SMC

Clean Wet Series

High Purity Chemical Valve

Integral Fittings Series LVC

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

Body material: New PFA

3 port added

Threaded Ports Series LVA

- Diaphragm material PTFE, EPR, NBR are selectable

Body material: New PFA/ Stainless steel/ PPS

3 port added

Manual Operation Series LVH

- Locking and non-locking types available
- Integral fitting type/Threaded type

Body material: New PFA/ Stainless steel/ PPS

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.

Prevents Micro-Bubbles Diaphragm (PTFE)

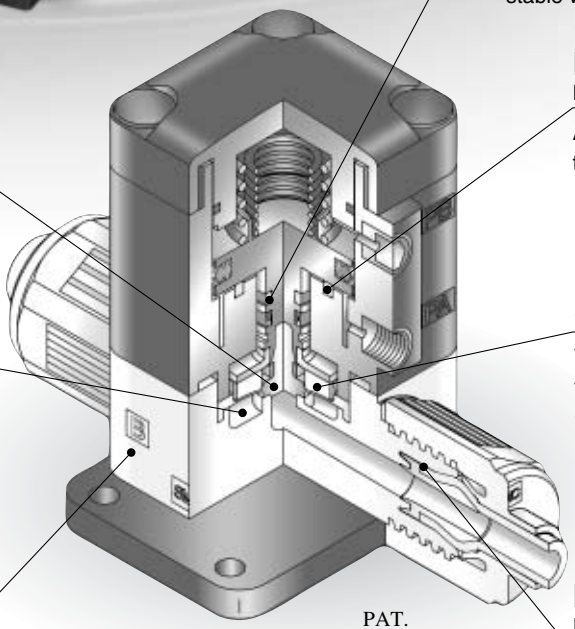
Special diaphragm construction insures gentle opening and closing that prevents the formation of micro-bubbles.

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.

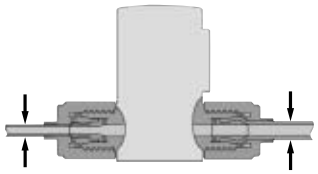


PAT.

Back-pressure resistance and long life Buffer

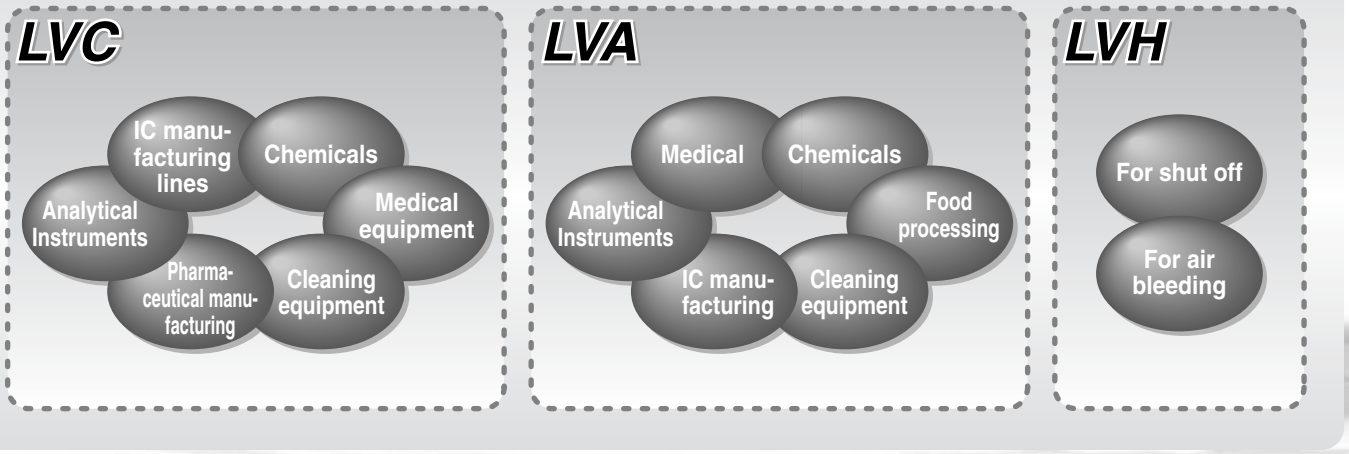
The diaphragm is supported by a buffer that minimizes deformation, which gives it long life and resistance to back-pressure.

