

# High Purity Chemical Liquid Valve

## LVC/LVA/LVH Series



**Air Operated Integrated Fitting Type LVC Series** ▶ P.159

- 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.171

- Diaphragm material PTFE, EPDM, NBR are selectable

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



**Manually Operated LVH Series** ▶ P.190  
Integrated Fitting Type/Threaded Type

- Locking and non-locking types available

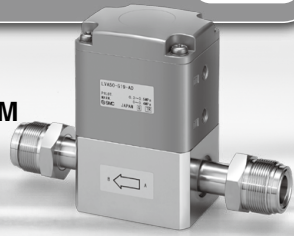
Body material: **New PFA/Stainless steel/PPS**



**Organic Solvents Compatible**

**Air Operated LVA Series** ▶ P.186

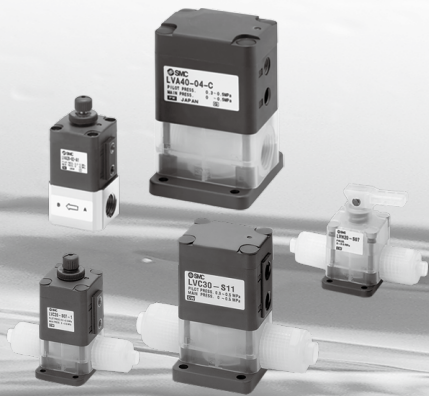
Body: **Stainless steel**  
Actuator section: **ADC**  
Buffer: Choose from **FKM/EPDM**



**Manually Operated LVH□M Series** ▶ P.201

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





## 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)

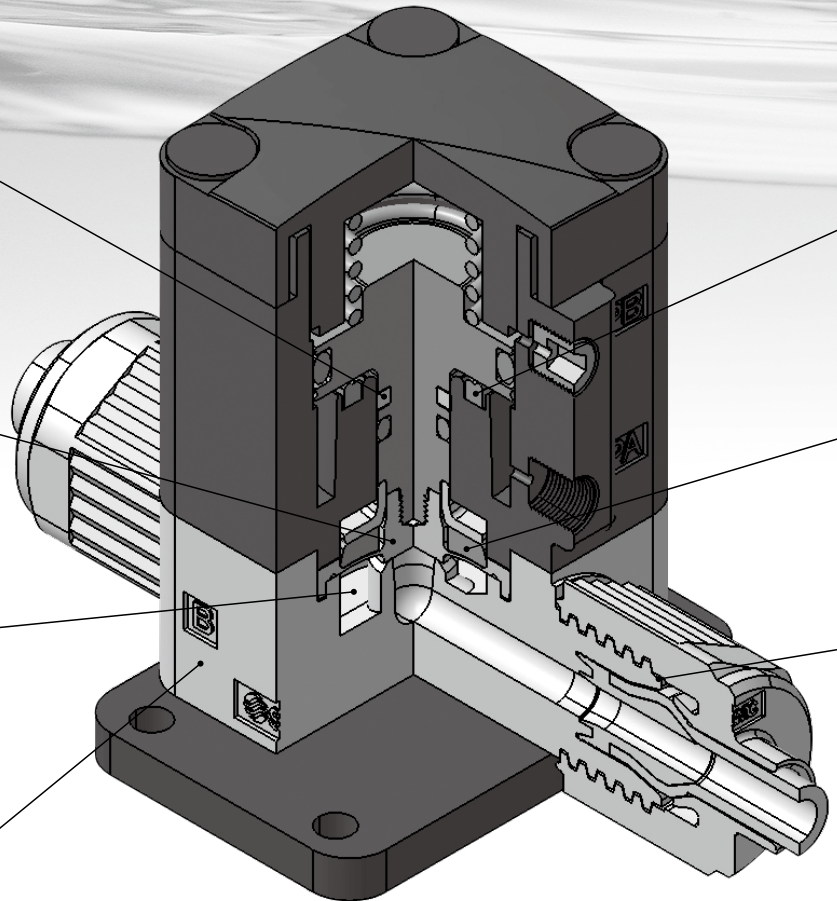
Special diaphragm construction ensures gentle opening and closing that prevents the generation of micro-bubbles.

## 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.186

Manually Operated

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

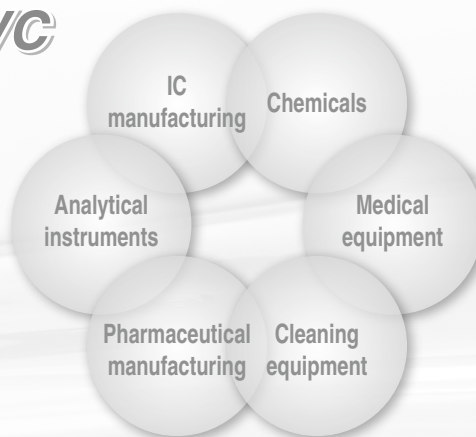
▶ P.201

- Body: **Stainless steel**, Actuator section: **ADC**, Buffer: **FKM/EPDM** (Select one)
- Fitting type: Compression fittings, Face 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

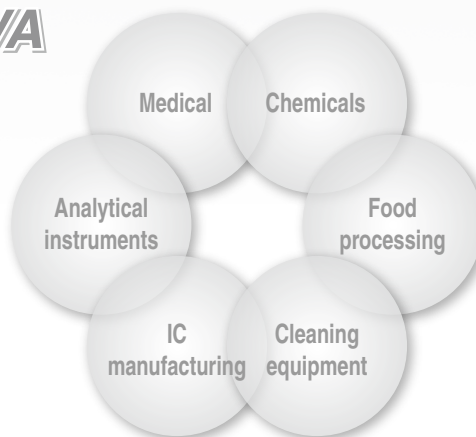


**Main Applications and Fields**

**LVC**



**LVA**



**LVH**



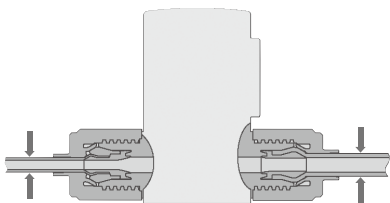
**Low particle generation Piston bumper**

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

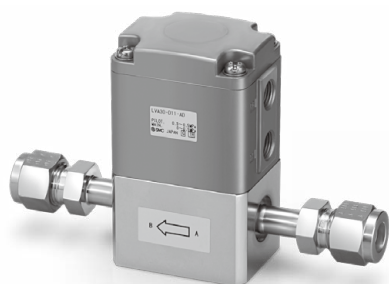
**Back-pressure resistance and long life Buffer**

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

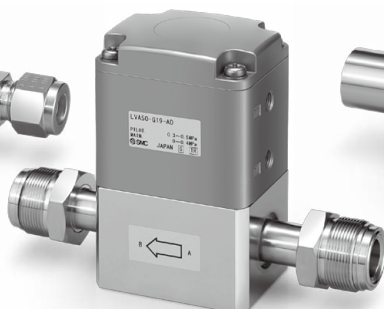
**Different tubing sizes can be selected Hyper fitting**



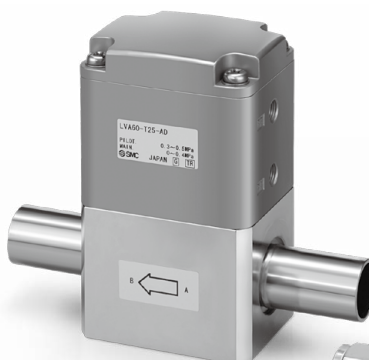
- No leak design (quadruple seal)
- Nut lock mechanism (sealing)
- High flexural strength (tubing supports)



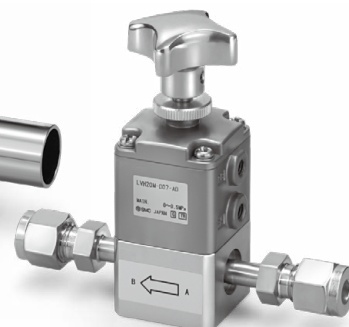
**LVA30-D11-AD**  
Compression fittings



**LVA50-G19-AD**  
Face seal fittings


















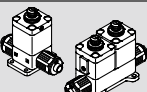


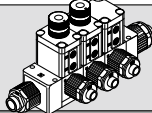
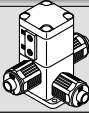

**LVA60-T25-AD**  
Integrated tubing



**LVH20M-D07-AD**  
Compression fittings

**Air Operated** Series Variations

Integrated Fitting Type *LVC* Series ▶ P.159

Type	Symbol	Valve type	Model				
			Orifice diameter				
			LVC2□	LVC3□	LVC4□	LVC5□	LVC6□
			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
Basic		   N.C. N.O. Double acting	N.C.	●	●	●	●
			N.O.	●	●	●	●
			Double acting	●	●	●	●
With flow rate adjustment		  N.C. Double acting	N.C.	●	●	●	●
			Double acting	●	●	●	●
With bypass		  N.C. Double acting	N.C.	—	●	●	—
			Double acting	—	●	●	—
With flow rate adjustment & bypass		  N.C. Double acting	N.C.	—	●	●	—
			Double acting	—	●	●	—
With indicator		 N.C.	N.C.	●	●	●	●
Suck back		  Single Unit	Single	●	—	—	—
			Unit	●	—	—	—
Manifold (Up to 5 stations)							
3-port		 N.C.	N.C.	●	—	—	—



**Air Operated Series Variations**

**Threaded Type LVA Series ▶ P.171**

Type	Symbol	Model	Orifice diameter		LVA1□		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□		
			Port size		ø2	ø4	ø8	ø12	ø20	ø22							
			Stainless steel 316	PPS	1/8	1/4	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	1		
Basic		N.C.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
			N.O.	—	—	●	●	●	●	●	●	●	●	●	●	●	●
			Double acting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
With flow rate adjustment		N.C.	—	—	●	●	●	●	●	●	●	●	●	●	●	●	
		Double acting	—	—	●	●	●	●	●	●	●	●	●	●	●	●	●
With bypass		N.C.	—	—	—	—	—	—	●	—	—	—	—	●	—	—	
		Double acting	—	—	—	—	—	—	●	—	—	—	—	●	—	—	—
With flow rate adjustment & bypass		N.C.	—	—	—	—	—	—	●	—	—	—	—	●	—	—	
		Double acting	—	—	—	—	—	—	●	—	—	—	—	●	—	—	—
With indicator		N.C.	—	—	●	●	●	●	●	●	●	●	●	●	●	●	
Manifold (Up to 5 stations)																	

\*1: Refer to page 171 for the applicable optional body materials.

Type	Symbol	Model	ø2	ø4	ø8	ø12	ø20	ø22
3-port		N.C.	—	—	—	● <sup>*2</sup>	—	—

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

**Organic Solvents Compatible Compression Fittings/Face Seal Fittings/Integrated Tubing**



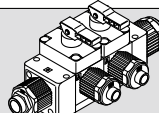
**LVA Series ▶ P.186**

Type	Symbol	Model	Orifice diameter		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□		
			Tubing O.D.		ø4	ø8	ø12	ø20	ø22						
			Metric	Inch	6	10	12	19	—						
Basic		N.C.	●	●	●	●	●	●	●	●	●	●	●	●	
			N.O.	●	●	●	●	●	●	●	●	●	●	●	●
			Double acting	●	●	●	●	●	●	●	●	●	●	●	●
With flow rate adjustment		N.C.	●	●	●	●	●	●	●	●	●	●	●	●	
		Double acting	●	●	●	●	●	●	●	●	●	●	●	●	
With indicator		N.C.	●	●	●	●	●	●	●	●	●	●	●		
High back pressure		N.C.	●	●	●	●	●	●	●	●	●	●	●	●	
		N.O.	●	●	●	●	●	●	●	●	●	●	●	●	
		Double acting	●	●	●	●	●	●	●	●	●	●	●	●	
High back pressure with flow rate adjustment		N.C.	●	●	●	●	●	●	●	●	●	●	●	●	
		Double acting	●	●	●	●	●	●	●	●	●	●	●	●	
High back pressure with indicator		N.C.	●	●	●	●	●	●	●	●	●	●	●		



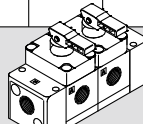
**Manually Operated** Series Variations

**LVH Series** ▶ P.190

**Integrated Fitting Type**


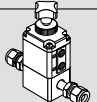
Type	Symbol	Model	Orifice diameter		
			Tubing O.D.		
			Metric	Inch	Valve type
Basic	 	N.C.	LVH20	LVH30	LVH40
			3, 4, 6 1/8, 3/16, 1/4	6, 8, 10 1/4, 3/8	10, 12 3/8, 1/2
Manifold (Up to 5 stations)					

**Threaded Type**

Type	Symbol	Model	Orifice diameter								
			Material								
			Port size								
Basic	 	N.C.	LVH20		LVH30			LVH40			
			1/8 1/4	1/4 1/4	1/4 3/8	3/8 3/8	3/8 3/8	3/8 1/2	1/2 1/2	1/2 1/2	
Manifold (Up to 5 stations)											

**Organic Solvents Compatible** Compression Fittings/Face Seal Fittings/Integrated Tubing

**LVH□M Series** ▶ P.201

Type	Symbol	Model	Orifice diameter				
			Tubing O.D.				
			Metric	Inch	Valve type	Material	Port size
Basic		N.C.	LVH20M	LVH30M	LVH40M	LVH50M	LVH60M
			6 1/4	10 3/8	12 1/2	19 3/4	— 1
Manifold (Up to 5 stations)							

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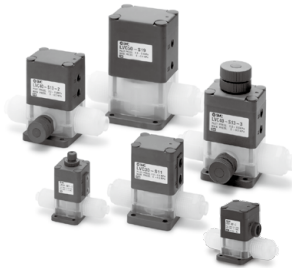
### <Series Variations>

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#### Air Operated

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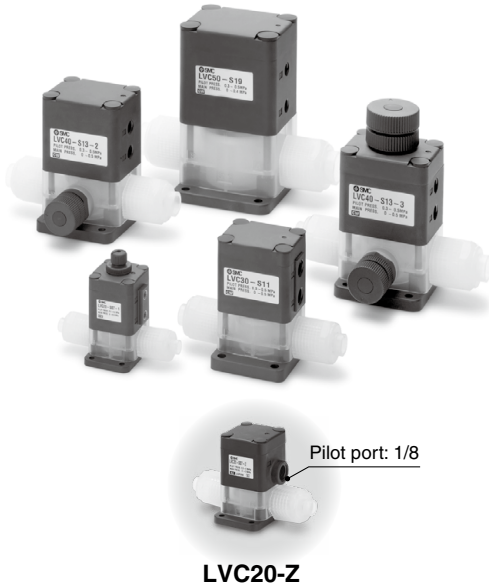
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## Standard Specifications



LVC20-Z

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 208 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.

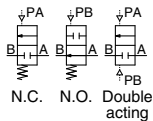
\*3: Applicable for the LVC21 (N.O.) and LVC22 (double acting) types

\*4: Applicable for the LVC20 (N.C.)-Z type

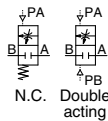
\*: Please contact SMC if the manifold will be used with vacuum and B → A flow.

### Symbol

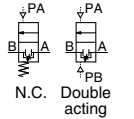
Basic/With indicator



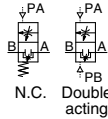
With flow rate adjustment



With bypass



With flow rate adjustment & bypass



## 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 205 for information on changing tubing sizes.

## ⚠ Precautions

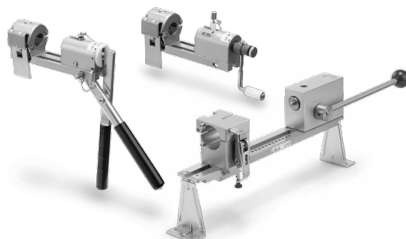
Be sure to read this before handling the products. Refer to page 501 for safety instructions, and pages 207 and 209 for high purity chemical liquid valve precautions.

### 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

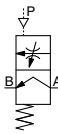
# LVC Series

## 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



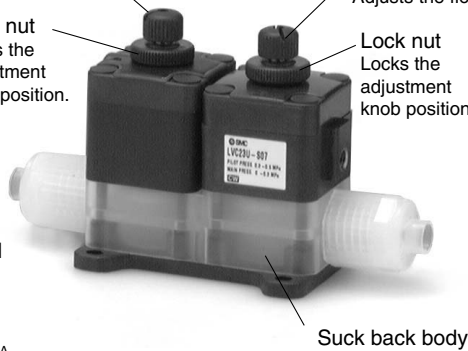
### Unit type

Adjustment knob  
Adjusts the amount of suck back.

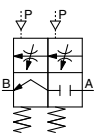
Lock nut  
Locks the adjustment knob position.

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 205 for details.

\*2: Refer to page 208 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

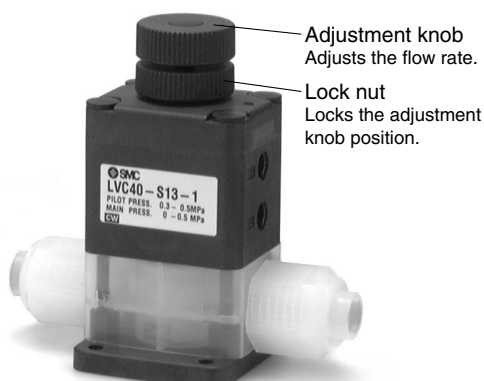
Symbol	Connecting tubing size	Body class
Metric size		
03	3 x 2	○
04	4 x 3	○
06	6 x 4	◎
Inch size		
03	1/8" x 0.086"	○
05	3/16" x 1/8"	○
07	1/4" x 5/32"	◎

◎ Basic size ○ With reducer

## Options

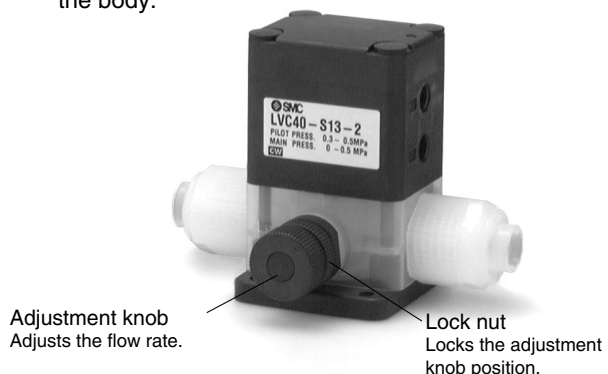
### ■ With flow rate adjustment

The flow rate is adjusted by controlling the diaphragm stroke.



### ■ With bypass

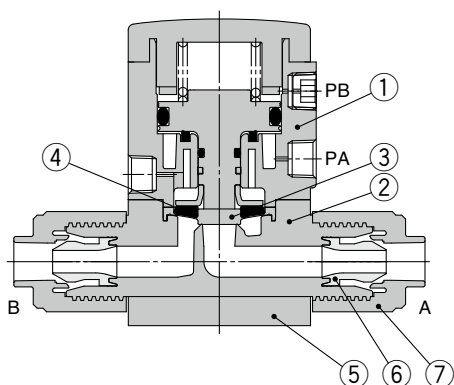
A small amount of fluid from the inlet side is allowed to flow continuously to the outlet side by providing a bypass inside the body.



