

# 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**

Symbol	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	
03	3/8	4
04	1/2	

**Applicable tubing size**

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

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

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

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

**Material** \*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.	○	○	○
		Non-locking Locking			

### Threaded Type Variations

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



## ⚠️ Precautions

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

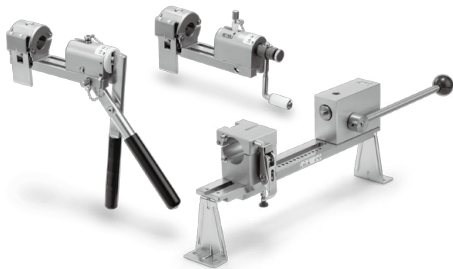
### Piping

## ⚠️ Caution

### Integrated fitting type

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

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



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

#### Tightening Torque for Piping

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

### Threaded type

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

This can cause damage to the valve body.

## Standard Specifications: Integrated Fitting Type

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

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

## Different Diameter Tubing Applicable with Reducer

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

● With reducer

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

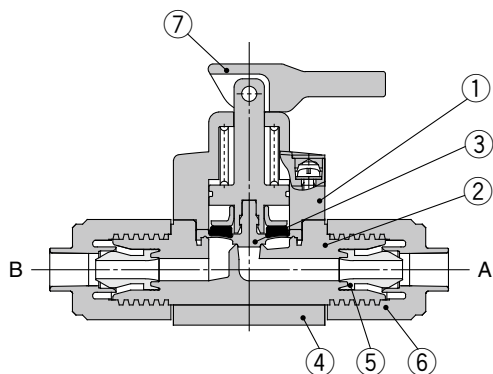
\*: Refer to page 49 for information on changing tubing sizes.

## Standard Specifications: Threaded Type

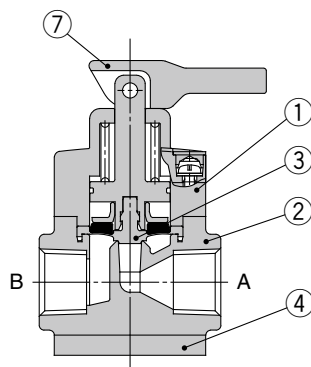
Model		LVH20	LVH30	LVH40
Port size		1/8, 1/4	1/4, 3/8	3/8, 1/2
Orifice diameter		ø4	ø8	ø12
Flow rate characteristics	Kv	0.3	1.4	2.1
	Cv	0.35	1.7	2.5
Withstand pressure [MPa]		1		
Operating pressure [MPa]	A → B	0 to 0.5		
	B → A	0 to 0.2		
Back pressure [MPa]		0.3 or less		
Valve leakage [cm <sup>3</sup>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

## Construction

### Integrated fitting type



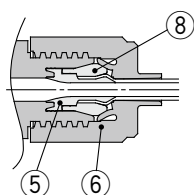
### Threaded type



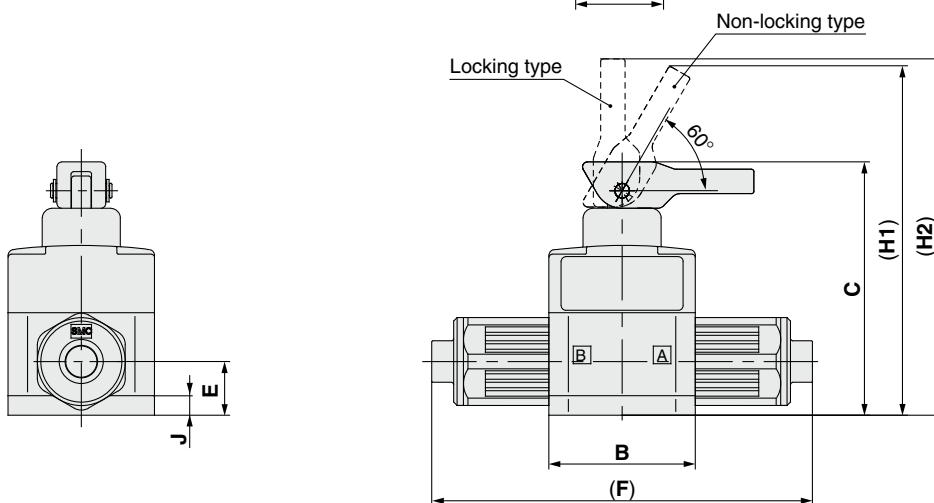
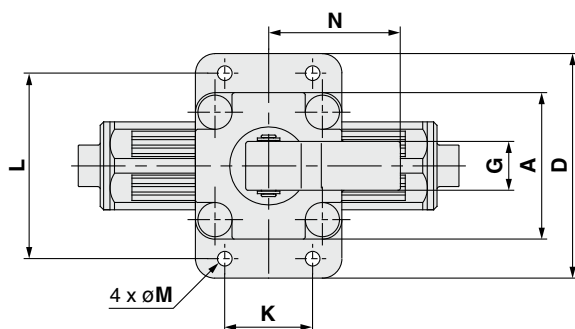
### Component Parts

