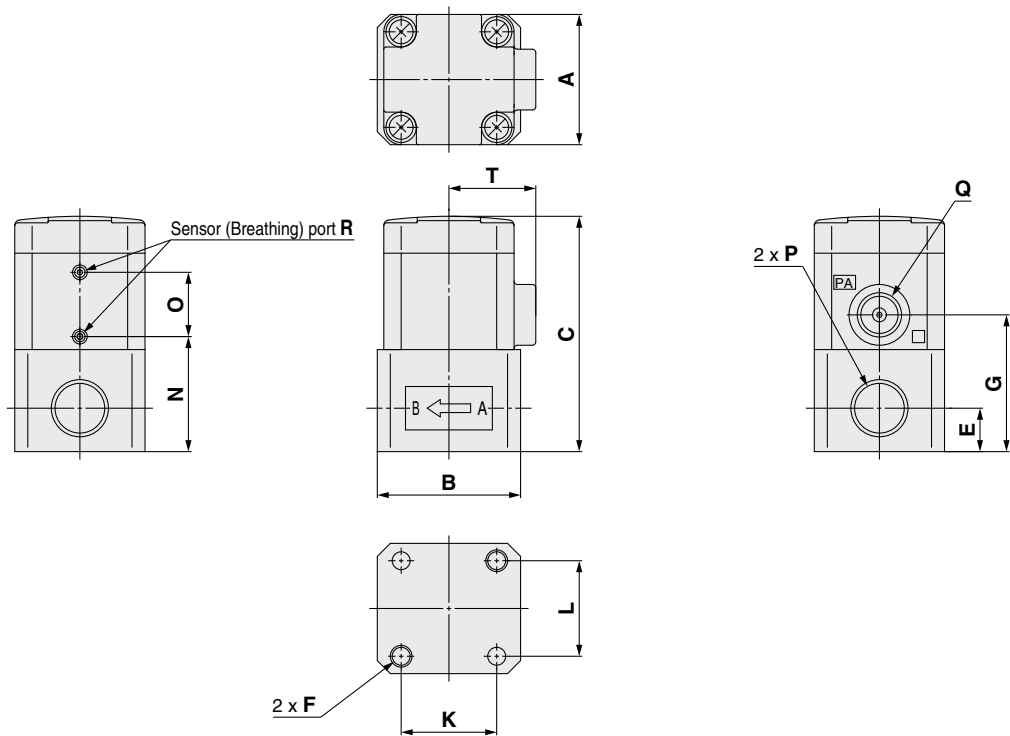


# LVA Series

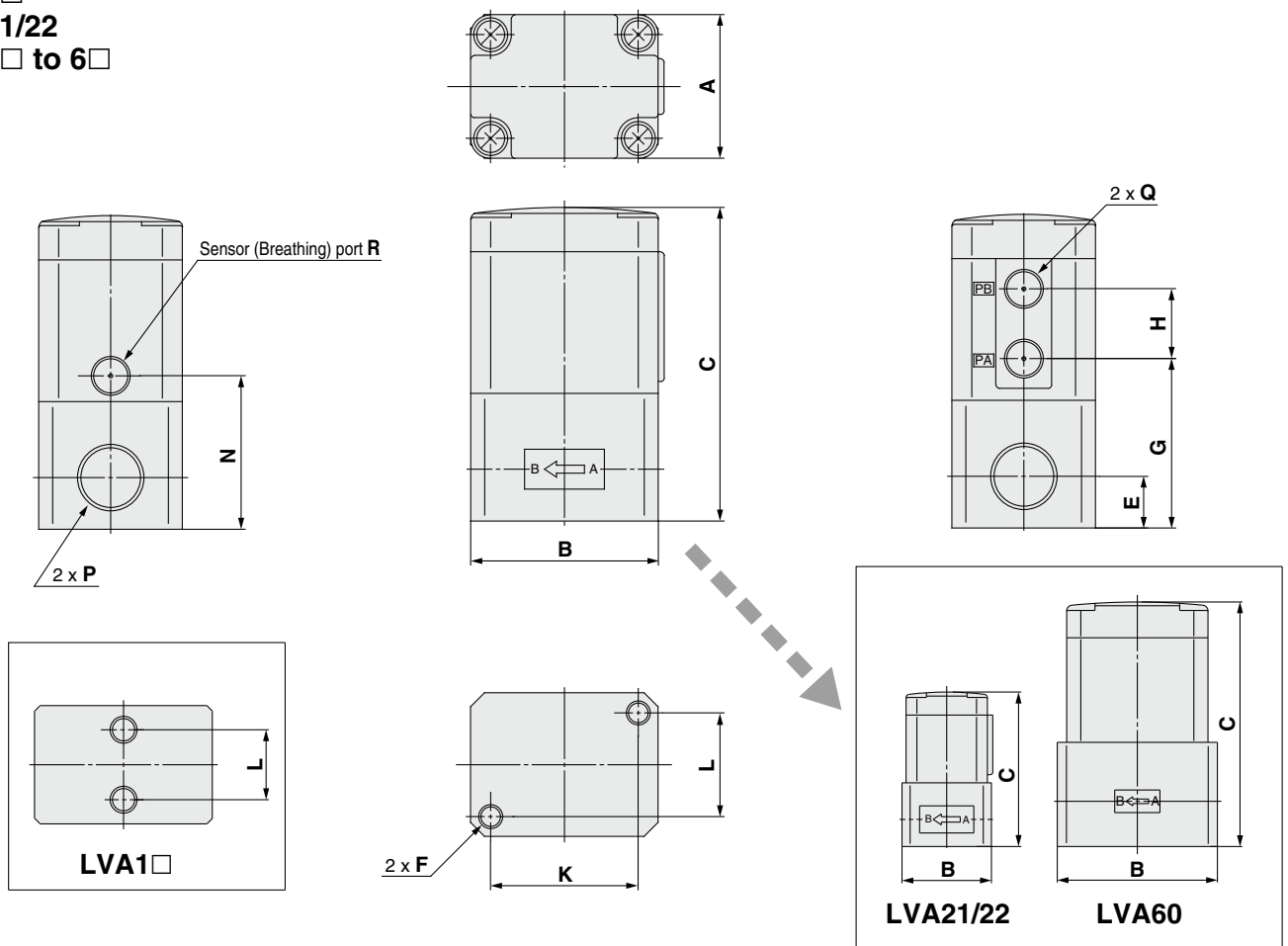
## Dimensions

Body material: Stainless steel

LVA20



LVA1□  
LVA21/22  
LVA3□ to 6□

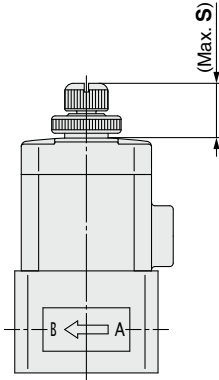


## Dimensions

Body material: Stainless steel

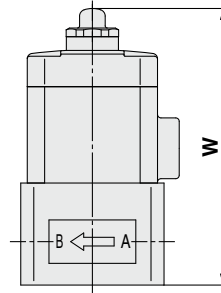
With flow rate adjustment

**LVA20**

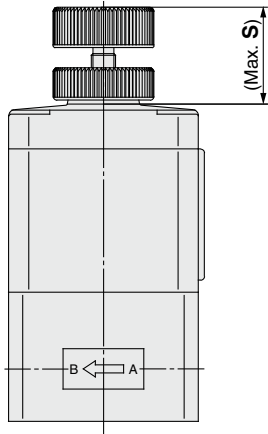


With indicator

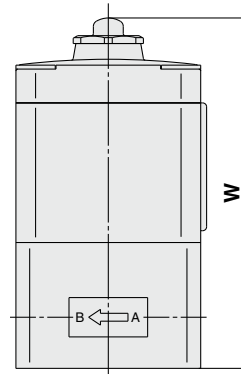
**LVA20**



**LVA22**  
**LVA3<sub>2</sub><sup>0</sup> to 6<sub>2</sub><sup>0</sup>**



**LVA30 to 60**



**Dimensions [mm]**

Model	S
LVA2□	14.5
LVA3□	24.4
LVA4□	29
LVA5□	34.5
LVA6□	36

**Dimensions [mm]**

Model	W
LVA20	63.7
LVA30	89.1
LVA40	109.9
LVA50	140.5
LVA60	147.8

## Dimensions

[mm]

Model	A	B	C	E	F	G	H	K	L	N	O	P	Q	R	T
LVA1□	20	33	49.5	10	M5 x 0.8 x 4	27.5	11	—	13	27.5	—	Rc1/8, 1/4 NPT1/8, 1/4 G1/8, 1/4*	M5 x 0.8	ø4.2	—
LVA20	30	33	54.2	10	M5 x 0.8 x 5	31.5	—	22	22	26.5	14.8		Rc1/8 NPT1/8 G1/8*	ø2.4	20
LVA2 <sub>2</sub> <sup>1</sup>	30	33	57	10	M5 x 0.8 x 5	31	13	22	22	26	—		M5 x 0.8	M3 x 0.5	—
LVA3□	36	47	78.6	13	M6 x 1.0 x 8	42.5	17.5	37	26	38.5	—	Rc1/4, 3/8 NPT1/4, 3/8 G1/4, 3/8*	Rc1/8 NPT1/8 G1/8*	Rc1/8 NPT1/8 G1/8*	—
LVA4□	46	60	95.4	16	M8 x 1.25 x 10	54.5	18	47.5	33.5	47.5	—	Rc3/8, 1/2 NPT3/8, 1/2 G3/8, 1/2*			—
LVA5□	58	75	122.5	19	M8 x 1.25 x 10	61.5	27.5	60	43	55.5	—	Rc1/2, 3/4 NPT1/2, 3/4 G1/2, 3/4*			—
LVA6□	58	85	129.8	24	M8 x 1.25 x 10	68.8	27.5	60	43	62.8	—	Rc1 NPT1 G1*			—

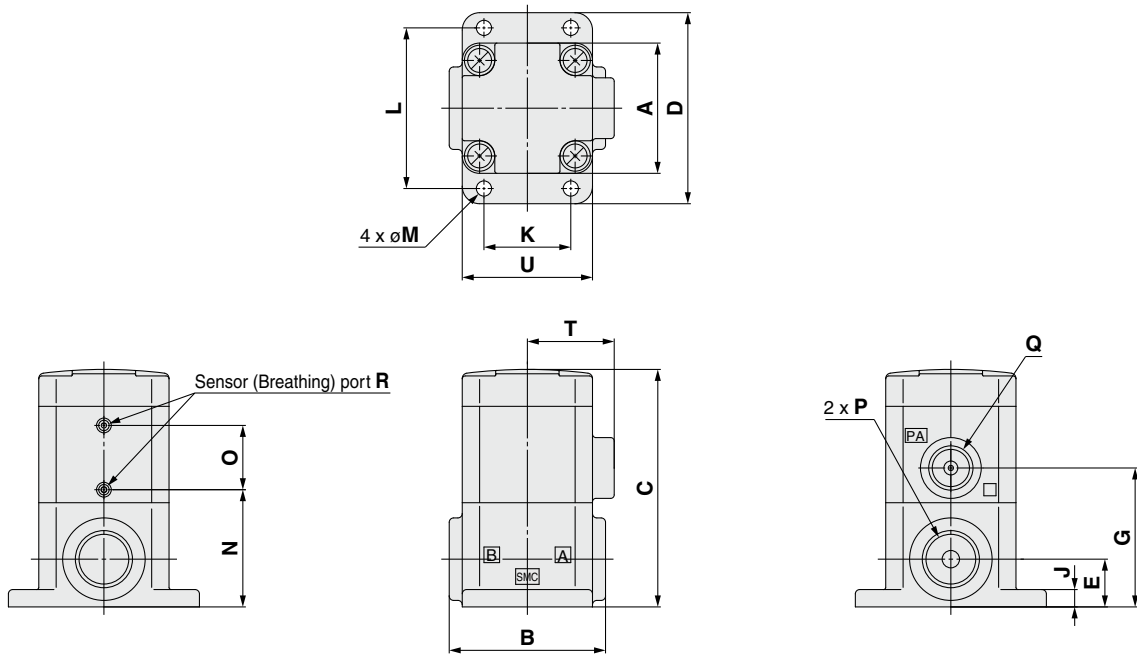
\*: For details on G threads and thread depths, refer to page 51-1.

# LVA Series

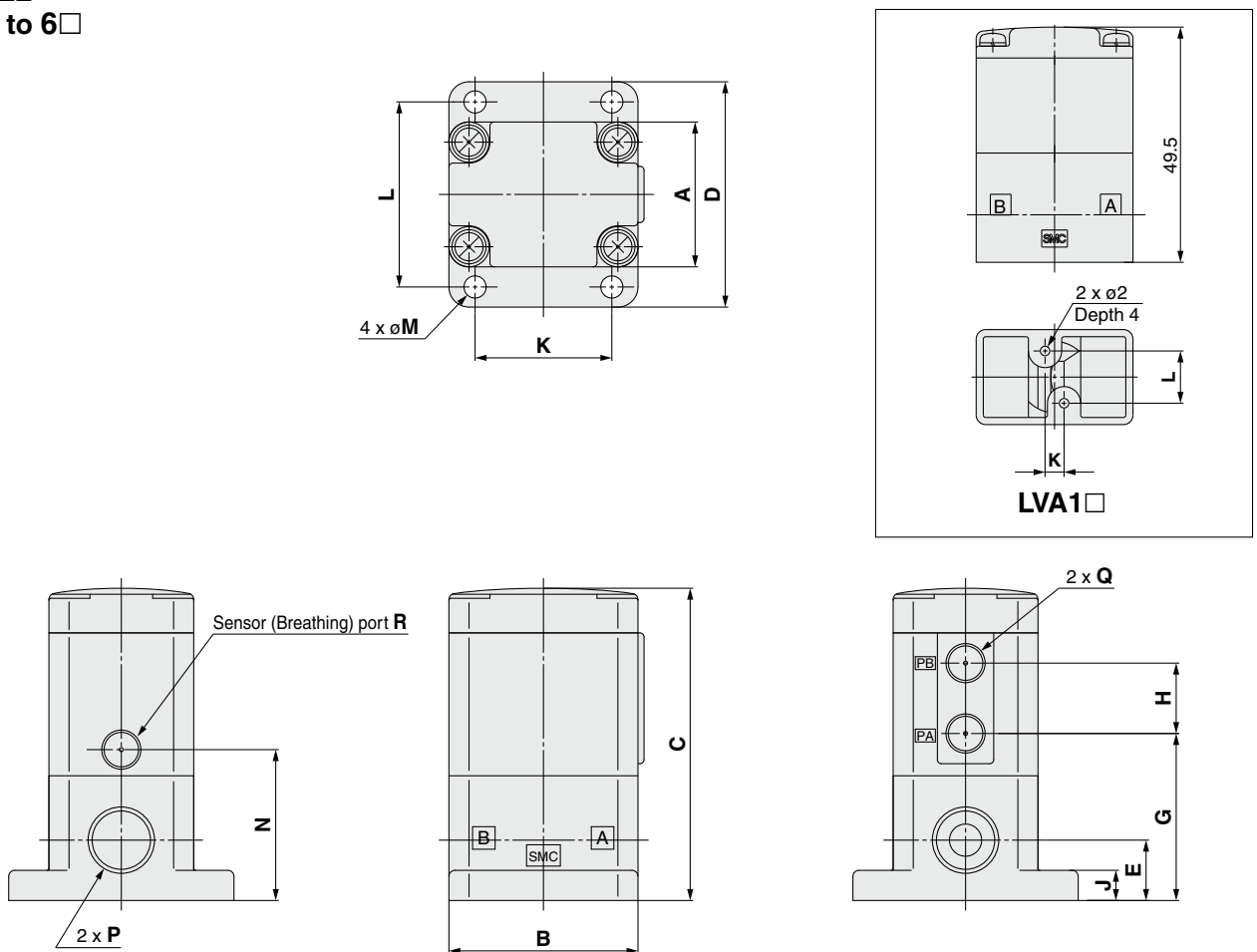
## Dimensions

Body material: PPS

LVA20

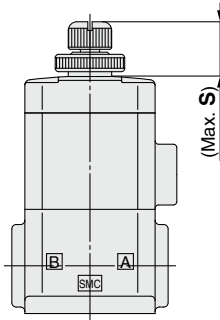


LVA1□  
LVA21/22  
LVA3□ to 6□

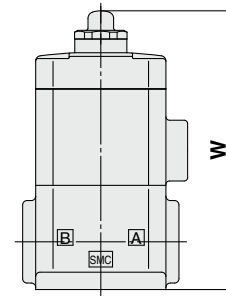


## Dimensions

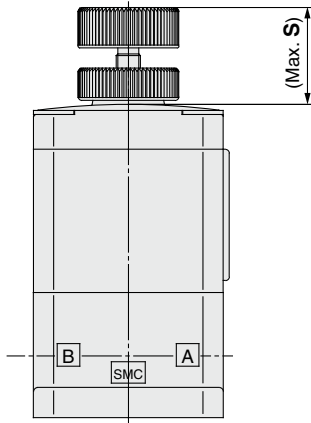
Body material: PPS  
With flow rate adjustment  
**LVA20**