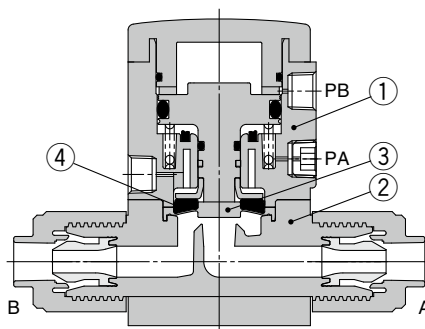


## Construction

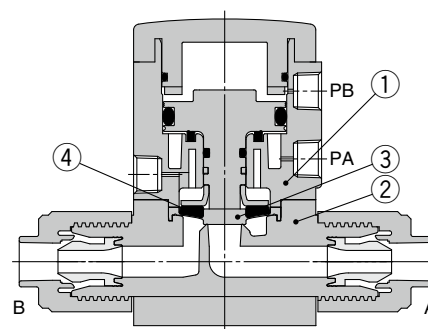
### Standard type N.C. type



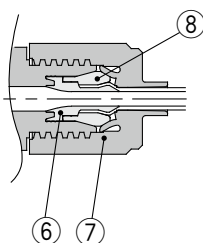
### N.O. type



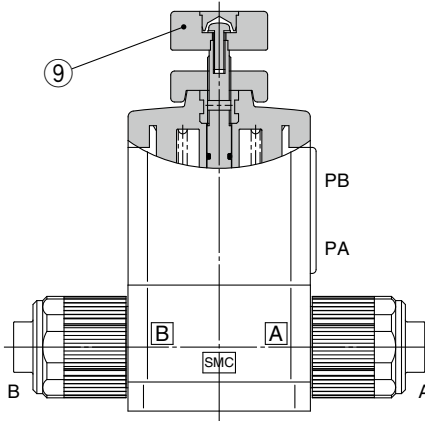
### Double acting type



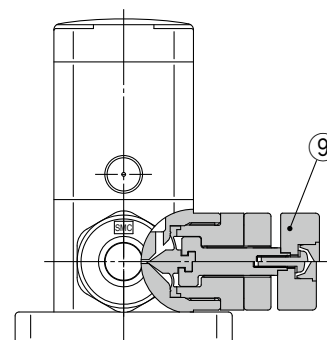
### With reducer



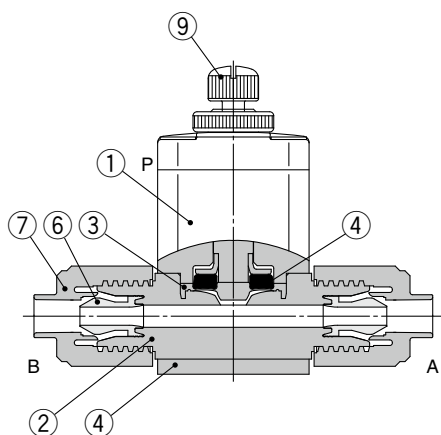
### With flow rate adjustment



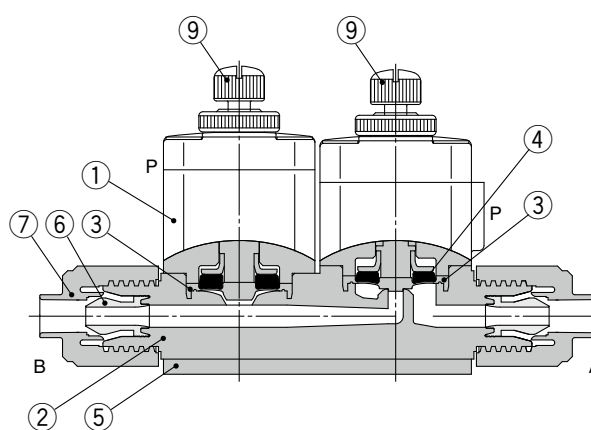
### With bypass



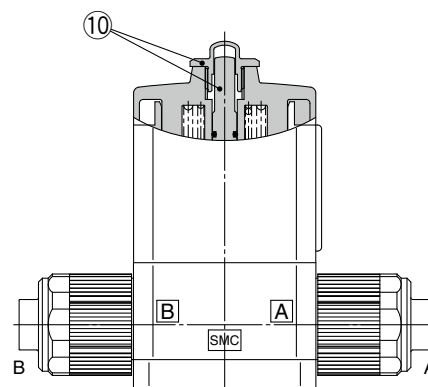
### Suck back (Single type)



### Suck back (Unit type)



### With indicator



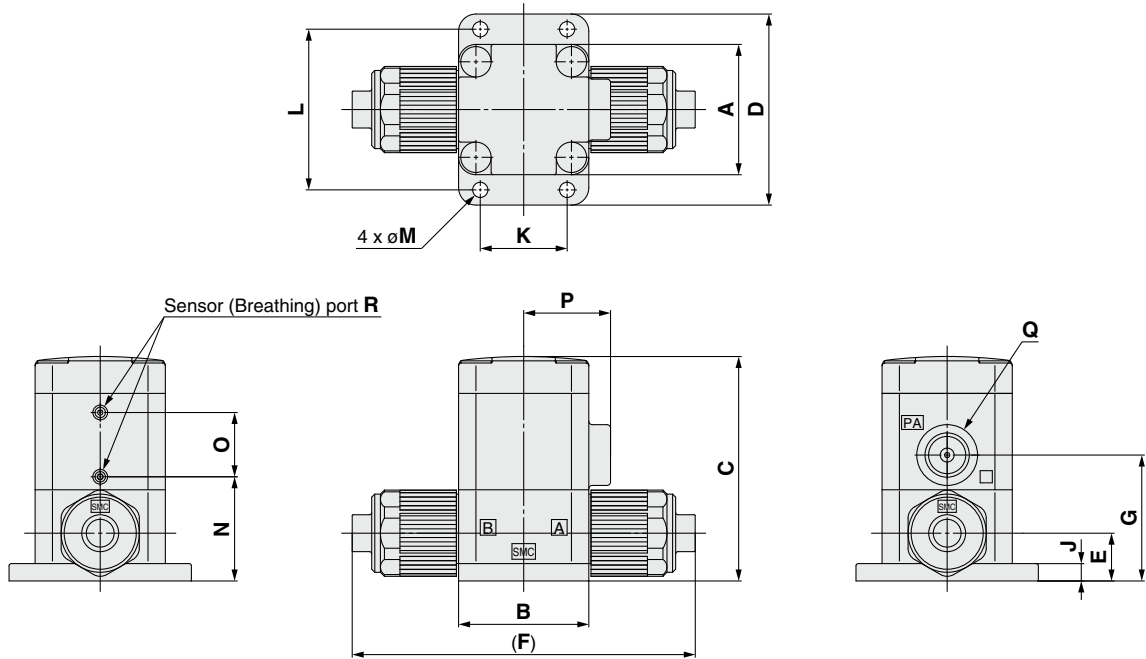
### Component Parts

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

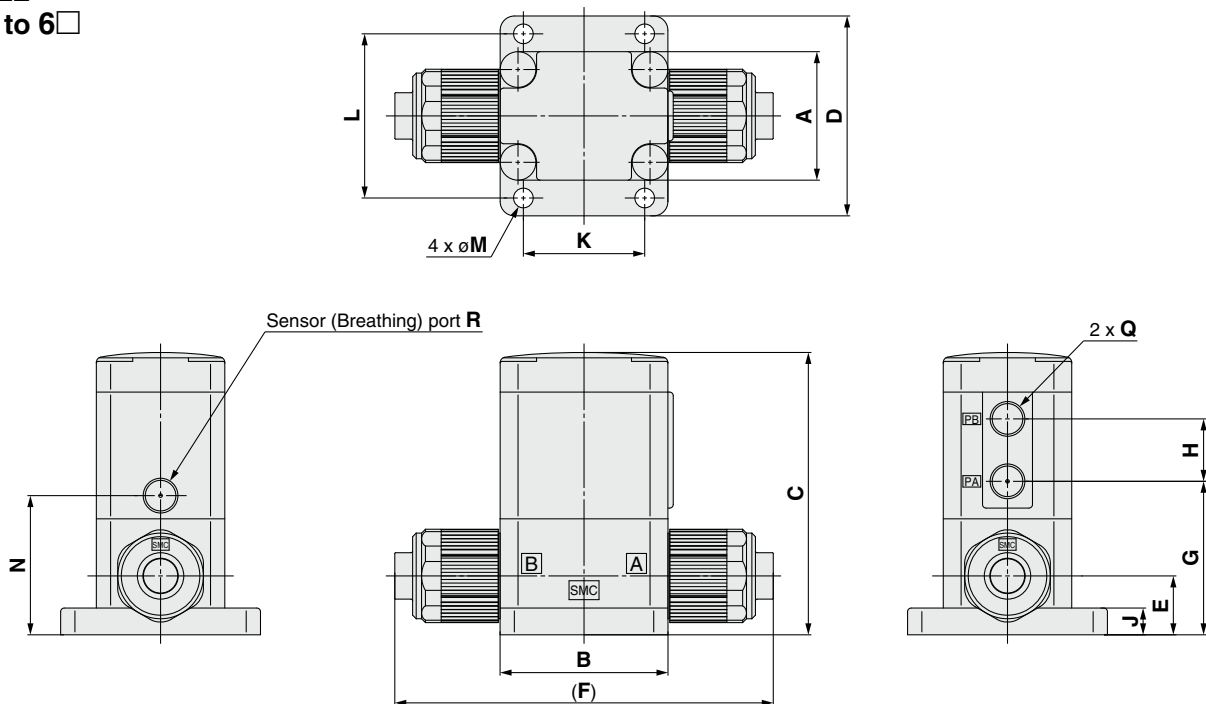
# LVC Series

## Dimensions

### LVC20



### LVC21/22 LVC3□ to 6□



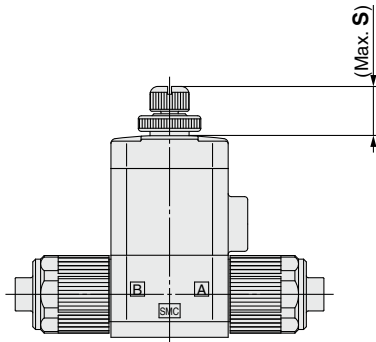
## Dimensions

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	—	—		

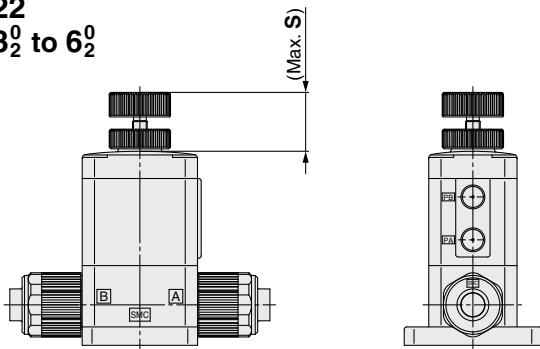
## Dimensions

With flow rate adjustment

LVC20



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

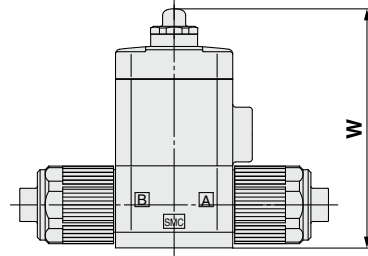


**Dimensions** [mm]

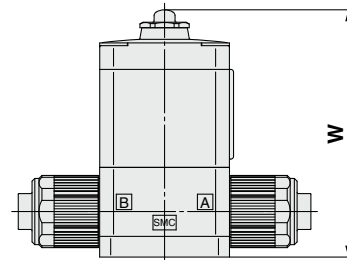
Model	S
LVC2□	14.5
LVC3□	24.4
LVC4□	29
LVC5□	34.5
LVC6□	36

With indicator

LVC20



LVC30 to 60

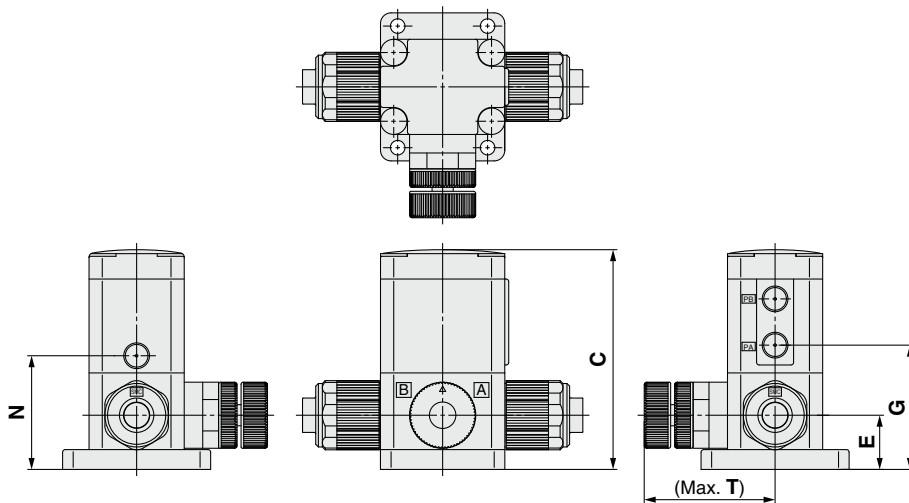


**Dimensions** [mm]

Model	W
LVC20	61.2
LVC30	89.6
LVC40	110.4
LVC50	147
LVC60	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
LVC3□	83.1	20.5	47	43	50.5
LVC4□	95.9	22	55	48	54.5
LVC5□	129	26	68	62	60

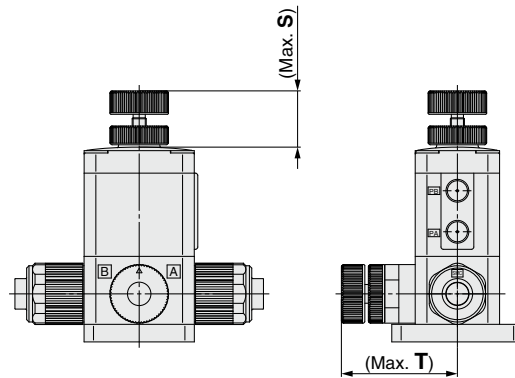


# LVC Series

## Dimensions

With flow rate adjustment & bypass

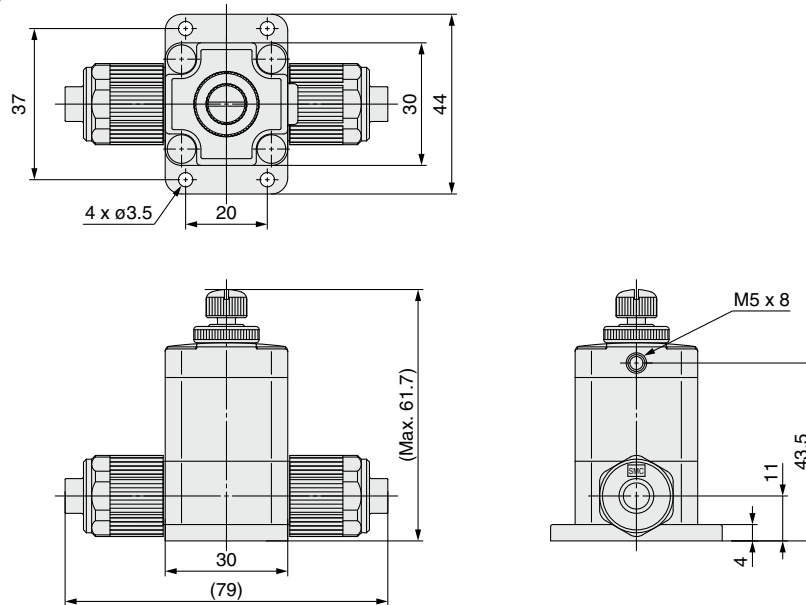
LVC3<sub>2</sub><sup>0</sup> to LVC5<sub>2</sub><sup>0</sup>



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

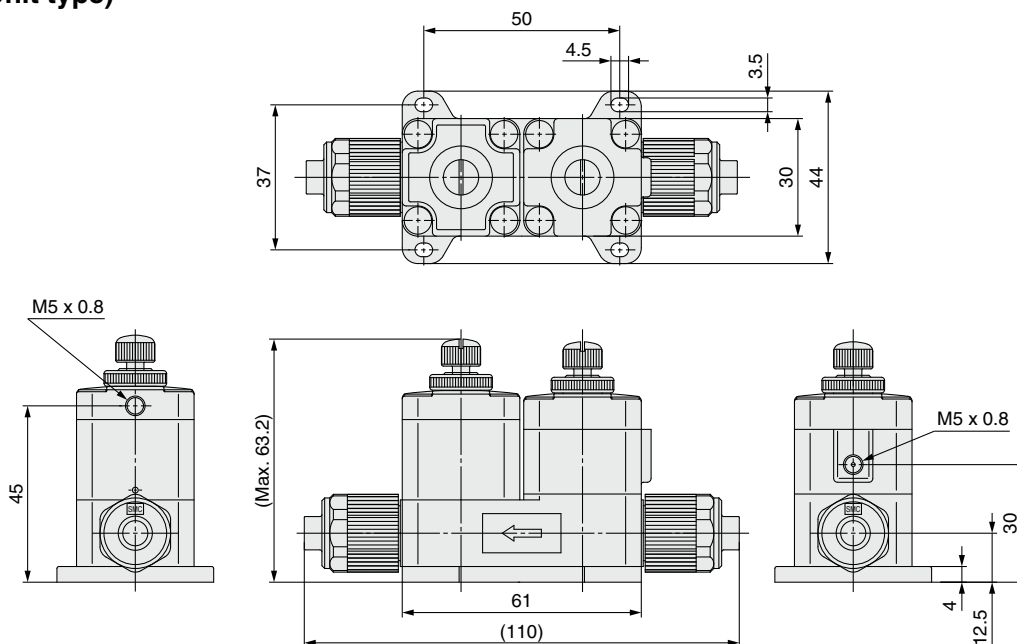
Suck back (Single type)

LVC23

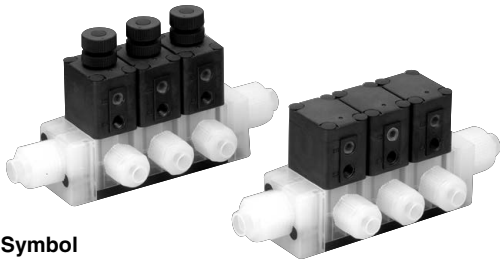


Suck back (Unit type)

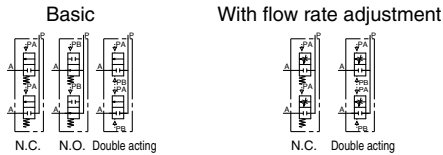
LVC23U



# LVC Series Manifolds



Symbol



## Manifold Specifications

Model	LLC2A	LLC3A	LLC4A	LLC5A
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"	3/4" x 5/8"
Tubing size (port A)	1/4" x 5/32"	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"

\*1: Refer to page 208 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**

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 5
06	6 x 4	3	2
07	1/4" x 5/32"		
08	8 x 6		
10	10 x 8	4	3
11	3/8" x 1/4"		
10	10 x 8		
12	12 x 10	5	4
13	1/2" x 3/8"		
12	12 x 10		
19	19 x 16, 3/4" x 5/8"	5	5
12	12 x 10		
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

**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	4	3
11	3/8" x 1/4"		
10	10 x 8		
12	12 x 10	5	4
13	1/2" x 3/8"		
12	12 x 10		
19	19 x 16, 3/4" x 5/8"	5	5
12	12 x 10		
13	1/2" x 3/8"		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 208 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**

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

**Body type**

Symbol	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	3	3
07	1/4" x 5/32"		
06	6 x 4		
07	1/4" x 5/32"	4	4
08	8 x 6		
10	10 x 8		
11	3/8" x 1/4"	5	5
10	10 x 8		
11	3/8" x 1/4"		
12	12 x 10		
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"		

**Option**

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

\*: Refer to "Variations" on page 167 for option combinations. Options cannot be combined each other.