Different tubing sizes can be selected Hyper fitting

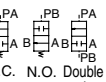
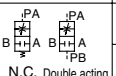
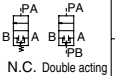
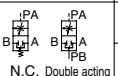
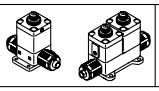
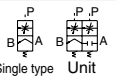
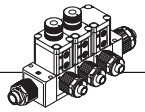
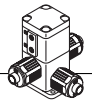


- No leak design (quadruple seal)
- Nut lock mechanism (sealing)
- High flexural strength (tubing supports)

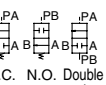
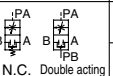
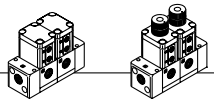
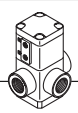
Main applications and fields



Air Operated
Integral Fitting Type Series LVC ▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸ P. 1

Type	Symbol	Valve type	Model	LVC2□	LVC3□	LVC4□	LVC5□	LVC6□
			Orifice diameter	ø4	ø8	ø10	ø16	ø22
			Tubing O.D. Metric	4, 6	6, 8, 10	10, 12	12, 19	19, 25
			Tubing O.D. Inch	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 by-pass 	 N.C. Double acting		N.C.	—	○	○	○	—
			Double acting	—	○	○	○	—
With flow rate adjustment & by-pass 	 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.		N.C.	○	—	—	—	—

Air Operated
Threaded Type Series LVA ▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸▸ P. 11

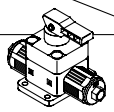
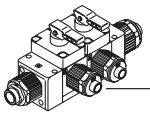
Type	Symbol	Valve type	Body material Note 1)	Model	LVA1□		LVA2□		LVA3□		LVA4□		LVA5□		LVA6□
				Orifice diameter	ø2		ø4		ø8		ø12		ø20		ø22
			Stainless steel (SUS316)	Port size	1/8	1/4	1/8	1/4	1/4	3/8	3/8	1/2	1/2	3/4	1
					○	○	○	○	○	○	○	○	○	○	○
			PPS		○	○	—	○	—	○	—	○	—	○	—
			PFA		—	—	—	○	—	○	—	○	—	○	○
Basic type 	 N.C. N.O. Double acting			N.C.	○	○	○	○	○	○	○	○	○	○	○
				N.C.	—	—	○	○	○	○	○	○	○	○	○
				N.O.	○	○	○	○	○	○	○	○	○	○	○
With flow rate adjustment 	 N.C. Double acting			Double acting	—	—	○	○	○	○	○	○	○	○	○
				Double acting	—	—	○	○	○	○	○	○	○	○	○
With by-pass 	 N.C. Double acting			N.C.	—	—	—	—	—	○	—	○	—	○	—
				Double acting	—	—	—	—	—	○	—	○	—	○	—
With flow rate adjustment & by-pass 	 N.C. Double acting			N.C.	—	—	—	—	—	○	—	○	—	○	—
				Double acting	—	—	—	—	—	○	—	○	—	○	—
With indicator 	 N.C.			N.C.	—	—	○	○	○	○	○	○	○	○	○
Manifold (5 stations max.) 															
3 port 	 N.C.			N.C.	—	—	—	Note 2) ○	—	—	—	—	—	—	—

Note1) Refer to the page 11 for the applicable optional body materials.

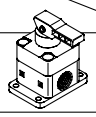
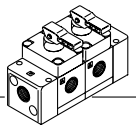
Note2) Only PFA is applicable as a body material.

Manually Operated Series LVH P. 21

Integral Fitting Type

Type / Symbol / Valve type	Model	LVH20	LVH30	LVH40
	Orifice diameter	ø4	ø8	ø10
	Tubing O.D. Metric	4, 6	6, 8, 10	10, 12
	Tubing O.D. Inch	1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2
Basic type  Non-locking / Locking	N.C.	○	○	○
Manifold (5 stations max.) 				