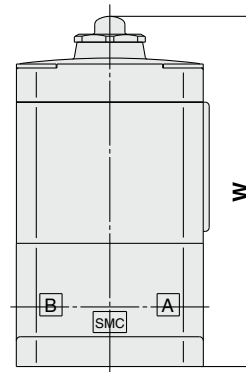
With indicator  
**LVA20**



**LVA22**  
**LVA3<sub>2</sub><sup>0</sup> to 5<sub>2</sub><sup>0</sup>**



**LVA30 to 50**



Dimensions [mm]

Model	S
LVA2□	14.5
LVA3□	24.4
LVA4□	29
LVA5□	34.5

Dimensions [mm]

Model	W
LVA20	64.2
LVA30	88.1
LVA40	110.4
LVA50	147

## Dimensions

Model	A	B	C	D	E	G	H	J	K	L	M	N	O	P	Q	R	T	U
LVA1□	20	33	49.5	—	10	27.5	11	—	4	11	—	27.5	—	Rc1/8, 1/4 NPT1/8, 1/4 G1/8, 1/4*	M5 x 0.8	ø4.2	—	—
LVA20	30	36	54.7	44	11	32	—	4	20	37	3.5	27	14.8	Rc1/4 NPT1/4 G1/4*	Rc1/8 NPT1/8 G1/8*	ø2.4	20	30
LVA2 <sub>2</sub> <sup>1</sup>	30	36	57.5	44	11	31.5	13	4	20	37	3.5	26.5	—		M5 x 0.8			
LVA3□	36	47	77.6	56	15	41.5	17.5	7.5	34	46	5.5	37.5	—	Rc3/8 NPT3/8 G3/8*	Rc1/8 NPT1/8 G1/8*	Rc1/8 NPT1/8 G1/8*	—	—
LVA4□	46	60	95.9	68	22	55	18	8	42	57	5.5	48	—	Rc1/2 NPT1/2 G1/2*			—	—
LVA5□	58	75	129	84	26	68	27.5	8	56	71	6.5	62	—	Rc3/4 NPT3/4 G3/4*			—	—

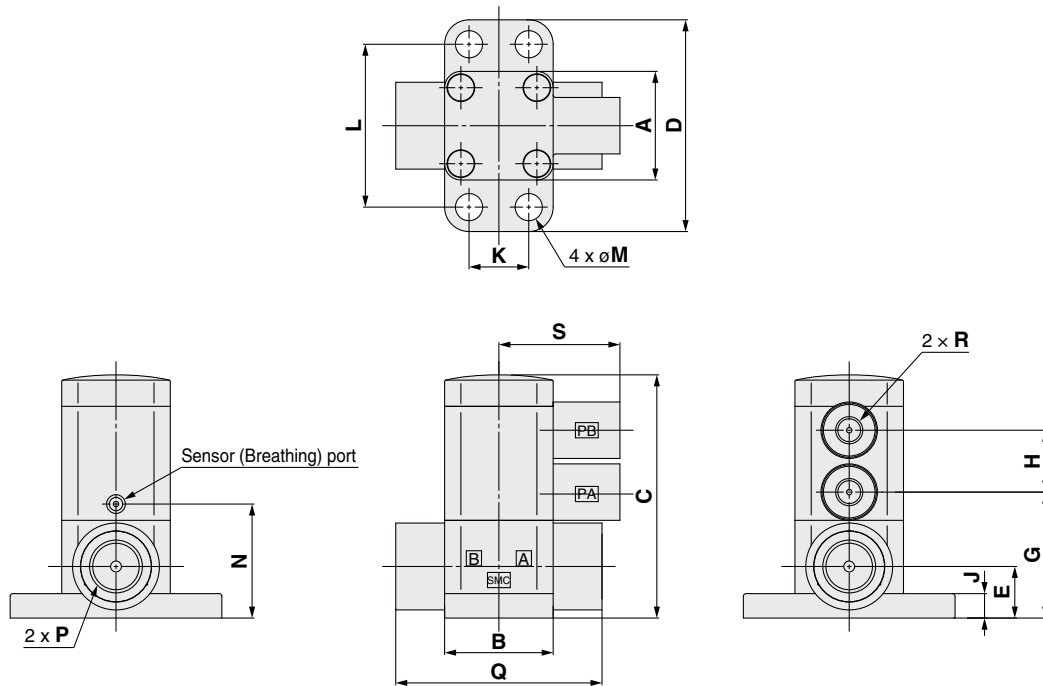
\*: For details on G threads and thread depths, refer to page 51-1.

# LVA Series

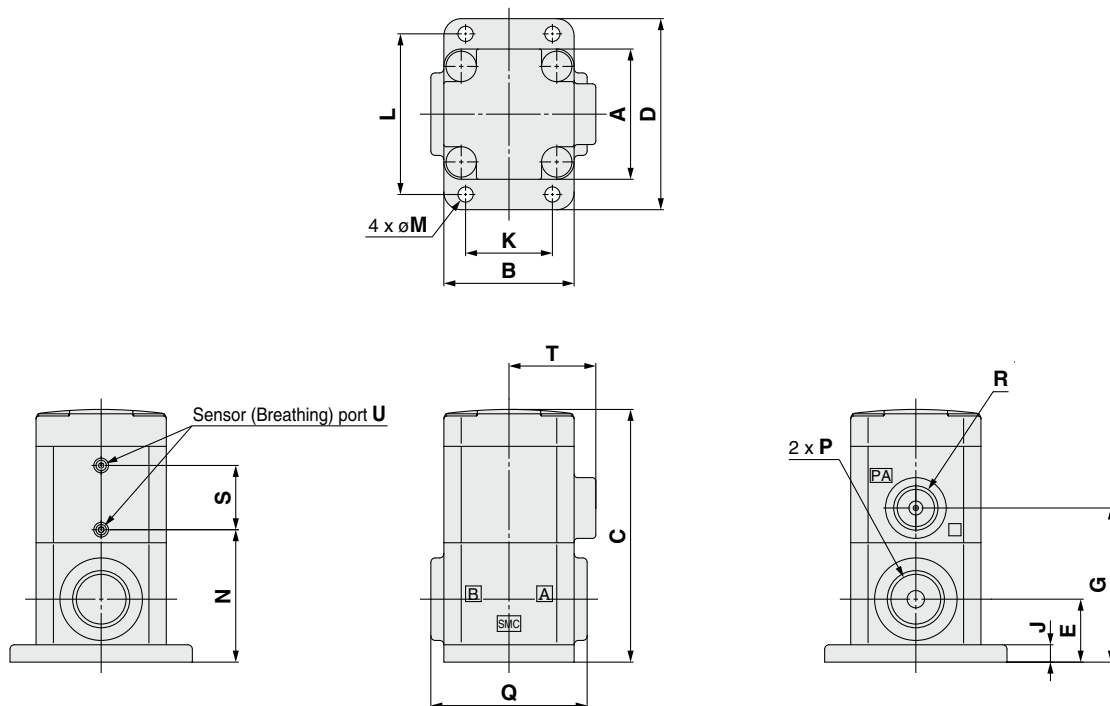
## Dimensions

Body material: PFA

LVA1□



LVA20



## Dimensions

Model	A	B	C	D	E	G	H	J	K	L	M	N	P	Q	R	S	T	U
LVA1□	20	20	44.8	39	9.5	23.2	11.4	4.5	11	30	5	21	Rc1/8 NPT1/8 G1/8*	38	M5 x 0.8	22.3	—	—
LVA20	30	30	58.2	44	14.5	35.5	—	4	20	37	3.5	30.5	Rc1/4 NPT1/4 G1/4*	36	Rc1/8 NPT1/8 G1/8*	14.8	20	ø2.4

\*: For details on G threads and thread depths, refer to page 51-1.

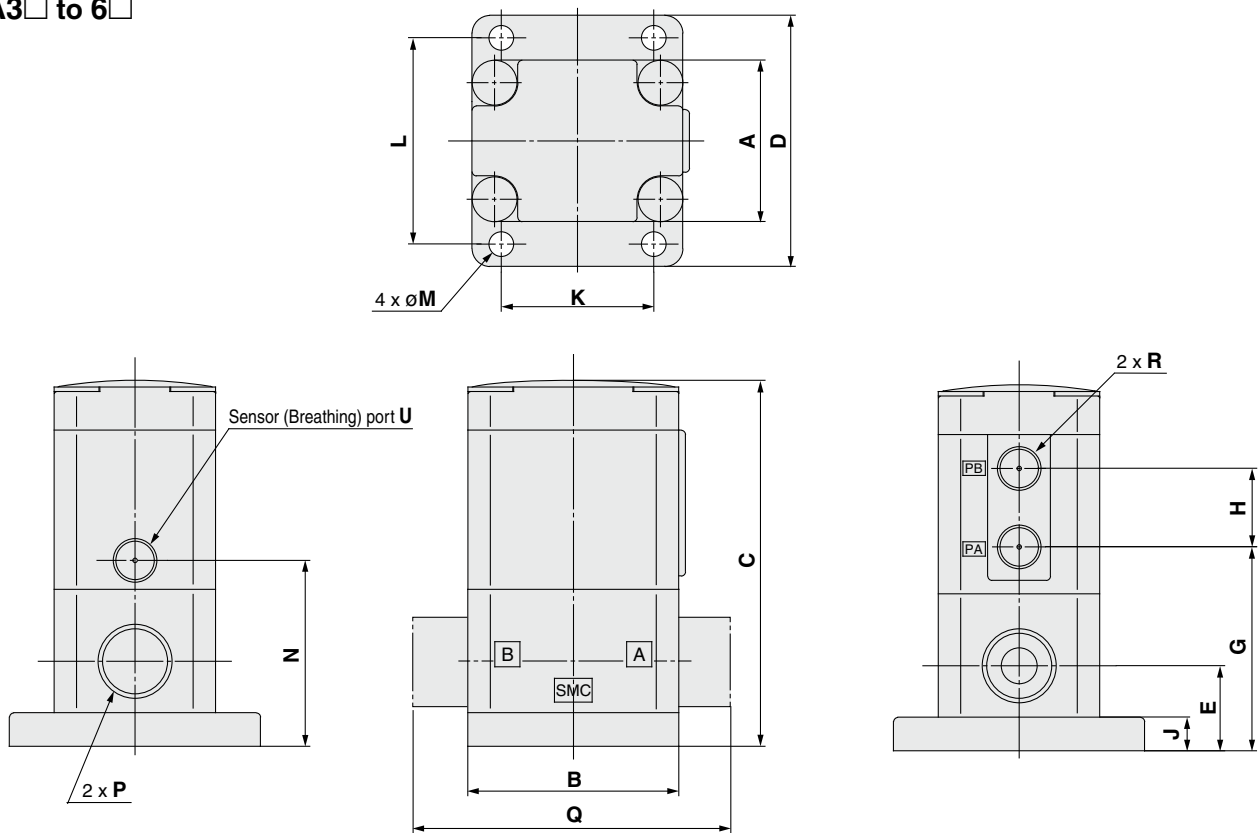


## Dimensions

Body material: PFA

LVA21/22

LVA3□ to 6□



## Dimensions

[mm]

Model	A	B	C	D	E	G	H	J	K	L	M	N	P	Q	R	U
LVA2 <sup>1</sup> <sub>2</sub>	30	36	61	44	14.5	35	13	4	20	37	3.5	30	Rc1/4 NPT1/4 G1/4*	—	M5 x 0.8	M3 x 0.5
LVA3□	36	47	81.6	56	19	45.5	17.5	7.5	34	46	5.5	41.5	Rc3/8 NPT3/8 G3/8*	—	Rc1/8 NPT1/8 G1/8*	Rc1/8 NPT1/8 G1/8*
LVA4□	46	60	95.9	68	22	55	18	8	42	57	5.5	48	Rc1/2 NPT1/2 G1/2*	—		
LVA5□	58	75	129	84	26	68	27.5	8	56	71	6.5	62	Rc3/4 NPT3/4 G3/4*	—		
LVA6□	58	75	137.8	84	32	76.8	27.5	8	56	71	6.5	70.8	Rc1 NPT1 G1*	117		

\*: For details on G threads and thread depths, refer to page 51-1.

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

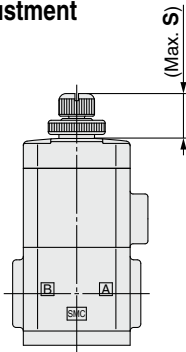
# LVA Series

## Dimensions

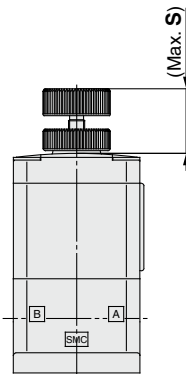
Body material: PFA

With flow rate adjustment

LVA20



LVA22  
LVA3<sub>2</sub><sup>0</sup> to 6<sub>2</sub><sup>0</sup>

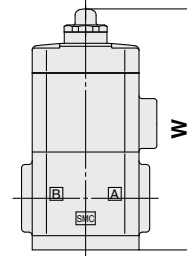


Dimensions [mm]

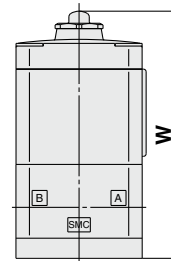
Model	S
LVA2□	14.5
LVA3□	24.4
LVA4□	29
LVA5□	34.5
LVA6□	36

With indicator

LVA20



LVA30 to 60

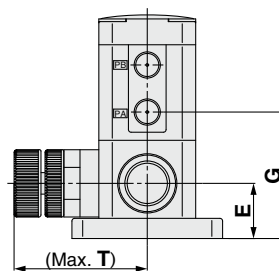
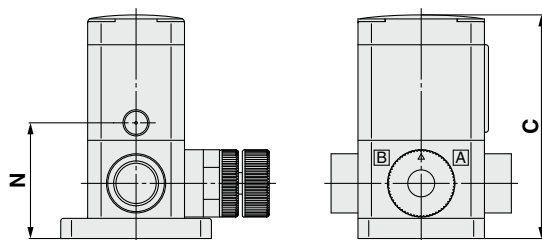
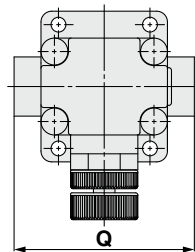


Dimensions [mm]

Model	W
LVA20	67.7
LVA30	92.1
LVA40	110.4
LVA50	147
LVA60	155.8

With bypass

LVA3<sub>2</sub><sup>0</sup> to 5<sub>2</sub><sup>0</sup>

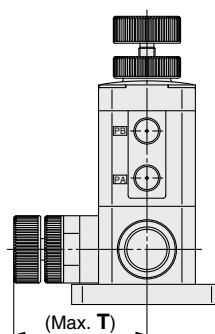
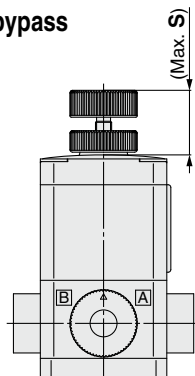


Dimensions

Model	C	E	G	N	T	Q
LVA3□	83.1	20.5	47	43	50.5	67
LVA4□	95.9	22	55	48	54.5	86
LVA5□	129	26	68	62	60	104

With flow rate adjustment & bypass

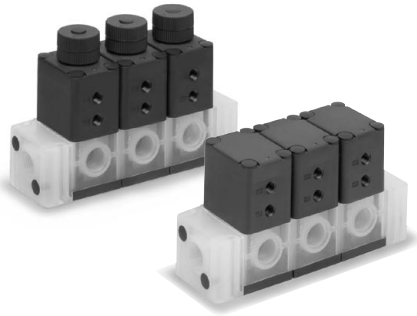
LVA3<sub>2</sub><sup>0</sup> to 5<sub>2</sub><sup>0</sup>



Dimensions [mm]

Model	S	T
LVA3□	24.4	50.5
LVA4□	29	54.5
LVA5□	34.5	60

# LVA Series Manifolds



## Manifold Specifications

Model	LLA2A	LLA3A	LLA4A	LLA5A
Manifold type	Stacking			
P (IN), A (OUT) type	Common IN/Individual OUT			
Valve stations	2 to 5 stations			
Port size (port P)	1/4	3/8	1/2	3/4
Port size (port A)	1/4	3/8	1/2	3/4

\*: Please contact SMC if the manifold will be used with A → P flow.

