

High Purity Chemical Valve

Series *LVC/LVA/LVH*

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

Clean-Wet Series



Air Operated Type

Integral Fittings Series *LVC* P.461

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

Body material:
New PFA



Air Operated Type

Threaded Ports Series *LVA* P.471

- Diaphragm material PTFE, EPR, NBR are selectable

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



Manual Operation Series *LVH* P.481

Integral fitting type/Threaded type

- Locking and non-locking types available

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

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3



Prevents Micro-Bubbles

Diaphragm (PTFE)

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

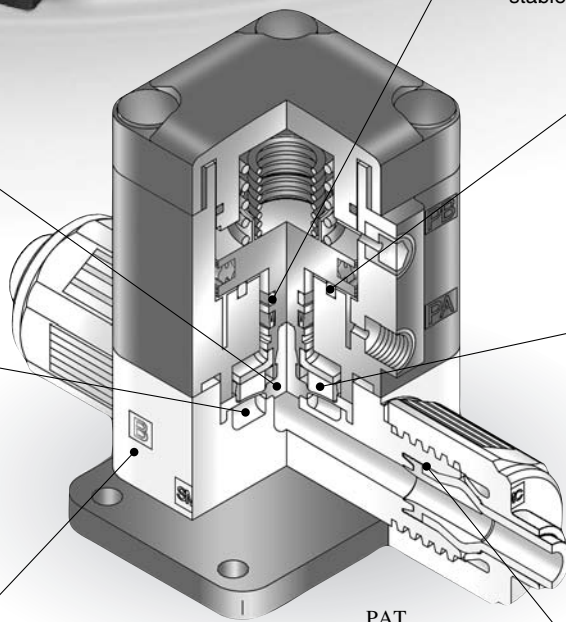
Minimal dead space

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

Outstanding corrosion resistance

Body (New PFA)

Compatible with chemicals such as acids, bases and ultra DI water.



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 formation with a stable work surface.

Low particle generation

Piston bumper

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

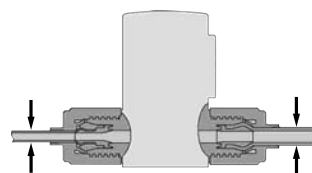
Back-pressure resistance and long life

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

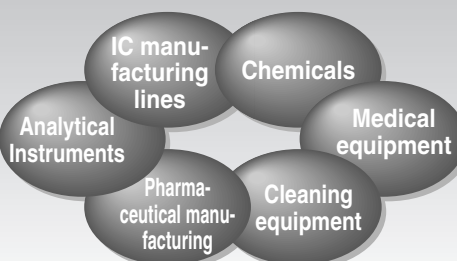
Hyper fitting



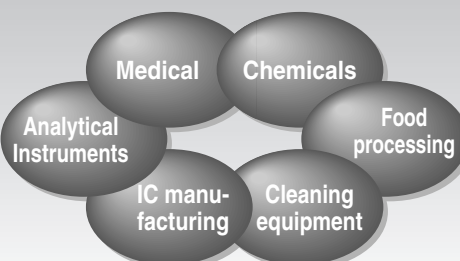
- No leak design (quadruple seal)
- Nut lock mechanism (sealing)
- High flexural strength (tubing supports)

Main applications and fields

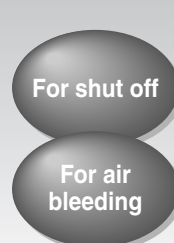
LVC



LVA

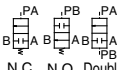
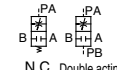
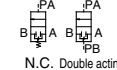
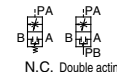
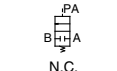
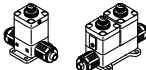
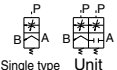


LVH



Air Operated

[illegible]

Type	Symbol	Valve type	Model					
			Orifice diameter	LVC2□	LVC3□	LVC4□	LVC5□	LVC6□
			Tubing O.D.	Metric	Inch			
				3, 4, 6	6, 8, 10	10, 12	12, 19	19, 25
				1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	3/4, 1
Basic type		 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 type Unit	Single type	○	—	—	—	—
			Unit	○	—	—	—	—
Manifold (5 stations max.)								

3 port 		N.C.		—	—	—	—	—
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Air Operated

Threaded Type Series LVA

[illegible]

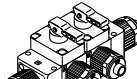
3 port		 iPA A R P P N.C.	N.C.	—	—	—	Note 2) 	—	—	—	—	—	—	—
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Note 1) Refer to the page 471 for the applicable optional body materials.

Note 2) Only PFA is applicable as a body material.

Series LV

Manually Operated Series LVH ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶ P.481

Type	Symbol	Valve type	Model	LVH20	LVH30	LVH40
			Orifice diameter	ø4	ø8	ø10
			Tubing O.D.	Metric	ø8, 10	ø10, 12
				Inch	1/4, 3/8	3/8, 1/2
Basic type		  Non-locking Locking	N.C.			
Manifold (5 stations max.)						

Threaded Type

[illegible]

Air Operated Type Integral Fitting Type (Hyper Fittings) Series *LVC*

How to Order Valves (Single Type)

LVC 2 0 - S 06

Body class

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø10
5	5	ø16
6	6	ø22

Valve type

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

LQ2 integral fitting

Note) Refer to variations in the table below for valve type combinations.

Applicable tubing size

Symbol	Connecting tubing O.D.	Body class	2	3	4	5	6
Metric sizes							
03	ø3		●				
04	ø4		●				
06	ø6		○	●			
08	ø8			●			
10	ø10			○	●		
12	ø12				○	●	
19	ø19					○	●
25	ø25						○
Inch sizes							
03	1/8		●				
05	3/16		●				
07	1/4		○	●			
11	3/8			○	●		
13	1/2				○	●	
19	3/4					○	●
25	1						○

○ Basic size ● With reducer

Note) Applicable fittings for body class 6 is LQ1.

Port B (OUT) different dia. size

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

Option

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

Note) Refer to "Variations" in the table below for option combinations. Options can not be combined each other.

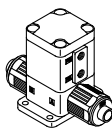
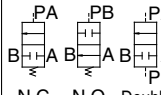
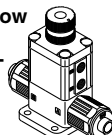
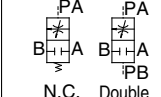
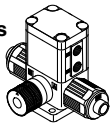
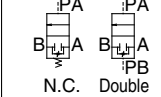
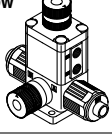
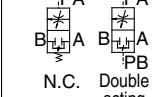
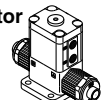
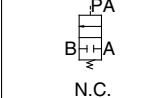
Material

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

Pilot port thread type

Symbol	Body class	Thread type
Nil	2	M5
	3, 4, 5, 6	Rc 1/8
N	3, 4, 5, 6	NPT 1/8

Variations

		Model		LVC20	LVC30	LVC40	LVC50	LVC60
		Orifice diameter		ø4	ø8	ø10	ø16	ø22
		Tubing O.D.	Metric	3, 4, 6	6, 8, 10	10, 12	12, 19	19, 25
			Inch	1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	3/4, 1
Type	Symbol	Valve type						
Basic type 	 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.	○	○	○	○	○	



Standard Specifications

Model		LVC20	LVC30	LVC40	LVC50	LVC60
Tubing O.D.	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 characteristics	Av x 10 ⁻⁶ m ²	8.4	40.8	60	144	192
	Cv	0.35	1.7	2.5	6	8
Withstand pressure (MPa)		1				
Operating pressure (MPa)		0 to 0.5			0 to 0.4	
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 ³ /min)		0 (with water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5				
Pilot port size		M5	Rc 1/8, NPT 1/8			
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Mass (kg)		0.09	0.23	0.42	0.86	1.00



Note 1) Contact SMC if the valve is to be used with vacuum and B → A flow.

Different Diameter Tubing Applicable with Reducer

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

● With reducer

Body class	Tubing O.D.														
	Metric sizes							Inch sizes							
	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	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○



Note) Refer to page 489 for information on changing tubing sizes.

⚠ Specific Product Precautions

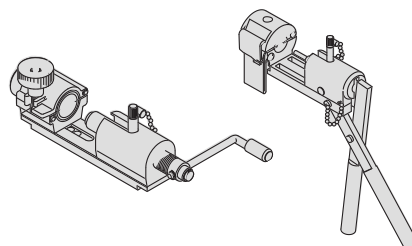
Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions, and pages 491 and 492 for High Purity Chemical Valve Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



⚠ Caution

2. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening torque for piping

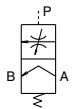
Body class	Torque (N·m)
2	1.5 to 2.0
3	3.0 to 3.5
4	7.5 to 9.0
5	11.0 to 13.0
6	5.5 to 6.0

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

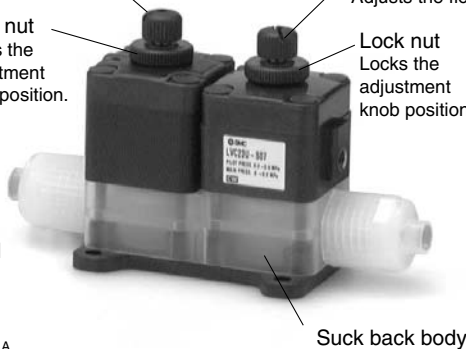
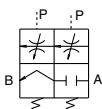
Adjustment knob
Adjusts the amount
of suck back.

Lock nut
Locks the
adjustment
knob position.

Adjustment knob
Adjusts the flow rate.

Lock nut
Locks the
adjustment
knob position.

Symbol



Suck back body

Standard Specifications

Model		LVC23	LVC23U
Tubing O.D. Note 1)	Metric sizes	(3), (4), 6	
	Inch sizes	(1/8), (3/16), 1/4	
Orifice diameter		—	ø3
Flow characteristics	$Av \times 10^{-6} m^2$	—	4.8
	Cv	—	0.2
Withstand pressure (MPa)		1	
Operating pressure (MPa)		0 to 0.2	
Maximum suck back volume (cm ³)		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	
Mass (kg)		0.08	0.16

Note 1) Different diameter tubing shown in () can be selected when used with a reducer. Refer to page 489 for details.

How to Order

LVC 2 3 -S 06

Body class

Symbol	Body class
2	2

Valve type

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

Body type

Nil	Single type
U	Unit type with 2 way valve

LQ2 integral 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 table below.	Different diameter tubing can be selected within the same body class.

Applicable tubing size

Symbol	Connecting tubing O.D.	Body class
Metric sizes		
03	ø3	○
04	ø4	○
06	ø6	◎
Inch sizes		
03	1/8	○
05	3/16	○
07	1/4	◎

◎ Basic size ○ With reducer

Options

■ With flow rate adjustment

The flow rate is adjusted by controlling the diaphragm stroke.



Adjustment knob
Adjusts the flow rate.

Lock nut
Locks the adjustment
knob position.

■ 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.

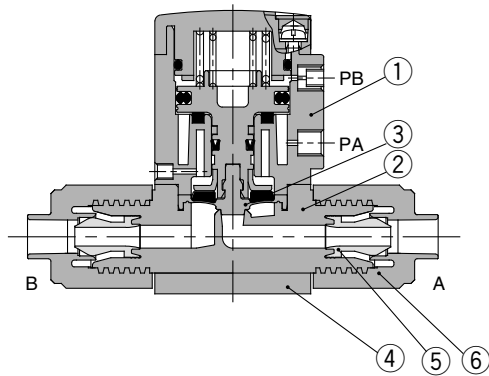


Adjustment knob
Adjusts the flow rate.

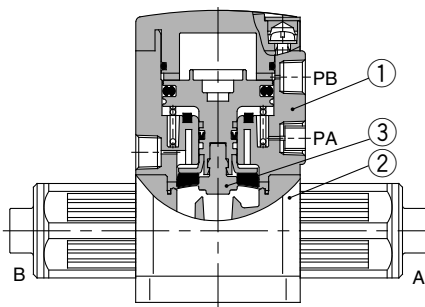
Lock nut
Locks the adjustment
knob position.