**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 167 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

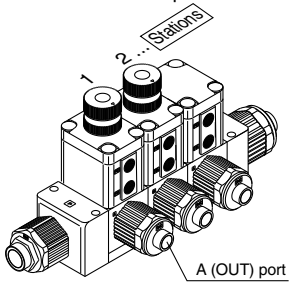
\*1: Refer to page 208 for details of the applicable tubing sizes.  
\*: When ordering plug only, refer to Blanking plug (LQ series) in the **Web Catalog** after checking the fitting size.

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 208.

# 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)

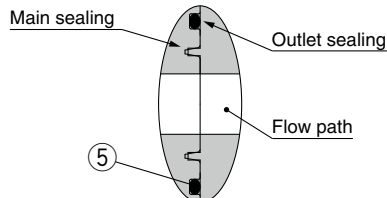
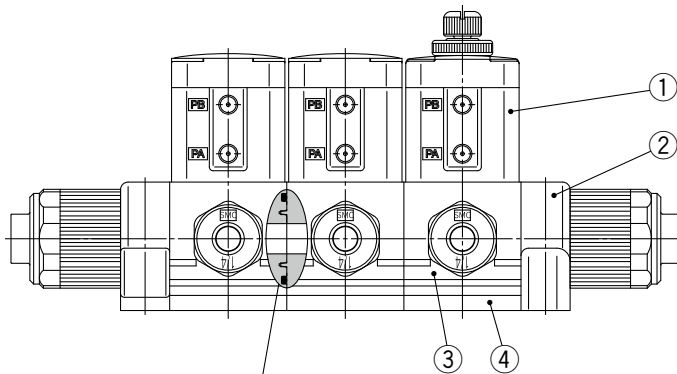
- Prefix the asterisk to the part no. of the valves, etc.

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>	N.C.	N.C.	○	○	○	○
	N.O.	N.O.	○	○	○	○
	Double acting	Double acting	○	○	○	○
<b>With flow rate adjustment</b>	N.C.	N.C.	○	○	○	○
	Double acting	Double acting	○	○	○	○
<b>With indicator</b>	N.C.	N.C.	○	○	○	○

## Construction



Manifold body connection

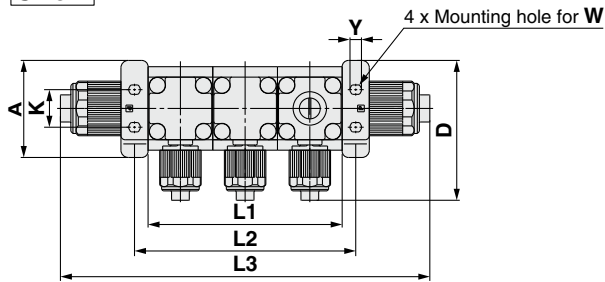
## Component Parts

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

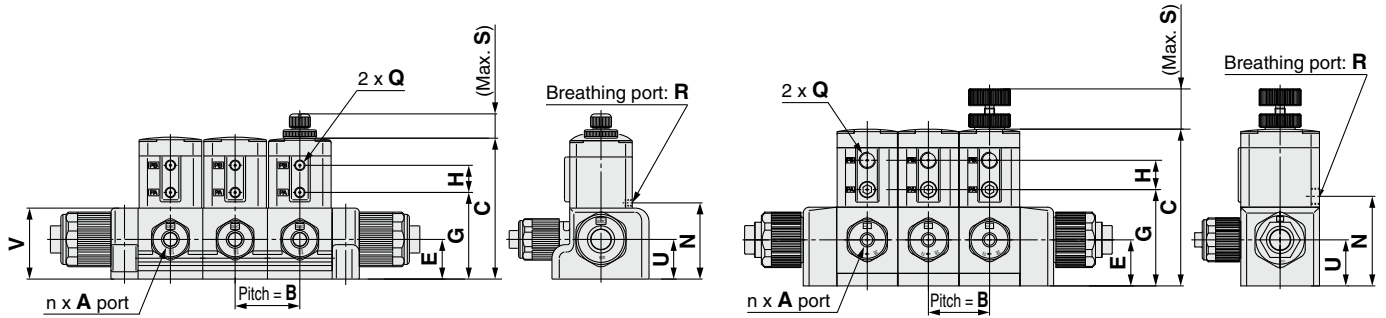
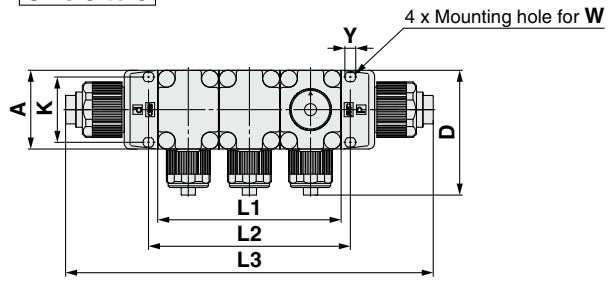
## Dimensions

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

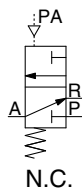
Model	Station Symbol	[mm]			
		2	3	4	5
LLC2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	146	177	208	239
LLC3A	L1	73	109.5	146	182.5
	L2	84	120.5	157	193.5
	L3	183	219.5	256	292.5
LLC4A	L1	94	141	188	235
	L2	109	156	203	250
	L3	219	266	313	360
LLC5A	L1	118	177	236	295
	L2	130	189	248	307
	L3	240	299	358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



# LVC Series 3-Port



Symbol



## 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	

\*: Cannot be used with the universal type

## How to Order Valve

### LVC 2 0 0 - S 07

#### Body class

Symbol	Body class	Orifice dia.
2	2	ø4

#### Valve type

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

#### LQ2 integrated fitting

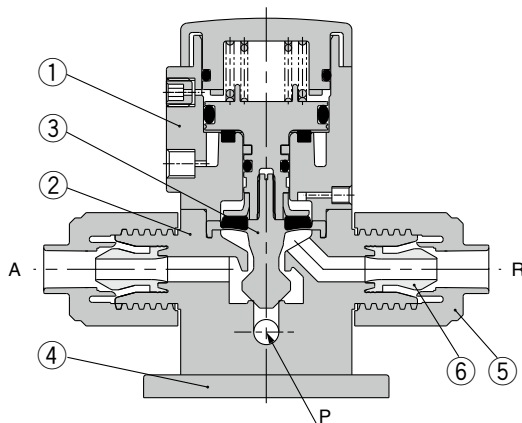
#### Applicable tubing size

Symbol	Connecting tubing size	Body class
<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 208 for details of the applicable tubing sizes.

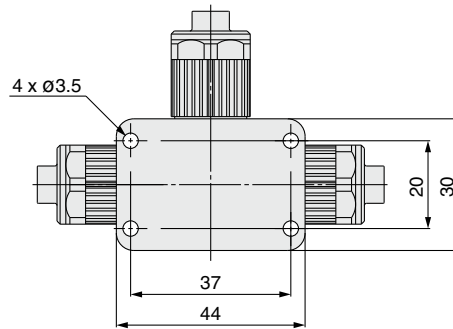
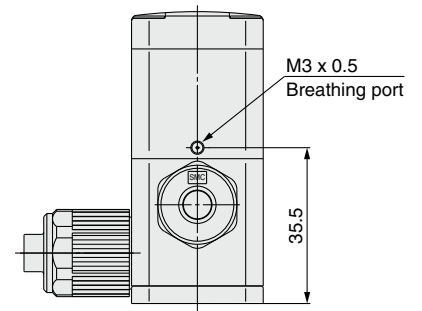
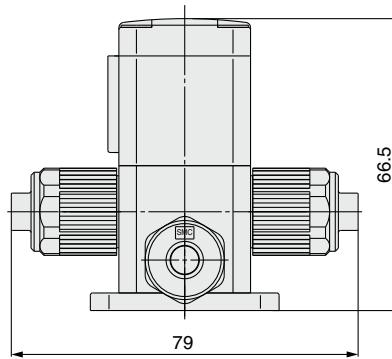
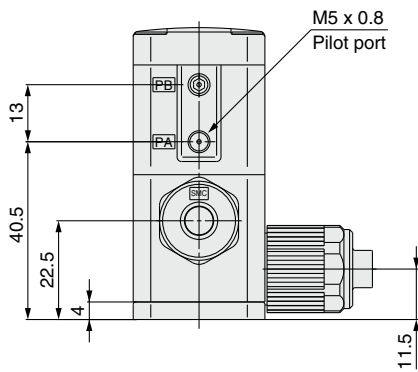
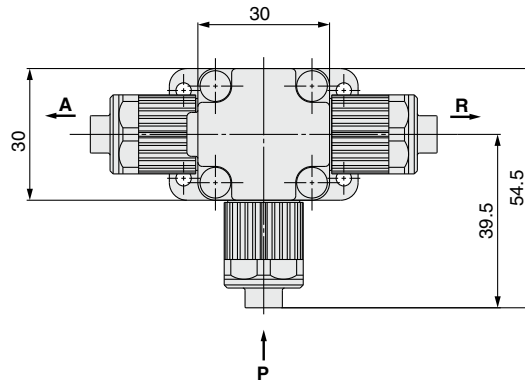
## Construction



### 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

**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.C.\*1/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

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

\*1: Select when material symbol "D," "E," "G," or "H" is selected.

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

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

Specifications

Symbol	Meaning
Nil	None
V	Vacuum specification

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

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

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

\*: Refer to Variations for valve type combinations.

Option

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

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

Material

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

\*1: When material symbol "F" is selected, the thread type symbol "F" cannot be selected.

Symbol	Port size	Body class
01	1/8	1
02	1/4	
01	1/8	2
02	1/4	
03	3/8	3
04	1/2	
05	3/4	5
06	1	

\*1: Check the "Variations" table for possible port size and body material combinations.

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*1		Valve type	Model						
			LVA10	LVA20	LVA30	LVA40	LVA50	LVA60		ø2	ø4	ø8	ø12	ø20	ø22	
Basic		N.C.	ø2	1/8	1/4	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	1	—	
			Stainless steel 316	○	○	○	○	○	○	○	○	○	○	○	○	○
			PPS	○	○	○	○	○	○	○	○	○	○	○	○	○
With flow rate adjustment		N.C.	ø2	—	—	○	○	○	○	○	○	○	○	○	○	
			Stainless steel 316	○	—	—	○	○	○	○	○	○	○	○	○	
			PPS	○	—	—	○	○	○	○	○	○	○	○	○	
With bypass		N.C.	ø2	—	—	—	—	—	—	○	—	—	○	—		
			Stainless steel 316	○	—	—	—	—	—	—	○	—	—	○	—	
			PPS	○	—	—	—	—	—	—	○	—	—	○	—	
With flow rate adjustment & bypass		N.C.	ø2	—	—	—	—	—	—	○	—	—	○	—		
			Stainless steel 316	○	—	—	—	—	—	—	○	—	—	○	—	
			PPS	○	—	—	—	—	—	—	○	—	—	○	—	
With indicator		N.C.	ø2	—	—	○	○	○	○	○	○	○	○	○		
			Stainless steel 316	○	—	—	○	○	○	○	○	○	○	○	○	

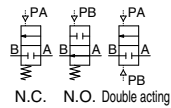
\*1: Refer to Material for the applicable optional body materials.

## Standard Specifications



### Basic type

Basic/With indicator

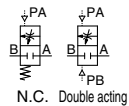


### LVA-Z

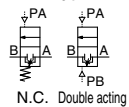


### With flow rate adjustment

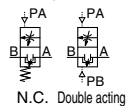
With flow rate adjustment



With bypass



With flow rate adjustment & bypass



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 page 501 for safety instructions, and pages 207 and 209 for high purity chemical liquid valve precautions.**

### Piping

## ⚠ Caution

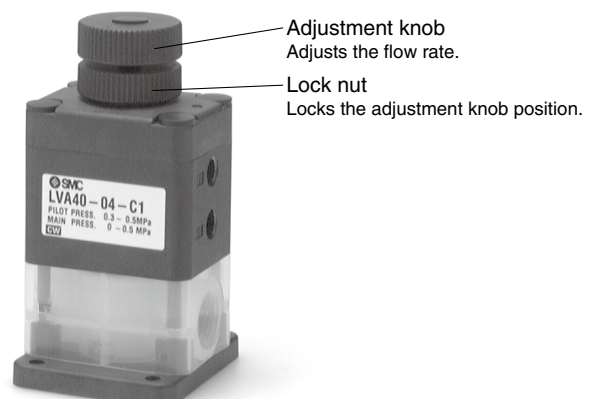
**1. Avoid using metal fittings with a resin body (taper threads).**

This can cause damage to the valve body.

## Option

### ■ With flow rate adjustment

Adjusts the flow rate by controlling the diaphragm stroke.

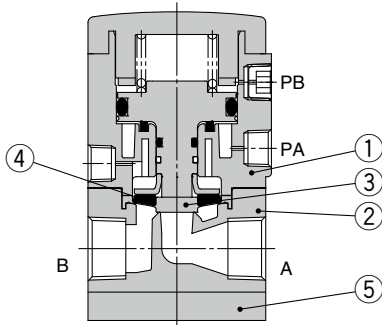




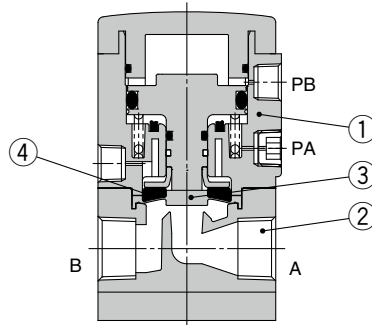
# LVA Series

## Construction

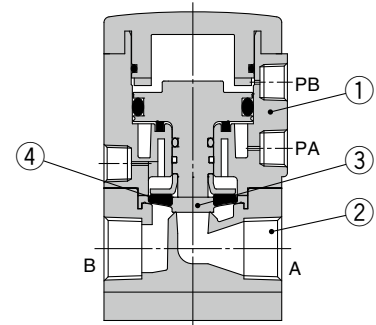
Standard type  
N.C. type



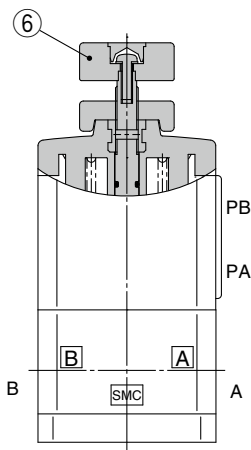
N.O. type



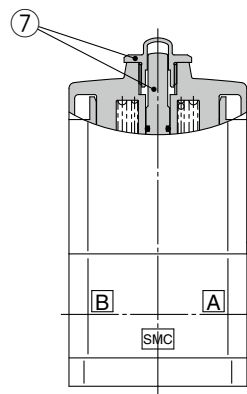
Double acting type



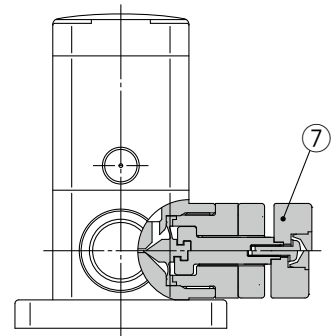
With flow rate adjustment



With indicator



With bypass (Body material: PFA)



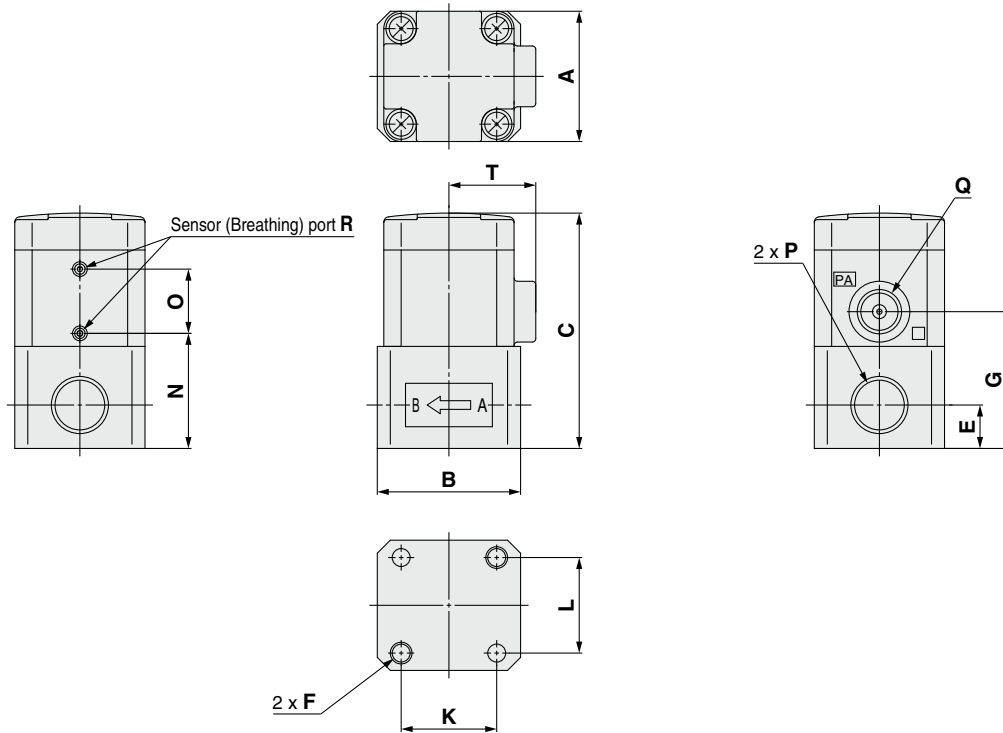
## Component Parts

No.	Description	Material	Option
1	Actuator section	PPS	PVDF
2	Body	Stainless steel 316	—
		PPS	
3	Diaphragm	PFA	—
		PTFE	
		NBR	
4	Buffer	EPR	EPDM
		FKM	
5	End plate (PFA body only)	PPS	PVDF
6	Flow rate adjuster section	PPS	—
7	Indicator	PP	—