## How to Order Manifold Base

**LLA 2 A - 05 - 02 - [ ] - C**

**Body class**

Symbol	Body class
2	2
3	3
4	4
5	5

**Base type**

Symbol	Base type
A	Stacking

**Manifold stations**

Symbol	Manifold stations
02	2 stations
⋮	⋮
05	5 stations

**Thread type**

Symbol	Thread type
Nil	Rc
N	NPT

**Material**

Symbol	Manifold
C	PFA

**Port size (port P)**

Symbol	Port size	Body class
02	1/4	2
03	3/8	3
04	1/2	4
06	3/4	5

## How to Order Valve

**LVA 2 0 A - 02 - [ ] - C [ ]**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø12
5	5	ø20

**Valve type**

Symbol	Valve type
0	N.C.
1	N.O.
2	Double acting

**Body type**

Symbol	Body type
A	Stacking type for manifold

**Port size (port A)**

Symbol	Port size	Body class
02	1/4	2
03	3/8	3
04	1/2	4
06	3/4	5

**Option**

Symbol	Option
Nil	None
1	With flow rate adjustment
4	With indicator

\*: Options cannot be combined.

**Material**

Symbol	Body	Actuator section End plate	Diaphragm	O-ring	Applicable option		Note
					1	4	
C	PFA	PPS	PTFE	FKM	●	●	—
F	PFA	PVDF	PTFE	FKM	—	—	Hydrofluoric acid compatible (Only LVA40, 50 type)
N	PFA	PPS	PTFE	EPDM	●	●	Ammonium hydroxide compatible

\*: An O-ring is in place for outlet sealing on the outside of the main sealing of the manifold body connection (wetted part). Refer to page 29 for details.

**Thread type**

Symbol	Thread type
Nil	Rc
N	NPT

It is not possible to order single unit valves for the manifold. For details, refer to Maintenance 4. in the High Purity Chemical Liquid Valve Precautions 2 on page 52.

Integrated Fitting Type  
LVC

Threaded Type  
LVA

Organic Solvents Compatible  
LVA

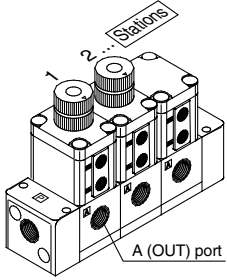
Manually Operated  
LVH

Organic Solvents Compatible  
LVH

# LVA Series

## How to Order Manifold Assembly (Example)

Enter the part number of the valves to be mounted together with the manifold base part number.



Stations are counted from station 1 on the left side, with the A (OUT) ports in front.

### <Example>

LLA2A-03-02-C..... 1 set    Manifold base part no.  
 \* LVA20A-02-C1 ..... 2 sets    Valve part no. (Stations 1 & 2)  
 \* LVA20A-02-C ..... 1 set    Valve part no. (Station 3)

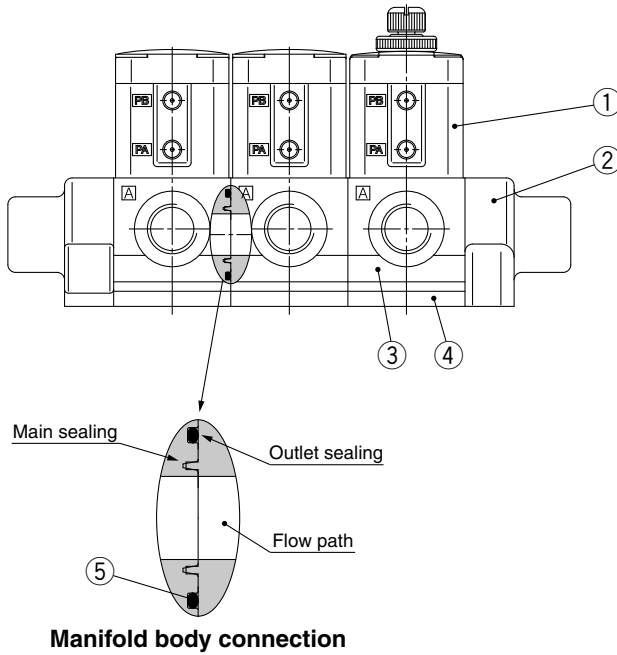
• Prefix the asterisk to the part no. of the valves, etc.

Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

## Manifold Variations

Type	Symbol	Valve type	Model	LVA20A	LVA30A	LVA40A	LVA50A
			Manifold material	PFA			
			Port size	1/4	3/8	1/2	3/4
			Orifice diameter	ø4	ø8	ø12	ø20
<b>Basic</b>		N.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		N.O.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Double acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>With flow rate adjustment</b>		N.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Double acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## Construction



## Component Parts

No.	Description	Material
1	Actuator section	PPS
		PVDF
2	Manifold	PFA
3	Body	PFA
4	End plate	PPS
		PVDF
5	O-ring	FKM
		EPDM

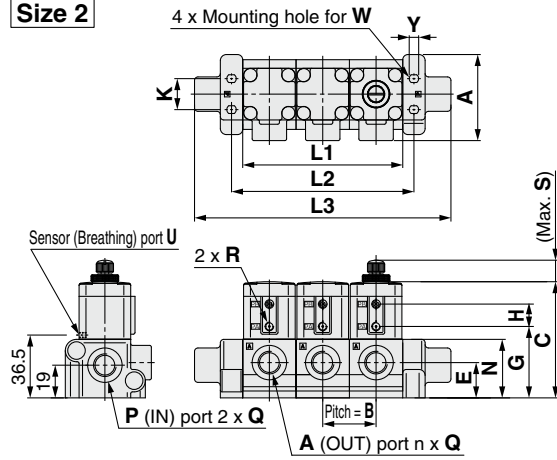


# LVA Series

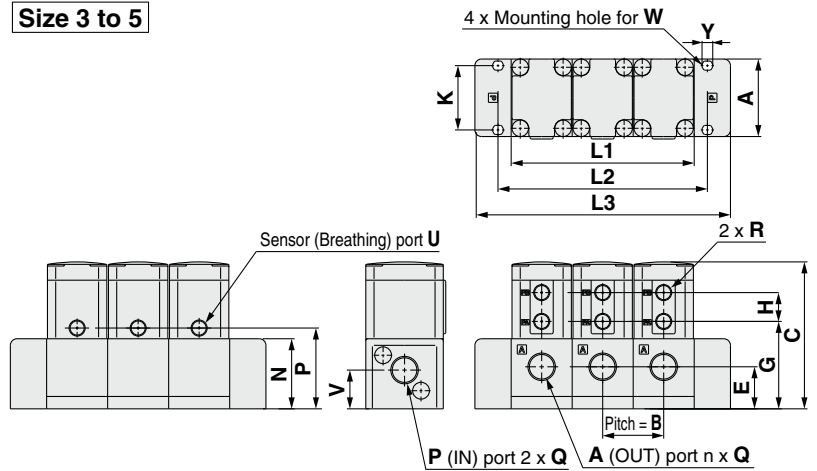
## Dimensions

LLA□A- Stations-□□-C

Size 2



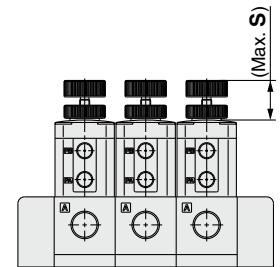
Size 3 to 5



Dimensions [mm]

Model	S
LLA2A	14.5
LLA3A	24.4
LLA4A	29
LLA5A	34.5

Model	Station Symbol	[mm]			
		2	3	4	5
LLA2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	118	149	180	211
LLA3A	L1	74	111	148	185
	L2	90	127	164	201
	L3	118	155	192	229
LLA4A	L1	94	141	188	235
	L2	112	159	206	253
	L3	144	191	238	285
LLA5A	L1	118	177	236	295
	L2	140	199	258	317
	L3	178	237	296	355



Dimensions

Model	A	B	C	E	G	H	K	N	P	Q	R	U	V	W	Y
LLA2A	50	31	67.5	20.5	41.5	13	18	34	36.5	Rc1/4, NPT1/4	M5 x 0.8	M3 x 0.5	19	M4	5.5
LLA3A	47	37	89.1	25.5	53	17.5	39	42.5	49	Rc3/8, NPT3/8	Rc1/8 NPT1/8	Rc1/8 NPT1/8	23.5	M5	6.5
LLA4A	60	47	103.4	29	62.5	18	50	48	55.5	Rc1/2, NPT1/2			26	M6	7.5
LLA5A	75	59	135.5	32.5	74.5	27.5	61	61	68.5	Rc3/4, NPT3/4			29	M6	7.5



# LVA Series 3 Port



## Standard Specifications

Model		LVA200
Orifice diameter		ø4
Port size		1/4
Flow rate characteristics	Kv	0.2
	Cv	0.3
Withstand pressure [MPa]		1
Operating pressure [MPa]		0 to 0.5
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)
Pilot air pressure [MPa]		0.4 to 0.5
Pilot port size		M5 x 0.8
Fluid temperature [°C]		0 to 100
Ambient temperature [°C]		0 to 60
Weight [kg]		0.162

## How to Order Valve

**LVA 2 0 0 - 02 [ ] - C**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4

**Thread type**

Symbol	Thread type
Nil	Rc
N	NPT

**Material**

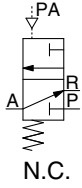
Symbol	Body	Actuator section	Diaphragm
C	PFA	PPS	PTFE

**Valve type**

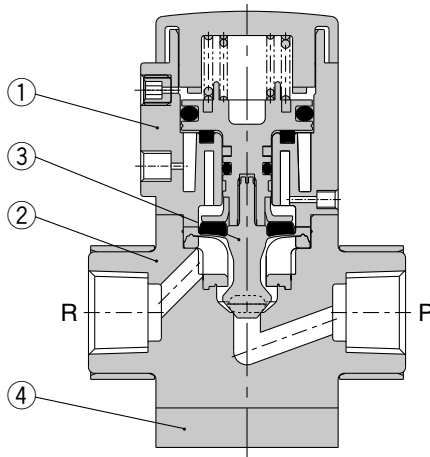
0	N.C.
---	------

**Port size**

Symbol	Port size
02	1/4



## Construction

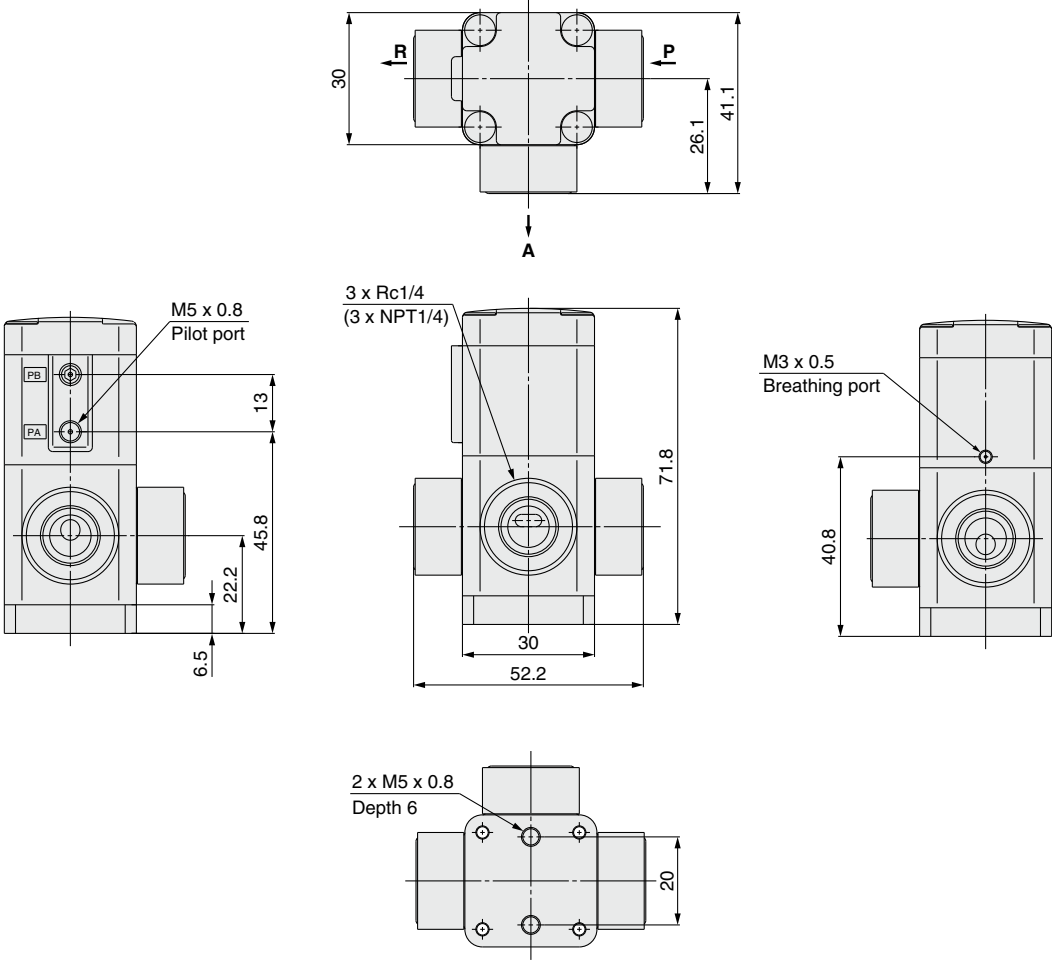


### Component Parts

No.	Description	Material
1	Actuator section	PPS
2	Body	PFA
3	Diaphragm	PTFE
4	End plate	Stainless steel

# LVA Series

## Dimensions



# Air Operated, Organic Solvents Compatible Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing LVA Series

## How to Order Valve

**LVA 2 0 - D 07 - AD - - -**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø12
5	5	ø20
6	6	ø22

**Valve type**

0	N.C.
1	N.O.
2	Double acting

**Option 2**

Nil	None
W	Low water hammer type
E	Body wetted parts equivalent to EP grade

**Option 1**

Nil	None
1	With flow rate adjustment
4	With indicator
5	High back pressure (0.5 MPa) tolerant
6	High back pressure with flow rate adjustment
9	High back pressure with indicator

\*: With flow rate adjustment: Only available with N.C. valve and double acting valve  
\*: With indicator: Only available with N.C. valve

**Fitting type**

Symbol	Type
D	With double ferrule fittings
G	With metal gasket seal fittings
T	Integrated tubing

**Applicable tubing size**

Symbol	Connecting tubing size	Body class					
		2	3	4	5	6	
<b>Metric size</b>							
06	ø6	○					
10	ø10		○				
12	ø12			○			
19	ø19				○		
<b>Inch size</b>							
07	1/4	○					
11	3/8		○				
13	1/2			○			
19	3/4				○		
25	1					○	

\*: Metric size is only available for fitting types D and T.

**Material**

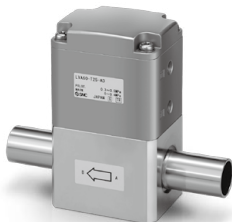
Symbol	Body	Actuator section	Diaphragm	Seal	Buffer
AD	Stainless steel	ADC	PTFE	FKM	FKM
ND				EPDM	EPDM

**Pilot port thread type**

Symbol	Body class	Thread type
Nil	2	M5 x 0.8
	3, 4, 5, 6	Rc1/8
N	3, 4, 5, 6	NPT1/8



**LVA30-D11-AD**  
Double ferrule fittings



**LVA60-T25-AD**  
Integrated tubing



**LVA50-G19-AD**  
Metal gasket seal fittings

## Standard Specifications

Model		LVA20	LVA30	LVA40	LVA50	LVA60
Tubing O.D.	Metric size*1	6	10	12	19	—
	Inch size	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø12	ø20	ø22
Flow rate characteristics	Kv	0.3	1.4	2.8	5.1	6.8
	Cv	0.35	1.7	3.3	6	8
Withstand pressure [MPa]		1				
Operating pressure [MPa]	Standard	A → B	0 to 0.5		0 to 0.4	
		B → A	0 to 0.2		0 to 0.1	
	High back pressure	A → B	0 to 0.5			
		B → A	0 to 0.4			
Back pressure [MPa]	Standard	N.C./N.O.	0.3 or less		0.2 or less	
		Double acting	0.4 or less		0.3 or less	
	High back pressure*2	N.C./N.O./Double acting	0.5 or less			
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5 (High back pressure: 0.5 to 0.8)*2				
Pilot port size		M5	Rc1/8, NPT1/8			
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				
Fitting type		With double ferrule fittings, With metal gasket seal fittings, Integrated tubing				

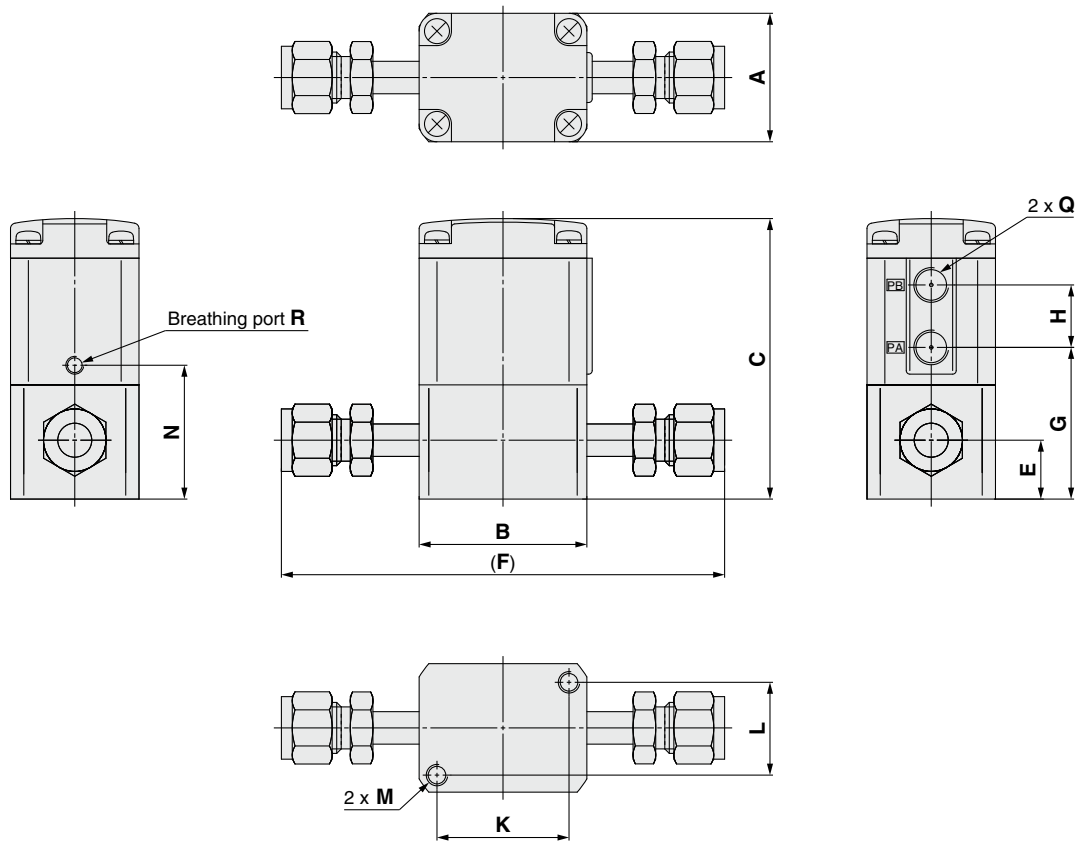
\*1: Metric size is only available for fitting types D and T.