Construction

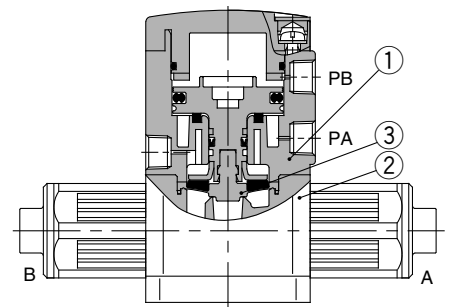
Standard type
N.C. type



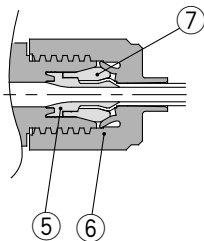
N.O. type



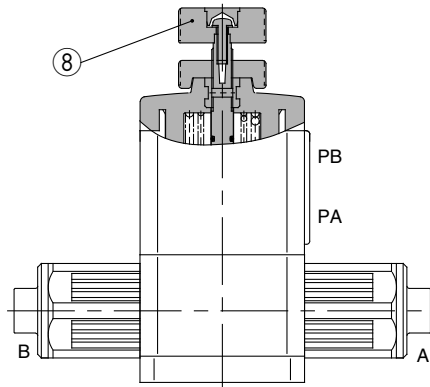
Double acting type



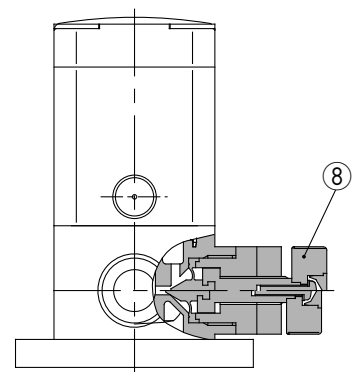
With reducer



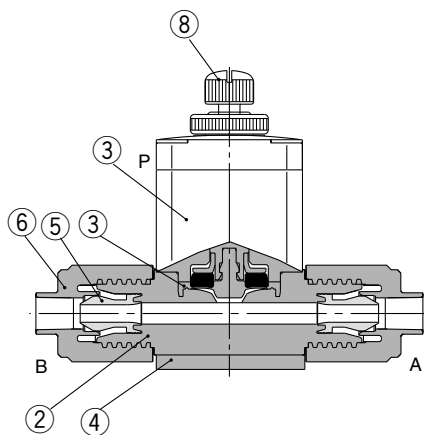
With flow rate adjustment



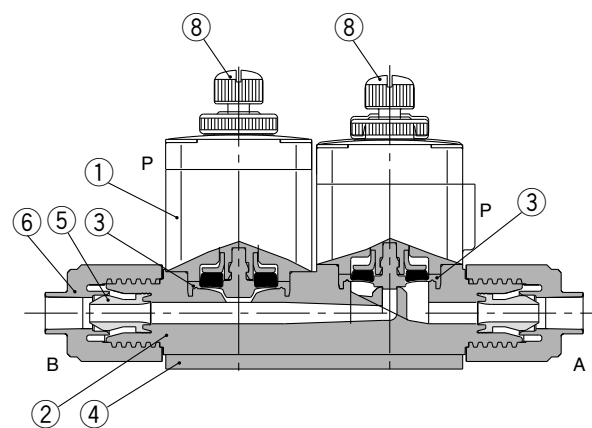
With bypass



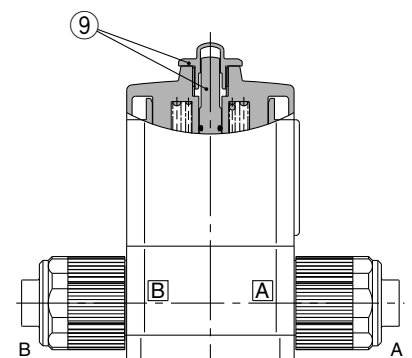
Suck back (single type)



Suck back (unit type)



With indicator

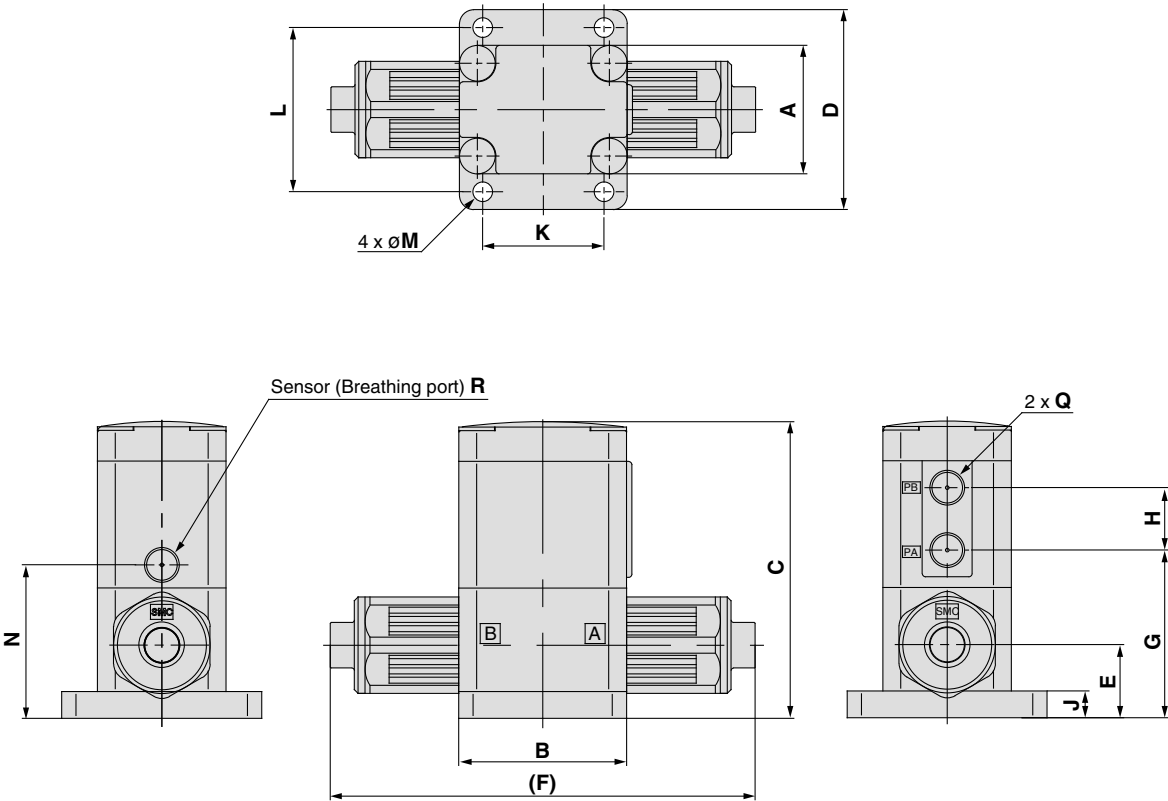


Parts list

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

Dimensions

Basic type



LVC
LVA
LVH
LVD
LVQ
LQ1
LVN
TL/TIL
LQ3

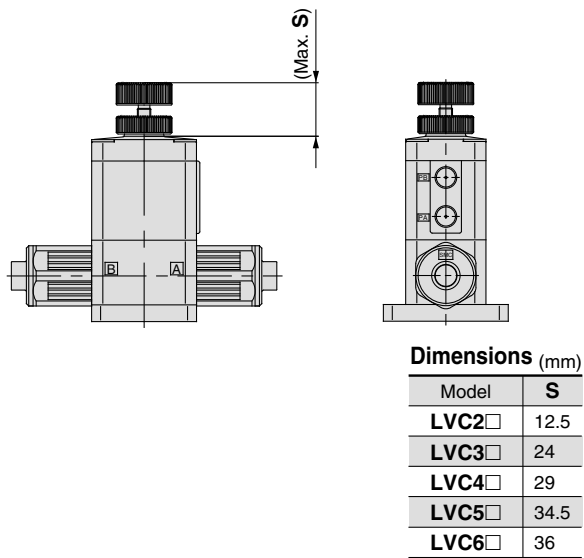
Dimensions

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R
LVC2□	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	56	16.5	106	43	17.5	7.5	34	46	5.5	39	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8
LVC4□	46	60	96	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	138	84	32	165	77	27.5	8	56	71	6.5	71		