Threaded Type

Type / Symbol / Valve type	Model	LVH20				LVH30				LVH40			
	Orifice diameter	ø4				ø8				ø12			
	Material	SUS316		PPS	PFA	SUS316		PPS	PFA	SUS316		PPS	PFA
	Port size	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2
Basic type  Non-locking / Locking	N.C.	○	○	○	○	○	○	○	○	○	○	○	○
Manifold (5 stations max.) 													

Special Tools P. 29

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

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

Option

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
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 1	2	3	4	Note
Nil	PFA	PPS	PTFE	●	●	●	●	–
F	PFA	PVDF	PTFE					Hydrofluoric acid compatible (Only LVC40, 50 type)
N	PFA	PPS	PTFE	●	●	●	●	Ammonium hydroxide compatible

Applicable tubing size

Symbol	Connecting tubing O.D.	Body class 2	3	4	5	6
Metric sizes						
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

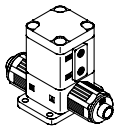
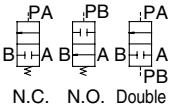
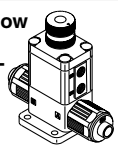
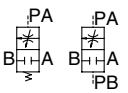
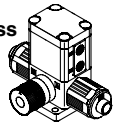
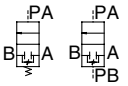
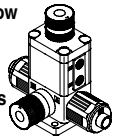
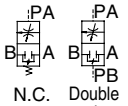
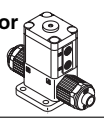
Port B (OUT) different dia. size

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.

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

Type	Symbol	Valve type	Model	LVC20	LVC30	LVC40	LVC50	LVC60
			Orifice diameter	ø4	ø8	ø10	ø16	ø22
			Tubing O.D. Metric	4, 6	6, 8, 10	10, 12	12, 19	19, 25
			Tubing O.D. Inch	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 adjust-ment 	 N.C. Double acting	N.C.		○	○	○	○	○
		Double acting		○	○	○	○	○
With by-pass 	 N.C. Double acting	N.C.		—	○	○	○	—
		Double acting		—	○	○	○	—
With flow rate adjust-ment & by-pass 	 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				
Weight (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						
	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 29 for information on changing tubing sizes.

⚠ Specific Product Precautions

Be sure to read before handling. Refer to pages 35 through 37 for safety instructions and high purity chemical valve precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

Refer to pages 29 through 31 regarding tubing connection and special tools.

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

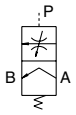
Body class	Torque (Nm)
2	0.3 to 0.4
3	0.8 to 1.0
4	1.0 to 1.2
5	2.5 to 3.0
6	5.5 to 6.0

Suck Back

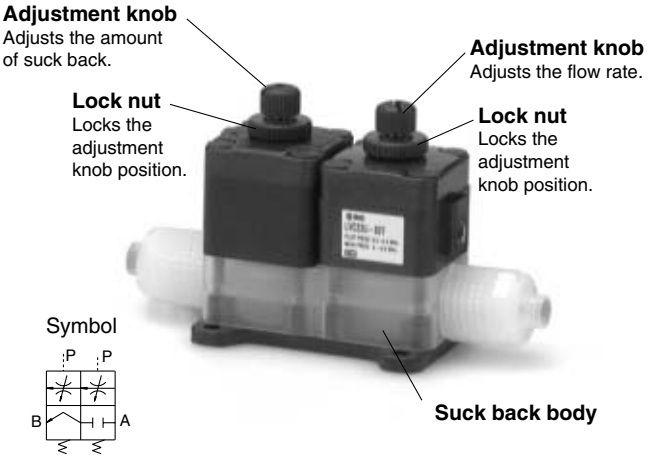
A change of volume inside the suck back valve pulls in liquid at the end of the nozzle to prevent dripping.

Single type

Symbol



Unit type



Symbol

Standard Specifications

Model		LVC23	LVC23U
Tubing O.D. Note 1)	Metric sizes	(4), 6	
	Inch sizes	(1/8), (3/16), 1/4	
Orifice diameter		—	ø3
Flow characteristics	Av x 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	
Weight (kg)		0.08	0.16

Note 1) Different diameter tubing shown in ( ) can be selected when used with a reducer. Refer to page 29 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

Port B (OUT) different dia. size

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

Applicable tubing size

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

◎ Basic size ○ With reducer

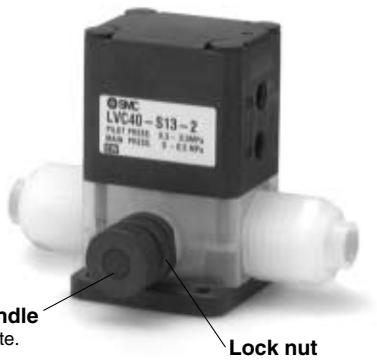
Options

■ With flow rate adjustment

The flow rate is adjusted by controlling the diaphragm stroke.