\*2: High back pressure is optional.

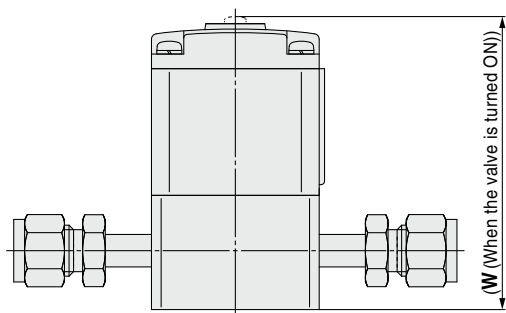
# LVA Series

## Dimensions

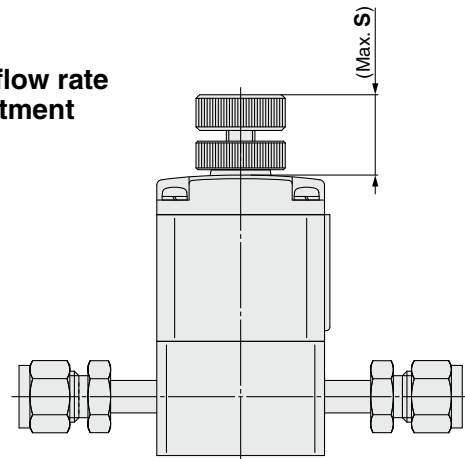
Body material: Stainless steel  
With double ferrule fittings



With indicator



With flow rate adjustment

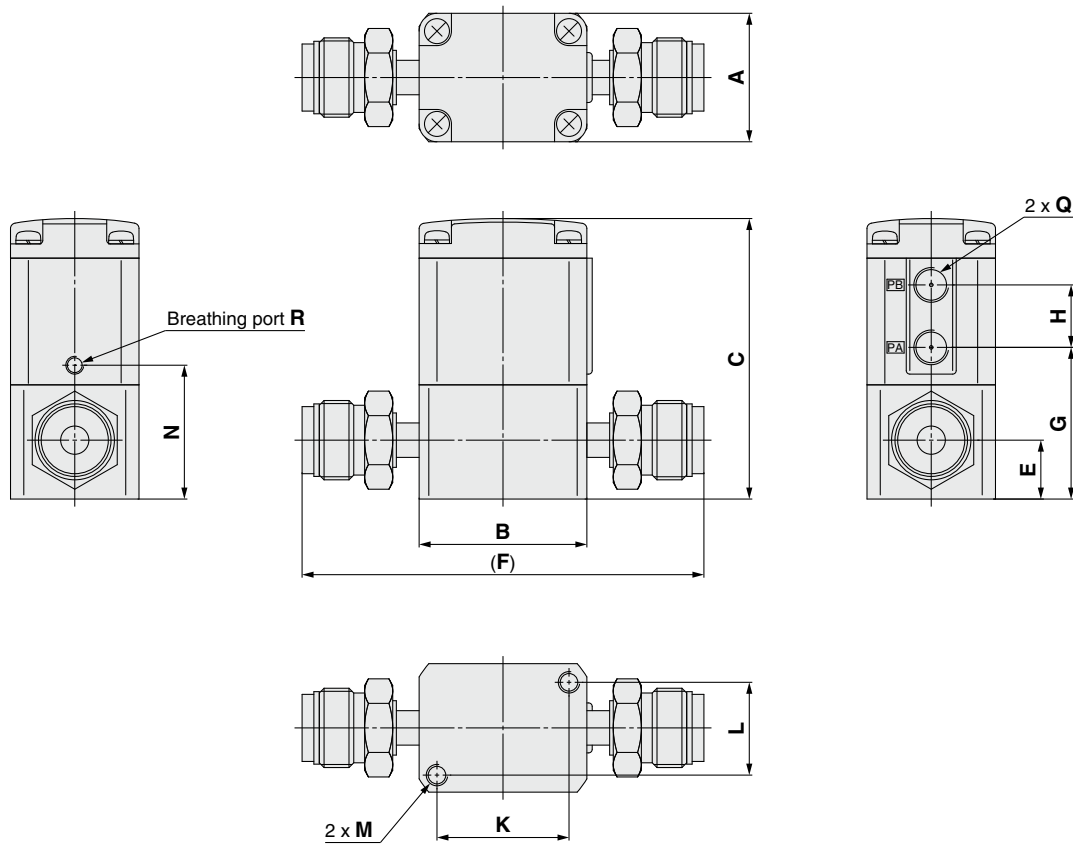


## Dimensions

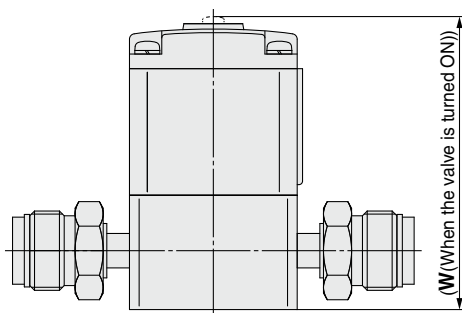
Model	A	B	C	E	F	G	H	K	L	M	N	Q	R	S	W
LVA2□-D□-AD ND	30	30	54.5	12	96.4	30.5	13	22	22	M5 x 0.8 Thread depth 5	25.5	M5 x 0.8	M3 x 0.5	17.1	58.4
LVA3□-D□-AD ND	36	47	78.6	16.5	127	42.5	17.5	37	26	M6 x 1 Thread depth 8	37.5	Rc1/8 NPT1/8	M5 x 0.8	24.9	82.1
LVA4□-D□-AD ND	46	60	85.9	16.5	147.2	48	18	47.5	33.5	M8 x 1.25 Thread depth 10	40	Rc1/8 NPT1/8	M5 x 0.8	30	89.9
LVA5□-D19-AD ND	58	75	120	23	166.8	62	27.5	60	43	M8 x 1.25 Thread depth 10	55	Rc1/8 NPT1/8	M5 x 0.8	36.1	125.5
LVA6□-D25-AD ND	58	75	129	27	190.2	71	27.5	60	43	M8 x 1.25 Thread depth 10	64	Rc1/8 NPT1/8	M5 x 0.8	36.1	136

## Dimensions

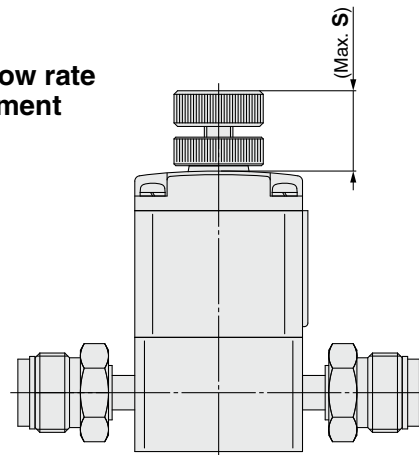
Body material: Stainless steel  
 With metal gasket seal fittings



With indicator



With flow rate adjustment



## Dimensions

Model	A	B	C	E	F	G	H	K	L	M	N	Q	R	S	W
LVA2□-G07- <sup>AD</sup> <sub>ND</sub>	30	30	54.5	12	91	30.5	13	22	22	M5 x 0.8 Thread depth 5	25.5	M5 x 0.8	M3 x 0.5	17.1	58.4
LVA3□-G11- <sup>AD</sup> <sub>ND</sub>	36	47	78.6	16.5	112.6	42.5	17.5	37	26	M6 x 1 Thread depth 8	37.5	Rc1/8 NPT1/8	M5 x 0.8	24.9	82.1
LVA4□-G13- <sup>AD</sup> <sub>ND</sub>	46	60	85.9	16.5	131.6	48	18	47.5	33.5	M8 x 1.25 Thread depth 10	40	Rc1/8 NPT1/8	M5 x 0.8	30	89.9
LVA5□-G19- <sup>AD</sup> <sub>ND</sub>	58	75	120	23	178.2	62	27.5	60	43	M8 x 1.25 Thread depth 10	55	Rc1/8 NPT1/8	M5 x 0.8	36.1	125.5
LVA6□-G25- <sup>AD</sup> <sub>ND</sub>	58	75	129	27	192.8	71	27.5	60	43	M8 x 1.25 Thread depth 10	64	Rc1/8 NPT1/8	M5 x 0.8	36.1	136

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

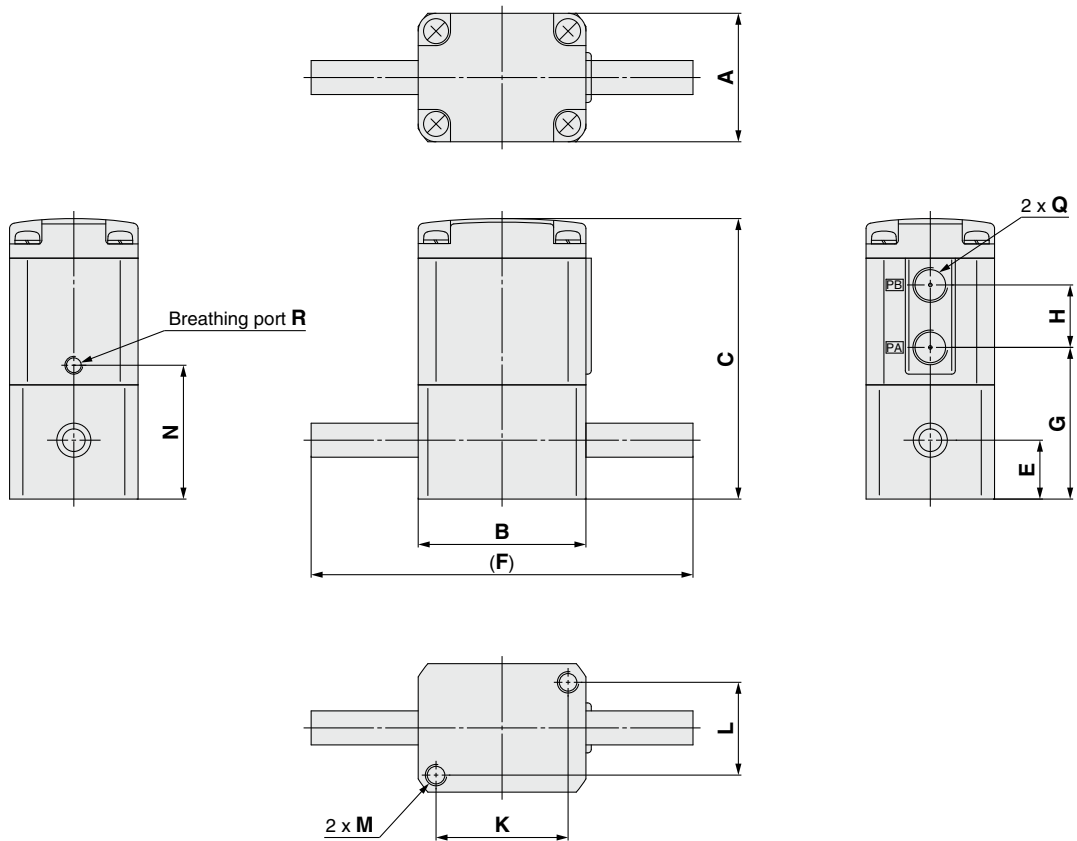
Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

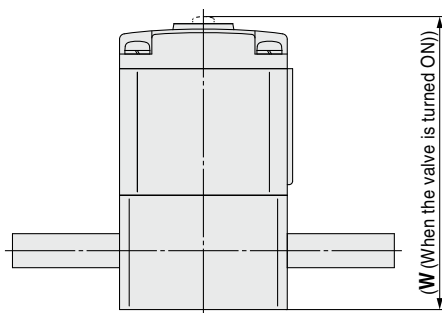
# LVA Series

## Dimensions

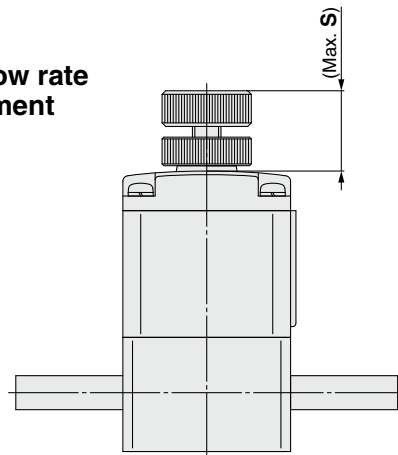
Body material: Stainless steel  
Integrated tubing



With indicator



With flow rate adjustment



## Dimensions

Model	A	B	C	E	F	G	H	K	L	M	N	Q	R	S	W
LVA2□-T□-AD ND	30	30	54.5	12	70	30.5	13	22	22	M5 x 0.8 Thread depth 5	25.5	M5 x 0.8	M3 x 0.5	17.1	58.4
LVA3□-T□-AD ND	36	47	78.6	16.5	107	42.5	17.5	37	26	M6 x 1 Thread depth 8	37.5	Rc1/8 NPT1/8	M5 x 0.8	24.9	82.1
LVA4□-T□-AD ND	46	60	85.9	16.5	120	48	18	47.5	33.5	M8 x 1.25 Thread depth 10	40	Rc1/8 NPT1/8	M5 x 0.8	30	89.9
LVA5□-T19-AD ND	58	75	120	23	155	62	27.5	60	43	M8 x 1.25 Thread depth 10	55	Rc1/8 NPT1/8	M5 x 0.8	36.1	125.5
LVA6□-T25-AD ND	58	75	129	27	155	71	27.5	60	43	M8 x 1.25 Thread depth 10	64	Rc1/8 NPT1/8	M5 x 0.8	36.1	136

# Manually Operated Integrated Fitting Type/Threaded Type LVH Series

## How to Order Valve (Single Type)

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø10

**Integrated fitting type**

**Threaded type**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø12

**Valve type**

0	N.C.
---	------

**Lever operation**

Symbol	Type
Nil	Non-locking (self-reset)
L	Locking

**Port size**

Symbol	Port size	Body class
01	1/8	2
02	1/4	
02	1/4	3
03	3/8	4
03	3/8	
04	1/2	

**Applicable tubing size**

Symbol	Connecting tubing size	Body class			
		2	3	4	
<b>Metric size</b>					
03	3 x 2	●			
04	4 x 3	●			
06	6 x 4	○	●		
08	8 x 6		●		
10	10 x 8		○	●	
12	12 x 10			○	
<b>Inch size</b>					
03	1/8" x 0.086"	●			
05	3/16" x 1/8"	●			
07	1/4" x 5/32"	○	●		
11	3/8" x 1/4"		○	●	
13	1/2" x 3/8"			○	

○ Basic size ● With reducer  
\*: Refer to page 52 for details of the applicable tubing sizes.

**Port B (OUT) different dia. size**

Symbol	Application
Nil	Ports A & B same size
	Different diameter tubing can be selected within the same body class.