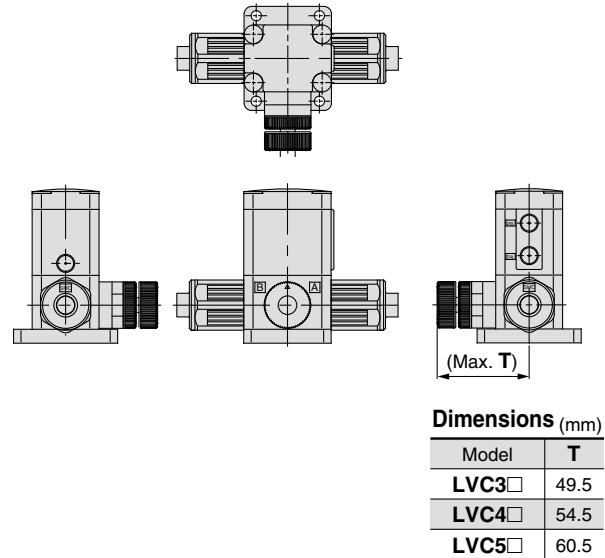
Series LVC

Dimensions

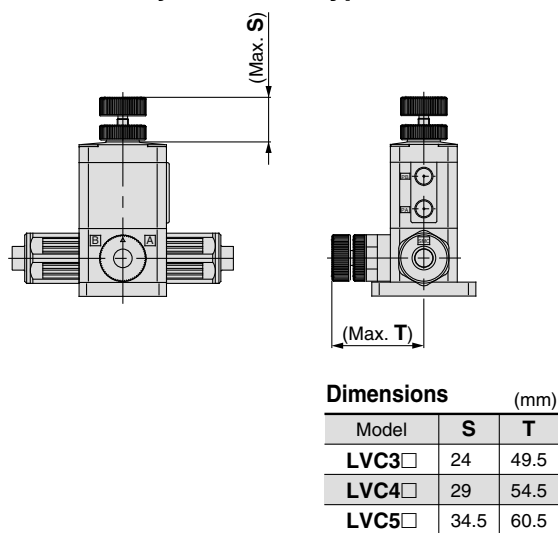
With flow rate adjustment



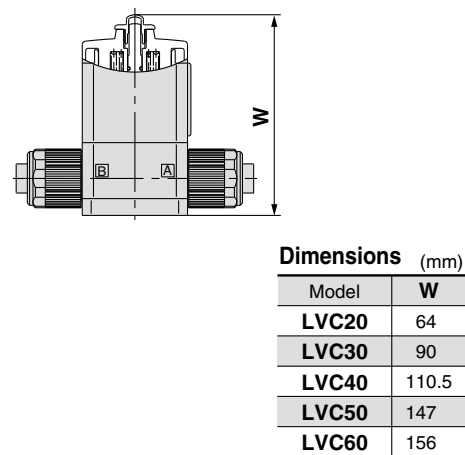
With bypass



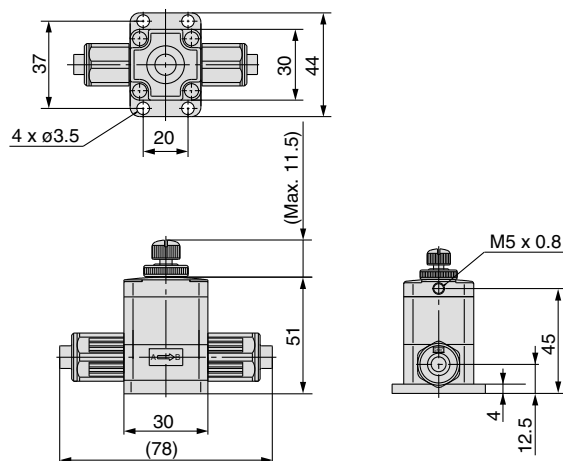
With flow rate adjustment & bypass



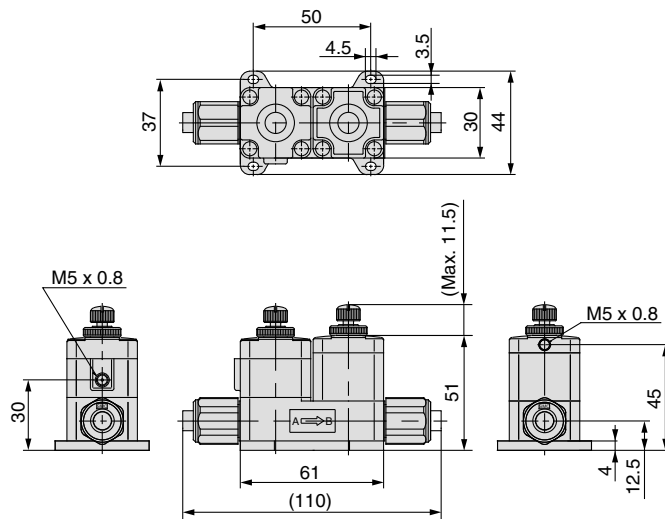
With indicator



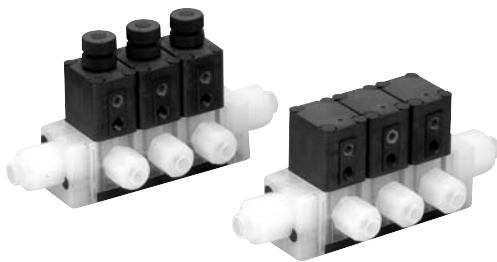
Suck back (Single type)



Suck back (Unit type)



Series LVC Manifolds



Manifold Specifications

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



Note 1) Contact SMC if the manifold will be used with vacuum and A → P flow.

How to Order Manifold Base

LLC 2 A - 02 - S 11

Body class

Symbol	Body class
2	2
3	3
4	4
5	5

Base type

A	Stacking type
A	Stacking type

Manifold stations

Symbol	Valve stations
02	2 stations
:	:
05	5 stations

LQ2 integral fitting

Tubing size for P port and L side connection

Symbol	Tubing size	Body class
00	Plug	2 to 5
06	ø6	2
07	1/4"	
08	ø8	
10	ø10	
11	3/8"	3
10	ø10	
11	3/8"	
12	ø12	
13	1/2"	4
12	ø12	
19	ø19, 3/4"	5
12	ø12	
13	1/2"	
19	ø19, 3/4"	

Tubing size for P port and R side connection

Symbol	Tubing size	Body class
Nil	L side, R side same size	2 to 5
00	Plug	2 to 5
06	ø6	2
07	1/4"	
08	ø8	
10	ø10	
11	3/8"	3
10	ø10	
11	3/8"	
12	ø12	
13	1/2"	4
12	ø12	
19	ø19, 3/4"	5
12	ø12	
13	1/2"	
19	ø19, 3/4"	

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	ø12
5	5	ø20

Valve type

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

Body type

A	Stacking type for manifold
A	Stacking type for manifold

LQ2 integral fitting

Tubing size

Symbol	Tubing size	Body class
03	ø3, 1/8"	2
04	ø4	
05	3/16"	
06	ø6	
07	1/4"	3
06	ø6	
08	ø8	
10	ø10	
11	3/8"	4
10	ø10	
11	3/8"	
12	ø12	
13	1/2"	5
12	ø12	
13	1/2"	
19	ø19, 3/4"	

Option

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

Note) Options can not be combined each other.

Material

Symbol	Body	Actuator section End plate	Dia- phragm	Applicable option 1 4	Note
Nil	PFA	PPS	PTFE	● ●	—
F	PFA	PVDF	PTFE		Hydrofluoric acid compatible
N	PFA	PPS	PTFE	● ●	Ammonium hydroxide compatible

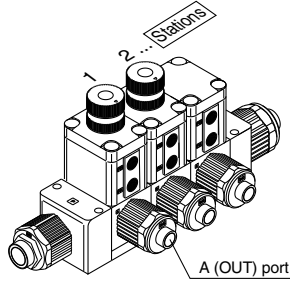
Pilot port thread type

Symbol	Body class	Thread type
Nil	2	M5
	3/4/5	Rc 1/8
N	3/4/5	NPT 1/8

Series LVC

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..... 1set 1 set Manifold base part no.
 * LVC20A-S07-1..... 2 sets 2 sets Valve part no. (stations 1 & 2)
 * LVC20A-S07 1 set 1 set Valve part no. (station 3)

• Add the * symbol at the beginning of part numbers for valves, etc. to be mounted.

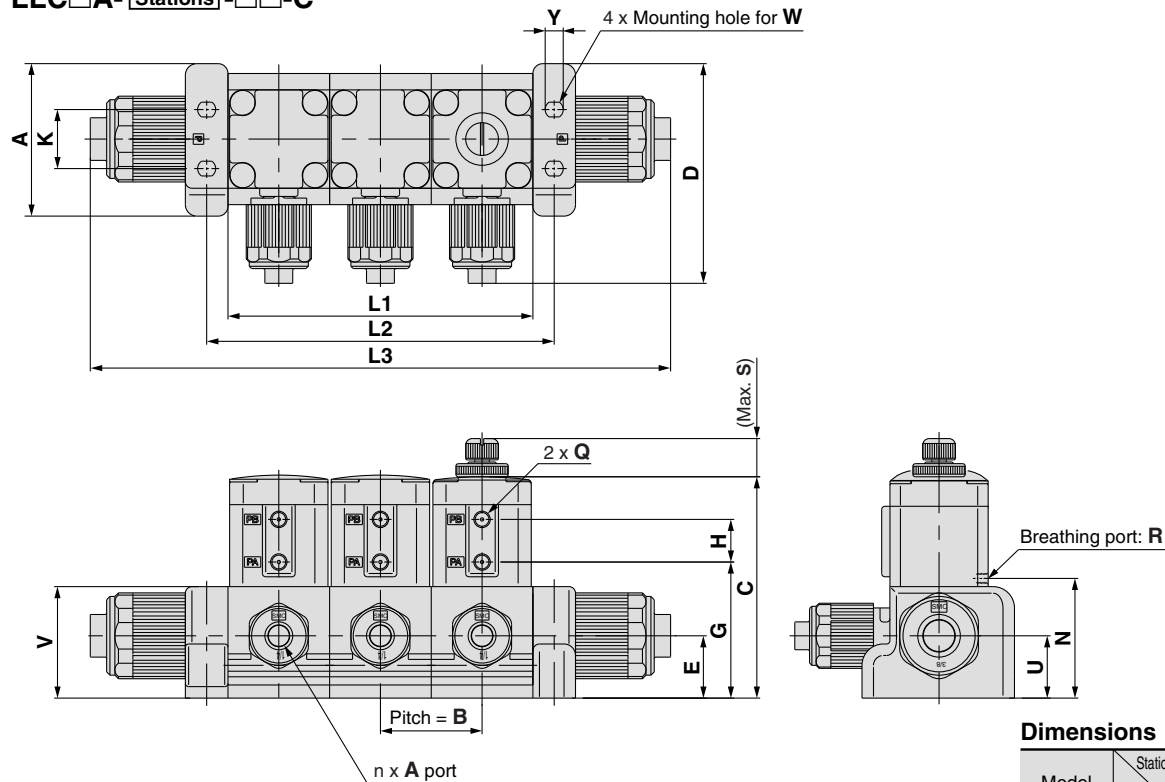
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

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			
		N.C.	N.O.	Double acting	Double acting
Basic type		N.C.	○	○	○
		N.O.	○	○	○
		Double acting	○	○	○
With flow rate adjustment		N.C.	○	○	○
		Double acting	○	○	○
		Double acting	○	○	○

Dimensions

LLC□A-□Stations-□□-C



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	11.5	19	34	M4	5.5
LLC3A	47	36.5	93.5	76	27.5	57.5	17.5	39	53.5	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8	24	27.5	47	M5	6.5
LLC4A	60	47	111.5	95	33.5	70.5	18	50	63.5			29	33.5	56	M6	7.5
LLC5A	75	59	131	114	33.5	70	27.5	62	64			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

Series LVC 3 Port



Standard Specifications

Model		LVC200
Orifice diameter		ø4
Flow characteristics	$Av \times 10^{-6} m^2$	7.2
	Cv	0.3
Withstand pressure (MPa)		1
Operating pressure (MPa)		0 to 0.5
Valve leakage (cm ³ /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
Mass (kg)		0.120

LVC

LVA

LVH

LVD

LVQ

LQ1

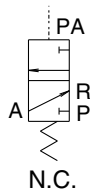
LVN

TL/TIL

LQ3

How to Order Valve

LVC 2 0 0 - S 07



Symbol	Body class	Orifice dia.
2	2	ø4

Valve type	
0	N.C.

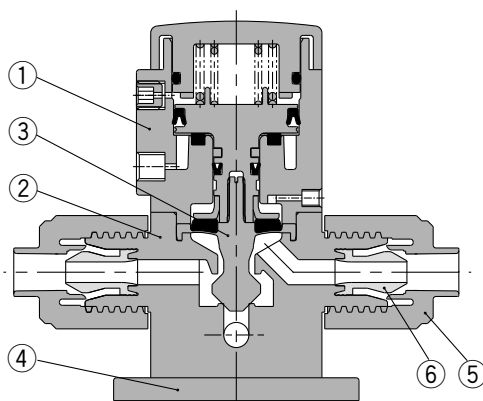
LQ2 integral fitting

Applicable tubing size

Symbol	Connecting tubing O.D.	Body class
		2
Metric sizes		
03	ø3	●
04	ø4	●
06	ø6	○
Inch sizes		
03	1/8	●
05	3/16	●
07	1/4	○