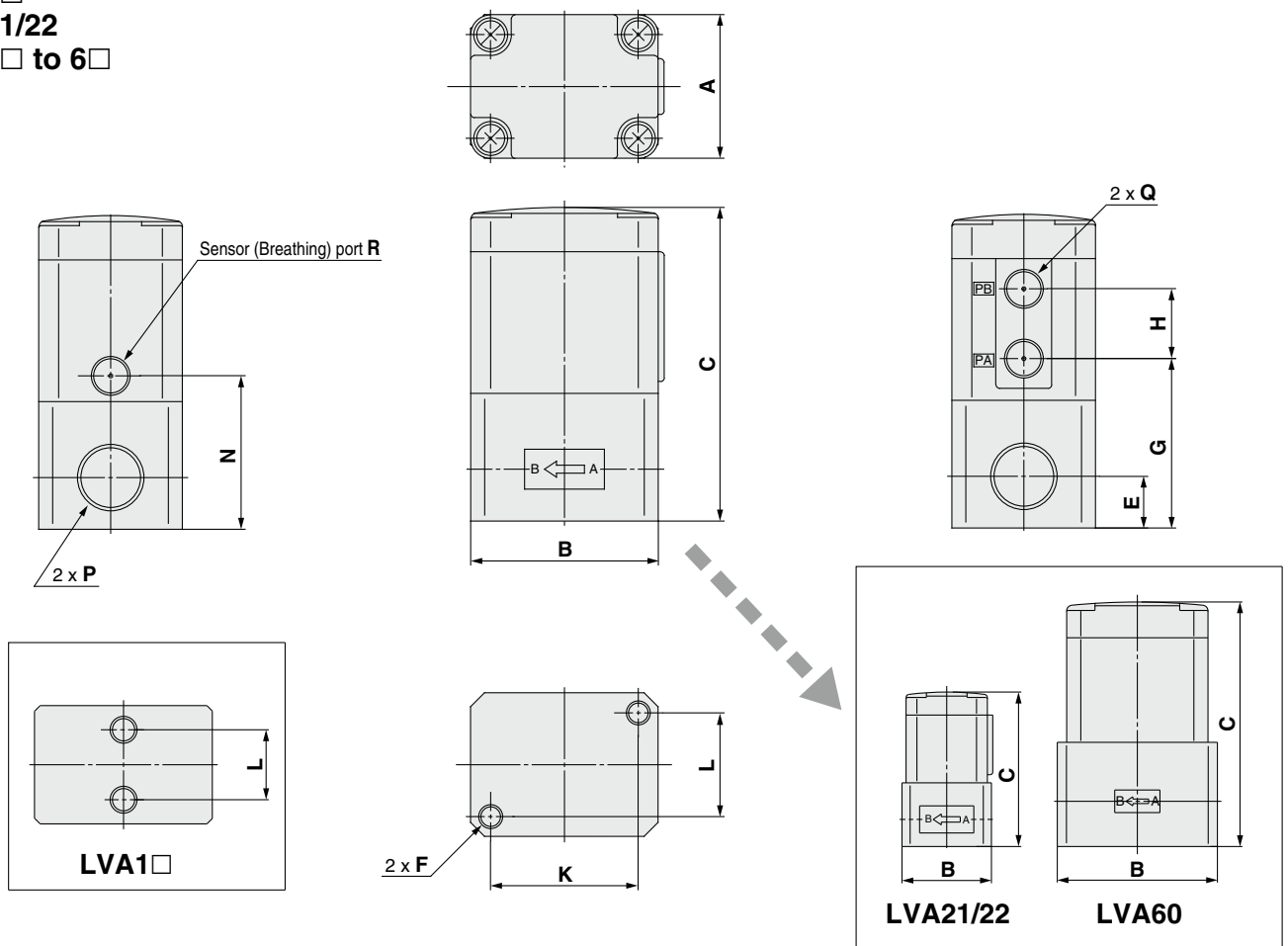
## Dimensions

Body material: Stainless steel

LVA20



LVA1□  
LVA21/22  
LVA3□ to 6□



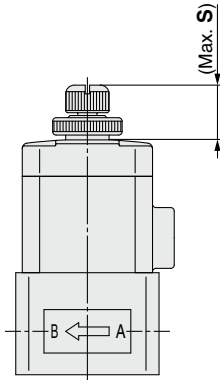
# LVA Series

## Dimensions

Body material: Stainless steel

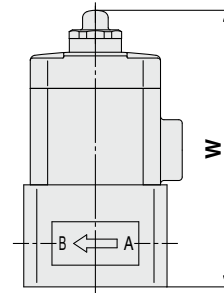
With flow rate adjustment

LVA20

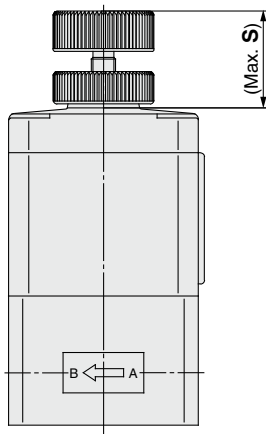


With indicator

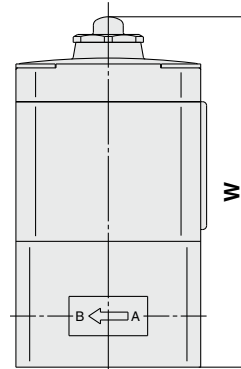
LVA20



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]

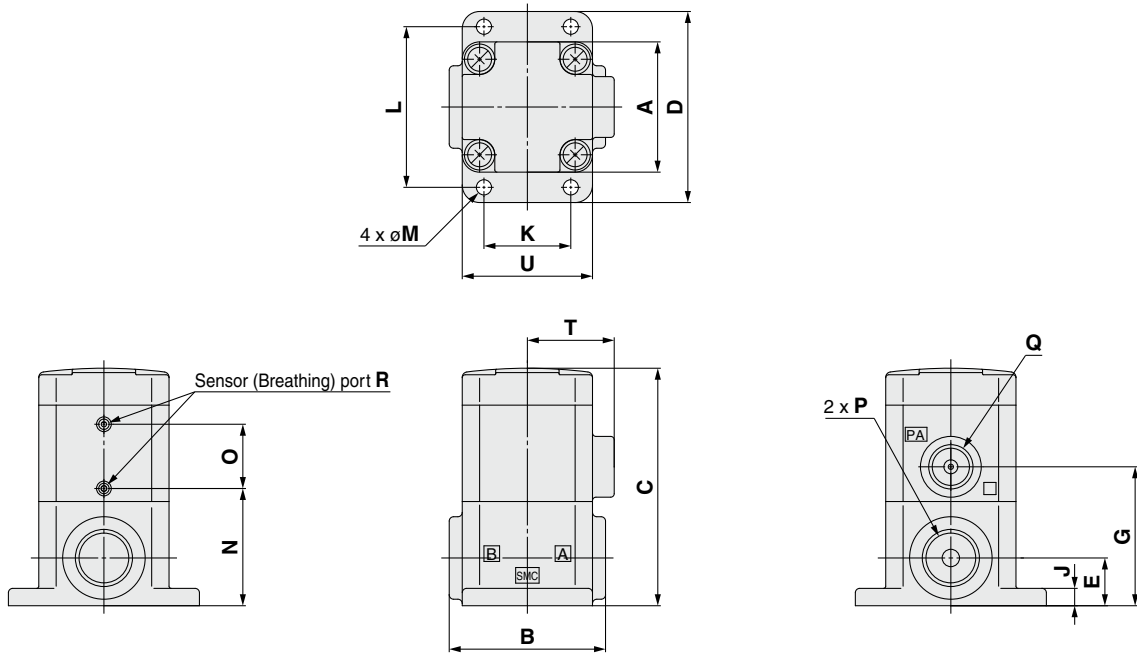
Model	A	B	C	E	F	G	H	K	L	N	O	P	Q	R	T
LVA1□	20	33	49.5	10	M5 x 0.8 x 4	27.5	11	—	13	27.5	—	Rc1/8, 1/4 NPT1/8, 1/4 G1/8, 1/4*	M5 x 0.8	ø4.2	—
LVA20	30	33	54.2	10	M5 x 0.8 x 5	31.5	—	22	22	26.5	14.8		Rc1/8 NPT1/8 G1/8*	ø2.4	20
LVA2 <sub>2</sub> <sup>1</sup>	30	33	57	10	M5 x 0.8 x 5	31	13	22	22	26	—		M5 x 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 207.

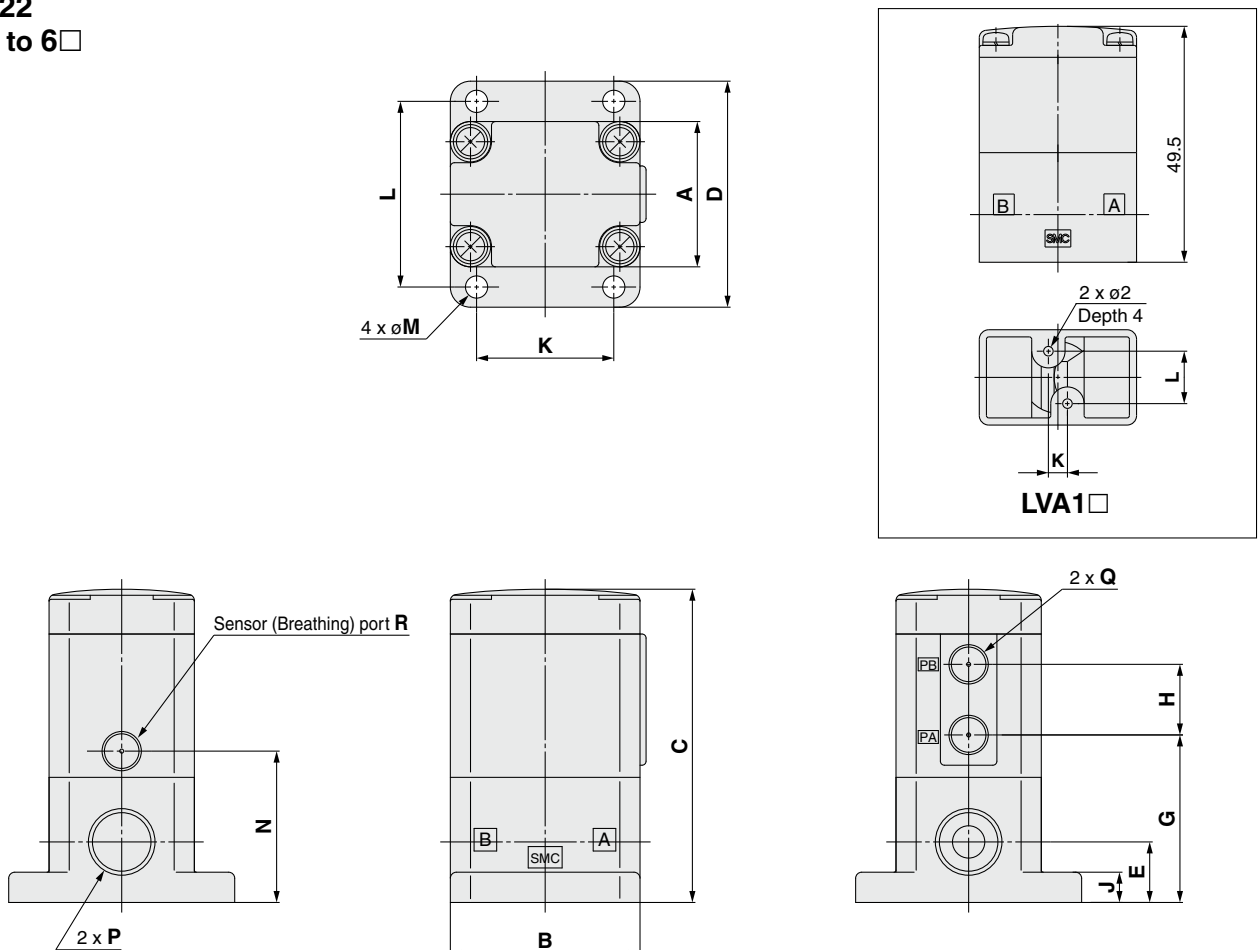
**Dimensions**

Body material: PPS

**LVA20**



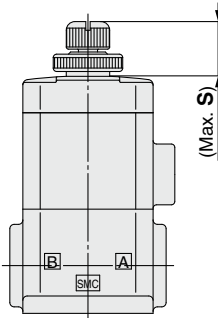
**LVA1□**  
**LVA21/22**  
**LVA3□ to 6□**



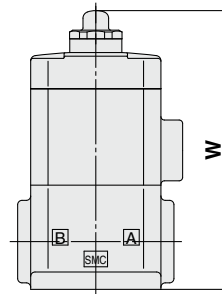
# LVA Series

## Dimensions

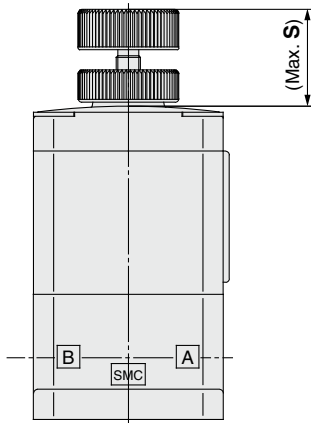
Body material: PPS  
With flow rate adjustment  
LVA20



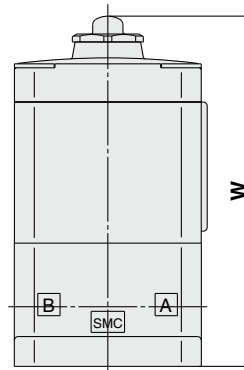
With indicator  
LVA20



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	M3 x 0.5	—	—
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*			—	—

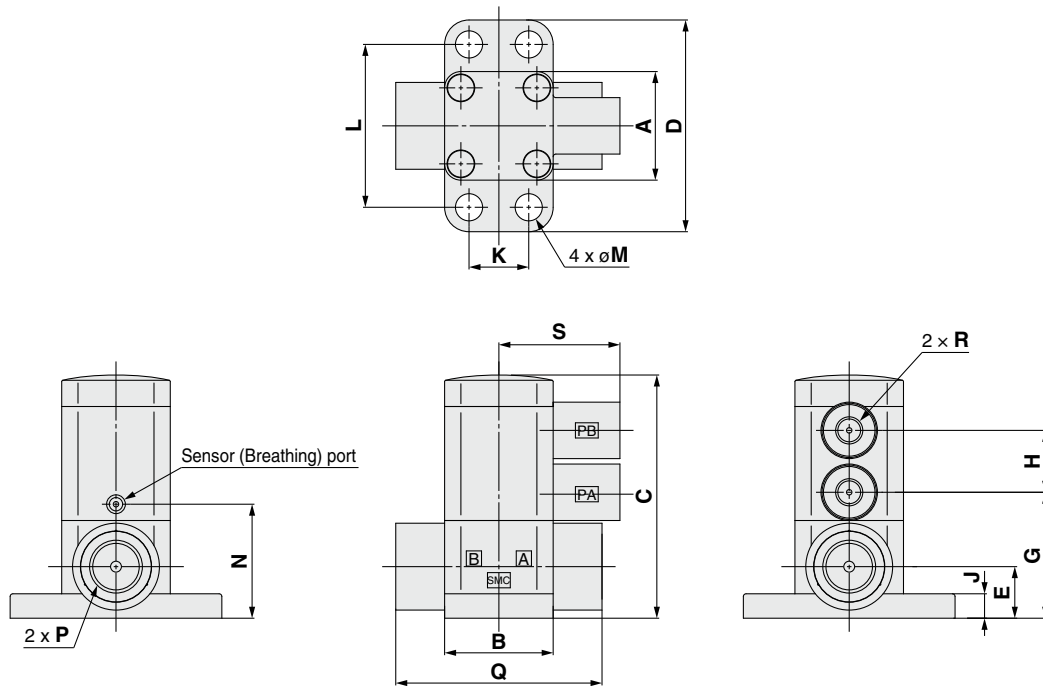
\*: For details on G threads and thread depths, refer to page 207.



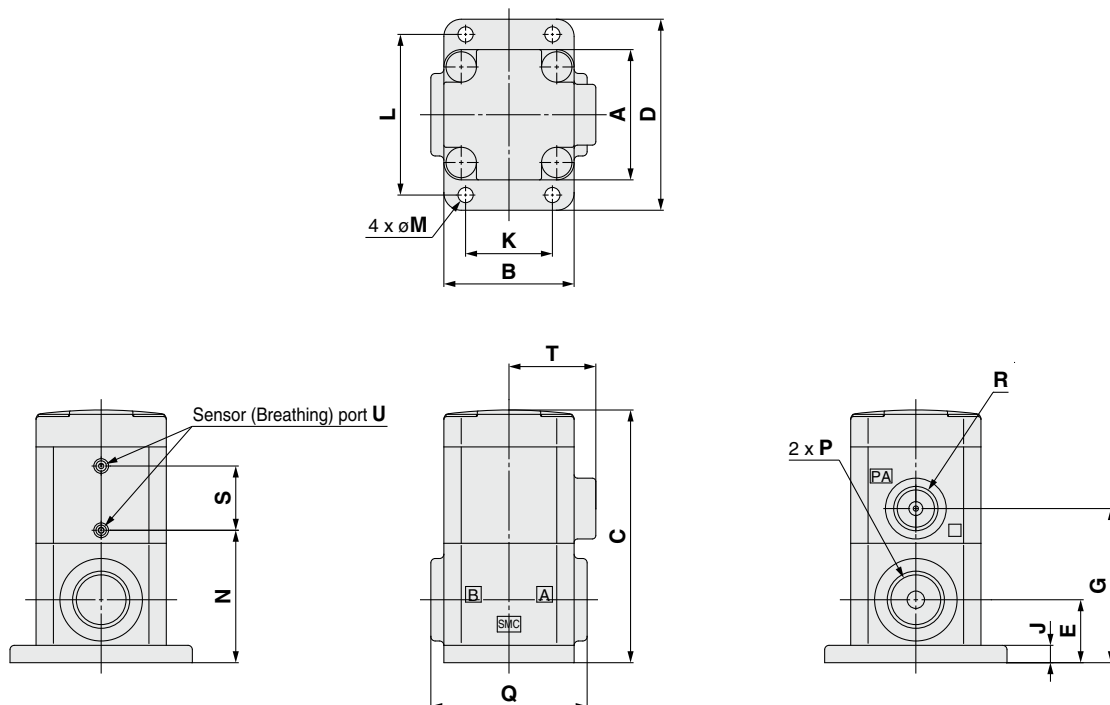
## Dimensions

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 207.