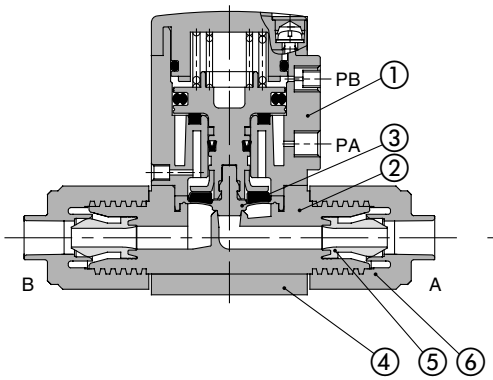
■ With by-pass

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

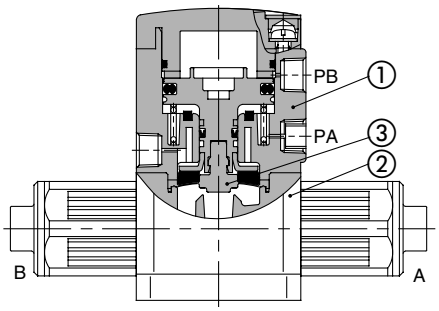


Construction

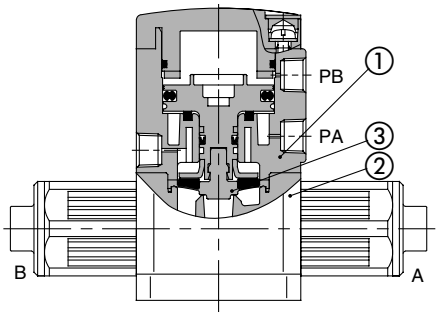
Standard type
N.C. type



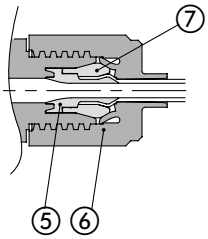
N.O. type



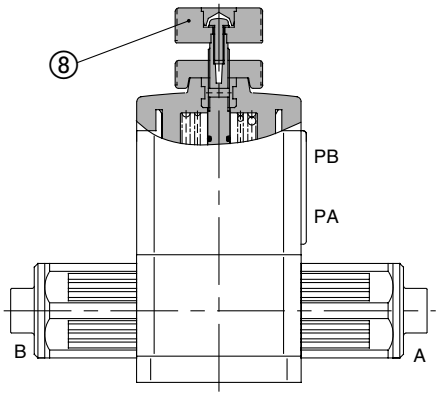
Double acting type



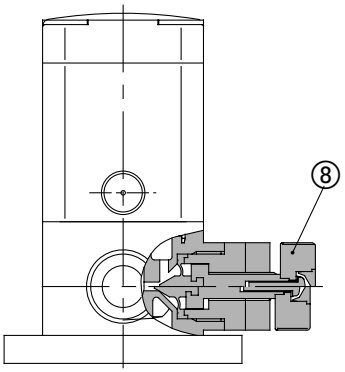
With reducer



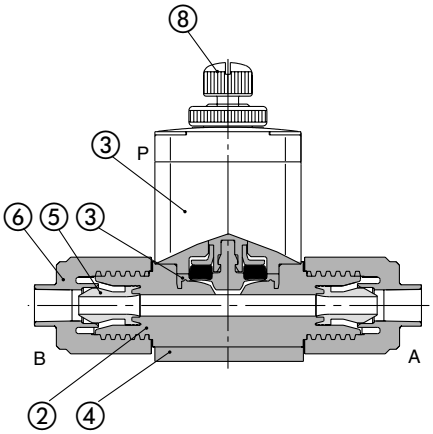
With flow rate adjustment



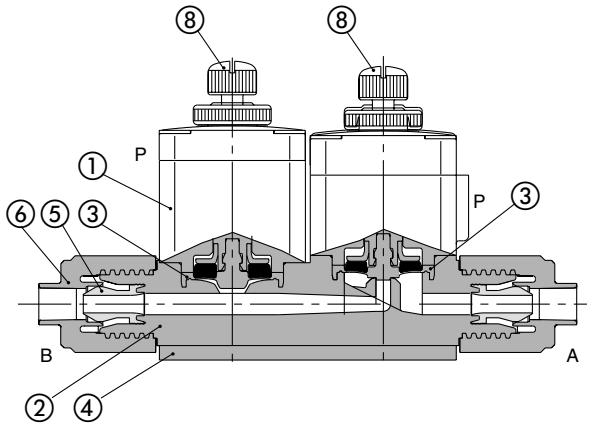
With by-pass



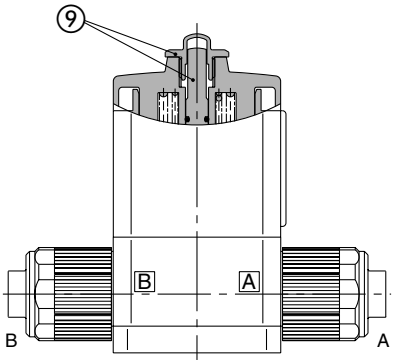
Suck back (single type)



Suck back (unit type)