**Material**<sup>\*1</sup>



Symbol	Body	Actuator section End plate	Diaphragm
A	Stainless steel	PP	PTFE
B	PPS	PP	PTFE
		PPS	
C	PFA	PP	PTFE
		PPS	

\*1: Refer to Variations for port size and material combinations.


**Pilot port thread type**

Symbol	Thread type
Nil	Rc
N	NPT
F	G

### Integrated Fitting Type Variations

		Model	LVH20	LVH30	LVH40
Orifice diameter			ø4	ø8	ø10
Tubing O.D.		Metric	3, 4, 6	6, 8, 10	10, 12
		Inch	1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2
Type	Symbol	Valve type			
Basic		N.C.	○	○	○
					

### Threaded Type Variations

		Model	LVH20			LVH30			LVH40				
Orifice diameter			ø4			ø8			ø12				
Port size		Symbol	1/8	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2
			Valve type										
Basic		N.C.	Stainless steel 316	PPS	PFA	Stainless steel 316	PPS	PFA	Stainless steel 316	PPS	PFA		
			○	○	○	○	○	○	○	○	○	○	





## ⚠️ Precautions

Be sure to read this before handling the products. Refer to the back cover for Safety Instructions, and pages 51 and 52 for High Purity Chemical Liquid Valve Precautions.

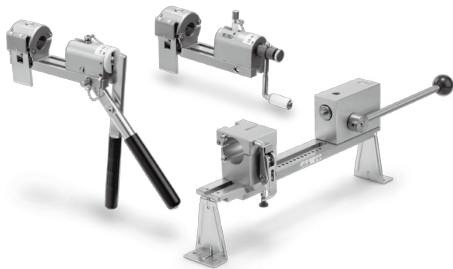
### Piping

## ⚠️ Caution

### Integrated fitting type

#### 1. Connect tubing with special tools.

Refer to the catalog "High-Purity Fluoropolymer Fittings Hyper Fittings/LQ1, 2 Series Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from the SMC website.)



2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

#### Tightening Torque for Piping

Body class	Torque [N·m]
2	1.5 to 2.0
3	3.0 to 3.5
4	7.5 to 9.0

### Threaded type

#### 1. Avoid using metal fittings with a resin body (taper threads).

This can cause damage to the valve body.

## Standard Specifications: Integrated Fitting Type

Model		LVH20	LVH30	LVH40
Tubing O.D.	*1 Metric size	6	10	12
	Inch size	1/4	3/8	1/2
Orifice diameter		ø4	ø8	ø10
Flow rate characteristics	Kv	0.3	1.4	2.1
	Cv	0.35	1.7	2.5
Withstand pressure [MPa]		1		
Operating pressure [MPa]	A → B	0 to 0.5		
	B → A	0 to 0.2		
Back pressure [MPa]		0.3 or less		
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)		
Action		Toggle type (non-locking/locking)		
Fluid temperature [°C]		0 to 60		
Ambient temperature [°C]		0 to 60		
Weight [kg]		0.06	0.14	0.26

\*1: Refer to page 52 for details of the applicable tubing sizes.

## Different Diameter Tubing Applicable with Reducer

Different diameter tubing can be selected (within a body class) by using a nut and insert bushing (reducer).

● With reducer

Body class	Tubing O.D.										
	Metric size						Inch size				
	3	4	6	8	10	12	1/8	3/16	1/4	3/8	1/2
2	●	●	○	—	—	—	●	●	○	—	—
3	—	—	●	●	○	—	—	—	●	○	—
4	—	—	—	—	●	○	—	—	—	●	○

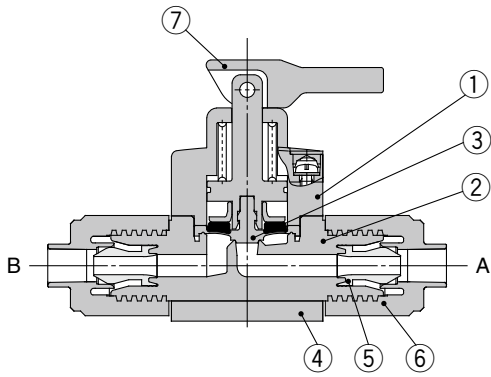
\*: Refer to page 49 for information on changing tubing sizes.

## Standard Specifications: Threaded Type

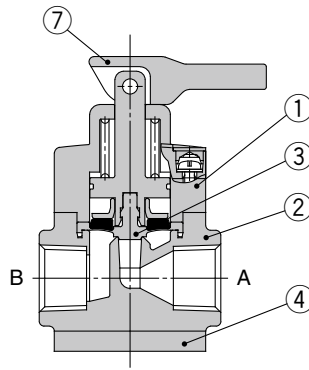
Model		LVH20	LVH30	LVH40
Port size		1/8, 1/4	1/4, 3/8	3/8, 1/2
Orifice diameter		ø4	ø8	ø12
Flow rate characteristics	Kv	0.3	1.4	2.1
	Cv	0.35	1.7	2.5
Withstand pressure [MPa]		1		
Operating pressure [MPa]	A → B	0 to 0.5		
	B → A	0 to 0.2		
Back pressure [MPa]		0.3 or less		
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)		
Action		Toggle type (non-locking/locking)		
Fluid temperature [°C]		0 to 60		
Ambient temperature [°C]		0 to 60		
Weight [kg]	Stainless steel	0.15	0.36	0.71
	PPS	0.04	0.09	0.17
	PFA	0.05	0.11	0.20

## Construction

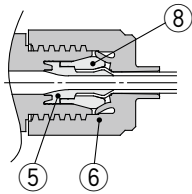
### Integrated fitting type



### Threaded type



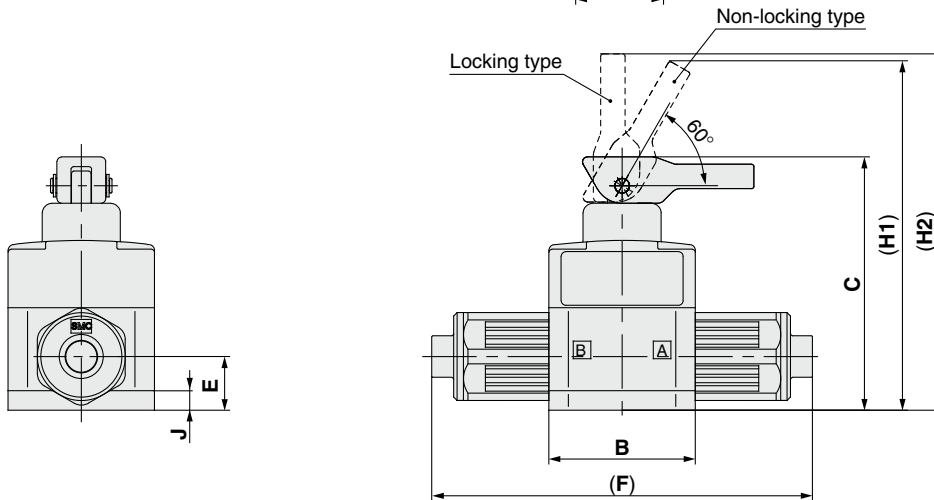
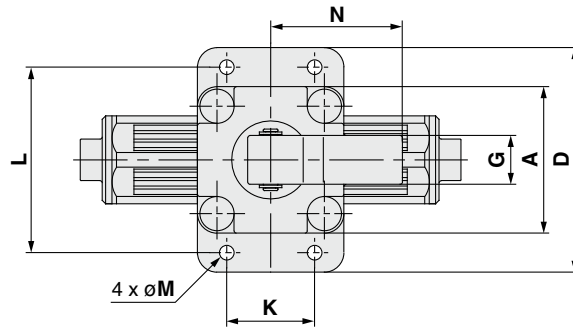
### With reducer



### Component Parts

No.	Description	Material	Note
1	Actuator section	PP	—
2	Body	PFA	Integrated fitting type
		Stainless steel	Threaded type
		PPS	
		PFA	
3	Diaphragm	PTFE	—
4	End plate	PPS	PFA body only
5	Insert bushing	PFA	—
6	Nut	PFA	—
7	Lever	PP	—
8	Collar	PFA	—

## Dimensions: Integrated Fitting Type



### Dimensions

Model	A	B	C	D	E	F	G	H1	H2	J	K	L	M	N
LVH20□	30	30	52	44	11	79	10	72.5	74	4	20	37	3.5	27
LVH30□	36	47	81.5	56	16.5	106	19	111	113	7.5	34	46	5.5	37.5
LVH40□	46	60	100	68	22.5	131	20.5	139	143	8	42	57	5.5	50

[mm]

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

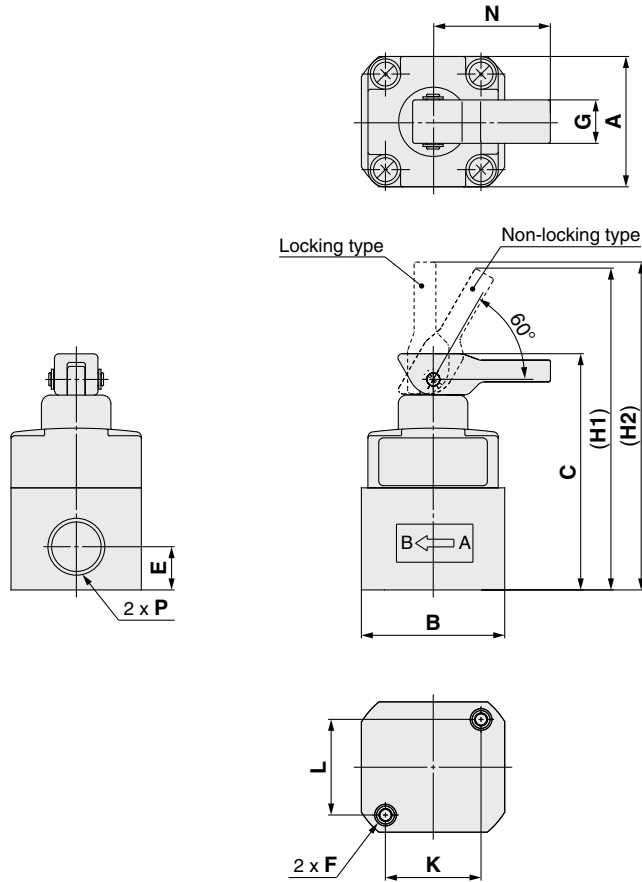
Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

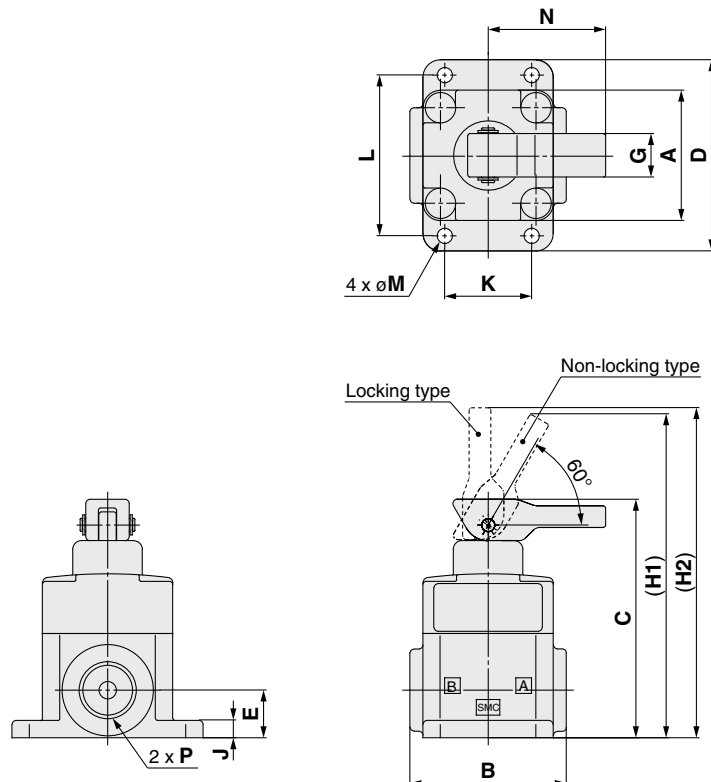
# LVH Series

## Dimensions: Threaded Type

Body material: Stainless steel

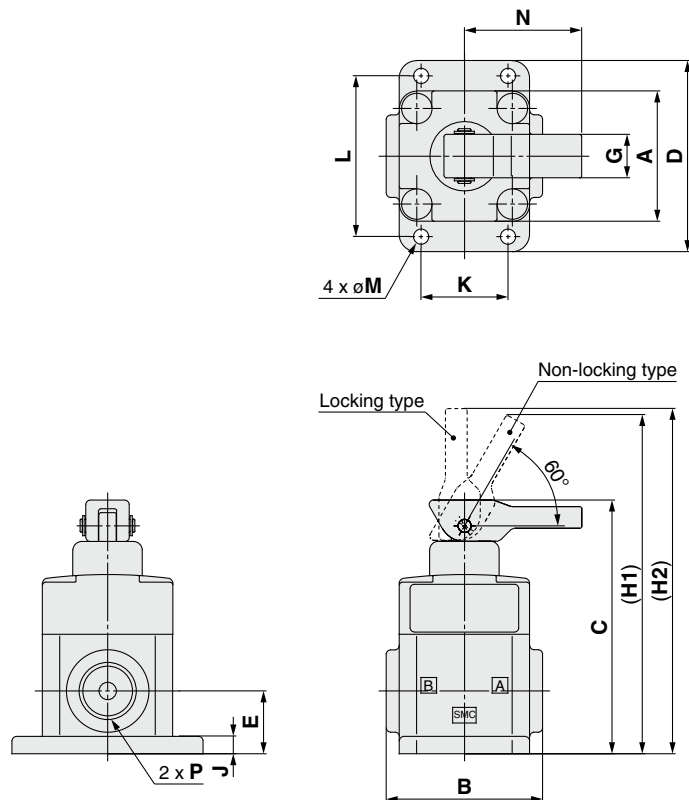


Body material: PPS



## Dimensions: Threaded Type

Body material: PFA



Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

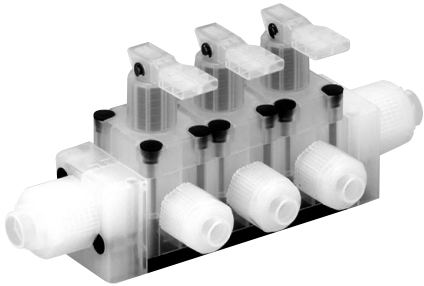
Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

## Dimensions

Body material	Model	A	B	C	D	E	F	G	H1	H2	J	K	L	M	N	P
Stainless steel	LVH20□	30	33	54.5	—	10	M5 x 0.8	10	75	76.5	—	22	22	—	27	Rc1/8, 1/4, NPT1/8, 1/4, G1/8, 1/4
	LVH30□	36	47	81	—	13	M6 x 1	19	110.5	112.5	—	37	26	—	37	Rc1/4, 3/8, NPT1/4, 3/8, G1/4, 3/8
	LVH40□	46	60	99	—	16	M8 x 1.25	20.5	138	142	—	47.5	33.5	—	50	Rc3/8, 1/2, NPT3/8, 1/2, G3/8, 1/2
PPS	LVH20□	30	36	55	44	11	—	10	75.5	77	4	20	37	3.5	27	Rc1/4, NPT1/4, G1/4
	LVH30□	36	47	80	56	15	—	19	109.5	111.5	7.5	34	46	5.5	37	Rc3/8, NPT3/8, G3/8
	LVH40□	46	60	99.5	68	22	—	20.5	138.5	142.5	8	42	57	5.5	50	Rc1/2, NPT1/2, G1/2
PFA	LVH20□	30	36	58.5	44	14.5	—	10	79	80.5	4	20	37	3.5	27	Rc1/4, NPT1/4, G1/4
	LVH30□	36	47	84	56	19	—	19	113.5	115.5	7.5	34	46	5.5	37	Rc3/8, NPT3/8, G3/8
	LVH40□	46	60	99.5	68	22	—	20.5	138.5	142.5	8	42	57	5.5	50	Rc1/2, NPT1/2, G1/2

# LVH Series Integrated Fitting Type Manifolds



## Manifold Specifications

Model	LLH2A	LLH3A	LLH4A
Manifold type	Stacking		
P (IN), A (OUT) type	Common IN/Individual OUT		
Valve stations	2 to 5 stations		
Tubing size *1 (port P)	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"
Tubing size (port A)	1/4" x 5/32"	3/8" x 1/4"	1/2" x 3/8"

\*1: Refer to page 52 for details of the applicable tubing sizes.

\*: Please contact SMC if the manifold will be used with A → P flow.