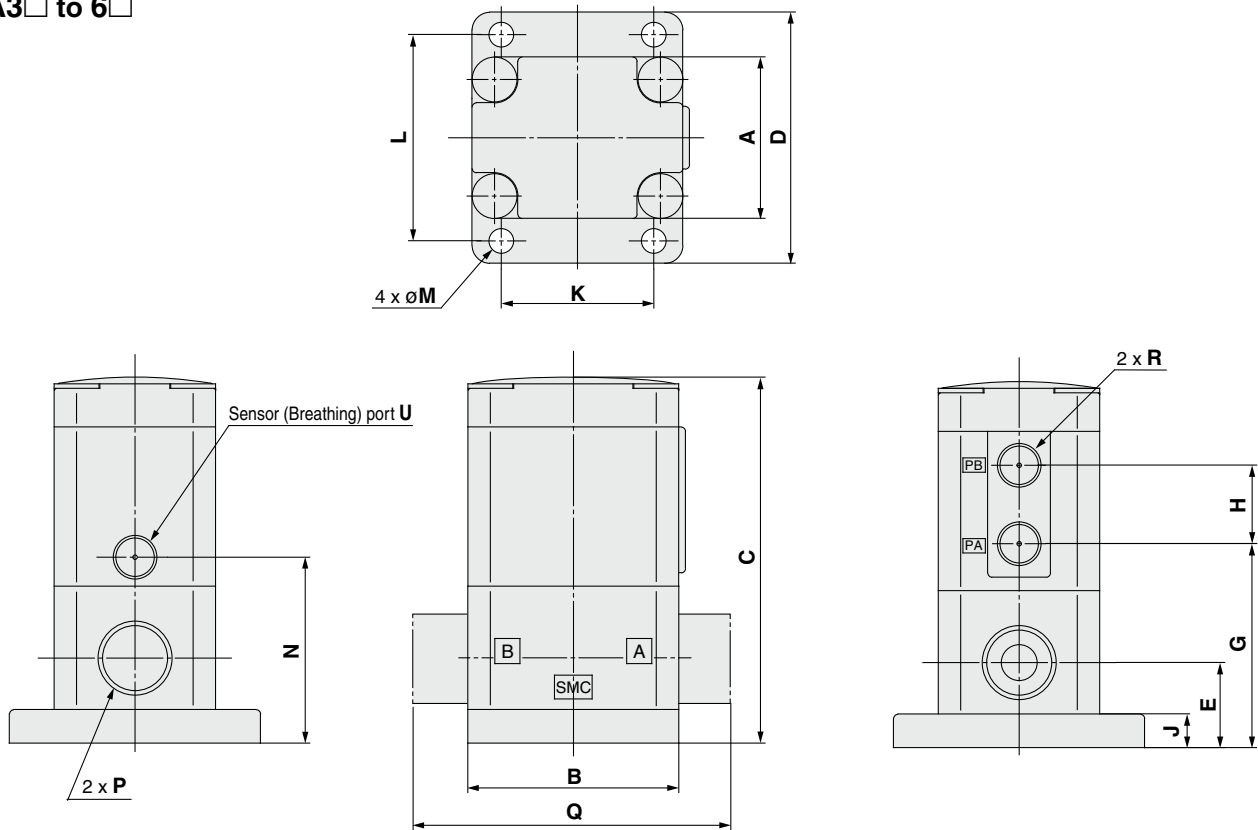
# LVA Series

## 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 <sub>2</sub> <sup>1</sup>	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		

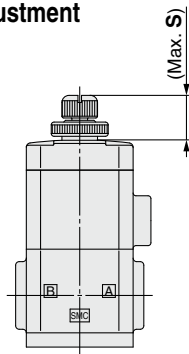
\*: For details on G threads and thread depths, refer to page 207.

## Dimensions

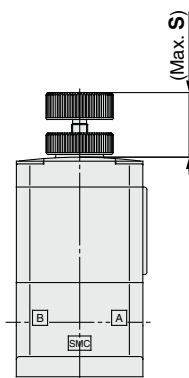
Body material: PFA

With flow rate adjustment

LVA20



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

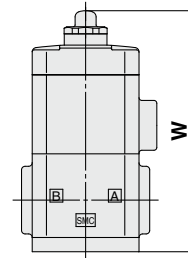


Dimensions [mm]

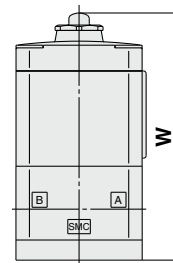
Model	S
LVA2□	14.5
LVA3□	24.4
LVA4□	29
LVA5□	34.5
LVA6□	36

With indicator

LVA20



LVA30 to 60

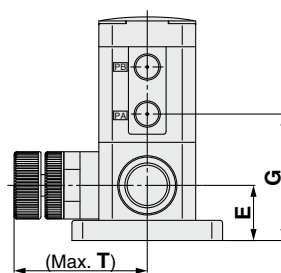
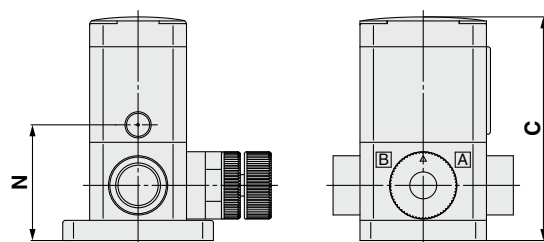
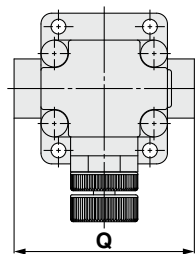


Dimensions [mm]

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>

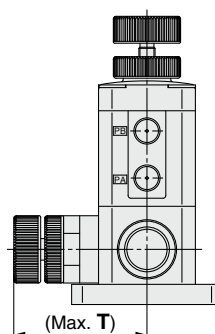
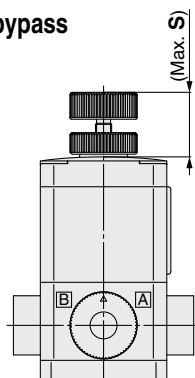


Dimensions

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

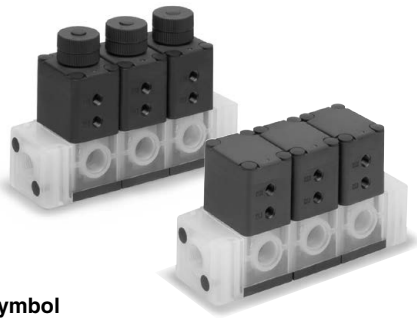
LVA3<sub>2</sub><sup>0</sup> to 5<sub>2</sub><sup>0</sup>



Dimensions [mm]

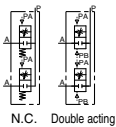
Model	S	T
LVA3□	24.4	50.5
LVA4□	29	54.5
LVA5□	34.5	60

# LVA Series Manifolds

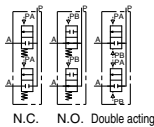


## Symbol

With flow rate adjustment



Basic

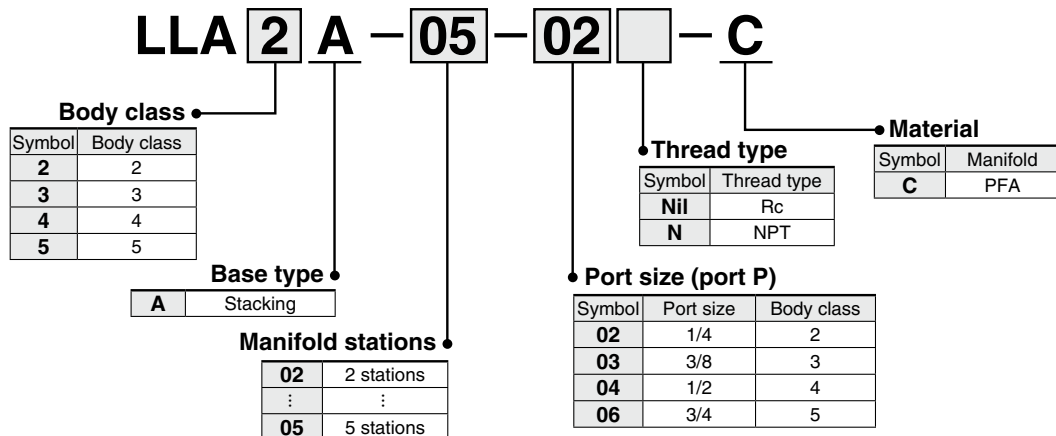


## Manifold Specifications

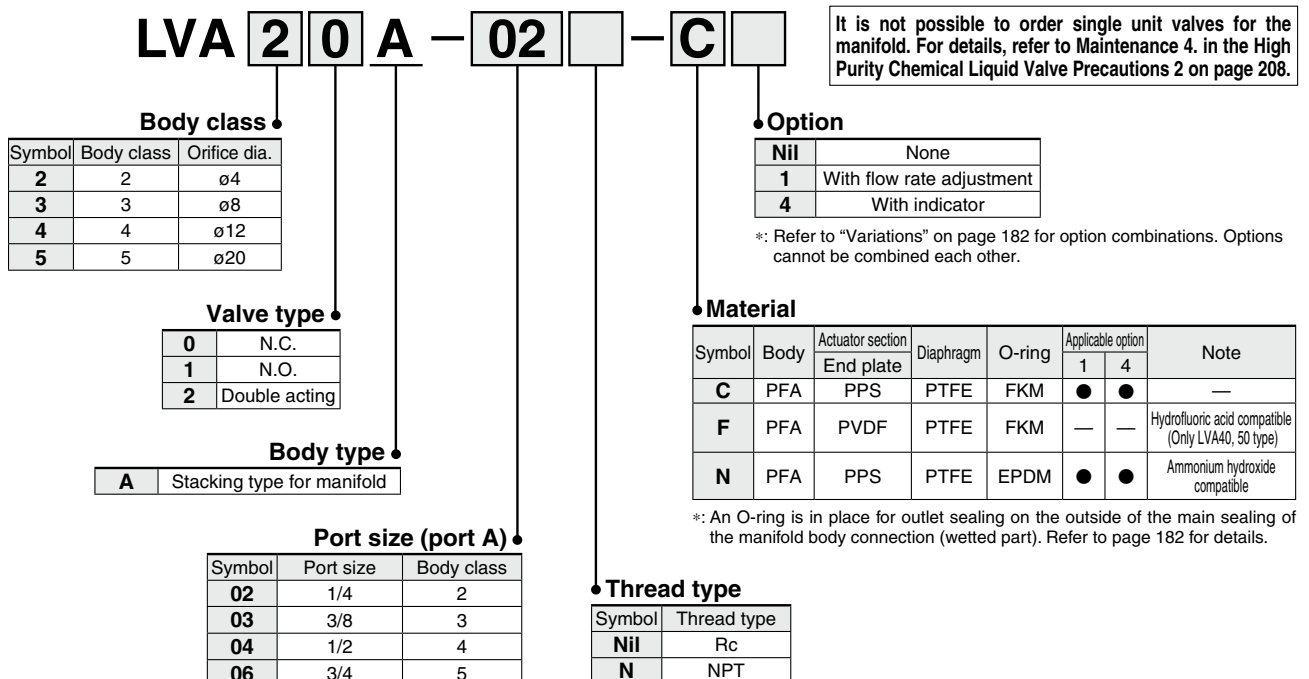
Model	LLA2A	LLA3A	LLA4A	LLA5A
Manifold type	Stacking			
P (IN), A (OUT) type	Common IN/Individual OUT			
Valve stations	2 to 5 stations			
Port size (port P)	1/4	3/8	1/2	3/4
Port size (port A)	1/4	3/8	1/2	3/4

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

## How to Order Manifold Base

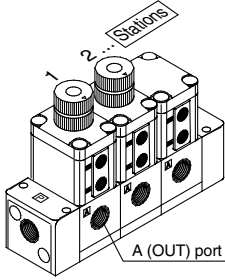


## How to Order Valve



## 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>

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)

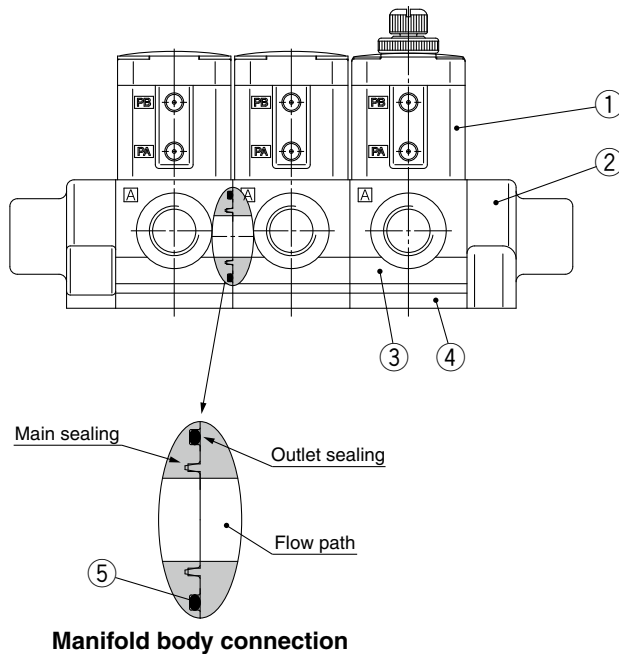
• Prefix the asterisk to the part no. of the valves, etc.

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

## Manifold Variations

Type	Symbol	Model	LVA20A	LVA30A	LVA40A	LVA50A
		Manifold material	PFA			
		Port size	1/4	3/8	1/2	3/4
		Orifice diameter	ø4	ø8	ø12	ø20
Basic		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"/>
With flow rate adjustment		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"/>
With indicator		N.C.	<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

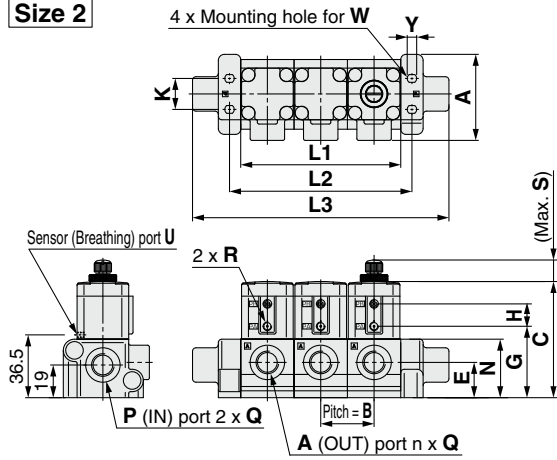


# LVA Series

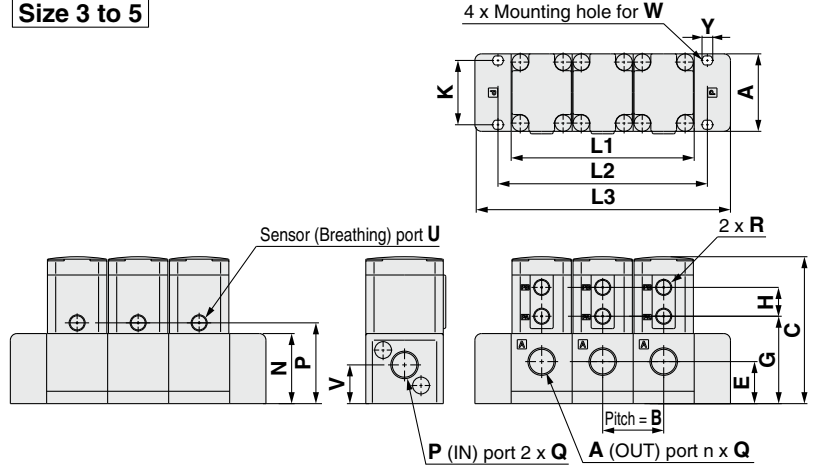
## Dimensions

LLA□A- Stations-□□-C

Size 2



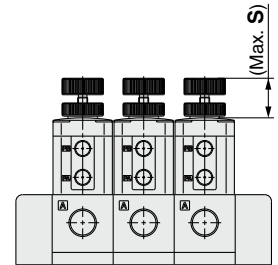
Size 3 to 5



Dimensions [mm]

Model	S
LLA2A	14.5
LLA3A	24.4
LLA4A	29
LLA5A	34.5

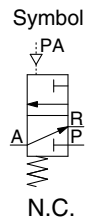
Model	Station Symbol	[mm]			
		2	3	4	5
LLA2A	L1	62	93	124	155
	L2	75	106	137	168
	L3	118	149	180	211
LLA3A	L1	74	111	148	185
	L2	90	127	164	201
	L3	118	155	192	229
LLA4A	L1	94	141	188	235
	L2	112	159	206	253
	L3	144	191	238	285
LLA5A	L1	118	177	236	295
	L2	140	199	258	317
	L3	178	237	296	355



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

※: Cannot be used with the universal type

## How to Order Valve

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

• **Body class**

Symbol	Body class	Orifice dia.
2	2	ø4

• **Valve type**

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

• **Port size**

Symbol	Port size
02	1/4

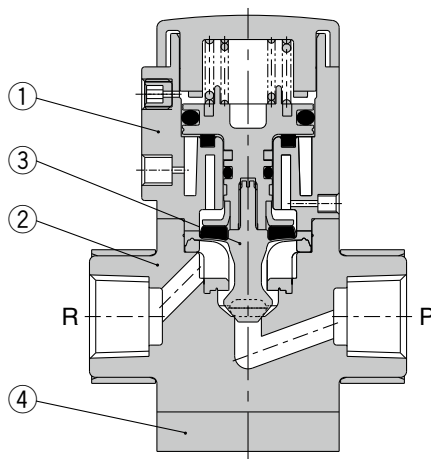
• **Thread type**

Symbol	Thread type
Nil	Rc
N	NPT

• **Material**

Symbol	Body	Actuator section	Diaphragm
C	PFA	PPS	PTFE

## Construction

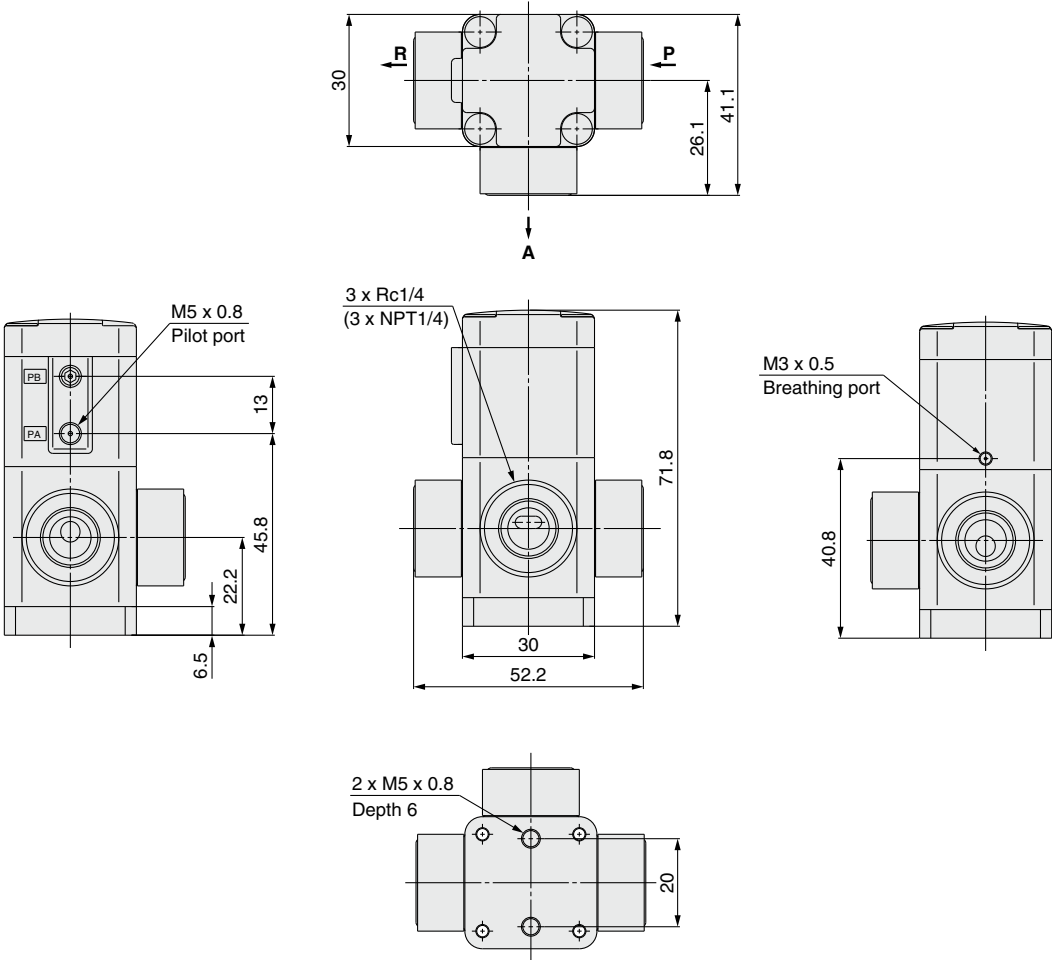


### Component Parts

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 Compression Fittings/Face 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

**Fitting type**

Symbol	Type
D	With compression fittings
G	With face 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.