With indicator

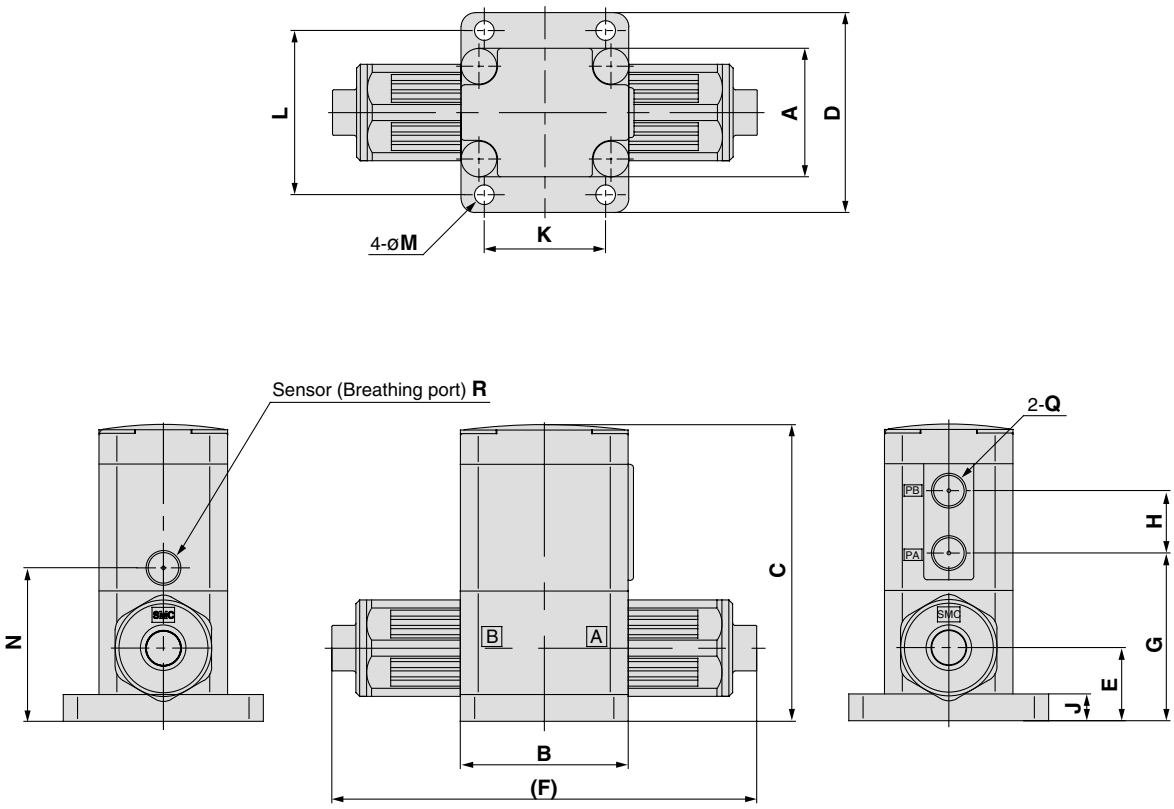


Parts list

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

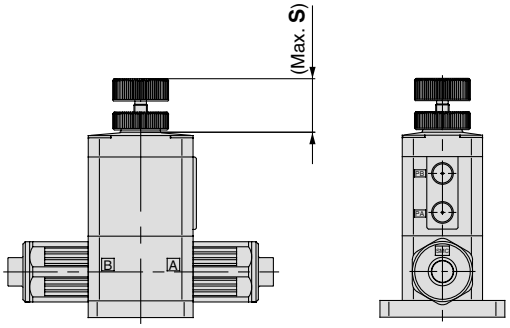


Dimensions (mm)

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		

Dimensions

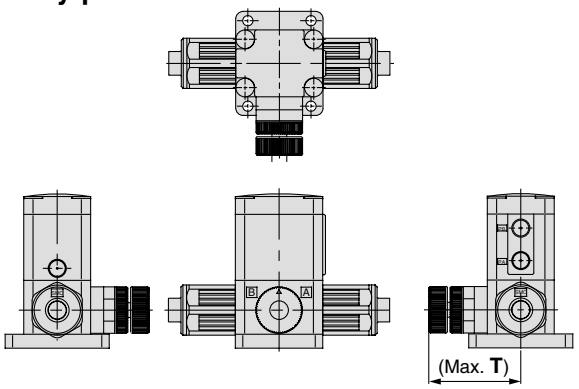
With flow rate adjustment



Dimensions (mm)

Model	S
LVC2□	11.5
LVC3□	24
LVC4□	29
LVC5□	34.5
LVC6□	36

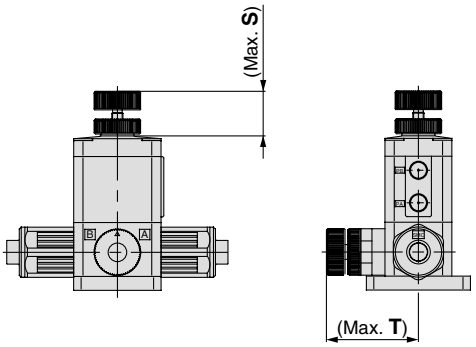
With by-pass



Dimensions (mm)

Model	T
LVC3□	49.5
LVC4□	54.5
LVC5□	60.5

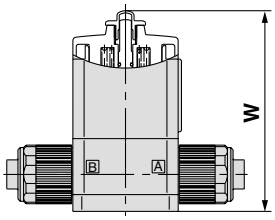
With flow rate adjustment & by-pass



Dimensions (mm)