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

[mm]

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

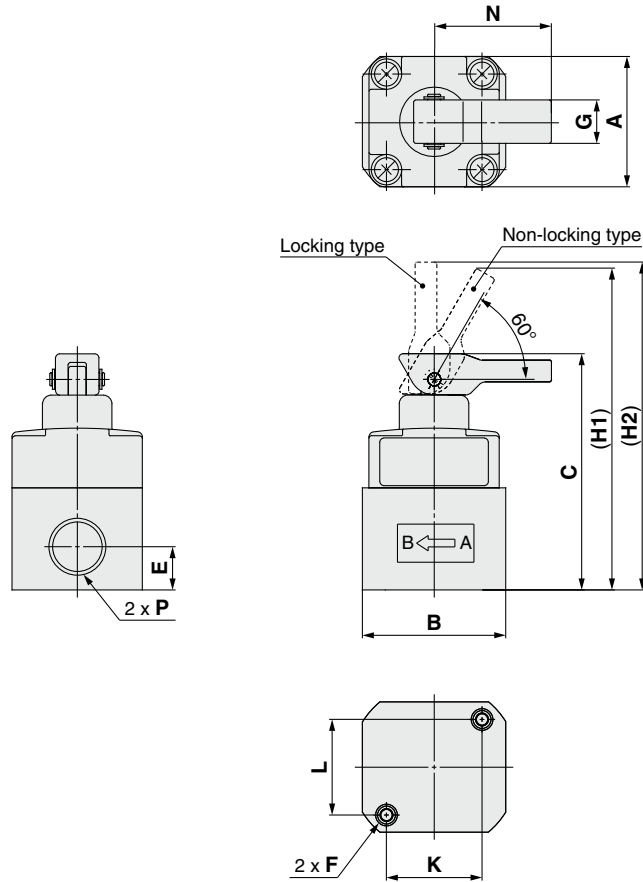
Manually Operated  
**LVB**

Organic Solvents Compatible  
**LVB**

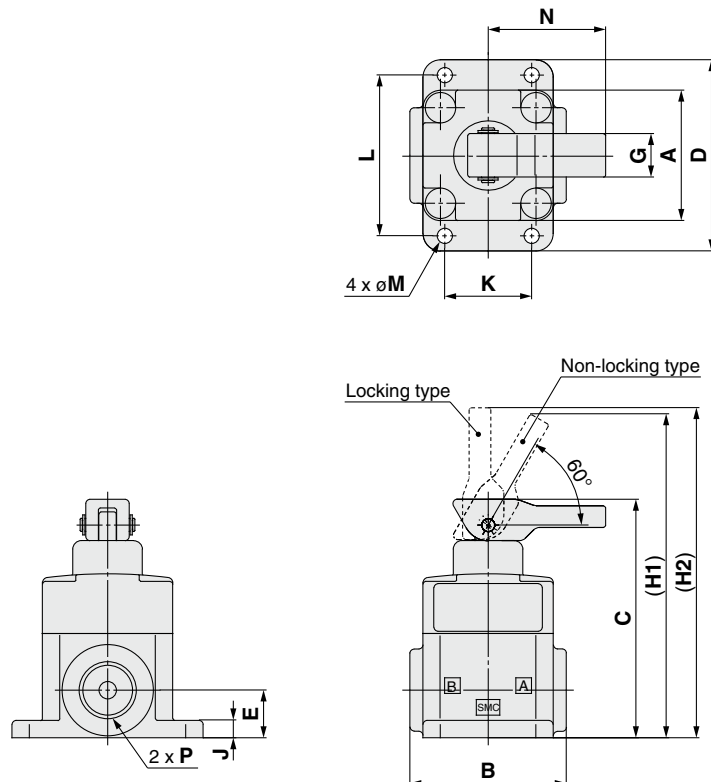
# LVH Series

## Dimensions: Threaded Type

Body material: Stainless steel

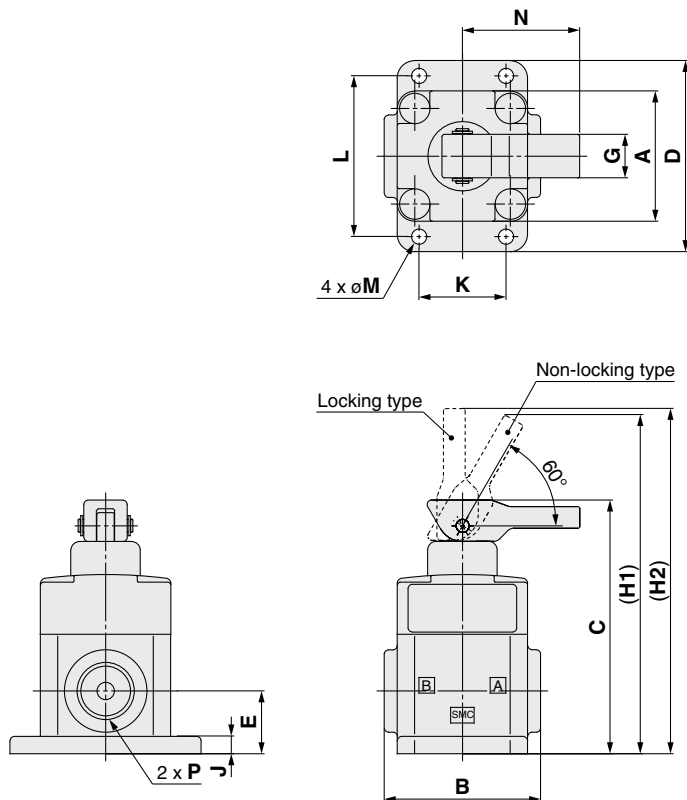


Body material: PPS



**Dimensions: Threaded Type**

Body material: PFA



Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

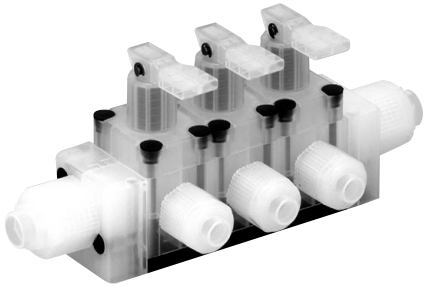
Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

**Dimensions**

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

# LVH Series Integrated Fitting Type Manifolds



## Manifold Specifications

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

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

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

## How to Order Manifold Base

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

**Body class**

Symbol	Body class
2	2
3	3
4	4

**Base type**

Symbol	Base type
A	Stacking

**Manifold stations**

Symbol	Manifold stations
02	2 stations
⋮	⋮
05	5 stations

**LQ2 integrated fitting**

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

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

**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 52 for details of the applicable tubing sizes.

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

## How to Order Valve

**LVH 2 0 A - S 07**

**Body class**

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

**Valve type**

Symbol	Valve type
0	N.C.