**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

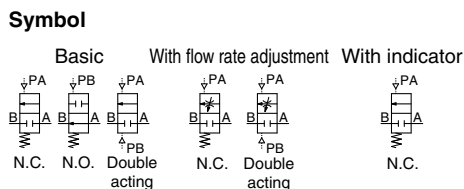
\*: With flow rate adjustment: Only available with N.C. valve and double acting valve  
\*: With indicator: Only available with N.C. valve

**Material**

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



## Standard Specifications

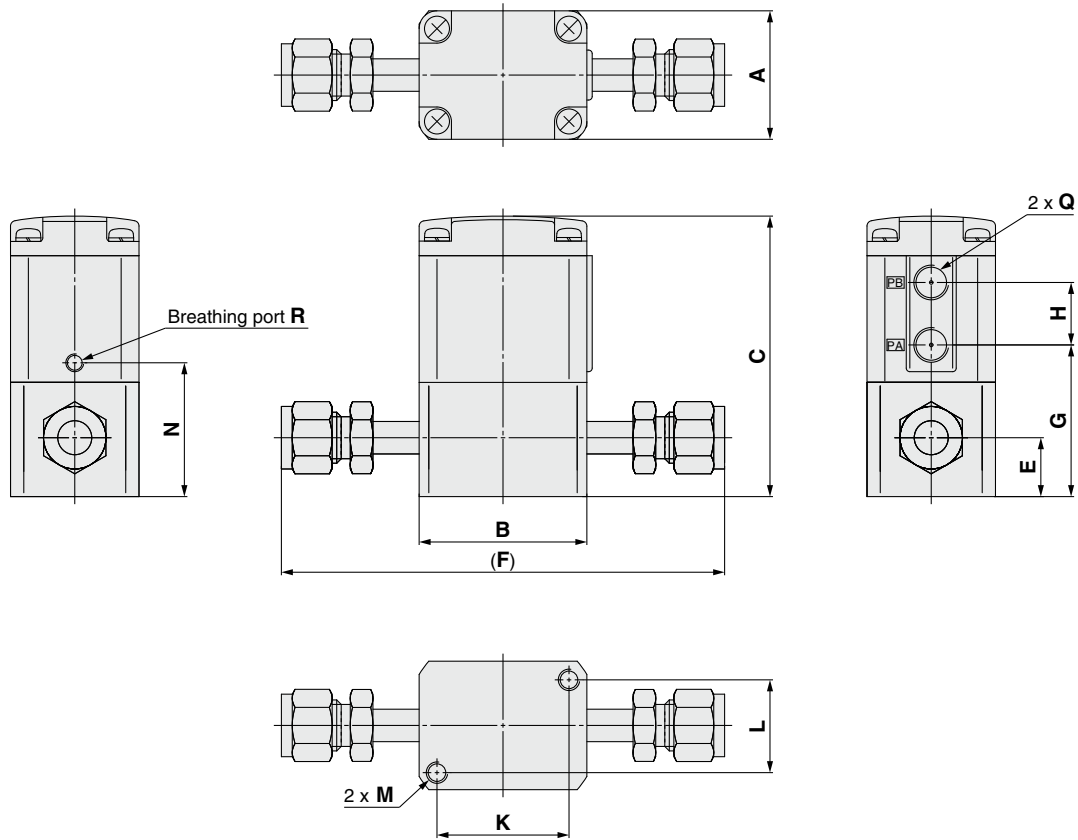
Model		LVA20	LVA30	LVA40	LVA50	LVA60	
Tubing O.D.	Metric size*1	6	10	12	19	—	
	Inch size	1/4	3/8	1/2	3/4	1	
Orifice diameter		ø4	ø8	ø12	ø20	ø22	
Flow rate characteristics	Kv	0.3	1.4	2.8	5.1	6.8	
	Cv	0.35	1.7	3.3	6	8	
Withstand pressure [MPa]		1					
Operating pressure [MPa]	Standard	A→B		0 to 0.5		0 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 compression fittings, With face seal fittings, Integrated tubing					
Fitting type*3	Fitting type	D	0.23	0.56	0.96	2.02	2.37
		G	0.24	0.63	0.97	2.12	2.50
		T	0.19	0.51	0.86	1.86	2.07

\*1: Metric size is only available for fitting types D and T.  
\*2: High back pressure is optional.  
\*3: Applicable tubing size (no options): inch size

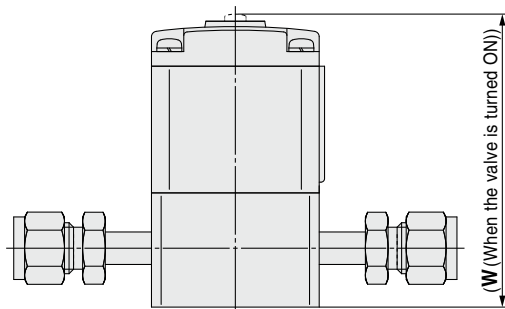
# LVA Series

## Dimensions

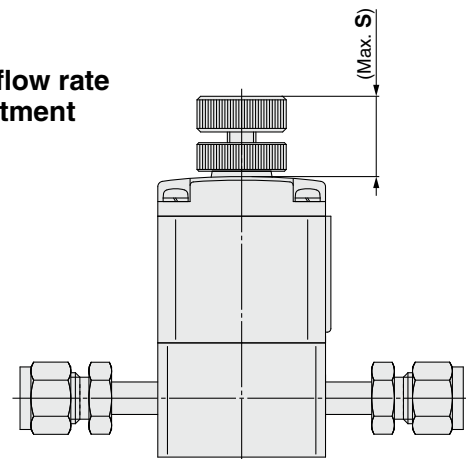
Body material: Stainless steel  
With compression fittings



With indicator



With flow rate adjustment

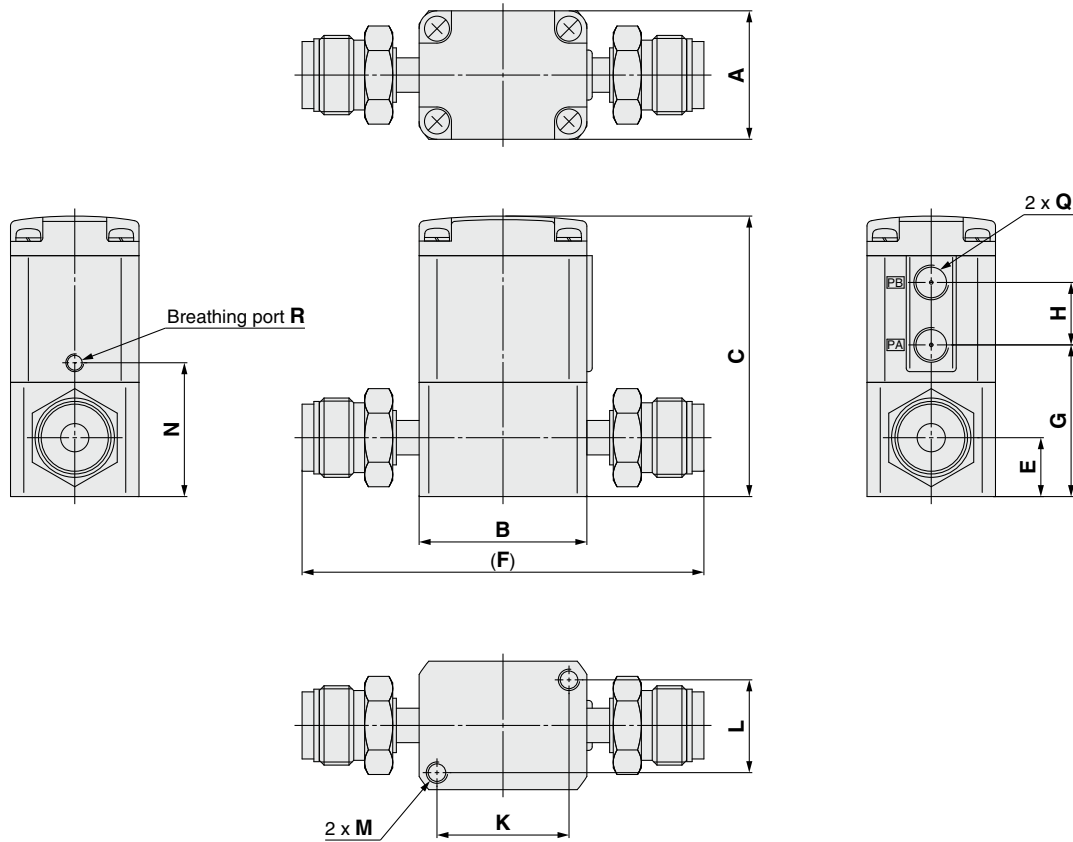


## Dimensions

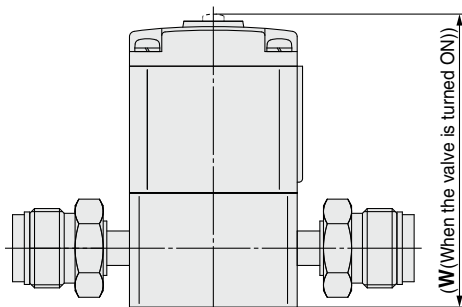
Model	A	B	C	E	F	G	H	K	L	M	N	Q	R	S	W
LVA2□-D□-AD ND	30	30	54.5	12	96.4	30.5	13	22	22	M5 x 0.8 Thread depth 5	25.5	M5 x 0.8	M3 x 0.5	17.1	58.4
LVA3□-D□-AD ND	36	47	78.6	16.5	127	42.5	17.5	37	26	M6 x 1 Thread depth 8	37.5	Rc1/8 NPT1/8	M5 x 0.8	24.9	82.1
LVA4□-D□-AD ND	46	60	85.9	16.5	147.2	48	18	47.5	33.5	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

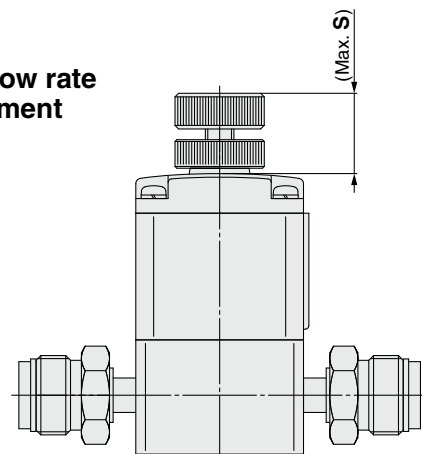
Body material: Stainless steel  
 With face seal fittings



With indicator



With flow rate adjustment



## Dimensions

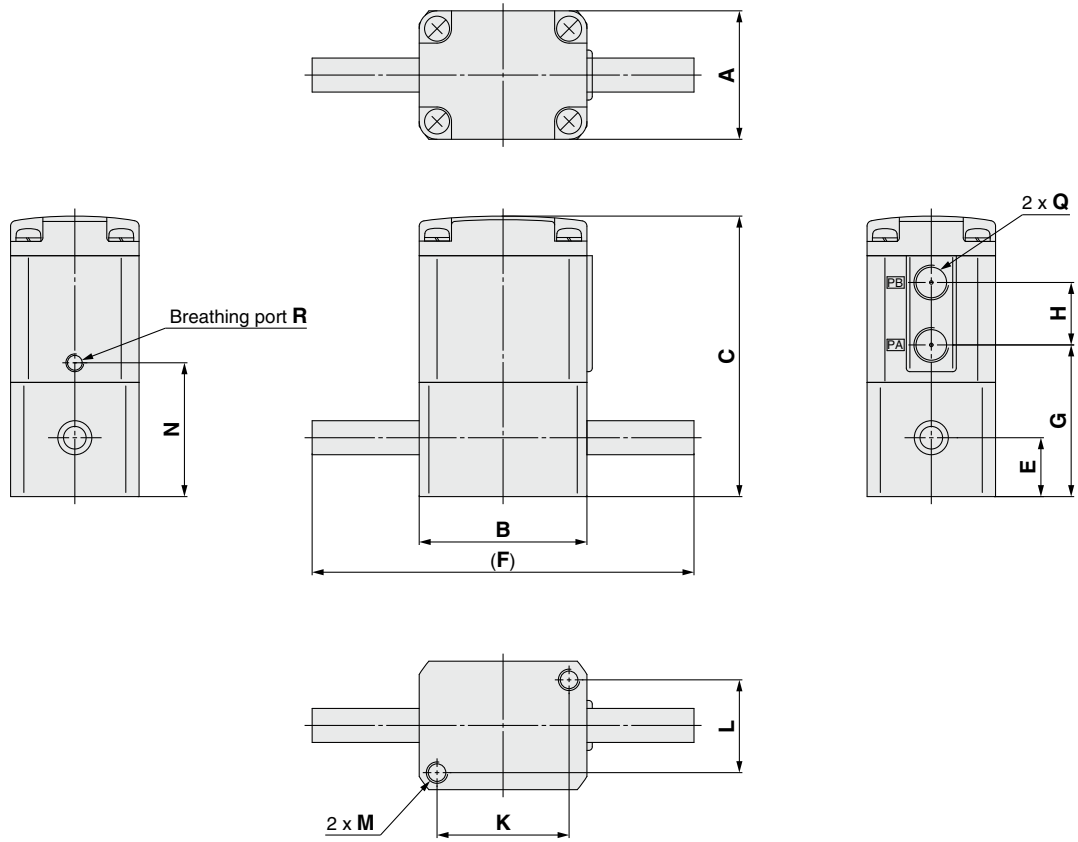
Model	A	B	C	E	F	G	H	K	L	M	N	Q	R	S	W
LVA2□-G07- <sup>AD</sup> <sub>ND</sub>	30	30	54.5	12	91	30.5	13	22	22	M5 x 0.8 Thread depth 5	25.5	M5 x 0.8	M3 x 0.5	17.1	58.4
LVA3□-G11- <sup>AD</sup> <sub>ND</sub>	36	47	78.6	16.5	112.6	42.5	17.5	37	26	M6 x 1 Thread depth 8	37.5	Rc1/8 NPT1/8	M5 x 0.8	24.9	82.1
LVA4□-G13- <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



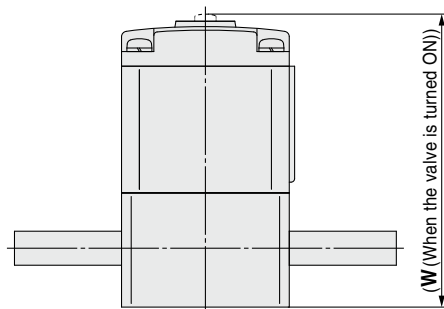
# LVA Series

## Dimensions

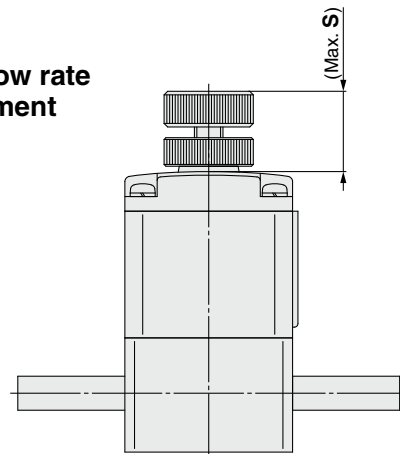
Body material: Stainless steel  
Integrated tubing



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	

**LQ2 integrated fitting**

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

Symbol	Application
Nil	Ports A & B same size

Refer to the applicable tubing table on the right.

**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 208 for details of the applicable tubing sizes.

**Material** \*1



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.	○	○	○
					

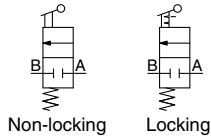
### Threaded Type Variations

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

# LVH Series



## Symbol



## ⚠️ Precautions

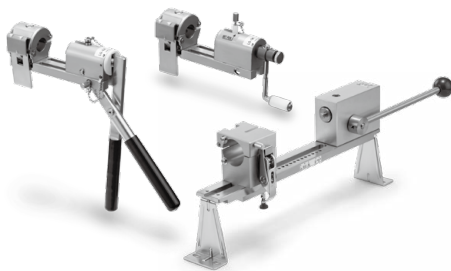
Be sure to read this before handling the products. Refer to page 501 for safety instructions, and pages 207 and 209 for high purity chemical liquid valve precautions.

## 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 208 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	—	—	—	—	●	○	—	—	—	—	●	○

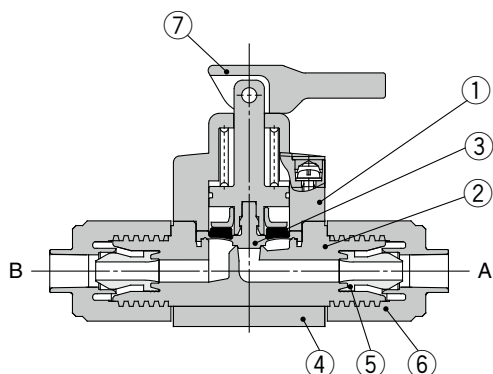
\*: Refer to page 205 for information on changing tubing sizes.