## How to Order Manifold Base

**LLH 2 A - 05 - S 11**

**Body class**

Symbol	Body class
2	2
3	3
4	4

**Base type**

Symbol	Base type
A	Stacking

**Manifold stations**

Symbol	Manifold stations
02	2 stations
⋮	⋮
05	5 stations

**LQ2 integrated fitting**

**Tubing size for port P and L side connection \*1**

Symbol	Tubing size	Fittings	Body class
00	Plug	—	2 to 4
06	6 x 4	3	2
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8		
10	10 x 8	4	3
11	3/8" x 1/4"		
12	12 x 10		
12	12 x 10	5	4
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 52 for details of the applicable tubing sizes.

\*: Port P fitting of the manifold base is one size bigger than the body class. When ordering plug only, refer to Blanking plug (LQ series) in the **WEB catalog** after checking the fitting size.

**Tubing size for port P and R side connection \*1**

Symbol	Tubing size	Fittings	Body class
Nil	L side, R side same size		
00	Plug	—	2 to 4
06	6 x 4	3	2
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8		
11	3/8" x 1/4"	4	3
10	10 x 8		
11	3/8" x 1/4"		
12	12 x 10	5	4
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 52 for details of the applicable tubing sizes.

\*: Port P fitting of the manifold base is one size bigger than the body class. When ordering plug only, refer to Blanking plug (LQ series) in the **WEB catalog** after checking the fitting size.

## How to Order Valve

**LVH 2 0 A - S 07**

**Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø10

**Valve type**

Symbol	Valve type
0	N.C.

**Body type**

Symbol	Body type
A	Stacking type for manifold

**Lever operation**

Symbol	Type
Nil	Non-locking (self-reset)
L	Locking

**LQ2 integrated fitting**

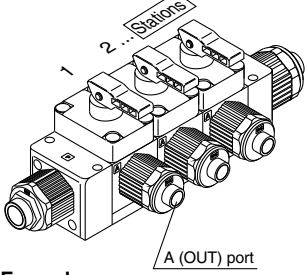
**Tubing size**

Symbol	Tubing size	Body class
03	ø3, 1/8"	2
04	ø4	
05	3/16"	
06	ø6	
07	1/4"	3
06	ø6	
07	1/4"	
08	ø8	
10	ø10	4
11	3/8"	
10	ø10	
11	3/8"	
12	ø12	
13	1/2"	

It is not possible to order single unit valves for the manifold. For details, refer to Maintenance 4. in the High Purity Chemical Liquid Valve Precautions 2 on page 52.

**How to Order Manifold Assembly (Example)**

Enter the part number of the valves to be mounted together with the manifold base part number.



Stations are counted from station 1 on the left side, with the A (OUT) ports in front.

**<Example>**

- LLH2A-03-S11 ..... 1 set    Manifold base part no.
- \* LVH20A-S07 ..... 2 sets    Valve part no. (Stations 1 & 2)
- \* LVH20AL-S07 ..... 1 set    Valve part no. (Station 3)

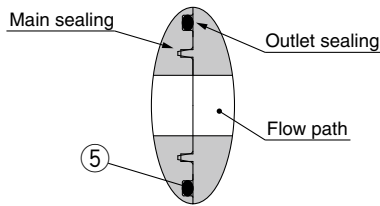
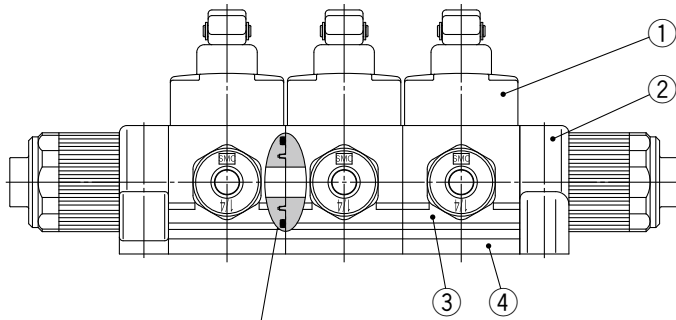
• Prefix the asterisk to the part no. of the valves, etc.

Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

**Integrated Fitting Type Manifold Variations**

		Model	LVH20	LVH30	LVH40
Manifold material			PFA		
Tubing size			1/4		
Orifice diameter			ø4	ø8	ø10
Valve type			N.C.		
Type	Symbol		○	○	○
<b>Manifold</b>					

**Construction**



**Manifold body connection**

**Component Parts**

No.	Description	Material
1	Actuator section	PP
2	Manifold	PFA
3	Body	PFA
4	End plate	PPS
5	O-ring	FKM

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

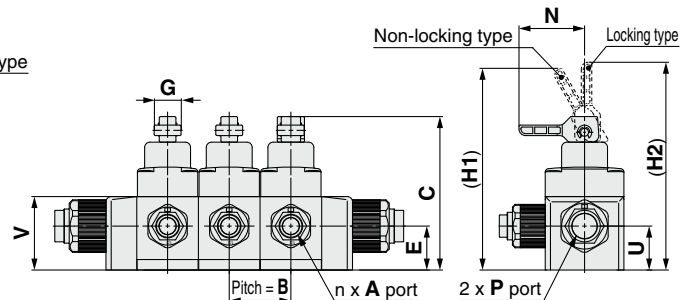
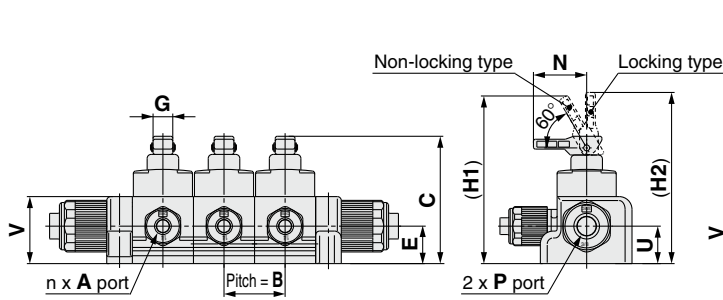
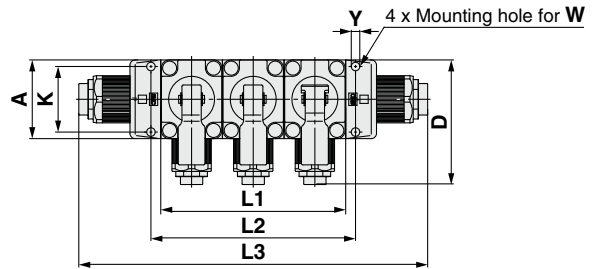
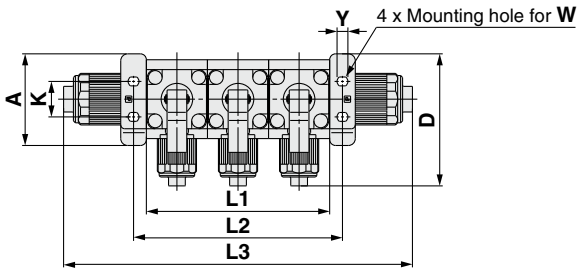
# LVH Series

## Dimensions

LLH□A- Stations -□□

Size 2

Size 3, 4



### Dimensions

[mm]

Model	A	B	C	D	E	G	H1	H2	K	N	U	V	W	Y
LLH2A	46.5	31	65	67	19	10	85.5	87	18	27	19	34	M4	5.5
LLH3A	47	36.5	94.5	76	27.5	19	125.5	127.5	39	37	27.5	47	M5	6.5
LLH4A	60	47	115	95	33.5	20.5	154	158	50	50	33.5	56	M6	7.5

[mm]

Model	Station Symbol	[mm]			
		2	3	4	5
LLH2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	146	177	208	239
LLH3A	L1	73	109.5	146	182.5
	L2	84	120.5	157	193.5
	L3	183	219.5	256	292.5
LLH4A	L1	94	141	188	235
	L2	109	156	203	250
	L3	219	266	313	360





# LVH Series Threaded Type Manifolds

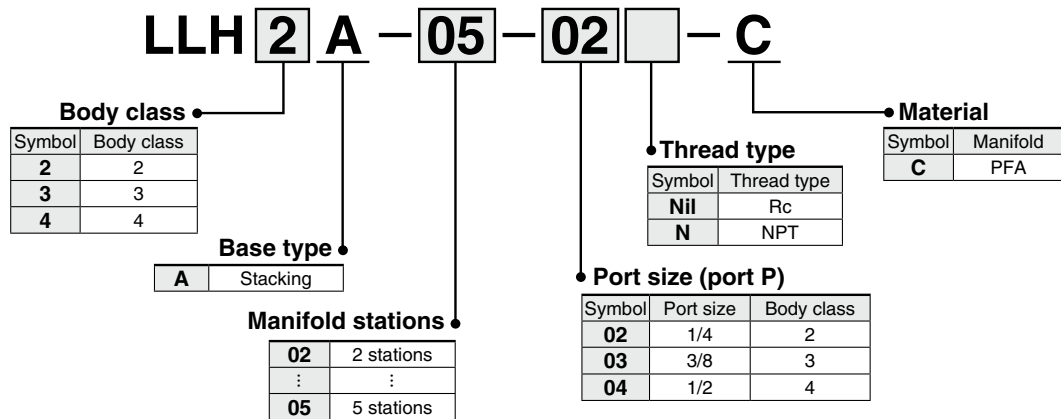


## Manifold Specifications

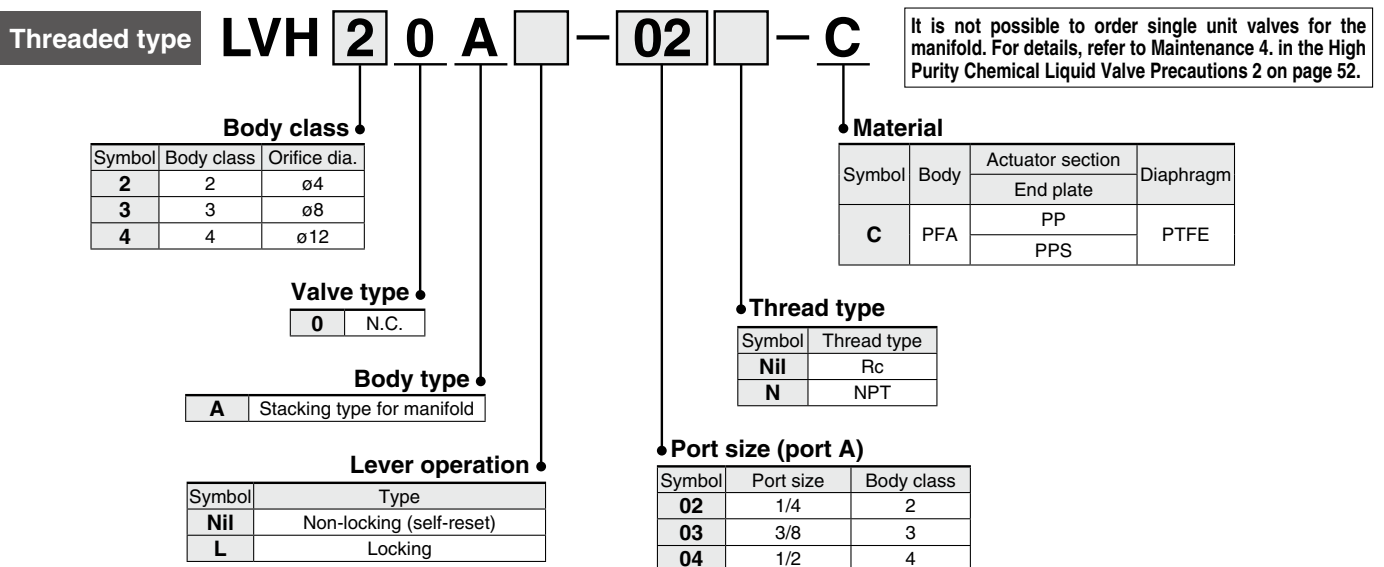
Model	LLH2A	LLH3A	LLH4A
Manifold type	Stacking		
P (IN), A (OUT) type	Common IN/Individual OUT		
Valve stations	2 to 5 stations		
Port size (port P)	1/4	3/8	1/2
Port size (port A)	1/4	3/8	1/2

\*: Please contact SMC if the manifold will be used with flow A → P.

## How to Order Manifold Base

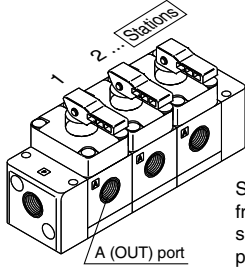


## How to Order Valve



**How to Order Manifold Assembly (Example)**

Enter the part number of the valves to be mounted together with the manifold base part number.



Stations are counted from station 1 on the left side, with the A (OUT) ports in front.

**<Example>**

- LLH2A-03-02-C ..... 1 set    **Manifold base part no.**
- \* LVH20A-02-C ..... 2 sets    **Valve part no. (Stations 1 & 2)**
- \* LVH20AL-02-C ..... 1 set    **Valve part no. (Station 3)**

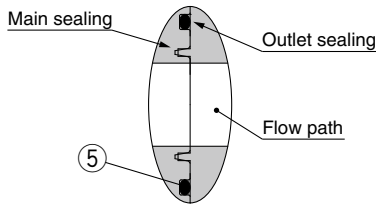
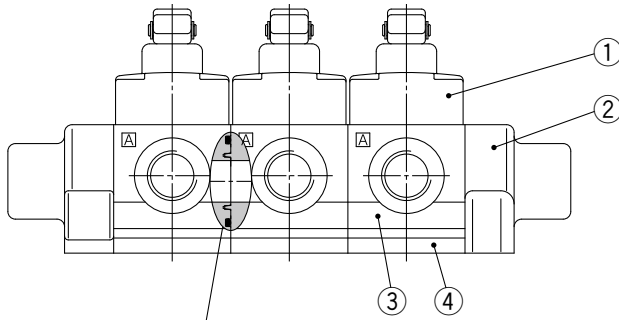
• Prefix the asterisk to the part no. of the valves, etc.

Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

**Threaded Type Manifold Variations**

Type	Symbol	Model	LVH20	LVH30	LVH40
		Manifold material	PFA		
		Port size	1/4	3/8	1/2
		Orifice diameter	ø4	ø8	ø12
		Valve type	ø4	ø8	ø12
<b>Manifold</b>	 Non-locking    Locking	N.C.	○	○	○

**Construction**



**Manifold body connection**

**Component Parts**

No.	Description	Material
1	<b>Actuator section</b>	PP
2	<b>Manifold</b>	PFA
3	<b>Body</b>	PFA
4	<b>End plate</b>	PPS
5	<b>O-ring</b>	FKM

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

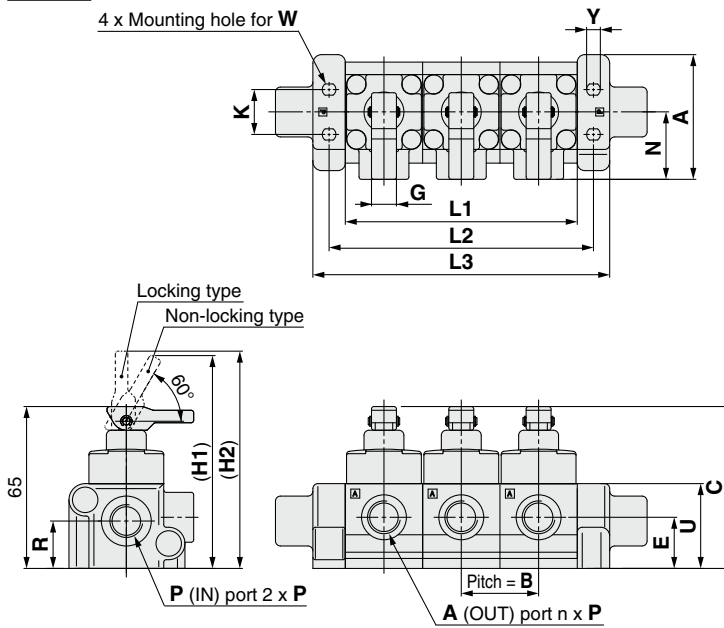
Organic Solvents Compatible  
**LVH**

# LVH Series

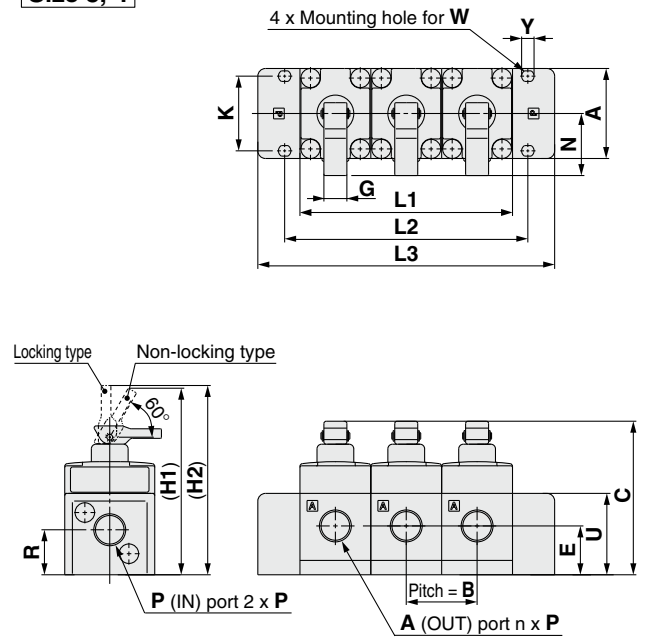
## Dimensions

LLH□A- Stations -□□-C

Size 2



Size 3, 4



### Dimensions

Model	A	B	C	E	G	H1	H2	K	N	P	R	U	W	Y
LLH2A	50	31	65	20.5	10	85.5	87	18	27	Rc1/4, NPT1/4	19	34	M4	5.5
LLH3A	47	37	90	25.5	19	112.5	114.5	39	37	Rc3/8, NPT3/8	23.5	42.5	M5	6.5
LLH4A	60	47	107	29	20.5	146	150	50	50	Rc1/2, NPT1/2	24	48	M6	7.5

Model	Station Symbol	[mm]			
		2	3	4	5
LLH2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	118	149	180	211
LLH3A	L1	74	111	148	185
	L2	90	127	164	201
	L3	118	155	192	229
LLH4A	L1	94	141	188	235
	L2	112	159	206	253
	L3	144	191	238	285



# Manually Operated, Organic Solvents Compatible Double Ferrule Fittings/Metal Gasket Seal Fittings/Integrated Tubing

# LVH□M Series

## How to Order Valve

LVH 2 0 M - D 07 - AD - □

### Body class

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø12
5	5	ø20
6	6	ø22

### Fitting type

Symbol	Type
D	With double ferrule fittings
G	With metal gasket seal fittings
T	Integrated tubing

### Option

Nil	None
E	Body wetted parts equivalent to EP grade

### Applicable tubing size

Symbol	Connecting tubing size	Body class				
		2	3	4	5	6
<b>Metric size</b>						
06	ø6	○				
10	ø10		○			
12	ø12			○		
19	ø19				○	
<b>Inch size</b>						
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

### Material

Symbol	Body	Actuator section	Diaphragm	Seal	Buffer
AD	Stainless steel	ADC	PTFE	FKM	FKM
ND	Stainless steel			EPDM	EPDM

\*: Metric size is only available for fitting types D and T.