**Body type**

Symbol	Body type
A	Stacking type for manifold

**Lever operation**

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

**Tubing size**

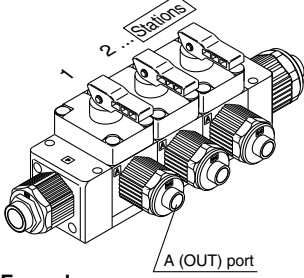
Symbol	Tubing size	Body class
03	ø3, 1/8"	2
04	ø4	
05	3/16"	
06	ø6	
07	1/4"	3
06	ø6	
07	1/4"	
08	ø8	4
10	ø10	
11	3/8"	
10	ø10	
11	3/8"	4
12	ø12	
13	1/2"	

**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 52.

## How to Order Manifold Assembly (Example)

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



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

### <Example>

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

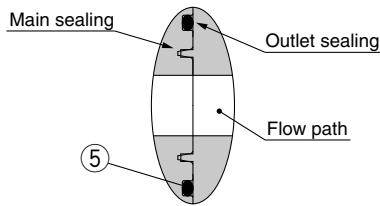
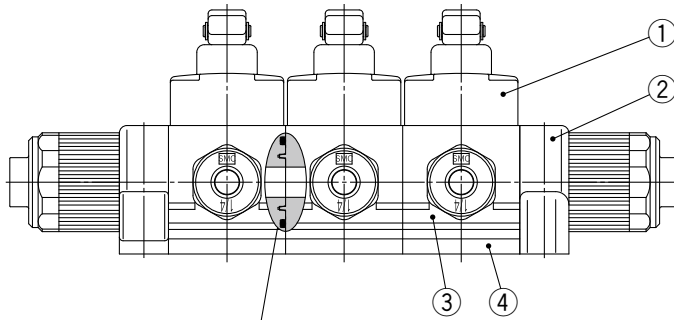
• Prefix the asterisk to the part no. of the valves, etc.

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

## Integrated Fitting Type Manifold Variations

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

## Construction



**Manifold body connection**

### Component Parts

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

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

Organic Solvents Compatible  
**LVH**

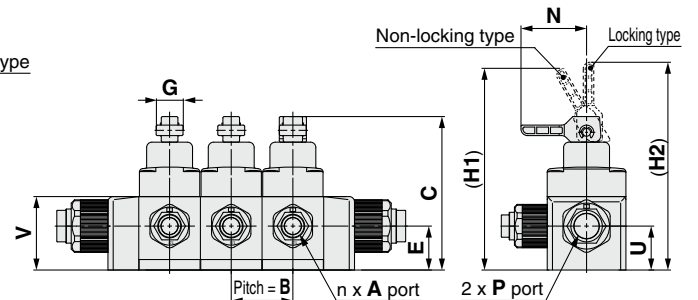
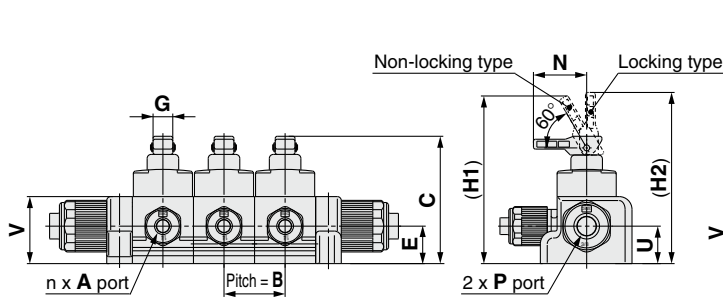
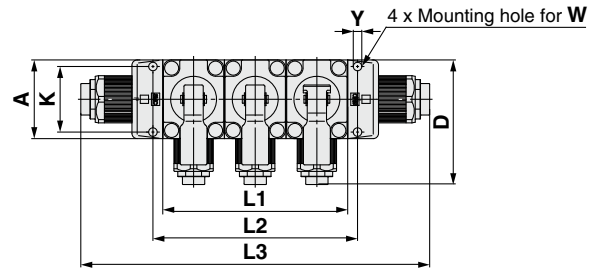
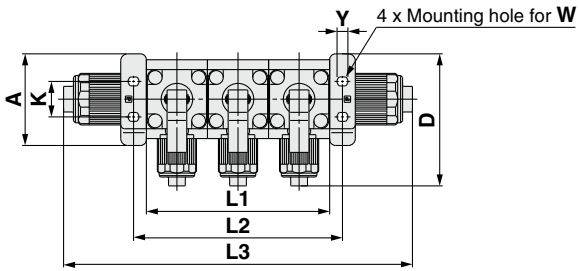
# LVH Series

## Dimensions

LLH□A- Stations -□□

Size 2

Size 3, 4



### Dimensions

[mm]