## Standard Specifications: Threaded Type

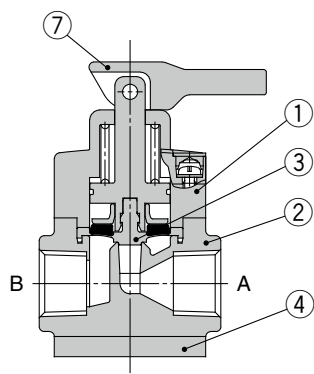
Model		LVH20	LVH30	LVH40
Port size		1/8, 1/4	1/4, 3/8	3/8, 1/2
Orifice diameter		ø4	ø8	ø12
Flow rate characteristics	Kv	0.3	1.4	2.1
	Cv	0.35	1.7	2.5
Withstand pressure [MPa]		1		
Operating pressure [MPa]	A → B	0 to 0.5		
	B → A	0 to 0.2		
Back pressure [MPa]		0.3 or less		
Valve leakage [cm <sup>3</sup> /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



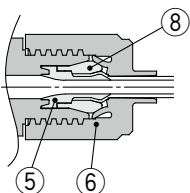
Threaded type



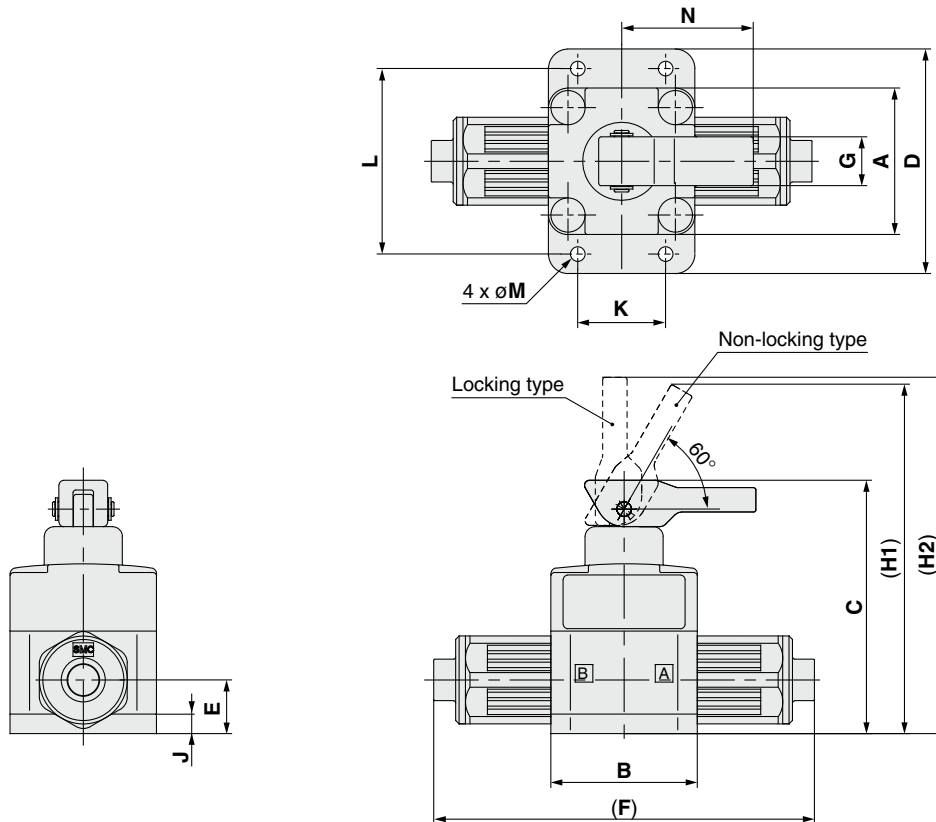
Component Parts

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	—

With reducer



## Dimensions: Integrated Fitting Type



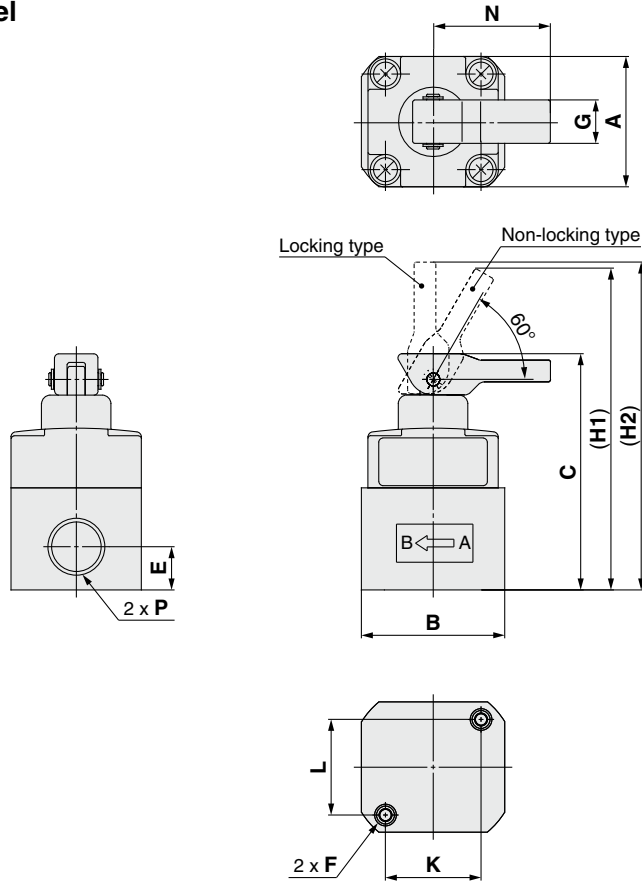
Dimensions

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

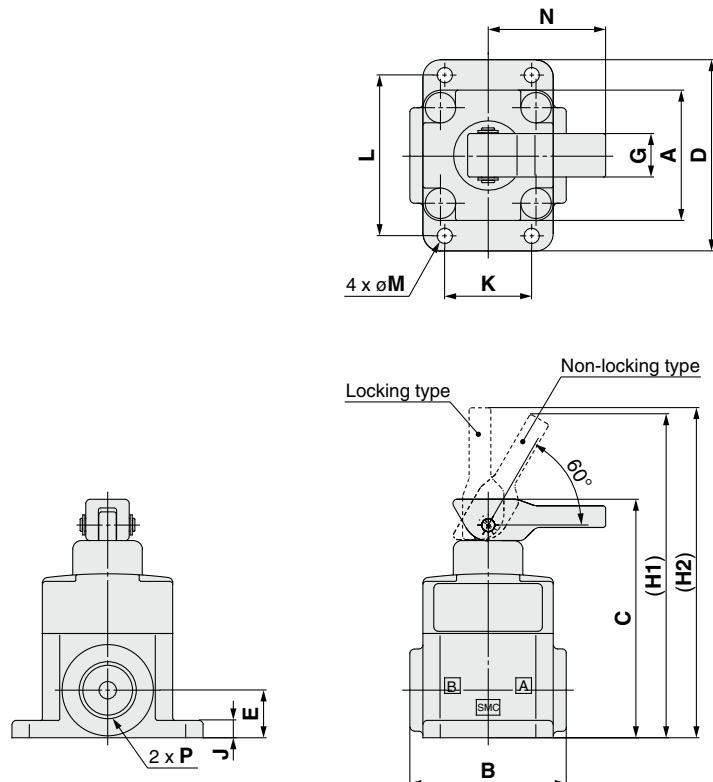
# LVH Series

## Dimensions: Threaded Type

Body material: Stainless steel

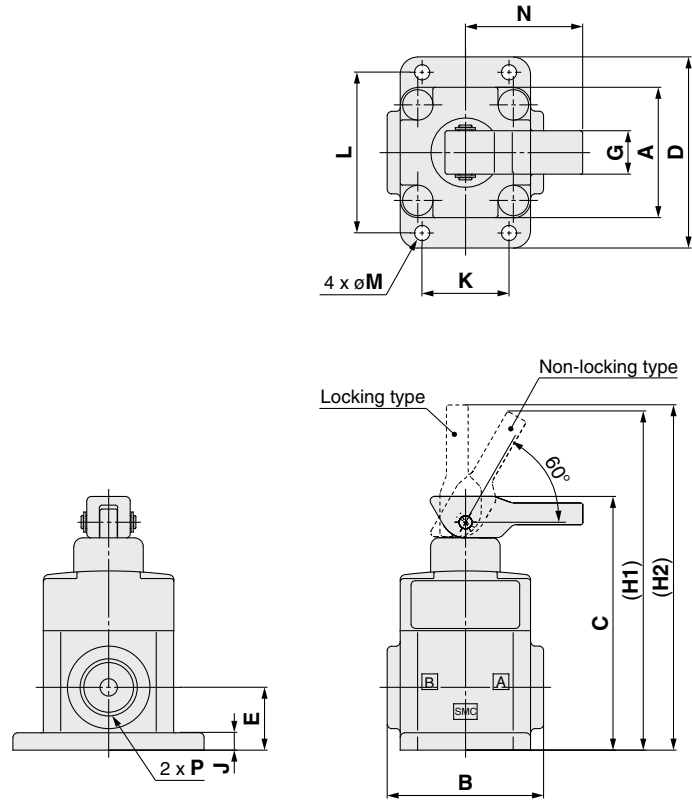


Body material: PPS



**Dimensions: Threaded Type**

Body material: PFA

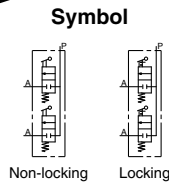
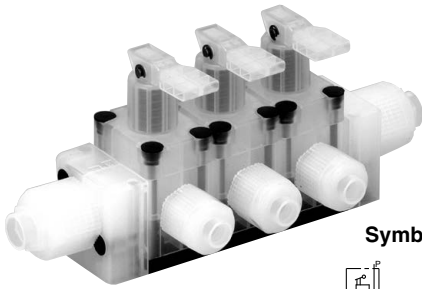


**Dimensions**

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 208 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"		

**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		
12	12 x 10		
13	1/2" x 3/8"	5	4
12	12 x 10		
19	19 x 16, 3/4" x 5/8"		

\*1: Refer to page 208 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

**Tubing size**

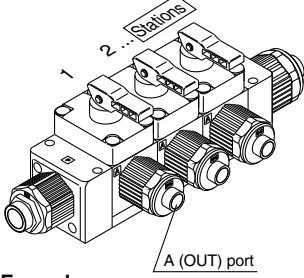
Symbol	Tubing size	Body class
03	ø3, 1/8"	2
04	ø4	
05	3/16"	
06	ø6	
07	1/4"	3
06	ø6	
08	ø8	
10	ø10	4
11	3/8"	
10	ø10	
12	ø12	
13	1/2"	

**LQ2 integrated fitting**

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 208.

**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)**

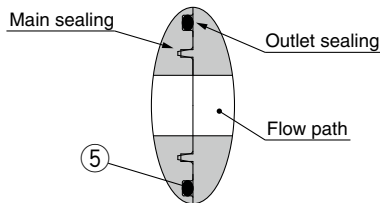
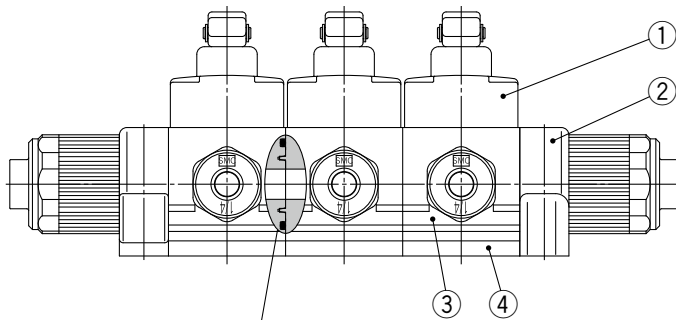
• Prefix the asterisk to the part no. of the valves, etc.

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		PFA			
Orifice diameter		1/4	3/8	1/2	
Valve type		ø4	ø8	ø10	
Type	Symbol				
<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

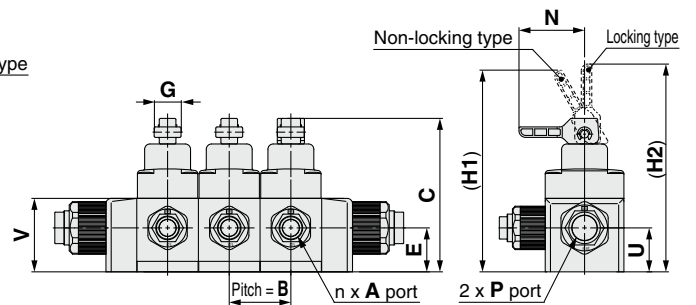
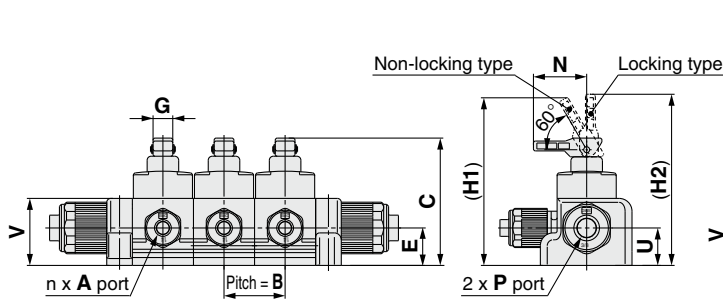
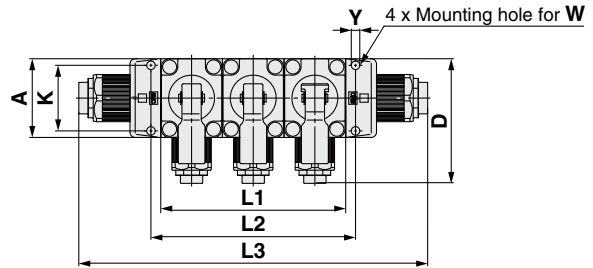
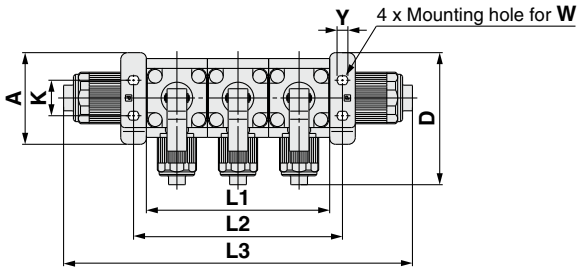
# LVH Series

## Dimensions

LLH□A- Stations-□□

Size 2

Size 3, 4



### Dimensions

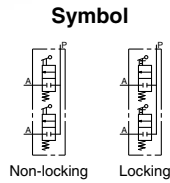
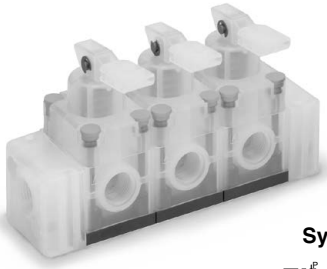
[mm]

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	Stations			
		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

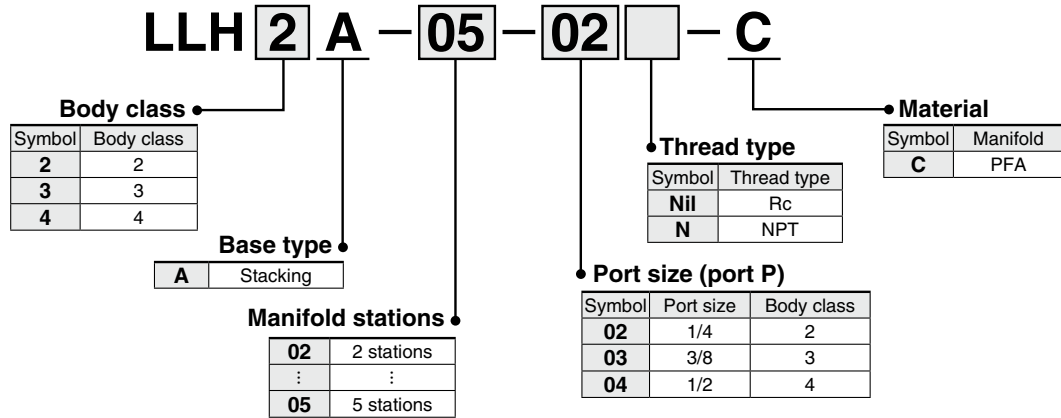


## Manifold Specifications

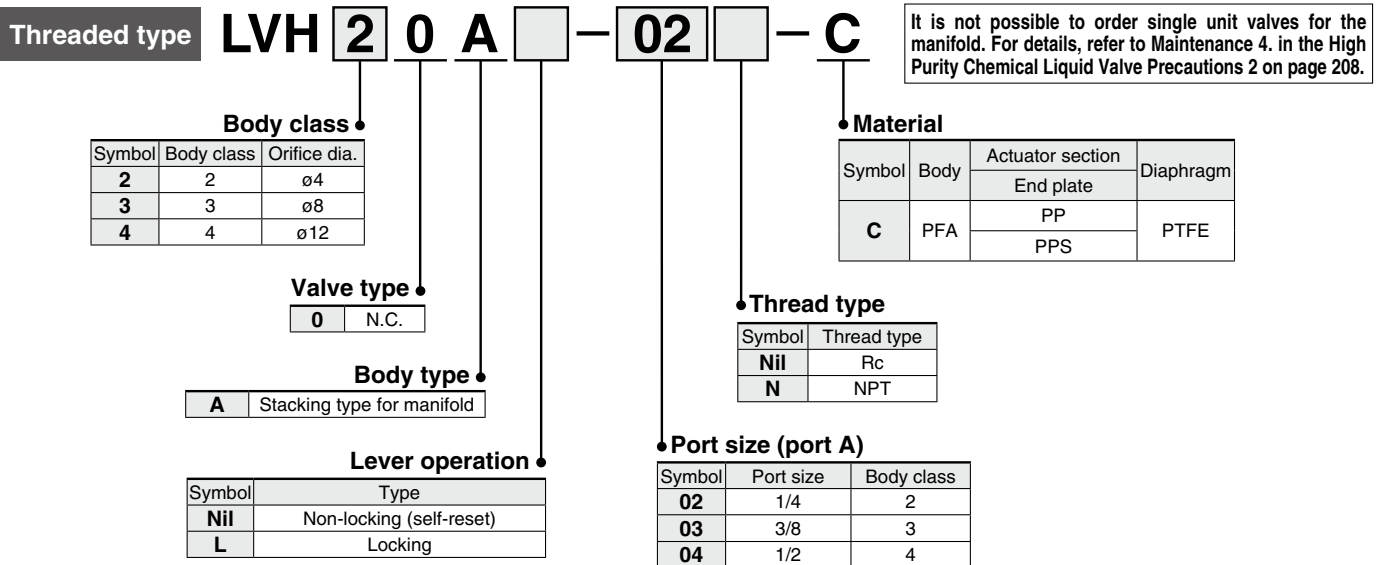
Model	LLH2A	LLH3A	LLH4A
Manifold type	Stacking		
P (IN), A (OUT) type	Common IN/Individual OUT		
Valve stations	2 to 5 stations		
Port size (port P)	1/4	3/8	1/2
Port size (port A)	1/4	3/8	1/2

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

## How to Order Manifold Base



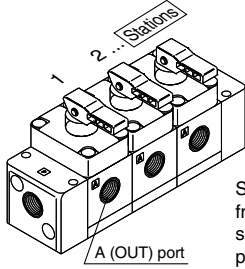
## How to Order Valve



# LVH 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.

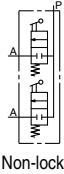
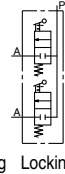
<Example>

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)**

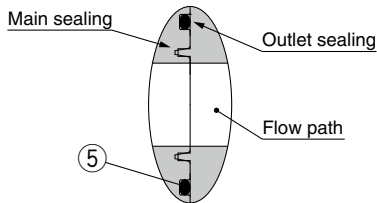
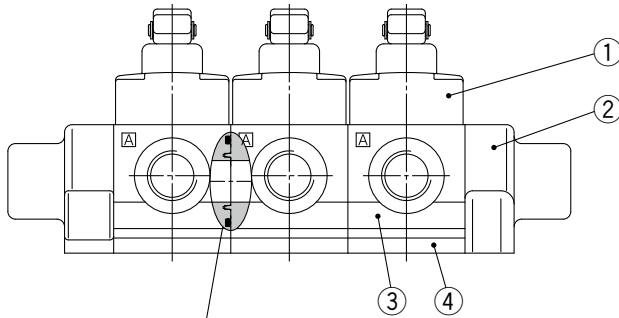
• Prefix the asterisk to the part no. of the valves, etc.