○ Basic size ● With reducer

Construction

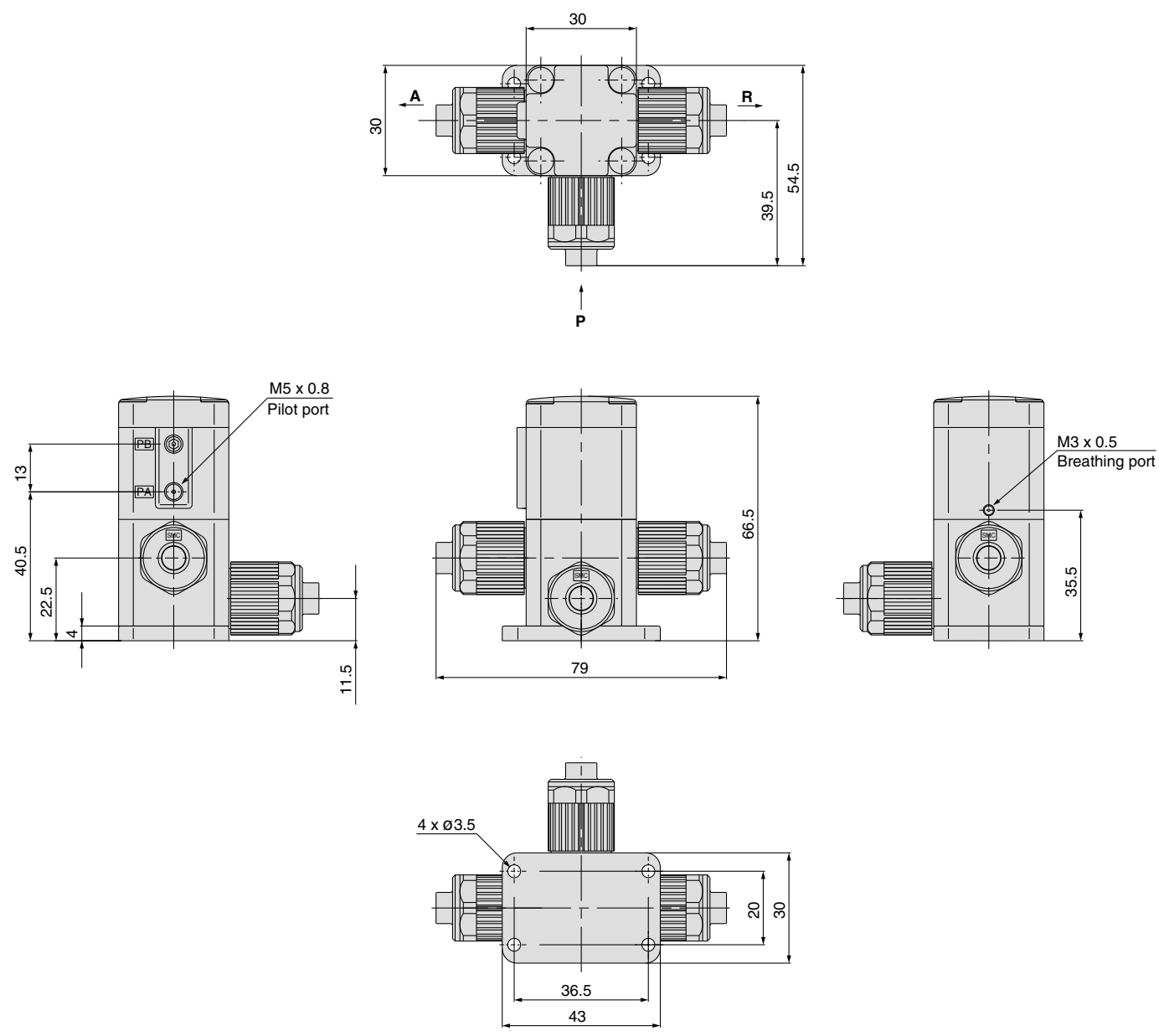


Parts list

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

Series LVC

Dimensions



Air Operated Type Threaded Type Series LVA

How to Order Valves (Single Type)

LVA 2 0 - 02 - A

Body class

Symbol	Body class	Orifice dia
1	1	ø2
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



Note) Refer to "Variations" in the table below for valve type combinations.

Port size

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

Thread type

Symbol	Thread type
Nil	Rc
N	NPT

Option

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

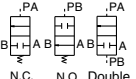
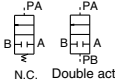
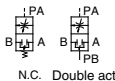


Note) Refer to "Variations" in the table below for option combinations. Options can not be combined each other.

Material

Symbol	Body	Actuator section End plate	Dia- phragm	Applicable option				Note
				1	2	3	4	
A	Stainless steel	PPS	PTFE	●			●	—
B	PPS	PPS	PTFE	●			●	Except LVA60
C	PFA	PPS	PTFE	●	●	●	●	Except LVA10
D	Stainless steel	PPS	NBR	●			●	Except LVA60
E	Stainless steel	PPS	EPR	●			●	Except LVA60
F	PFA	PVDF	PTFE					Hydrofluoric acid compatible (Only LVA40, 50 type)
G	PPS	PPS	NBR	●			●	Except LVA60
H	PPS	PPS	EPR	●			●	Except LVA60
N	PFA	PPS	PTFE	●	●	●	●	Ammonium hydroxide compatible Except LVA10

Variations

			Model	LVA10		LVA20		LVA30		LVA40		LVA50		LVA60									
			Orifice diameter	ø2		ø4		ø8		ø12		ø20		ø22									
			Body material (Note)	Stainless steel (SUS316)		1/8		1/8		1/4		3/8		3/8		1/2		1/2		3/4		1	
			Port size	PPS		PFA		—		—		—		—		—		—		—		—	
Type	Symbol		Valve type																				
Basic type		 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.	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		

Note) Refer to the "Material" table for the applicable optional body materials.



Basic type



With flow rate adjustment

Standard Specifications

Model		LVA10	LVA20	LVA30	LVA40	LVA50	LVA60
Orifice diameter		ø2	ø4	ø8	ø12	ø20	ø22
Port size		1/8, 1/4	1/8, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4	1
Flow characteristics	Av x 10 ⁻⁶ m ²	1.7	8.4	40.8	79.2	144	192
	Cv	0.07	0.35	1.7	3.3	6	8
Withstand pressure (MPa)		1					
Operating pressure (MPa)		0 to 0.5				0 to 0.4	
Back pressure (MPa)	N.C./N.O. ^{Note 2)}	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 ³ /min)		0 (with water pressure)					
Pilot air pressure (MPa)		0.3 to 0.5					
Pilot port size		M5		Rc 1/8, NPT 1/8			
Fluid temperature (°C)		0 to 100 ^{Note 1)}					
Ambient temperature (°C)		0 to 60					
Mass (kg)	Stainless steel (SUS)	0.12	0.18	0.44	0.86	1.67	1.96
	PPS	0.05	0.08	0.18	0.32	0.73	—
	PFA	—	0.09	0.20	0.35	0.78	0.90

Note 1) 0 to 60°C when the diaphragm is NBR or EPR.
 Note 2) The N.O. type is not available for LVA10.
 Note 3) Contact SMC if the valve will be used with vacuum and B → A flow.

Specific Product Precautions

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions, and pages 491 and 492 for High Purity Chemical Valve Precautions.

Piping

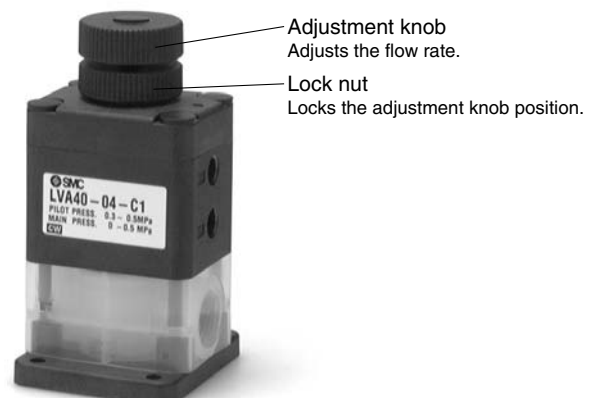
Caution

1. Avoid using metal fittings with a resin body (taper threads).
 This can cause damage to the valve body.

Options

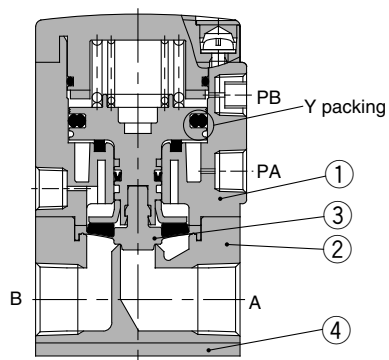
With flow rate adjustment

Adjusts the flow rate by controlling the diaphragm stroke.

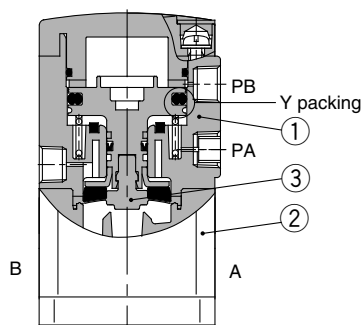


Construction

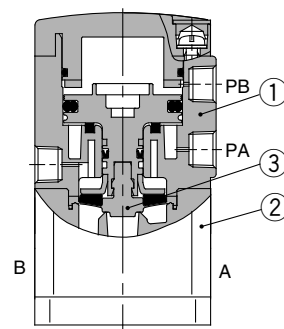
Standard type
N.C. type



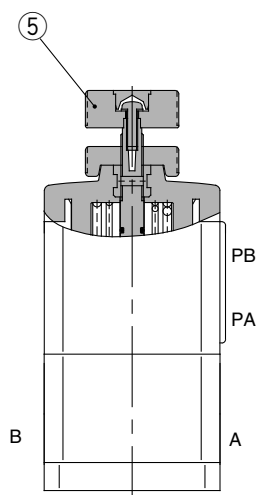
N.O. type



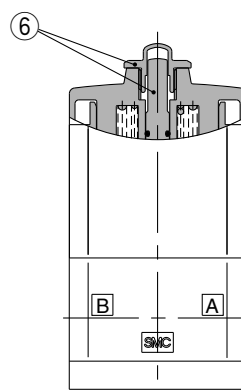
Double acting type



With flow rate adjustment



With indicator



LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

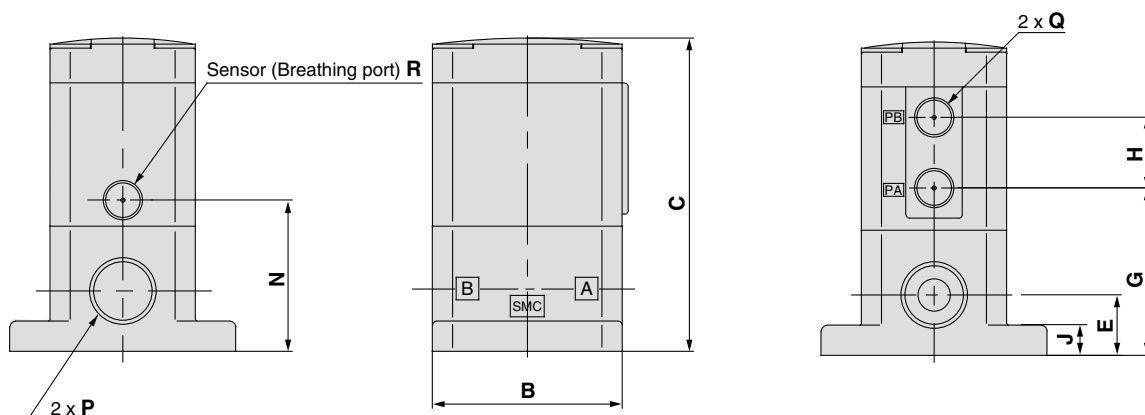
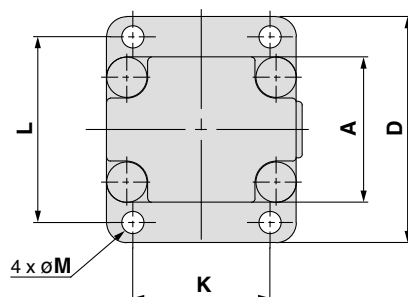
Parts list

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

Dimensions

Body material: PPS

Basic type



LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

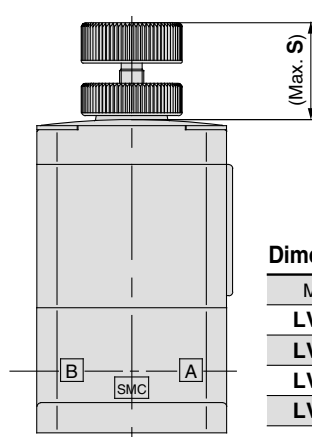
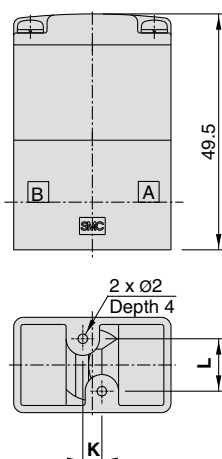
TL/TIL

LQ3

LVA10

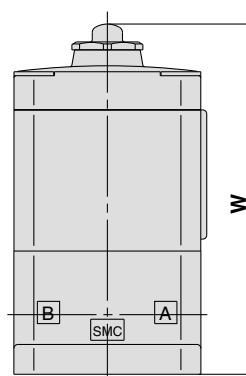
With flow rate adjustment

With indicator



Dimensions (mm)

Model	S
LVA2□	12.5
LVA3□	24
LVA4□	29
LVA5□	34.5



Dimensions (mm)