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

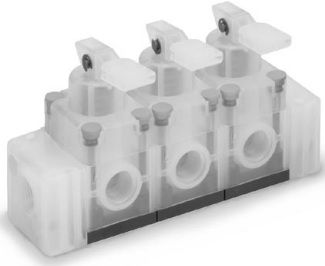
[mm]

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





# LVH Series Threaded Type Manifolds

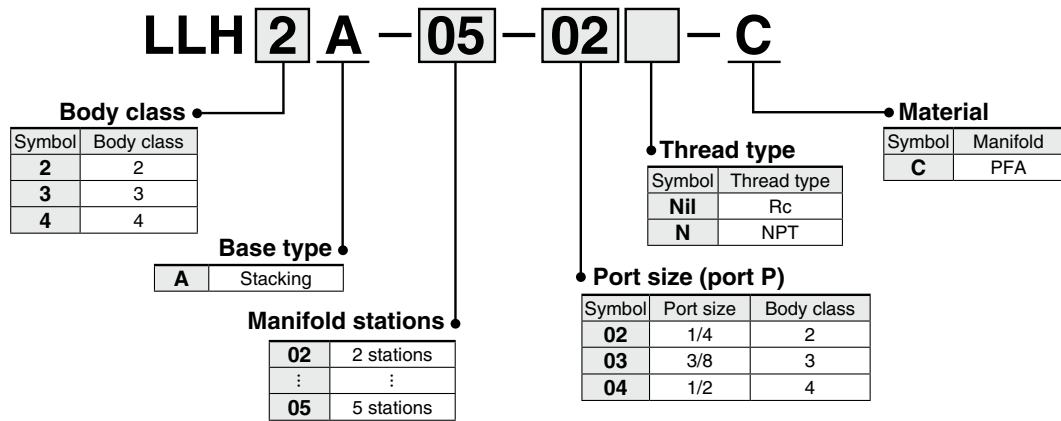


## Manifold Specifications

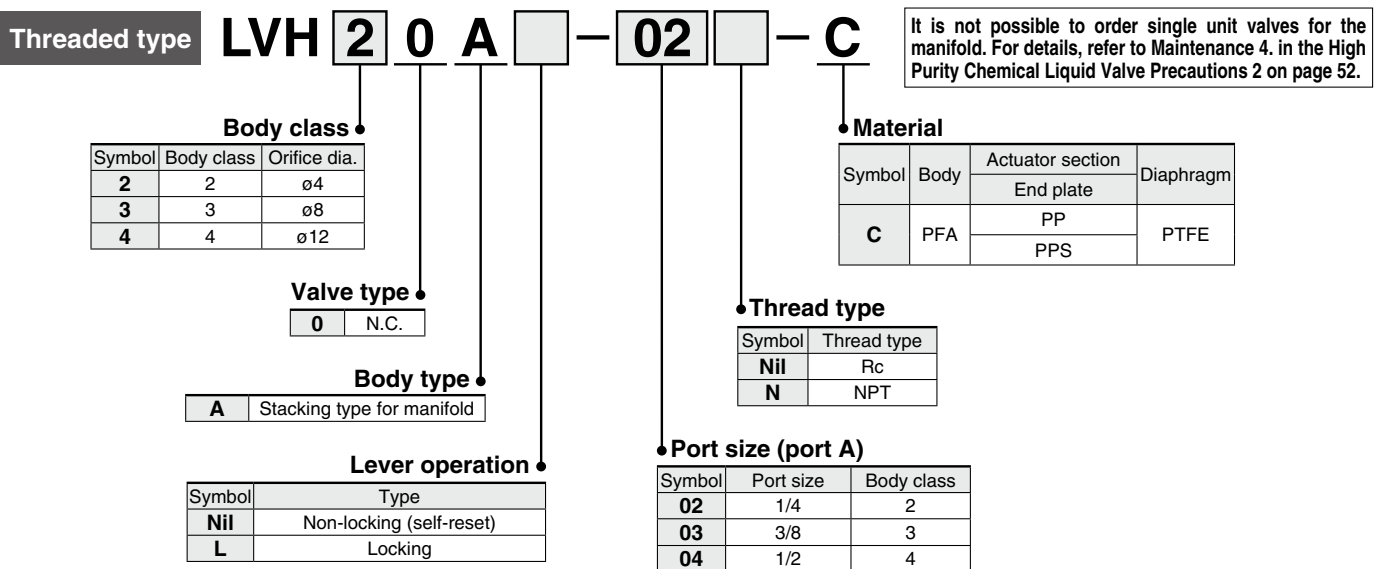
Model	LLH2A	LLH3A	LLH4A
Manifold type	Stacking		
P (IN), A (OUT) type	Common IN/Individual OUT		
Valve stations	2 to 5 stations		
Port size (port P)	1/4	3/8	1/2
Port size (port A)	1/4	3/8	1/2