Model	S	T
LVC3□	24	49.5
LVC4□	29	54.5
LVC5□	34.5	60.5

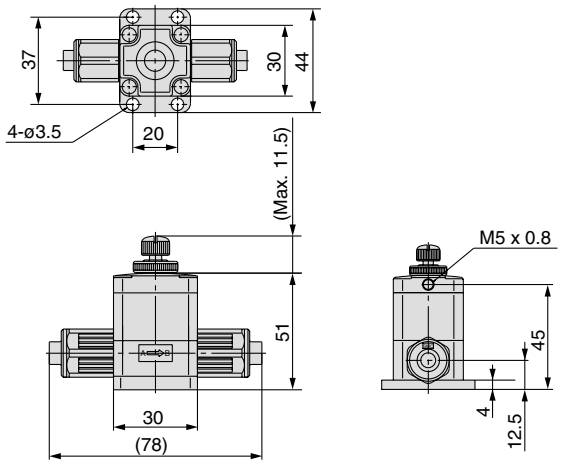
With indicator



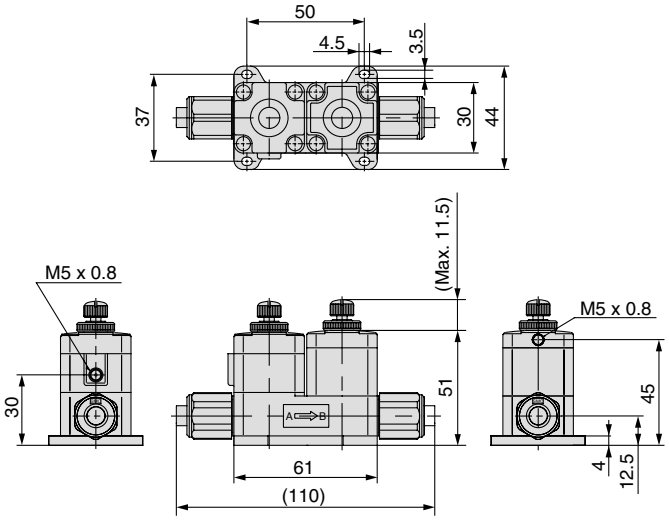
Dimensions (mm)

Model	W
LVC20	64
LVC30	90
LVC40	110.5
LVC50	147
LVC60	156

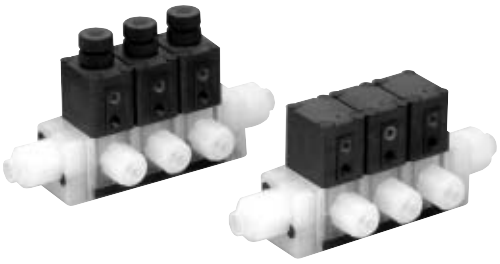
Suck back (Single type)



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

Manifold stations

02	2 stations
⋮	⋮
05	5 stations

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"	
10	Ø10	3
11	3/8"	
12	Ø12	
13	1/2"	
12	Ø12	4
13	1/2"	
19	Ø19, 3/4"	
12	Ø12	5
13	1/2"	
19	Ø19, 3/4"	

Tubing size for P port and R 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"	
10	Ø10	3
11	3/8"	
12	Ø12	
13	1/2"	
12	Ø12	4
13	1/2"	
19	Ø19, 3/4"	
12	Ø12	5
13	1/2"	
19	Ø19, 3/4"	

How to Order Valve

LVC 2 0 A – S07 □ – □ □

Body class

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

Valve type

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

Body type

A	Stacking type for manifold

Tubing size

Symbol	Tubing size	Body class
S03	1/8"	2
S04	Ø4	
S05	3/16"	
S06	Ø6	
S07	1/4"	
S06	Ø6	3
S07	1/4"	
S08	Ø8	
S10	Ø10	
S11	3/8"	
S10	Ø10	4
S11	3/8"	
S12	Ø12	
S13	1/2"	
S12	Ø12	5
S13	1/2"	
S19	Ø19, 3/4"	

Option

Nil	None
1	With flow rate adjustment
4	With indicator

Note) Options can not be combined each other.

Material

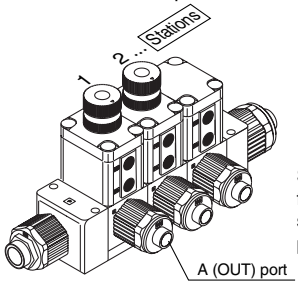
Symbol	Body	Actuator section End plate	Dia-phragm	Applicable option 1	Applicable option 4	Note
Nil	PFA	PPS	PTFE	●	●	–
F	PFA	PVDF	PTFE			Hydrofluoric acid compatible (Only LVC40, 50 type)
N	PFA	PPS	PTFE	●	●	Ammonium hydroxide compatible

Pilot port thread type

Symbol	Body class	Thread type
Nil	2	M5
	3/4/5	Rc 1/8
N	3/4/5	NP T1/8

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.

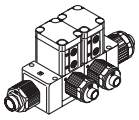
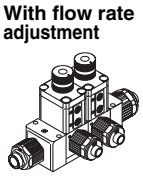
∗ LVC20A-S07-1 ····· 2 sets — 2 sets Valve part no. (stations 1 & 2)

∗ 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.