Model	W
LVA20	67
LVA30	88.5
LVA40	110.5
LVA50	147
LVA60	—

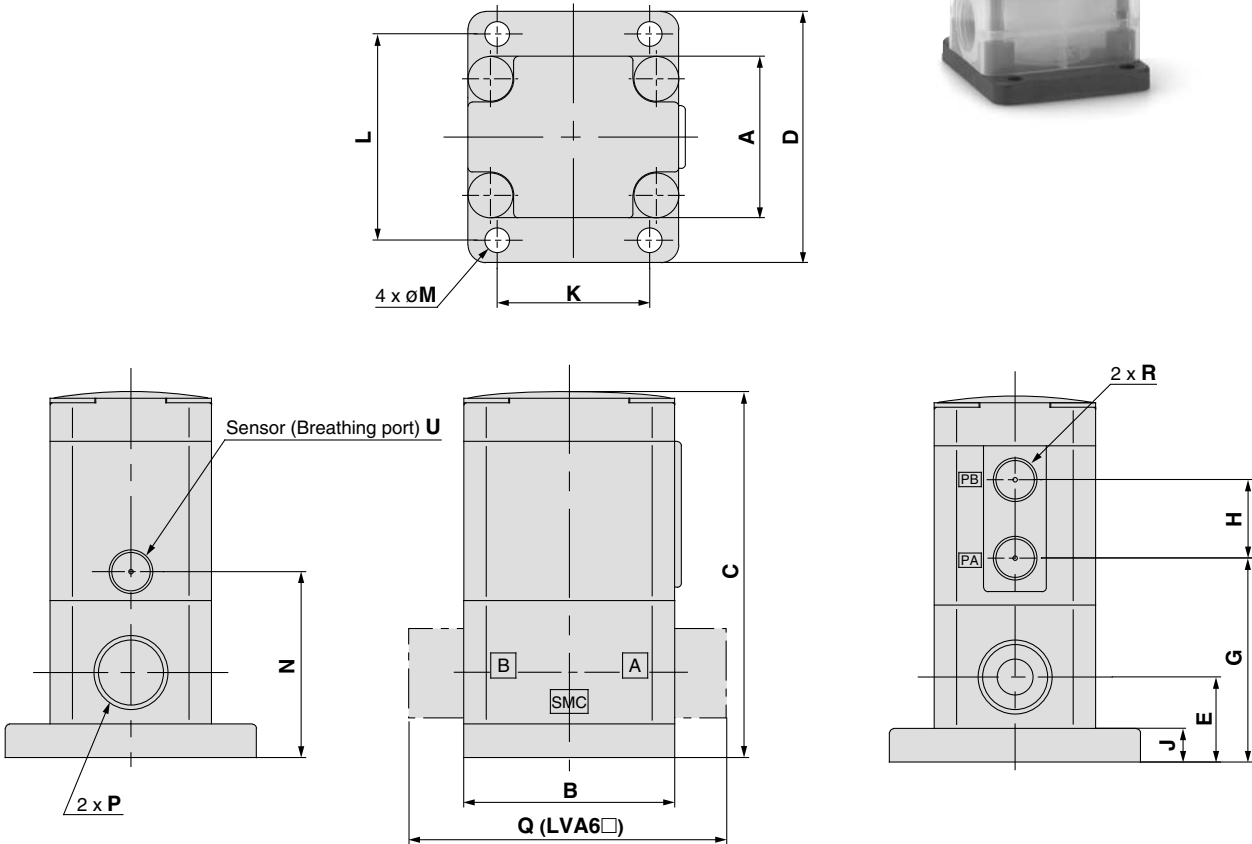
Dimensions

Model	A	B	C	D	E	G	H	J	K	L	M	N	P	Q	R
LVA1□	20	33	49.5	—	10	27.5	11	—	4	11	—	27.5	Rc 1/8, 1/4 NPT 1/8, 1/4	M5 x 0.8	ø4.2
LVA2□	30	36	57.5	44	11	31.5	13	4	20	37	3.5	26.5	Rc 1/4 NPT 1/4		M3 x 0.5
LVA3□	36	47	77.5	56	15	41.5	17.5	7.5	34	46	5.5	37.5	Rc 3/8 NPT 3/8	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8
LVA4□	46	60	96	68	22	55	18	8	42	57	5.5	48	Rc 1/2 NPT 1/2		
LVA5□	58	75	129	84	26	68	27.5	8	56	71	6.5	62	Rc 3/4 NPT 3/4		

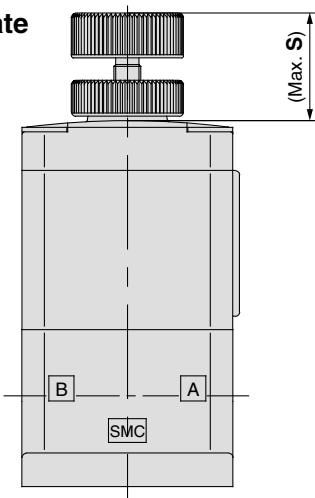
Series LVA

Dimensions

Body material: PFA
Basic type



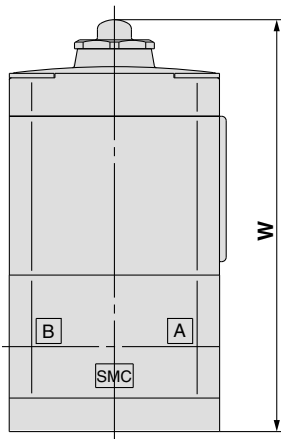
With flow rate
adjustment



Dimensions (mm)

Model	S
LVA2□	12.5
LVA3□	24
LVA4□	29
LVA5□	34.5
LVA6□	36

With indicator



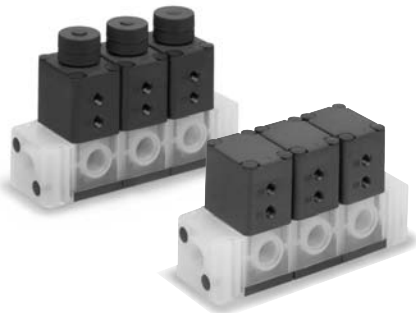
Dimensions (mm)

Model	W
LVA20	70.5
LVA30	92.5
LVA40	110.5
LVA50	147
LVA60	156

Dimensions

Model	A	B	C	D	E	G	H	J	K	L	M	N	P	Q	R	U
LVA2□	30	36	61	44	14.5	35	13	4	20	37	3.5	30	Rc 1/4 NPT 1/4	—	M5 x 0.8	M3 x 0.5
LVA3□	36	47	81.5	56	19	45.5	17.5	7.5	34	46	5.5	41.5	Rc 3/8 NPT 3/8	—	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8
LVA4□	46	60	96	68	22	55	18	8	42	57	5.5	48	Rc 1/2 NPT 1/2	—		
LVA5□	58	75	129	84	26	68	27.5	8	56	71	6.5	62	Rc 3/4 NPT 3/4	—		
LVA6□	58	75	138	84	32	77	27.5	8	56	71	6.5	71	Rc 1 NPT 1	117		

Series LVA Manifolds



Manifold Specifications

Model	LLA2A	LLA3A	LLA4A	LLA5A
Manifold type	Stacking type			
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

Note 1) Contact SMC if the manifold will be used with vacuum and A → P flow.

How to Order Manifold Base

LLA 2 A - 05 - 02 - C

- Body class**

Symbol	Body class
2	2
3	3
4	4
5	5
- Base type**

Symbol	Base type
A	Stacking type
- Manifold stations**

Symbol	Manifold stations
02	2 stations
⋮	⋮
05	5 stations
- Thread type**

Symbol	Thread type
Nil	Rc
N	NPT
- Port size (port P)**

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

Symbol	Manifold
C	PFA

How to Order Valve

LVA 2 0 A - 02 - C

- Body class**

Symbol	Body class	Orifice dia.
2	2	ø4
3	3	ø8
4	4	ø12
5	5	ø20
- Valve type**

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

Symbol	Body type
A	Stacking type for manifold
- Port size (port A)**

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

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

Note) Options can not be combined each other.
- Material**

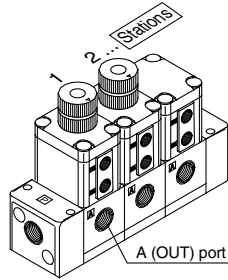
Symbol	Body	Actuator section End plate	Diaphragm	Applicable option	Note
C	PFA	PPS	PTFE	1 4	—
F	PFA	PVDF	PTFE		Hydrofluoric acid compatible (Only LVA40, 50 type)
N	PFA	PPS	PTFE		Ammonium hydroxide compatible
- Thread type**

Symbol	Thread type
Nil	Rc
N	NPT

Series **LVA**

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.

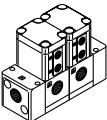
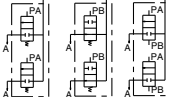
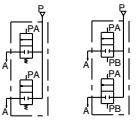
<Example>

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

• Add the * symbol at the beginning of part numbers for valves, etc. to be mounted.

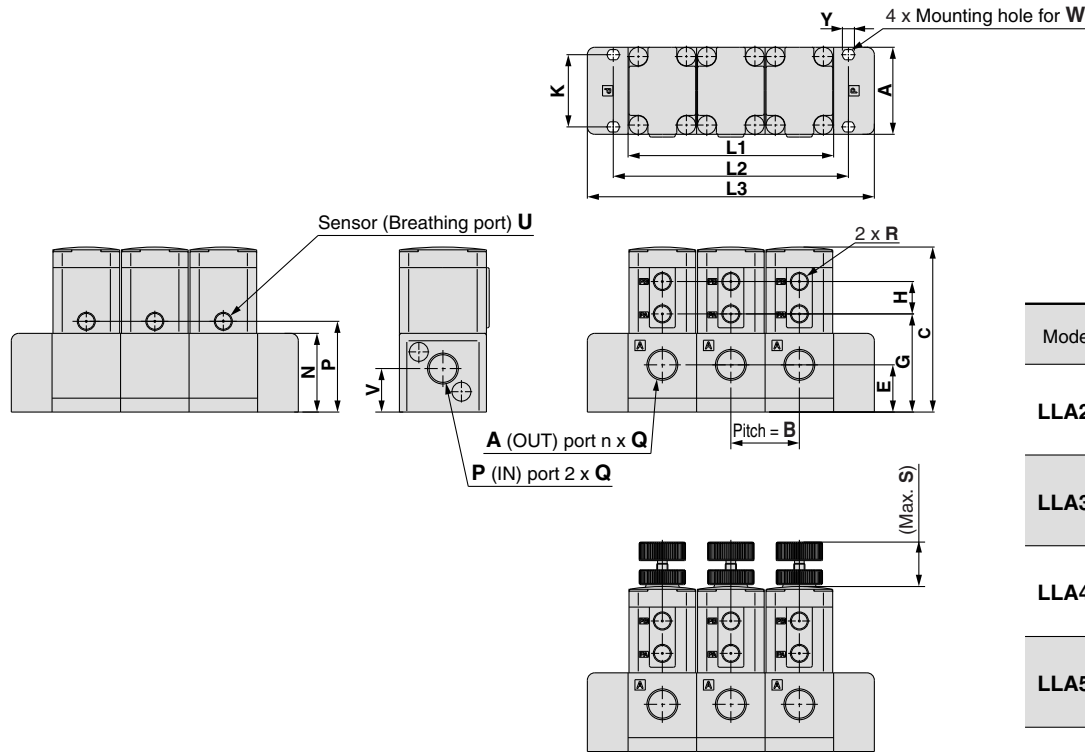
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

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
		Valve type					
		N.C.	○	○	○	○	
		N.O.	○	○	○	○	
		Double acting	○	○	○	○	
		N.C.	○	○	○	○	
		Double acting	○	○	○	○	

Dimensions

LLA□A-□Stations-□□-C



Dimensions (mm)