## Standard Specifications



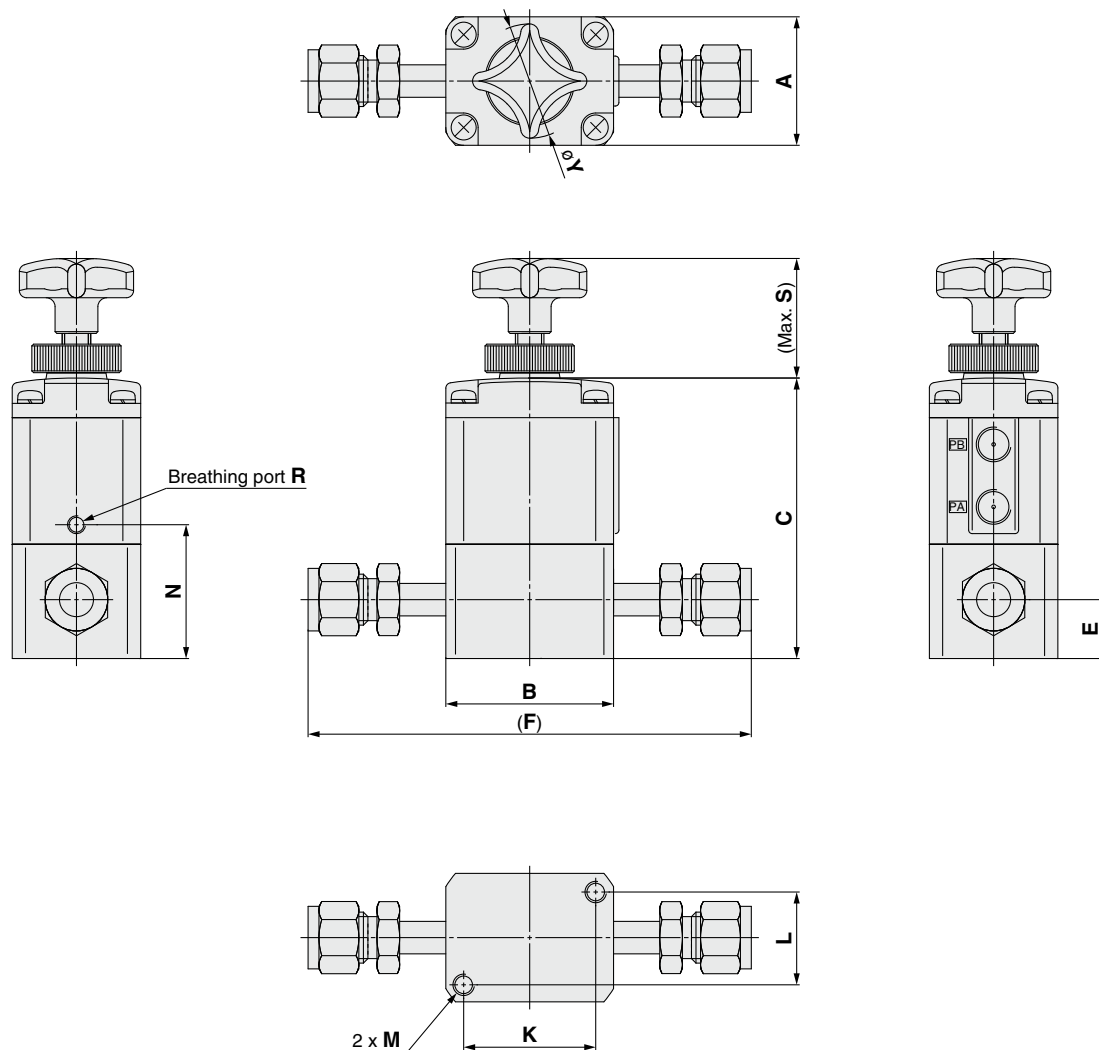
LVH20M-D07-AD  
Double ferrule fittings

Model		LVH20M	LVH30M	LVH40M	LVH50M	LVH60M
Tubing O.D.	Metric size <sup>*1</sup>	6	10	12	19	—
	Inch size	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø12	ø20	ø22
Flow rate characteristics	Kv	0.3	1.4	2.8	5.1	6.8
	Cv	0.35	1.7	3.3	6	8
Withstand pressure [MPa]		1				
Operating pressure [MPa] <A → B flow>		0 to 0.5				
Valve leakage [cm <sup>3</sup> /min]		0 (with water pressure)				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				
Fitting type		With double ferrule fittings, With metal gasket seal fittings, Integrated tubing				

\*1: Metric size is only available for fitting types D and T.

## Dimensions

Body material: Stainless steel  
 With double ferrule fittings



Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

## Dimensions

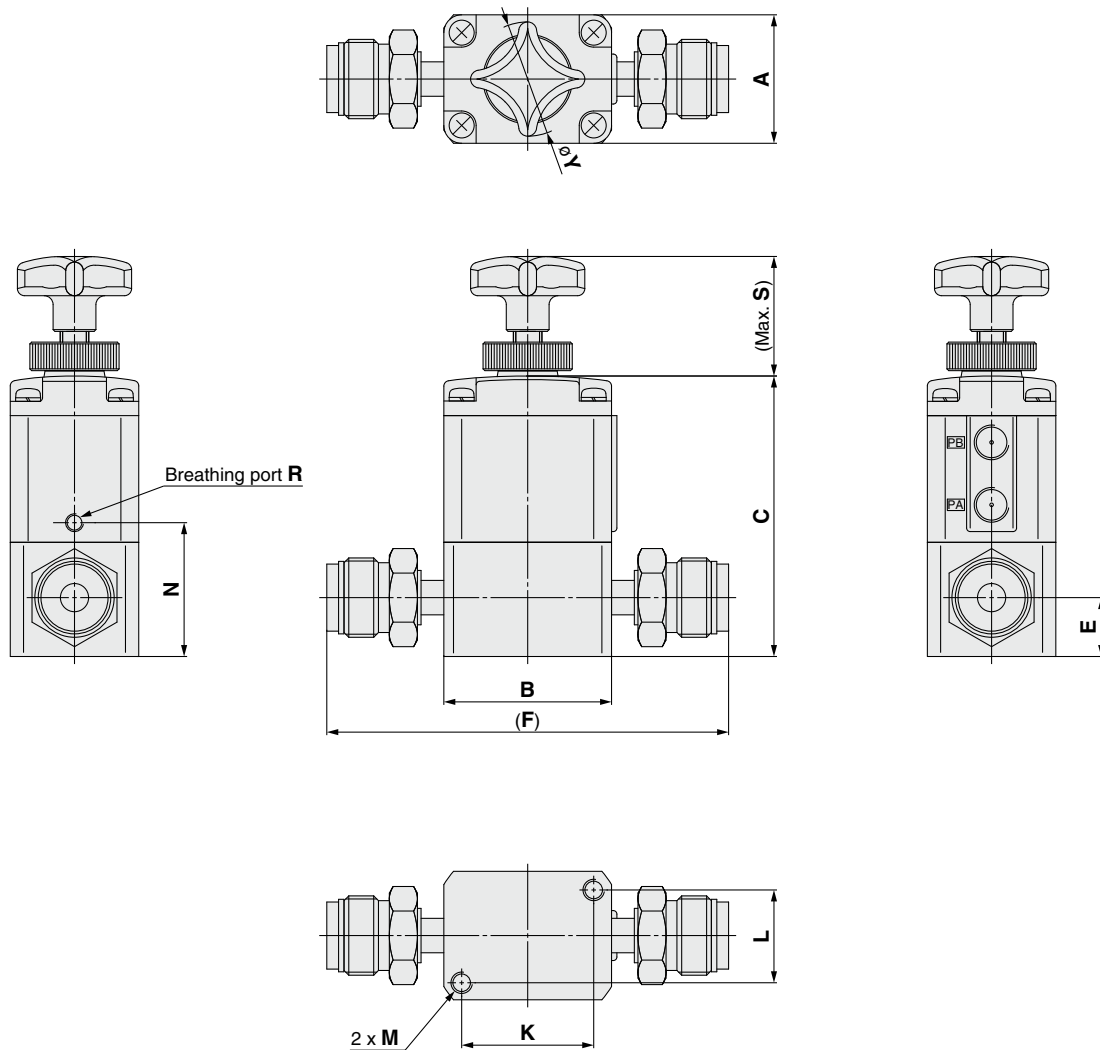
[mm]

Model	A	B	C	E	F	K	L	M	N	R	S	Y
LVH20M-D□-AD ND	30	30	54.5	12	96.4	22	22	M5 x 0.8 Thread depth 5	25.5	M3 x 0.5	31.1	32
LVH30M-D□-AD ND	36	47	78.6	16.5	127	37	26	M6 x 1 Thread depth 8	37.5	M5 x 0.8	35.9	32
LVH40M-D□-AD ND	46	60	85.9	16.5	147.2	47.5	33.5	M8 x 1.25 Thread depth 10	40	M5 x 0.8	44	40
LVH50M-D19-AD ND	58	75	120	23	166.8	60	43	M8 x 1.25 Thread depth 10	55	M5 x 0.8	55.1	50
LVH60M-D25-AD ND	58	75	129	27	190.2	60	43	M8 x 1.25 Thread depth 10	64	M5 x 0.8	55.1	50

# LVH□M Series

## Dimensions

Body material: Stainless steel  
With metal gasket seal fittings



## Dimensions

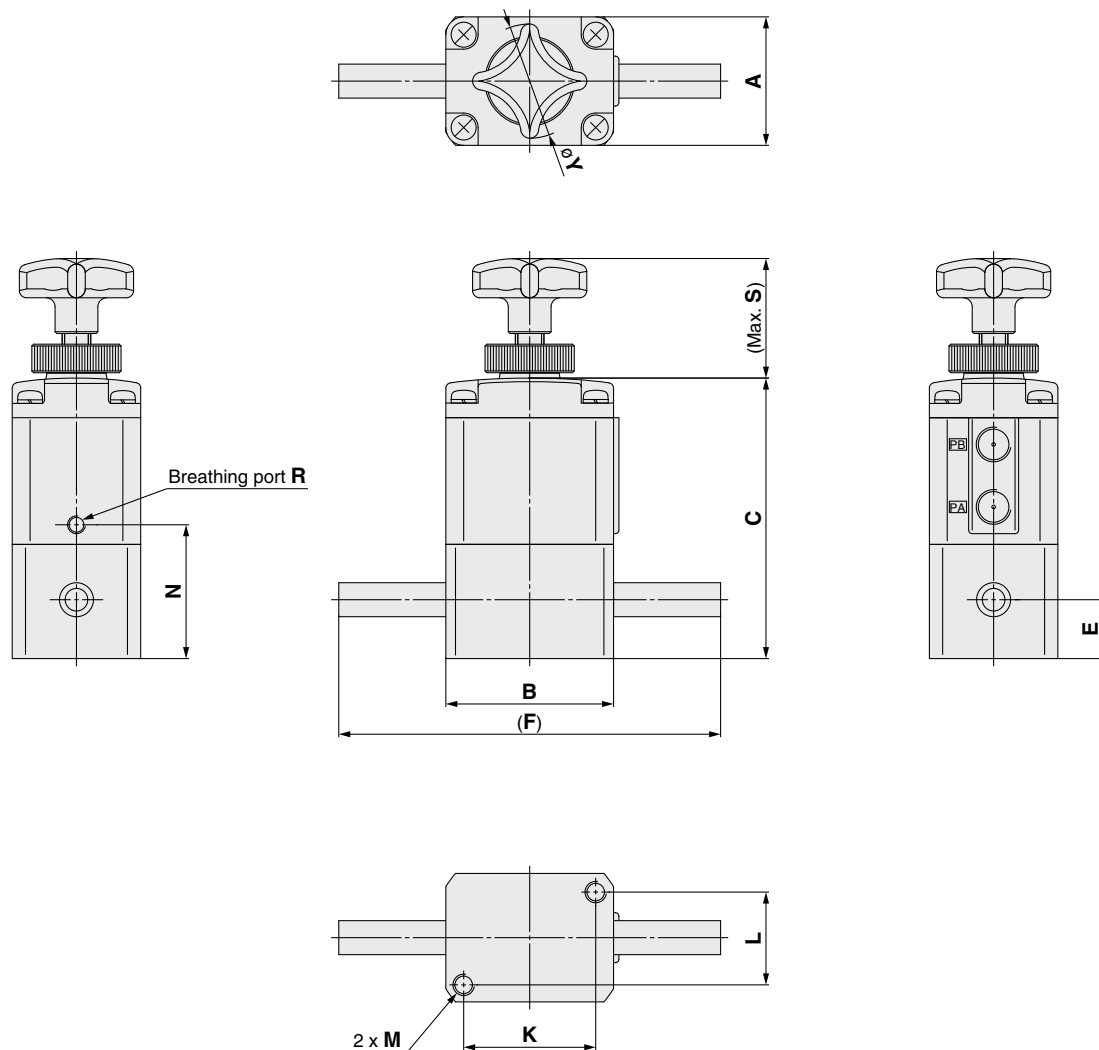
[mm]

Mode	A	B	C	E	F	K	L	M	N	R	S	Y
LVH20M-G07-AD ND	30	30	54.5	12	91	22	22	M5 x 0.8 Thread depth 5	25.5	M3 x 0.5	31.1	32
LVH30M-G11-AD ND	36	47	78.6	16.5	112.6	37	26	M6 x 1 Thread depth 8	37.5	M5 x 0.8	35.9	32
LVH40M-G13-AD ND	46	60	85.9	16.5	131.6	47.5	33.5	M8 x 1.25 Thread depth 10	40	M5 x 0.8	44	40
LVH50M-G19-AD ND	58	75	120	23	178.2	60	43	M8 x 1.25 Thread depth 10	55	M5 x 0.8	55.1	50
LVH60M-G25-AD ND	58	75	129	27	192.8	60	43	M8 x 1.25 Thread depth 10	64	M5 x 0.8	55.1	50



## Dimensions

Body material: Stainless steel  
 Integrated tubing



Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

## Dimensions

[mm]

Model	A	B	C	E	F	K	L	M	N	R	S	Y
LVH20M-T□-AD ND	30	30	54.5	12	70	22	22	M5 x 0.8 Thread depth 5	25.5	M3 x 0.5	31.1	32
LVH30M-T□-AD ND	36	47	78.6	16.5	107	37	26	M6 x 1 Thread depth 8	37.5	M5 x 0.8	35.9	32
LVH40M-T□-AD ND	46	60	85.9	16.5	120	47.5	33.5	M8 x 1.25 Thread depth 10	40	M5 x 0.8	44	40
LVH50M-T19-AD ND	58	75	120	23	155	60	43	M8 x 1.25 Thread depth 10	55	M5 x 0.8	55.1	50
LVH60M-T25-AD ND	58	75	129	27	155	60	43	M8 x 1.25 Thread depth 10	64	M5 x 0.8	55.1	50

# Fittings and Special Tools

## Fittings

### Changing Tubing Sizes

The tubing size can be changed within the same body class (body size) by replacing the nut and insert bushing.