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

## Construction



Manifold body connection

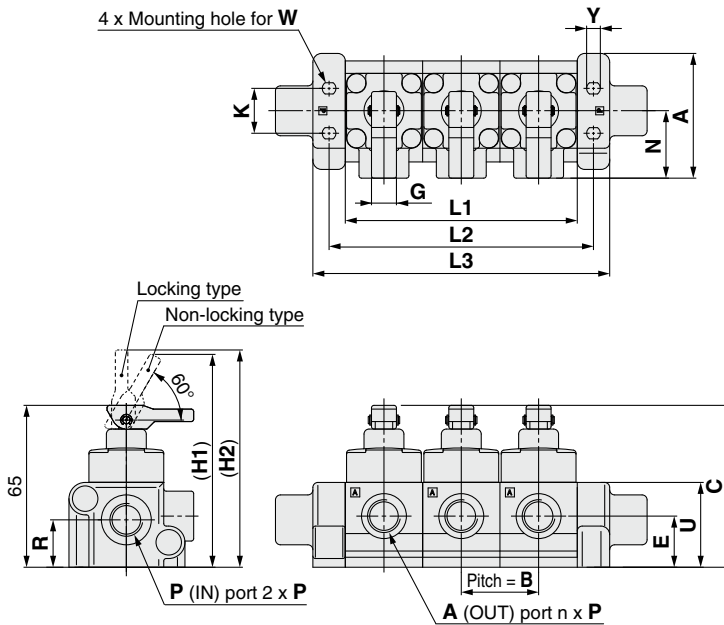
## Component Parts

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

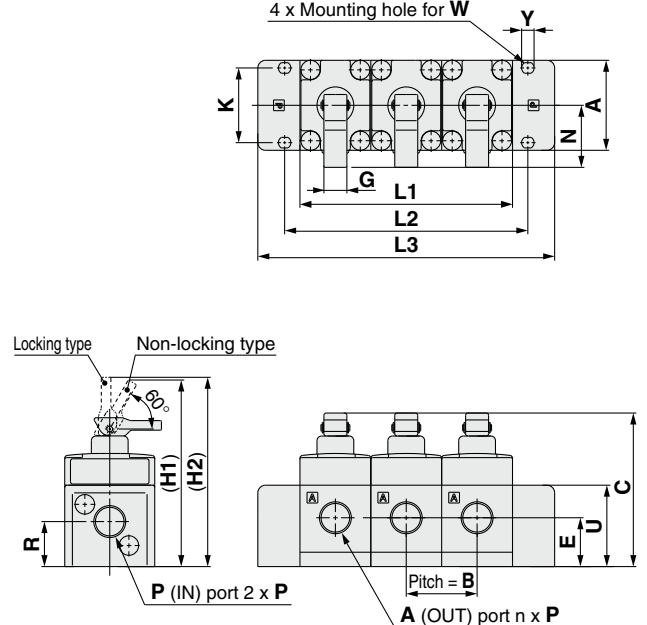
## Dimensions

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	[mm]			
	Symbol	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 Compression Fittings/Face 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 compression fittings
G	With face 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  
Compression fittings

### Symbol



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 compression fittings, With face seal fittings, Integrated tubing					
Weight <sup>*2</sup> [kg]	Fitting type	D	0.27	0.61	1.04	2.16	2.50
		G	0.28	0.67	1.05	2.26	2.63
		T	0.23	0.55	0.94	2.00	2.20

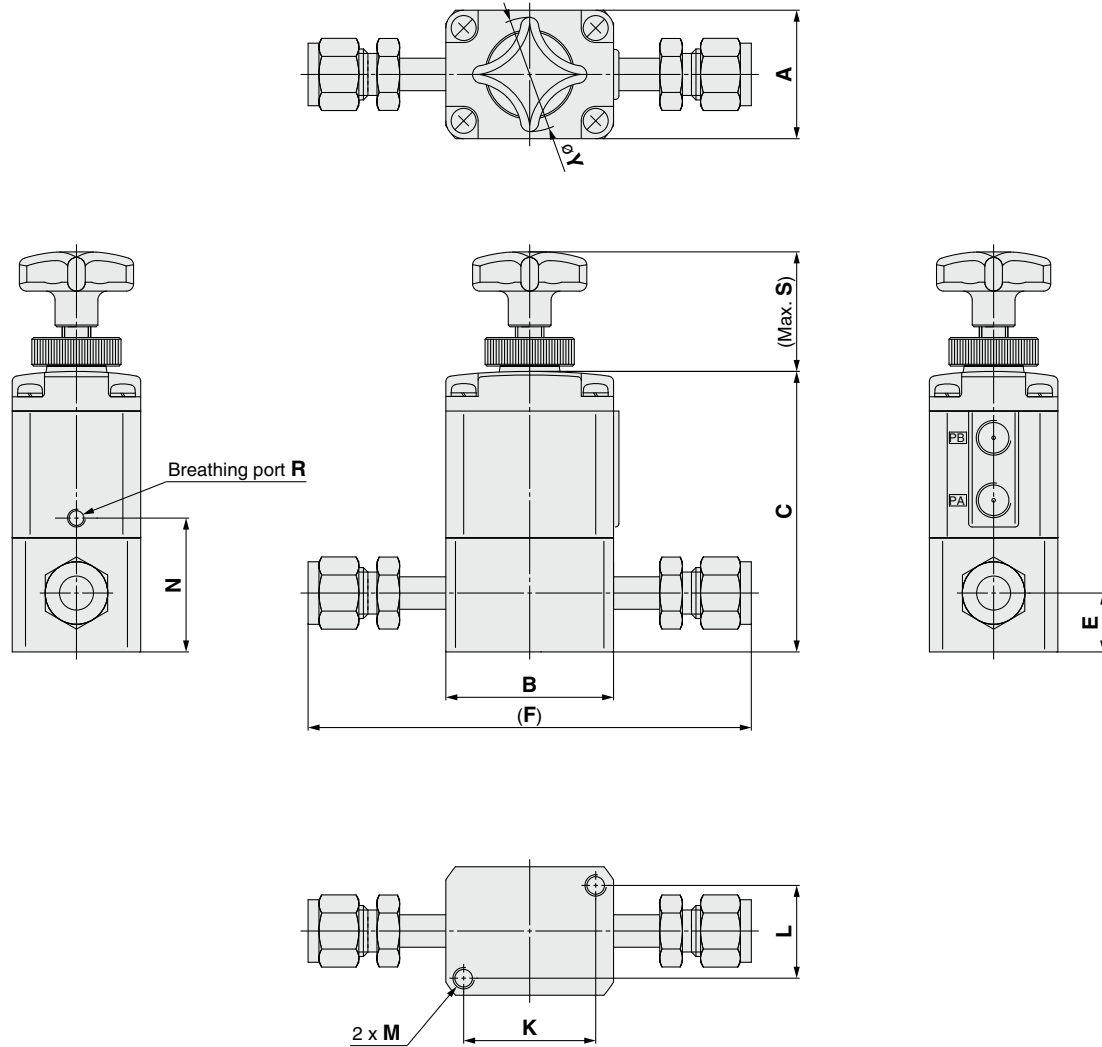
\*1: Metric size is only available for fitting types D and T.

\*2: Applicable tubing size: inch size



## Dimensions

Body material: Stainless steel  
 With compression fittings



## Dimensions

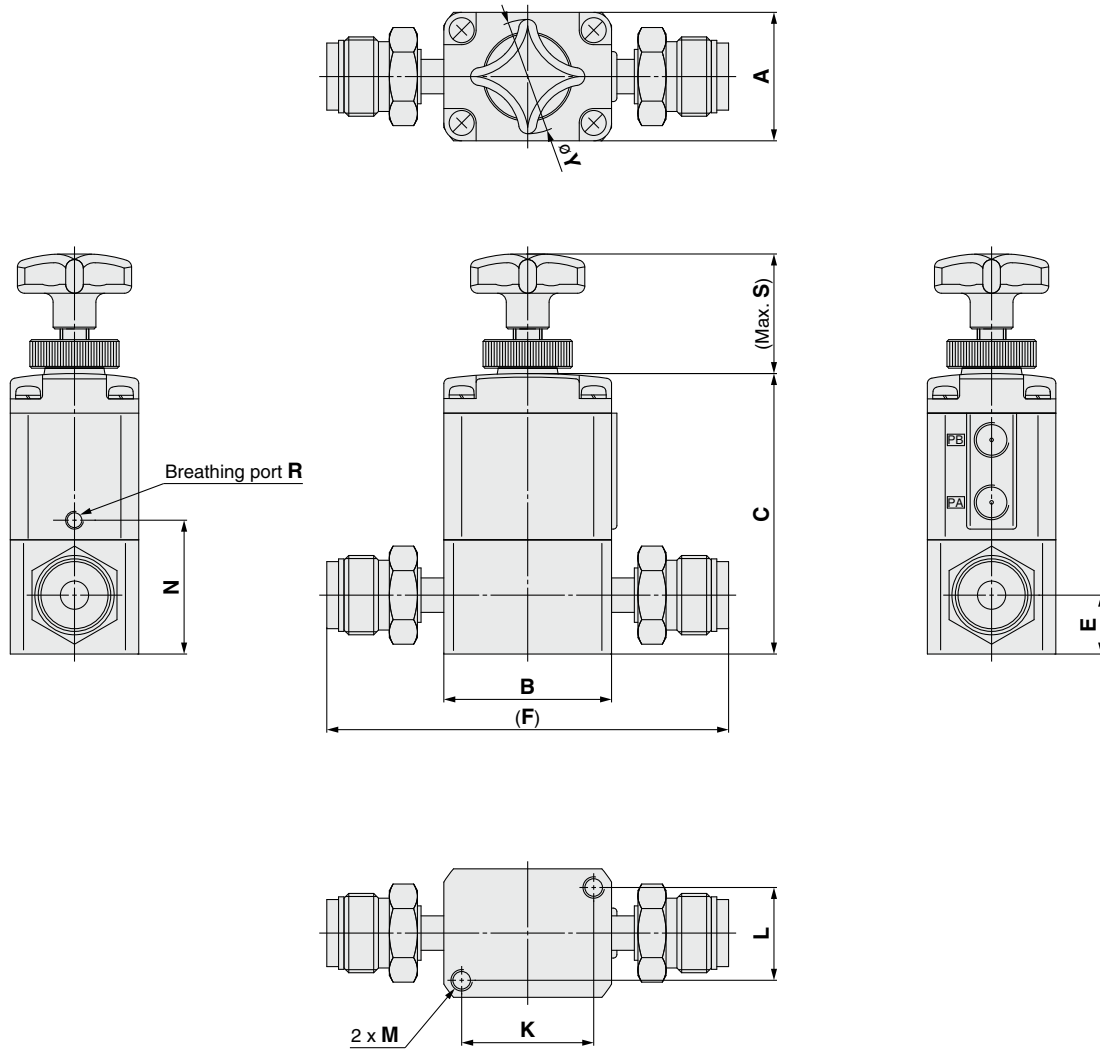
[mm]

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 face seal fittings



## Dimensions

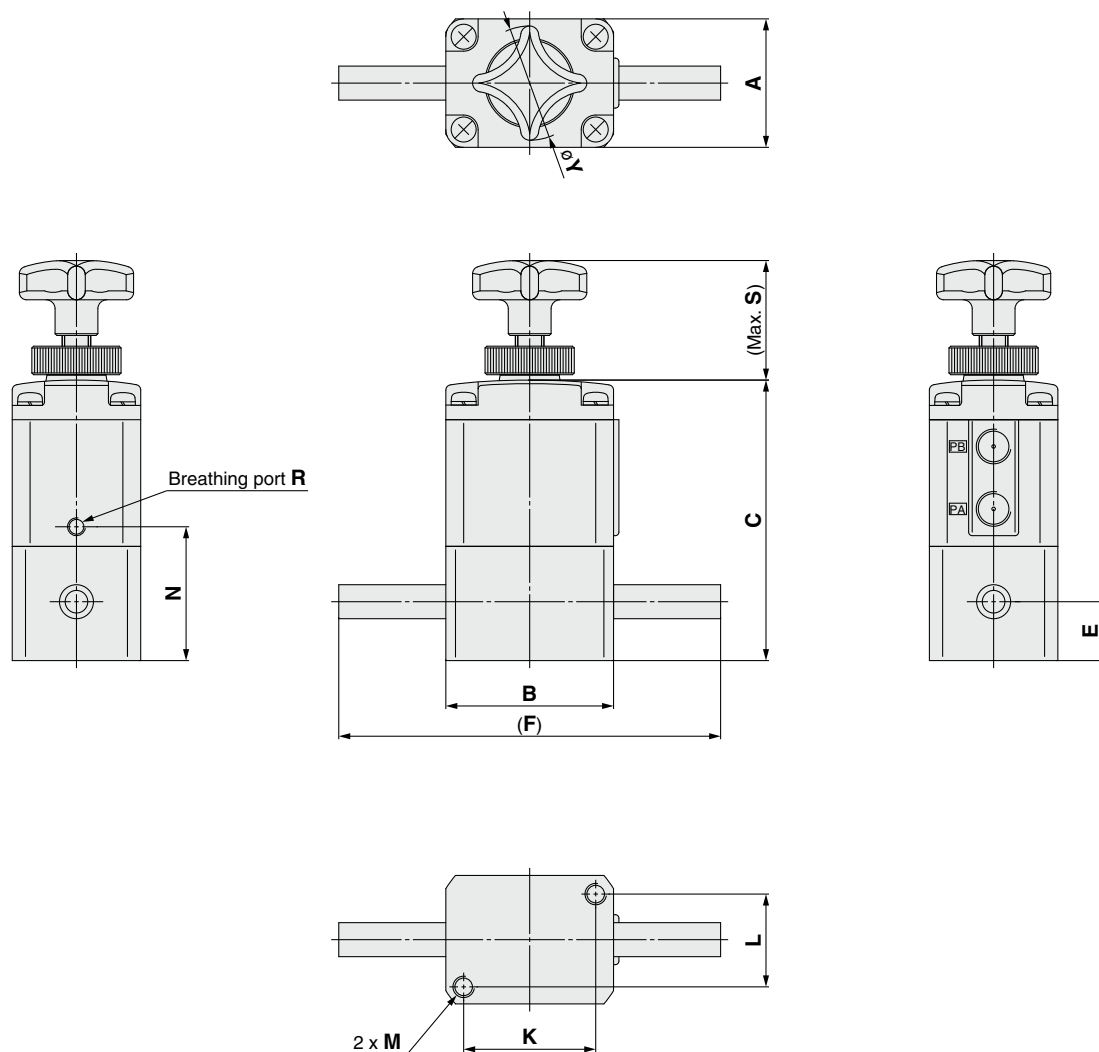
[mm]

Model	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



## 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.

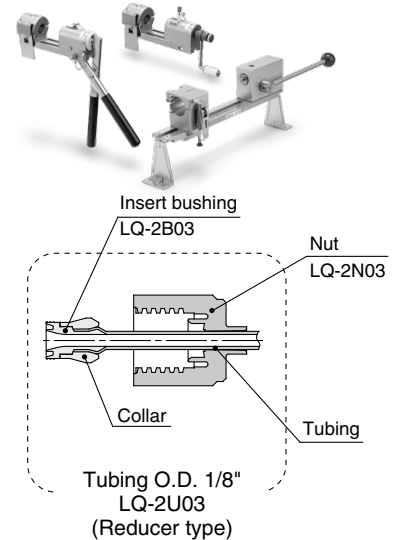
Body class	Tubing O.D.														
	Metric size							Inch size							
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

### 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.)

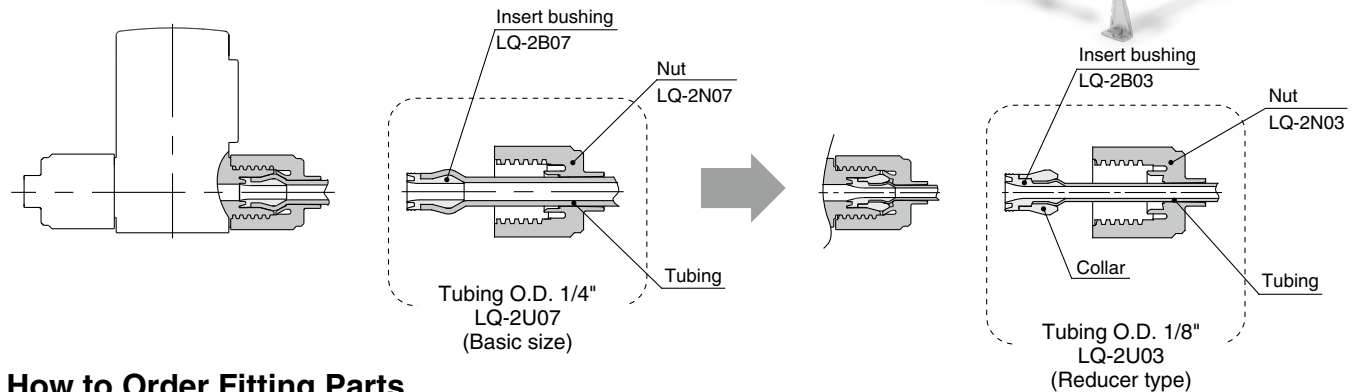


### Changing the tubing size

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 208 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 page 501 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 206. 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 page 501 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. 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 and/or bypass, 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 closed state when the product is shipped from the factory.

In addition, do not apply excessive force to the adjustment knob even when the lock nut is in a tightened state. Operate the adjustment knob when the lock nut is in a loosened state.

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			
ø25 x ø22	25.0	+0.2 -0.1	1.2	±0.12	
1/8" x 0.086"	3.18				
3/16" x 1/8"	4.75				
1/4" x 5/32"	6.35		1.6	±0.15	
3/8" x 1/4"	9.53				
1/2" x 3/8"	12.7				
3/4" x 5/8"	19.0		+0.3 -0.1		
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 page 501 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.