Model	S
LLA2A	11.5
LLA3A	24
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	M	N	P	Q	R	U	V	W	Y
LLA2A	50	31	68	20.5	41.5	13	18	4.5	34	35	Rc 1/4, NPT 1/4	M5 x 0.8	M3 x 0.5	19	M4	5.5
LLA3A	47	37	88.5	25.5	52.5	17.5	39	5.5	42.5	51.5	Rc 3/8, NPT 3/8	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8	23.5	M5	6.5
LLA4A	60	47	103.5	29	62.5	18	50	6.5	48	62.5	Rc 1/2, NPT 1/2			26	M6	7.5
LLA5A	75	59	135.5	32.5	74.5	27.5	61		61	68.5	Rc 3/4, NPT 3/4			29	M6	7.5

Series LVA 3 Port

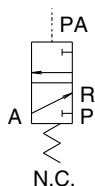


Standard Specifications

Model		LVA200
Orifice diameter		ø4
Port size		1/4
Flow characteristics	$Av \times 10^{-6} m^2$	7.2
	Cv	0.3
Withstand pressure (MPa)		1
Operating pressure (MPa)		0 to 0.5
Valve leakage (cm³/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
Mass (kg)		0.162

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.
---	------

Thread type

Symbol	Thread type
Nll	Rc
N	NPT

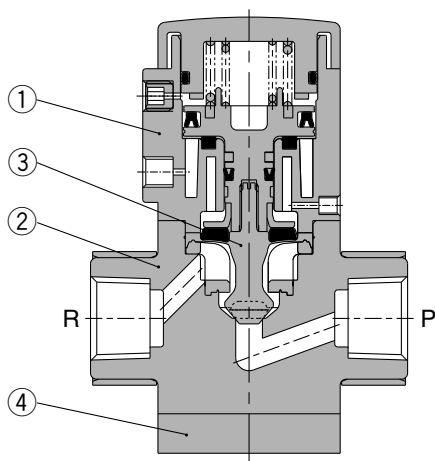
Port size

Symbol	Port size
02	1/4

Material

Symbol	Body	Actuator section	Diaphragm
C	PFA	PPS	PTFE

Construction

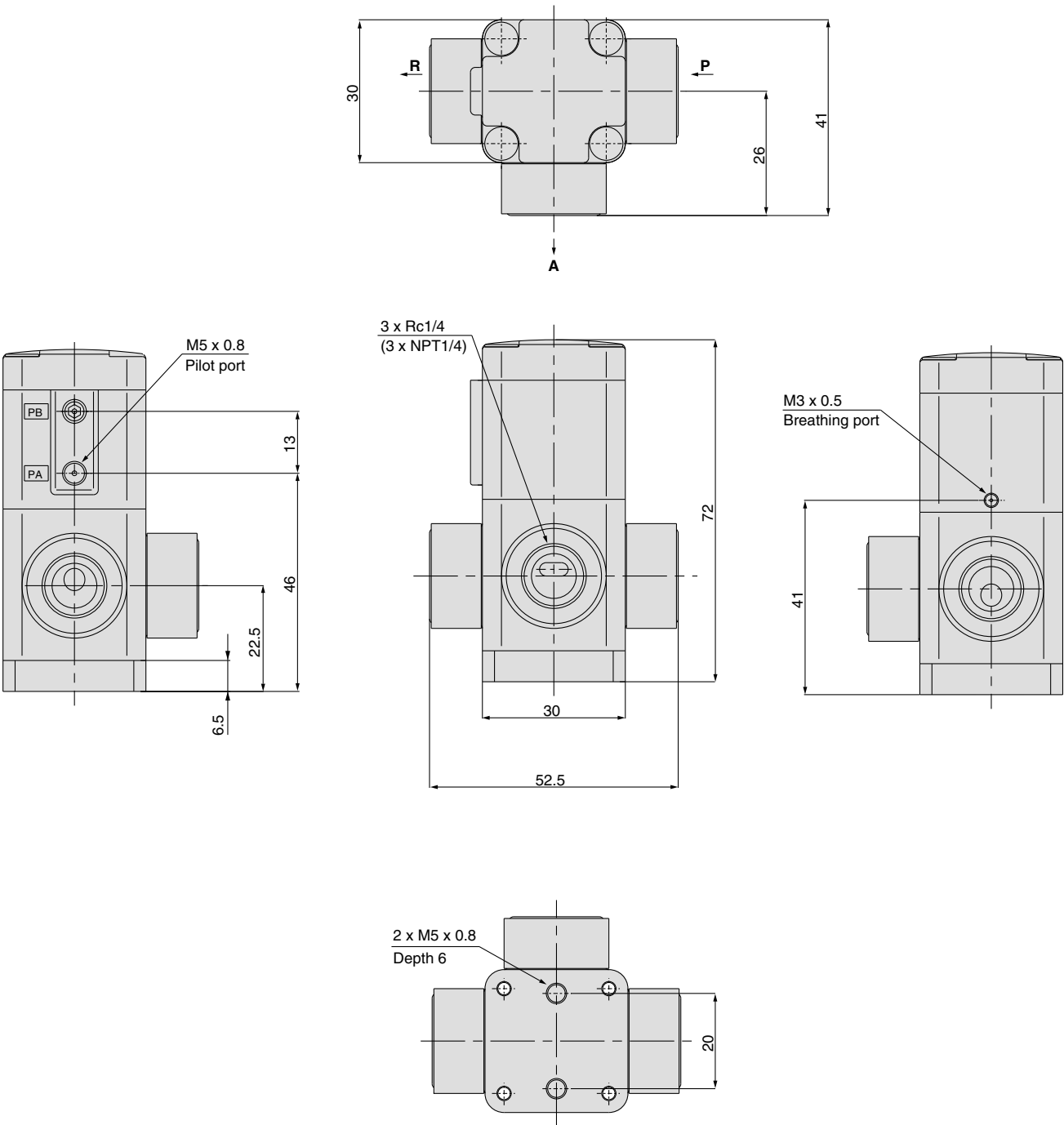


Parts list

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

Series LVA

Dimensions



Manually Operated Integral Fitting Type/Threaded Type Series *LVH*

How to Order Valve (Single Type)

Body class

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

Integral fitting type

Threaded type

Valve type

Symbol	Valve type
0	N.C.

Lever operation

Symbol	Lever operation
Nil	Non-locking type (self-reset type)
L	Locking type

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 O.D.	Body class
		2 3 4
Metric sizes		
03	ø3	●
04	ø4	●
06	ø6	○ ●
08	ø8	○ ●
10	ø10	○ ●
12	ø12	○
Inch sizes		
03	1/8	●
05	3/16	●
07	1/4	○ ●
11	3/8	○ ●
13	1/2	○

○ Basic size ● With reducer

Port B (OUT) different dia. size

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

Material (Note)

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

Note) Refer to "Variations" for port size and material combinations.

Pilot port thread type

Symbol	Thread type
Nil	Rc
N	NPT

Integral fitting type/Variations

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

Threaded type/Series variation

Model		LVH20				LVH30				LVH40			
Type	Orifice diameter	ø4				ø8				ø12			
	Port size												
	Symbol	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2
Basic type	Non-locking	○	○	○	○	○	○	○	○	○	○	○	○
	Locking												

Series LVH



⚠ Specific Product Precautions

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions, and pages 491 and 492 for High Purity Chemical Valve Precautions.

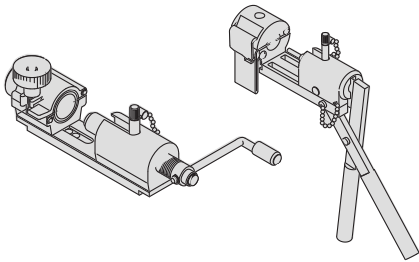
Piping

⚠ Caution

Integral fitting type

1. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



2. Tighten the nut to the end surface of the body. As a guide, 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/Integral Fitting Type

Model		LVH20	LVH30	LVH40
Tubing O.D.	Metric size	6	10	12
	Inch size	1/4	3/8	1/2
Orifice diameter		ø4	ø8	ø10
Flow characteristics	$Av \times 10^{-6} m^2$	8.4	40.8	60
	Cv	0.35	1.7	2.5
Withstand pressure (MPa)		1		
Operating pressure (MPa)		0 to 0.5		
Back pressure (MPa)		0.3 or less		
Valve leakage (cm³/min)		0 (with water pressure)		
Action		Toggle type (non-locking/locking)		
Fluid temperature (°C)		0 to 60		
Ambient temperature (°C)		0 to 60		
Mass (kg)		0.06	0.14	0.26



Note) Contact SMC if the valve is to be used with B → A flow.

Different Diameter Tubing Applicable with Reducer

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

● With reducer

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



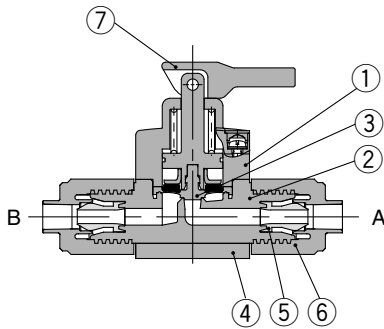
Note) Refer to page 489 for information on changing tubing sizes.

Standard Specifications/Threaded Type

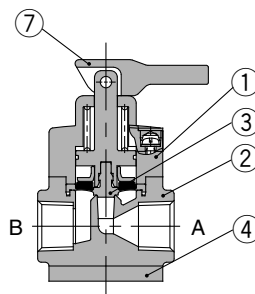
Model		LVH20	LVH30	LVH40
Port size		1/8, 1/4	1/4, 3/8	3/8, 1/2
Orifice diameter		ø4	ø8	ø12
Flow characteristics	$Av \times 10^{-6} m^2$	8.4	40.8	60
	Cv	0.35	1.7	2.5
Withstand pressure (MPa)		1		
Operating pressure (MPa)		0 to 0.5		
Back pressure (MPa)		0.3 or less		
Valve leakage (cm³/min)		0 (with water pressure)		
Action		Toggle type (non-locking/locking)		
Fluid temperature (°C)		0 to 60		
Ambient temperature (°C)		0 to 60		
Mass (kg)	Stainless steel (SUS)	0.15	0.36	0.71
	PPS	0.04	0.09	0.17
	PFA	0.05	0.11	0.20

Construction

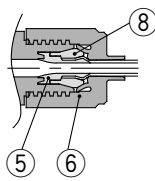
Integral fitting type



Threaded type



With reducer



Parts list

No.	Description	Material	Note
1	Actuator section	PP	
2	Body	PFA	Integral 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	—