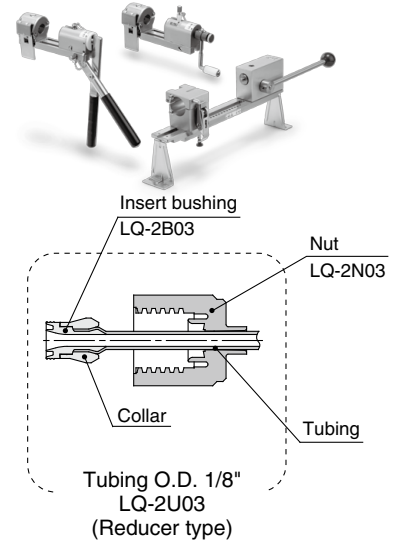
Body class	Tubing O.D.														
	Metric size							Inch size							
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

### Part Components

	Component parts		
	Nut	Insert	Collar (insert assembly)
○ Basic size	Yes	Yes	No
● Reducer type	Yes	Yes	Yes

### ⚠ Caution

- Connect tubing with special tools.**  
Refer to the catalog "High-Purity Fluoropolymer Fittings Hyper Fittings/LQ1, 2 Series Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from the SMC website.)

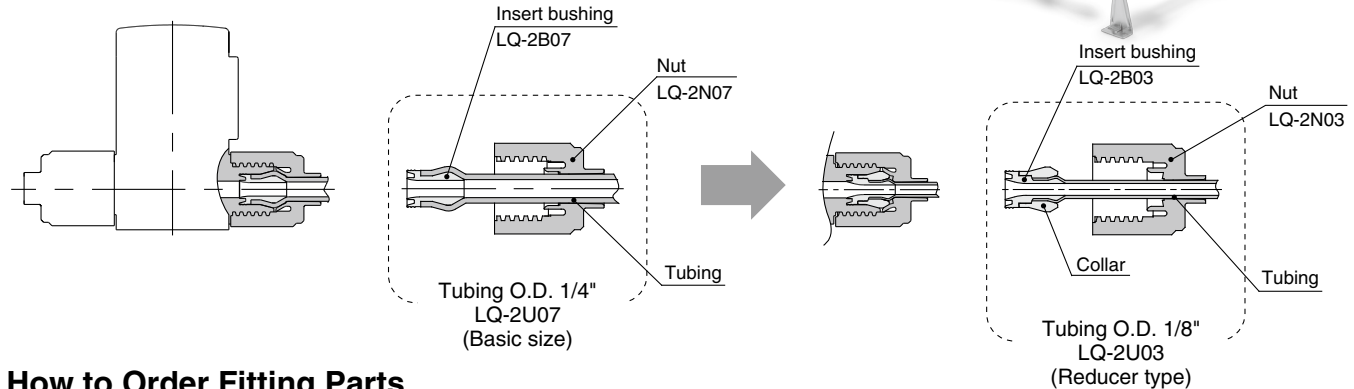


### Changing the tubing size

Example) Changing the tubing from an O.D. 1/4" to O.D. 1/8" in body class 2.

Prepare an insert bushing and nut for 1/8" O.D. tubing (LQ-2U03) and change the tubing size. (Refer to How to Order Fitting Parts.)

\*: Tubing is sold separately.



### How to Order Fitting Parts

**LQ** □ — **2** **U** **03**

\*: Type U is recommended when changing tubing sizes.

#### Fitting type

Symbol	Applicable fitting
Nil	LQ2
1	LQ1

#### Body class (fittings)

Symbol	Body class (fittings)	Applicable fitting
2	2	LQ1
3	3	
4	4	LQ2
5	5	LQ1
6	6	

#### Part type

Symbol	Type
U	Insert bushing & nut
B	Insert bushing
N	Nut

#### Tubing size\*1

Symbol	Tubing size	Body class (fittings)	Applicable fitting
03	1/8" x 0.086", 3 x 2	2	LQ1 LQ2
04	4 x 3		
05	3/16" x 1/8"		
06	6 x 4		
07	1/4" x 5/32"		
06	6 x 4		
08	8 x 6	3	
10	10 x 8		
07	1/4" x 5/32"		
11	3/8" x 1/4"		
10	10 x 8	4	
12	12 x 10		
11	3/8" x 1/4"		
13	1/2" x 3/8"	5	
12	12 x 10		
13	1/2" x 3/8"	6	
19	3/4" x 5/8", 19 x 16		
19	3/4" x 5/8", 19 x 16		
25	1" x 7/8", 25 x 22		LQ1

\*1: Refer to page 52 for details of the applicable tubing sizes.



LV□ Series

# Applicable Fluids

## High Purity Air and Manually Operated Chemical Liquid Valves Material and Fluid Compatibility Check List

Chemicals	Body material			Diaphragm material		
	Stainless steel 316	Fluoro resin PFA	Polyphenylene sulfide resin PPS	Fluoro resin PTFE	Nitrile rubber NBR	Ethylene propylene rubber EPR
Acetone	○	○*1	○*1	○*2	×	×
Ammonium hydroxide	○	○	○	○*2	×	×
Isobutyl alcohol	○	○*1	○*1	○*2	○	○
Isopropyl alcohol	○	○*1	○*1	○*2	○	○
Hydrochloric acid	×	○	○	○	×	×
Ozone (dry)	○	○	○	○	×	○
Hydrogen peroxide Concentration 5% or less, 50°C or less	×	○	○	○	×	×
Ethyl acetate	○	○*1	○*1	○*2	×	×
Butyl acetate	○	○*1	○*1	○*2	×	×
Nitric acid (except fuming nitric acid) Concentration 10% or less	×	○	○	○*2	×	×
DI water (deionized water)	○	○	○	○	×	○
Sodium hydroxide (caustic soda) Concentration 50% or less	○	○	○	○	×	×
Nitrogen gas	○	○	○	○	○	○
Ultrapure water	×	○	○*3	○	×	×
Toluene	○	○*1	○*1	○*2	×	×
Hydrofluoric acid	×	○	×	○*2	×	×
Sulfuric acid (except fuming sulfuric acid)	×	○	×	○*2	×	×
Phosphoric acid Concentration 80% or less	×	○	×	○	×	×

The material and fluid compatibility check list provides reference values as a guide only.

\*1: Use a stainless steel body, as static electricity may be generated.

\*2: Use caution as permeation may occur. The permeated fluid may effect the parts of other materials.

\*3: This product has corrosion resistance. However, due to the elution of components, the preservation of the purity level of ultrapure water cannot be guaranteed.

Table symbols ○ : Can be used or can be used under certain conditions.  
× : Cannot be used.

- Compatibility is indicated for fluid temperatures of 100°C or less.
  - The material and fluid compatibility check list provides reference values as a guide only, therefore we do not guarantee the application to our product.
  - The data above is based on the information presented by the material manufacturers.
  - SMC is not responsible for its accuracy and any damage happened because of this data.
  - Set the viscosity of a fluid to 300 cp or less.
- If a fluid with a high viscosity is used, this may cause inadequate closing of the valve.



# LV□ Series High Purity Chemical Liquid Valve Precautions 1

Be sure to read this before handling the products.  
Refer to the back cover for Safety Instructions.

## Design / Selection

### Warning

#### 1. Check the specifications.

Give careful consideration to operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalog.

#### 2. Fluids

Operate after confirming the compatibility of the product's component materials with fluids, using the check list on page 50. Please contact SMC regarding fluids other than those in the check list. Operate within the indicated fluid temperature range.

#### 3. Maintenance space

Ensure the necessary space for maintenance and inspections.

#### 4. Fluid pressure range

Keep the supplied fluid pressure within the operating pressure range shown in the catalog.

#### 5. Ambient environment

Install in an environment where there is no effect from radiant heat caused by heat sources, etc., and use within the ambient temperature range. After confirming the compatibility of the product's component materials with the ambient environment, operate so that fluid does not adhere to the product's exterior surfaces.

#### 6. Liquid seals

When circulating fluid:

Provide a relief valve in the system so that fluid does not get into the liquid seal circuit.

#### 7. Countermeasures for static electricity

Since static electricity may be generated depending on the fluid being used, implement suitable countermeasures.

## Mounting

### Warning

#### 1. If air leakage increases or equipment does not operate properly, stop operation.

After mounting, perform suitable function and leak tests to confirm that the mounting is correct.

#### 2. Operation Manual

Mount and operate the product after reading the manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

## Piping

### Caution

#### 1. Preparation before piping

Before piping is connected, it should be thoroughly flushed out with air or washed to remove chips, cutting oil and other debris from inside the pipe.

Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.

#### 2. Use the tightening torques shown below for the pilot port.

##### Tightening Torque for Operating Port

Operating port	Torque [N·m]
M5	1/6 turn with a tightening tool after first tightening by hand
Rc, NPT1/8	0.8 to 1.0

## Piping

### Caution

#### 3. Use of metal fittings

Do not use metal fittings for piping on taper threads made of resin, as this may cause damage to the threads.

##### LVA PPS Body Ported Tightening Torque for Fittings

Size	Breaking torque [N·m]	Tightening torque [N·m]	Guideline for tightening torque (Number of turns)
LVA20	2 to 3	0.5 to 1	2 to 3 turns
LVA30	6 to 8	2 to 3	3 to 4 turns
LVA40	11 to 14	5 to 7	3 to 4 turns
LVA50	18 to 20	8 to 10	3 to 4 turns

\*: Guideline for tightening torque

Number of turns when the fitting is screwed into the body with 2 to 3 windings of sealant tape applied to threaded portion of the piping. The value may differ for types other than sealant type.

#### 4. Use pilot ports and sensor (breathing) ports as indicated below.

	PA port	PB port	Sensor (breathing) port
N.C.	Pressure	Breathing	Breathing
N.O.	Breathing	Pressure	Breathing
Double acting	Pressure	Pressure	Breathing

For N.C. and N.O. types, the port which does not receive operating pressure is released to atmosphere. When intake and exhaust directly from the valve is not desired due to problems with the ambient environment or scattering of dust, etc., install piping and perform intake and exhaust at a location which does not present a problem.

#### 5. Connect tubing with special tools.

Refer to the catalog "High-Purity Fluoropolymer Fittings Hyper Fittings/LQ1, 2 Series Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from the SMC website.)



#### 6. SMC's G threads and thread depths

Body material: Stainless steel [mm]

	P	Q	R
LVA1	G1/8: 6.2	—	—
LVA20	G1/4: 9.4	G1/8: 6.2	—
LVA21/22	—	—	—
LVA3	G1/4: 9.4 G3/8: 9.7	—	—
LVA4	G3/8: 9.7 G1/2: 13	G1/8: 6.2	G1/8: 6.2
LVA5	G1/2: 13 G3/4: 14.5	—	—
LVA6	G1: 16.2	—	—

Body material: PPS [mm]

	P	Q	R
LVA1	G1/8: 6.2 G1/4: 9.4	—	—
LVA20	G1/4: 9.4	G1/8: 6.2	—
LVA21/22	—	—	—
LVA3	G3/8: 9.7	—	—
LVA4	G1/2: 13	G1/8: 6.2	G1/8: 6.2
LVA5	G3/4: 14.5	—	—

Body material: PFA [mm]

	P	R	U
LVA1	G1/8: 6.2 G1/4: 9.4	—	—
LVA20	G1/4: 9.4	G1/8: 6.2	—
LVA21/22	—	—	—
LVA3	G3/8: 9.7	—	—
LVA4	G1/2: 13	G1/8: 6.2	G1/8: 6.2
LVA5	G3/4: 14.5	—	—
LVA6	G1: 16.2	—	—



# LV□ Series High Purity Chemical Liquid Valve Precautions 2

Be sure to read this before handling the products.  
Refer to the back cover for Safety Instructions.

## Operating Air Supply

### Warning

#### 1. Use clean air.

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc., as this may cause damage or malfunction.

## Operating Environment

### Warning

1. Do not use in a location having an explosive atmosphere.
2. Do not operate in locations where vibration or impact occurs.
3. Do not use in locations where radiated heat will be received from nearby heat sources.
4. Do not use in environments which exceed the ambient temperature specifications of the product.

## Maintenance

### Warning

1. Maintenance should be performed in accordance with the procedures in the Operation Manual.  
Incorrect handling can cause damage or malfunction of machinery and equipment, etc.
2. Before removing equipment or compressed air supply/exhaust devices, shut off the air and power supplies, and exhaust compressed air from the system.  
Further, when restarting equipment after remounting or replacement, first confirm safety and then check the equipment for normal operation.
3. Perform work after removing residual chemicals and carefully replacing them with DI water (Deionized water) or air, etc.
4. Do not disassemble the product. Products which have been disassembled cannot be guaranteed.  
If disassembly is necessary, please contact SMC.
5. In order to obtain optimum performance from valves, perform periodic inspections to confirm that there are no leaks from valves or fittings, etc.

### Caution

1. Removal of drainage  
Flush drainage from filters regularly.

## Handling

### Warning

1. Operate within the ranges of the maximum operating pressure and back pressure.

## Handling

### Caution

#### 1. When the diaphragm is made of PTFE

Please note that when the product is shipped from the factory, gases such as N<sub>2</sub> and air may leak from the valve at a rate of 1 cm<sup>3</sup>/min (when pressurized).

2. When operated at a very low flow rate, the LV□ series with flow rate adjustment may vibrate, etc. depending on the operating conditions. Therefore, operate it after careful examination of the flow rate, pressure and piping conditions.
3. In the LV□ series, water hammering may occur depending on the fluid pressure conditions. In most cases, improvement is possible by adjusting the pilot pressure with a speed controller, etc., but the flow rate, pressure and piping conditions should be reviewed.
4. To adjust the flow rate for the LV□ series with flow rate adjustment, open gradually starting from the fully closed state.

Opening is accomplished by turning the adjustment knob counterclockwise. Additionally, do not apply excessive force to the adjustment knob when nearing a fully open or closed state. This may result in deformation of the orifice sheet surface or damage to the threaded portion of the adjustment knob. It is in the fully closed state when the product is shipped from the factory.

5. After a long period of nonuse, perform a test run before beginning regular operation.
6. Since the LVC is packaged in a clean room, use sufficient care in handling when opened.
7. Take extra care when setting the operating direction and when handling the lever of the LVH series.

## Use of Tubing

### Caution

1. Refer to the applicable tubing sizes shown below for tubing to be used.

#### Applicable Tubing Sizes

	Connecting tubing size	O.D. [mm]		Internal thickness [mm]	
		Standard size	Tolerance	Standard size	Tolerance
Metric size	ø3 x ø2	3.0	+0.2 -0.1	0.5	±0.06
	ø4 x ø3	4.0			
	ø6 x ø4	6.0			
	ø8 x ø6	8.0	+0.3 -0.1	1.0	±0.1
	ø10 x ø8	10.0			
	ø12 x ø10	12.0			
	ø19 x ø16	19.0	+0.3 -0.1	1.5	±0.15
ø25 x ø22	25.0				
Inch size	1/8" x 0.086"	3.18	+0.2 -0.1	0.5	±0.1
	3/16" x 1/8"	4.75		0.8	
	1/4" x 5/32"	6.35		1.2	±0.12
	3/8" x 1/4"	9.53	+0.3 -0.1	1.6	±0.15
	1/2" x 3/8"	12.7			
	3/4" x 5/8"	19.0	+0.3 -0.1	1.6	±0.15
	1" x 7/8"	25.4			



**LV□ Series**

# High Purity Chemical Liquid Valve Precautions 3

Be sure to read this before handling the products.  
Refer to the back cover for Safety Instructions.

## Return of Product

### **Warning**


If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC's approval and further instructions before attempting to return the item.


Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.


If you have any further questions, please don't hesitate to contact your SMC sales representative.

## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

\*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
 ISO 4413: Hydraulic fluid power – General rules relating to systems.  
 IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
 (Part 1: General requirements)  
 ISO 10218-1: Manipulating industrial robots – Safety.  
 etc.

### Warning

#### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

#### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

#### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

#### 1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.  
 If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.  
 If anything is unclear, contact your nearest sales branch.

### Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

#### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
 Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
 This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

#### \*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.  
 Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

#### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

#### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

#### Revision history

**Edition B** \* Body class 6, manifold specifications and options added to the LVC and LVA series.  
 \* Manifold specifications added to the LVH series.  
 \* Number of pages increased from 32 to 44. GR

**Edition C** \* 3 port added to the LVC and LVA series.  
 \* The models with indicator added to the LVC and LVA series. HX

**Edition D** \* Organic solvents compatible products (LVA/LVH) added.  
 \* Symbol changed.  
 \* LVC-Z type added.  
 \* Number of pages increased from 44 to 56. UR

## Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.