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

## How to Order Manifold Base

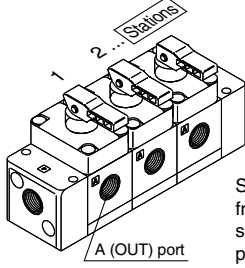


## How to Order Valve



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

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



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

**<Example>**

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

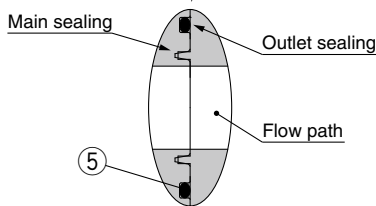
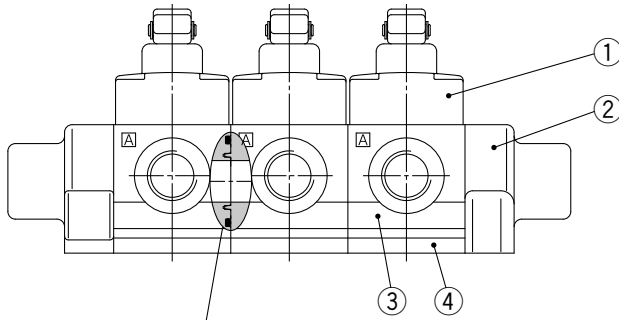
• Prefix the asterisk to the part no. of the valves, etc.