LVC

LVA

LVH

LVD

LVQ

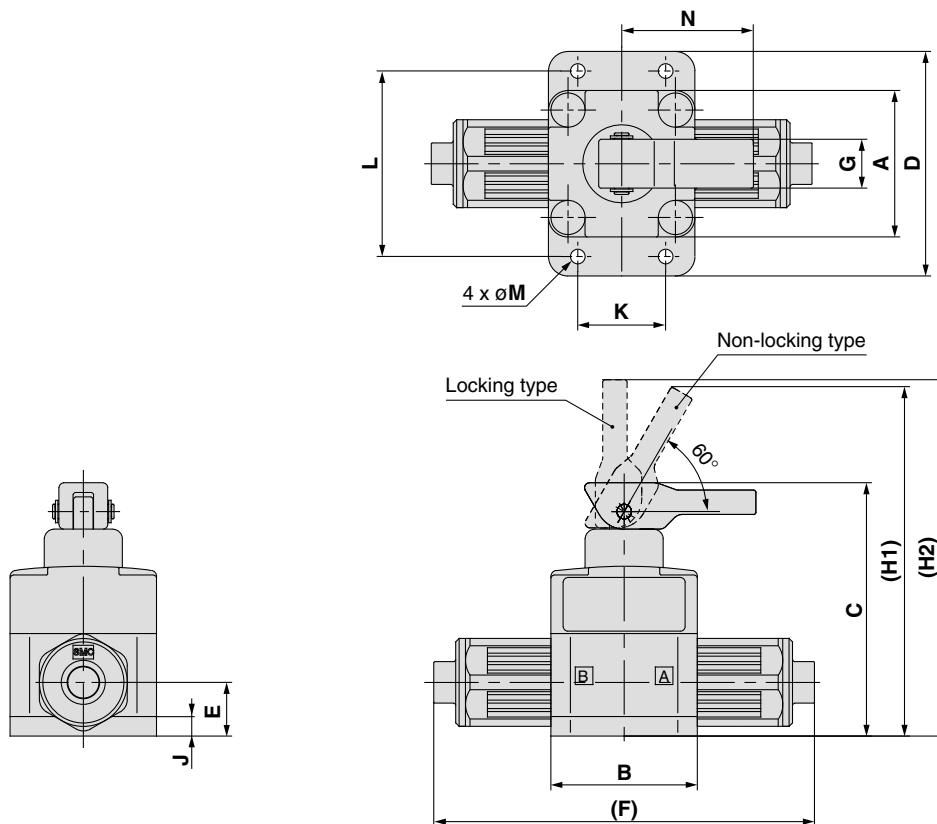
LQ1

LVN

TL/TIL

LQ3

Dimensions/Integral Fitting Type



Dimensions

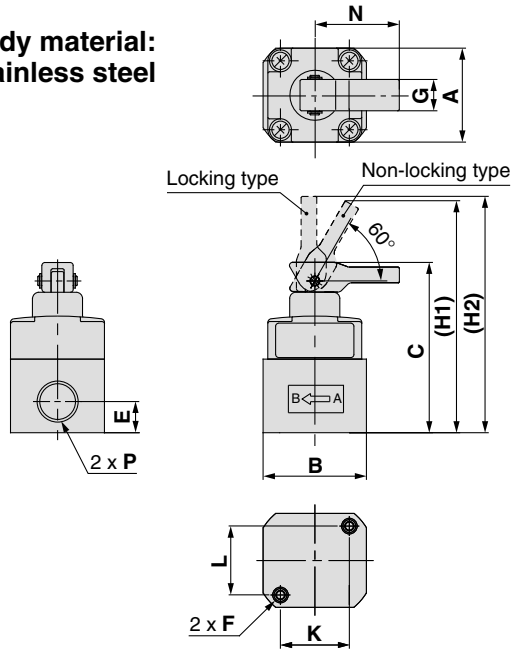
Model	A	B	C	D	E	F	G	H1	H2	J	K	L	M	N
LVH20□	30	30	52	44	11	79	10	72.5	74	4	20	37	3.5	27
LVH30□	36	47	81.5	56	16.5	106	19	111	113	7.5	34	46	5.5	37.5
LVH40□	46	60	100	68	22.5	131	20.5	139	143	8	42	57	5.5	50

(mm)

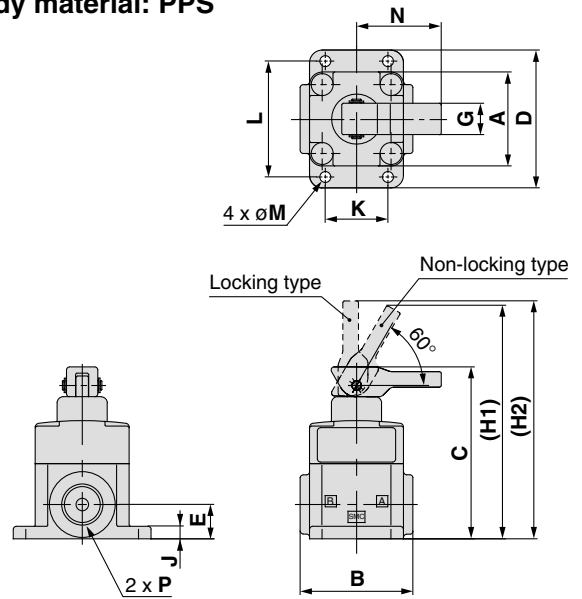
Series LVH

Dimensions/Threaded Type

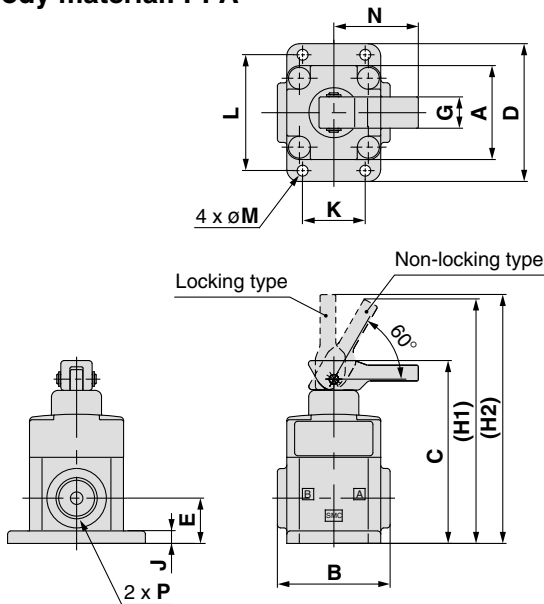
Body material:
Stainless steel



Body material: PPS



Body material: PFA

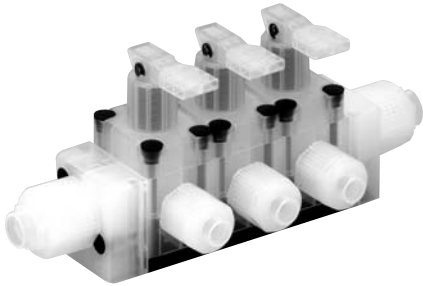


Dimensions

(mm)

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

Series LVH/Integral Fitting Type Manifolds



Manifold Specifications

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



Note 1) Contact SMC if the manifold will be used with vacuum and 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 type

Manifold stations

Symbol	Manifold stations
02	2 stations
05	5 stations

LQ2 integral fitting

Tubing size for port P and L side connection

Symbol	Tubing size	Body class
00	Plug	2 to 4
06	Ø6	2
07	1/4"	
08	Ø8	
10	Ø10	
11	3/8"	3
10	Ø10	
11	3/8"	
12	Ø12	
13	1/2"	4
12	Ø12	
13	1/2"	
19	Ø19, 3/4"	

Tubing size for port P and R side connection

Symbol	Tubing size	Body class
00	Plug	2 to 4
06	Ø6	2
07	1/4"	
08	Ø8	
10	Ø10	
11	3/8"	3
10	Ø10	
11	3/8"	
12	Ø12	
13	1/2"	4
12	Ø12	
13	1/2"	
19	Ø19, 3/4"	

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	Lever operation
Nil	Non-locking type (self-reset type)
L	Locking type

LQ2 integral fitting

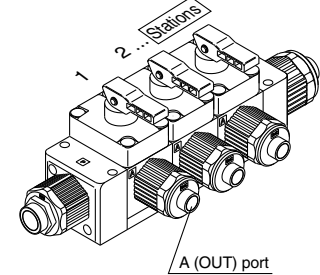
Tubing size

Symbol	Tubing size	Body class
03	Ø3, 1/8"	2
04	Ø4	
05	3/16"	
06	Ø6	
07	1/4"	3
06	Ø6	
07	1/4"	
08	Ø8	
10	Ø10	4
11	3/8"	
10	Ø10	
11	3/8"	
12	Ø12	4
13	1/2"	

Series **LVH**

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-SH 1 set 1 set Manifold base part no.
* LVH20A-S07 2 sets 2 sets Valve part no. (stations 1 & 2)
* LVH20AL-S07 1 set 1 set Valve part no. (station 3)

• Add the * symbol at the beginning of part numbers for valves, etc. to be mounted.

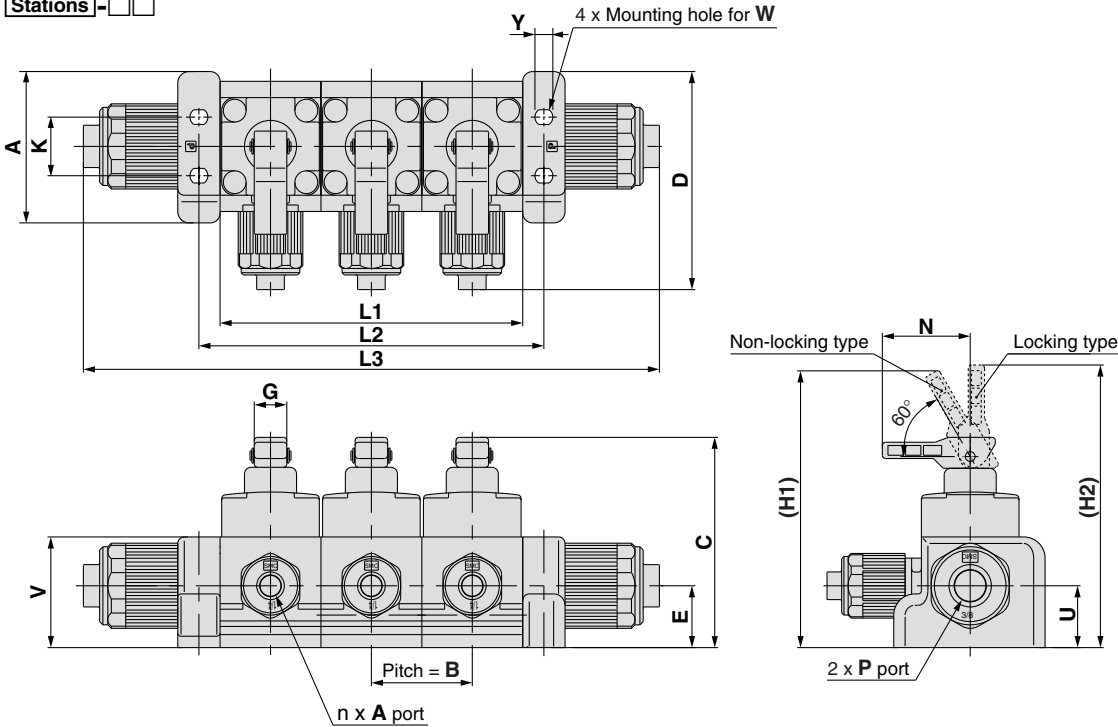
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

Threaded type manifold/Variations

Type	Symbol	Model		
		LVH20	LVH30	LVH40
		Manifold material		
		PFA		
Manifold		Tubing size		
		Orifice diameter		
		Valve type		
		1/4	3/8	1/2
		Ø4	Ø8	Ø10
		N.C.		
		○	○	○

Dimensions

LLH□A- Stations -□□



Dimensions

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	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

Series LVH/Threaded Type Manifolds



Manifold Specifications

Model	LLH2A	LLH3A	LLH4A
Manifold type	Stacking type		
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



Note 1) Contact SMC if the manifold will be used with vacuum and flow A → P.

LVC

LVA

LVH

LVD

LVQ

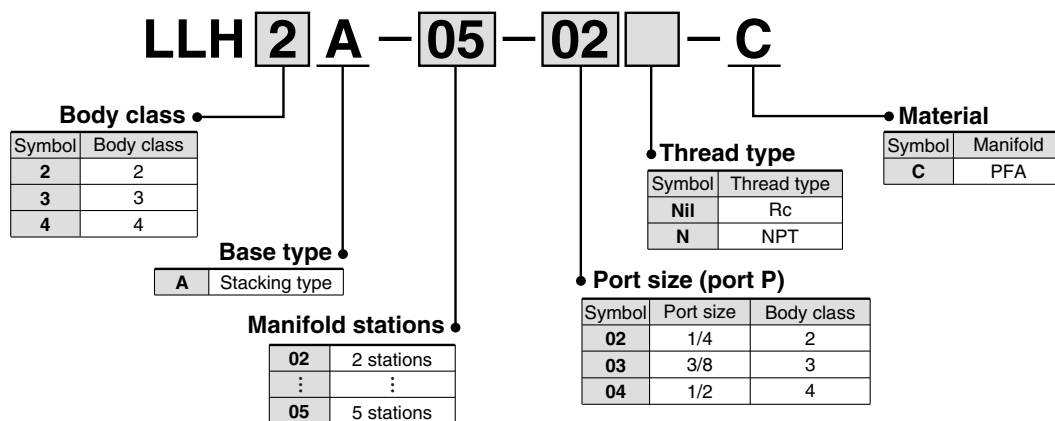
LQ1

LVN

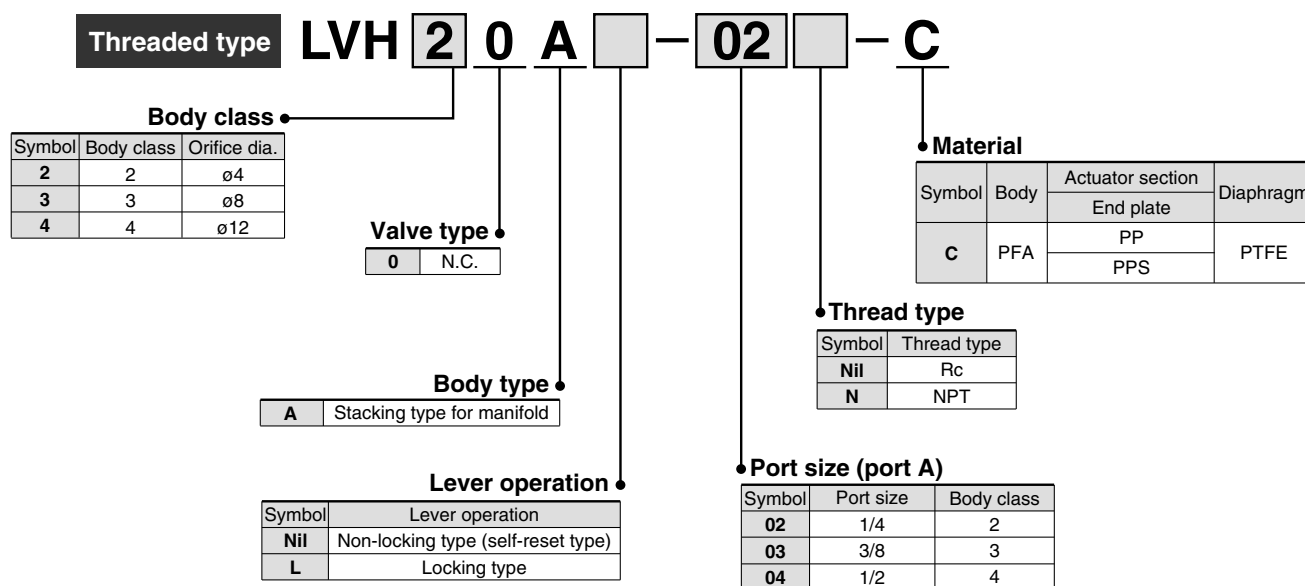
TL/TIL

LQ3

How to Order Manifold Base



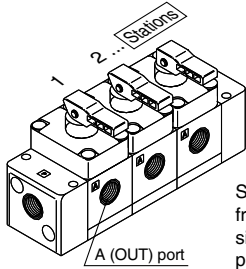
How to Order Valve



Series **LVH**

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 1 set Manifold base part no.
 - * LVH20A-02-C 2 sets 2 sets Valve part no. (stations 1 & 2)
 - * LVH20AL-02-C 1 set 1 set Valve part no. (station 3)

• Add the * symbol at the beginning of part numbers for valves, etc. to be mounted.

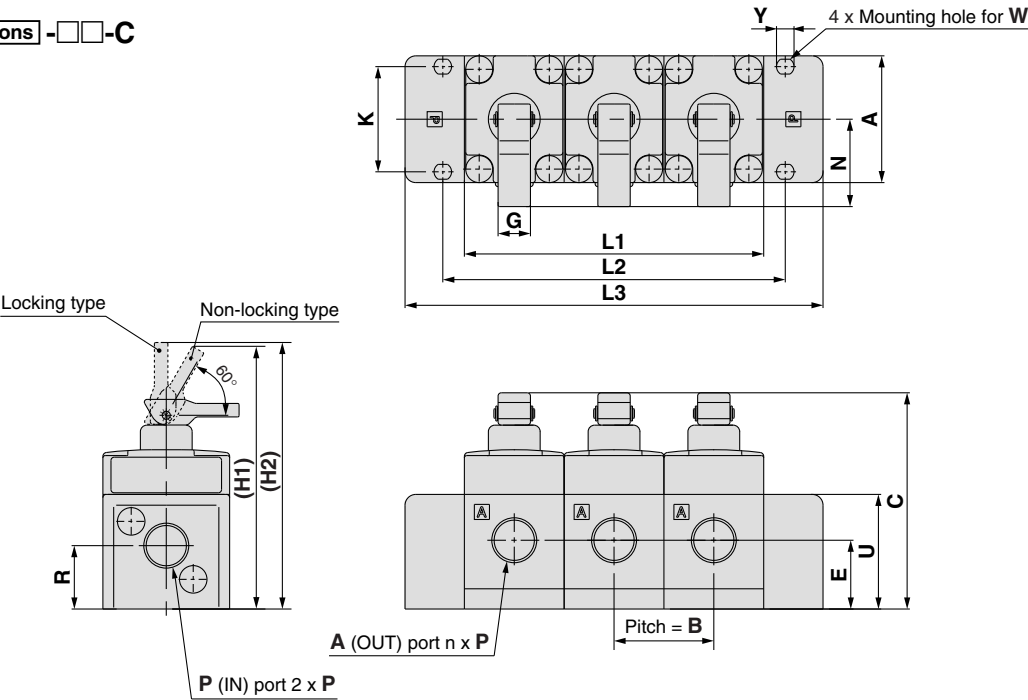
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

Threaded type manifold/Variations

Model		LVH20	LVH30	LVH40
Manifold material		PFA		
Port size		1/4	3/8	1/2
Orifice diameter		ø4	ø8	ø12
Type	Symbol	Valve type		
Manifold		N.C.		

Dimensions

LLH□A-□Stations-□□-C



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

		(mm)			
Model	Station 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

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 sizes							Inch sizes							
	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	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

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 the section on how to order fitting parts.)

Note) Tubing is sold separately.

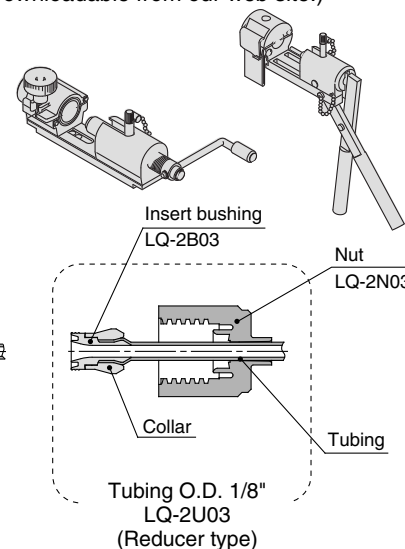
Part composition

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

Caution

1. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



How to order fitting parts

LQ 2 U 03

* Type U is recommended when changing tubing sizes.

Type of fitting

Symbol	Applicable fitting
Nil	LQ2
1	LQ1

Body class

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

Type of part

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

Tubing size

Symbol	Tubing O.D.	Body class	Applicable fitting
03	1/8", ø3	2	LQ2
04	ø4		
05	3/16"		
06	ø6		
07	1/4"		
06	ø6	3	
08	ø8		
10	ø10		
07	1/4"		
11	3/8"		
10	ø10	4	
12	ø12		
11	3/8"		
13	1/2"		
12	ø12		
13	1/2"	5	
19	3/4", ø19		
19	3/4", ø19		
25	1", ø25	6	LQ1



Applicable Fluids

Material and fluid compatibility check list for air and manually operated high purity valves

Chemical	Body material			Diaphragm material		
	Stainless steel SUS316	Fluoro resin PFA	Polyphenylene sulfide resin PPS	Fluoro resin PTFE	Nitrile rubber NBR	Ethylene propylene rubber EPR
Acetone	○	○ Note 1)	○ Note 1)	○ Note 2)	×	×
Ammonium hydroxide	○	○	○	○ Note 2)	×	×
Isobutyl alcohol	○	○ Note 1)	○ Note 1)	○ Note 2)	○	○
Isopropyl alcohol	○	○ Note 1)	○ Note 1)	○ Note 2)	○	○
Hydrochloric acid	×	○	○	○	×	×
Ozone (dry)	○	○	○	○	×	○
Hydrogen peroxide Concentration 5% or less, 50°C or less	×	○	○	○	×	×
Ethyl acetate	○	○ Note 1)	○ Note 1)	○ Note 2)	×	×
Butyl acetate	○	○ Note 1)	○ Note 1)	○ Note 2)	×	×
Nitric acid (except fuming nitric acid) Concentration 10% or less	×	○	○	○ Note 2)	×	×
DI water	○	○	○	○	×	○
Sodium hydroxide Concentration 50% or less	○	○	○	○	×	×
Nitrogen gas	○	○	○	○	○	○
Super pure water	×	○	○	○	×	×
Toluene	○	○ Note 1)	○ Note 1)	○ Note 2)	×	×
Hydrofluoric acid	×	○	×	○ Note 2)	×	×
Sulfuric acid (except fuming sulfuric acid)	×	○	×	○ Note 2)	×	×
Phosphoric acid Concentration 80% or less	×	○	×	○	×	×



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

Note 1) Use a stainless steel body, as static electricity may be generated.

Note 2) Use caution as permeation may occur and any permeated fluid could effect other material parts.

Table symbols

○ : Can be used

○ : Can be used in 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.



Series LV High Purity Chemical Valve Precautions 1

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions.

Design & Selection

Warning

1. Confirm 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 features page 490. 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

Operate within the ambient operating 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. Instruction 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 blown out with air (flushing) 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 when making connections to the pilot port.

Operating port tightening torque

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

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.

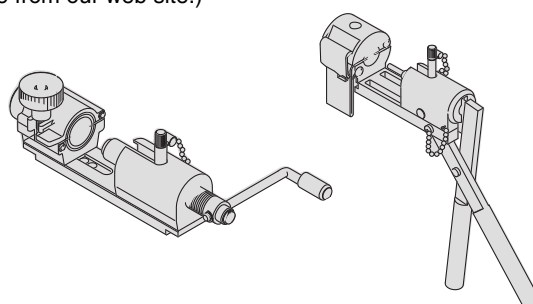
4. Use pilot ports and sensor (breathing) ports as indicated below.

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

In the case of 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 pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3



Series LV High Purity Chemical Valve Precautions 2

Be sure to read before handling.

Refer to front matters 42 and 43 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.

Maintenance

Warning

1. Maintenance should be performed in accordance with the procedures in the instruction 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 or air, etc.

4. Do not disassemble the product. Products which have been disassembled cannot be guaranteed.

If disassembly is necessary, 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.

Precautions on Usage

Warning

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

Caution

1. When the diaphragm is made of PTFE

Please note that when the product is shipped from the factory, gases such as N₂ and air may leak from the valve at a rate of 1cm³/min (when pressurized).

2. When operated at a very low flow rate, the series LV□ 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 series LV□, 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 series LV□ with flow rate adjustment, open gradually starting from the fully closed condition.

Opening is accomplished by turning the adjustment knob counter clockwise. Additionally, do not apply any unreasonable force to the adjustment knob when nearing a fully opened or closed state. This may result in deformation of the orifice sheet surface or damage to the threaded part of the adjustment knob. It is in the fully closed condition when the product is shipped from the factory.

5. After a long period of nonuse, perform a test run before beginning regular operation.

6. Since the LVC is packaged in a clean room use sufficient care in handling when opened.

7. Take extra care when setting the operating direction and when handling the lever of series LVH.