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

**Threaded Type Manifold Variations**

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

**Construction**



**Manifold body connection**

**Component Parts**

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

Integrated Fitting Type  
**LVC**

Threaded Type  
**LVA**

Organic Solvents Compatible  
**LVA**

Manually Operated  
**LVH**

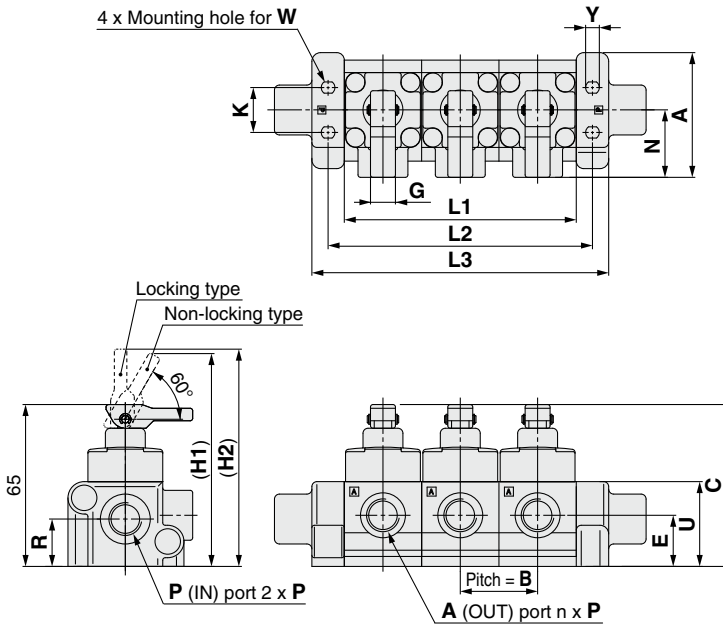
Organic Solvents Compatible  
**LVH**

# LVH Series

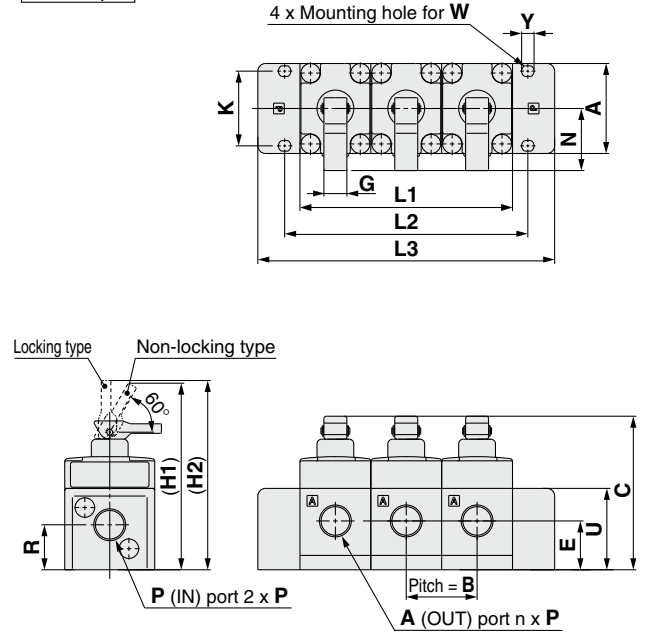
## Dimensions

LLH□A- Stations -□□-C

Size 2



Size 3, 4



### Dimensions

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

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

## Fittings

### Changing Tubing Sizes

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

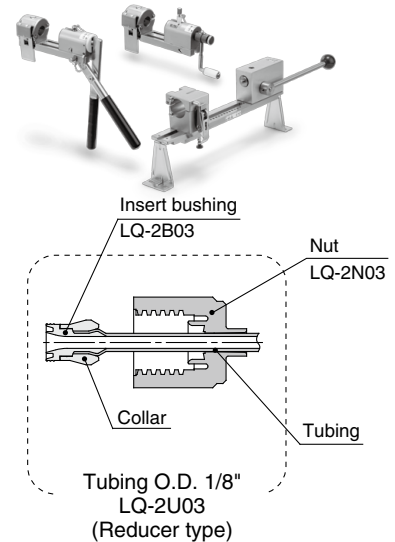
Body class	Tubing O.D.														
	Metric size							Inch size							
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

### 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.)

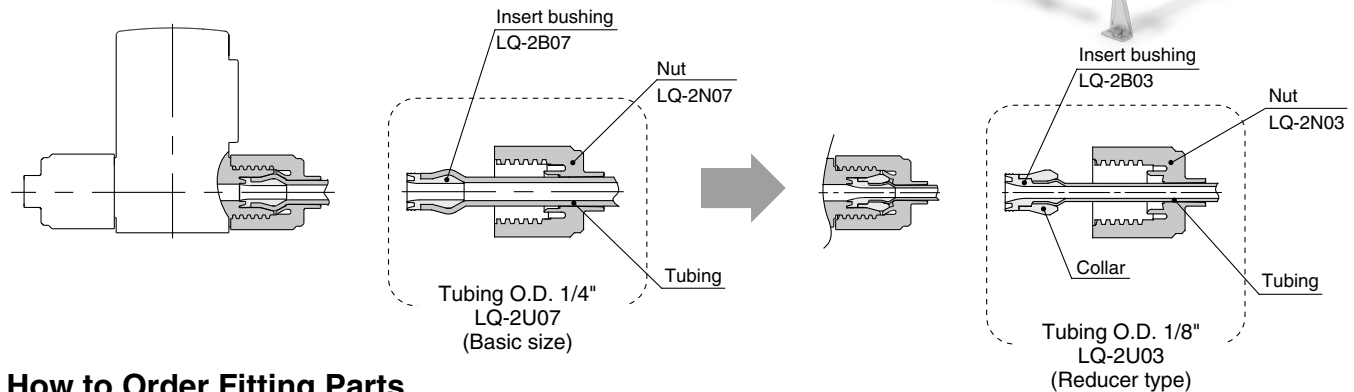


### Changing the tubing size

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"		
19	3/4" x 5/8", 19 x 16	6	
19	3/4" x 5/8", 19 x 16		
25	1" x 7/8", 25 x 22		

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



LV□ Series

# Applicable Fluids

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

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

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

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

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

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

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

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