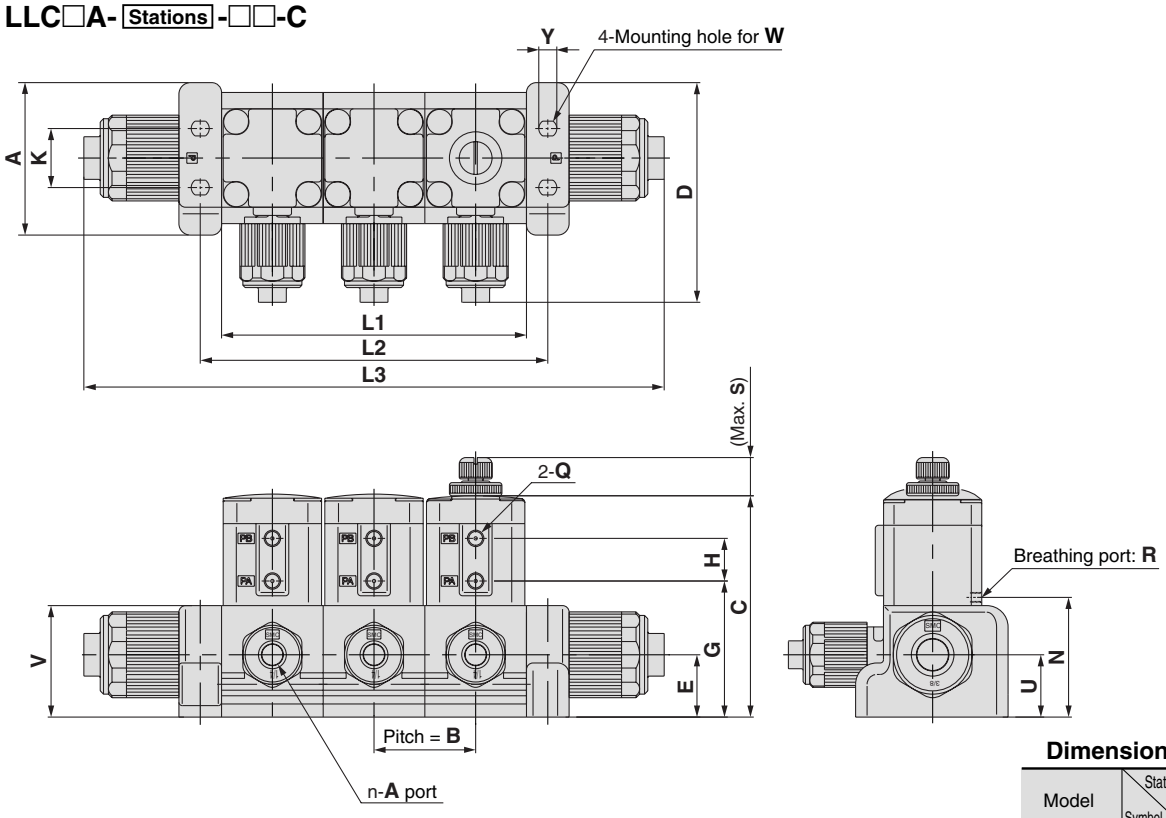
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

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
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	○	○	○	○

Dimensions

LLC□A- Stations -□□-C



Dimensions (mm)

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 (mm)

Model	Station / Symbol	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

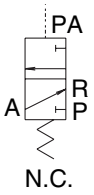
Series LVC
3 Port

Standard Specifications

Model		LVC200
Orifice diameter		ø4
Flow characteristics	Av x 10^{-6}m²	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
Weight (kg)		0.120

How to Order Valve

LVC 2 0 0 − S 07



Body class

Symbol	Body class	Orifice dia.
2	2	Ø4

Valve type

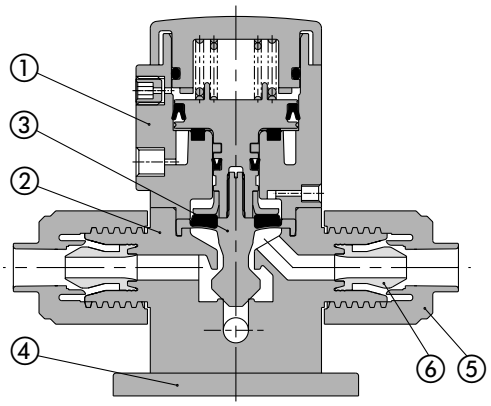
0	N.C

Applicable tubing size

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

○ Basic size ● With reducer

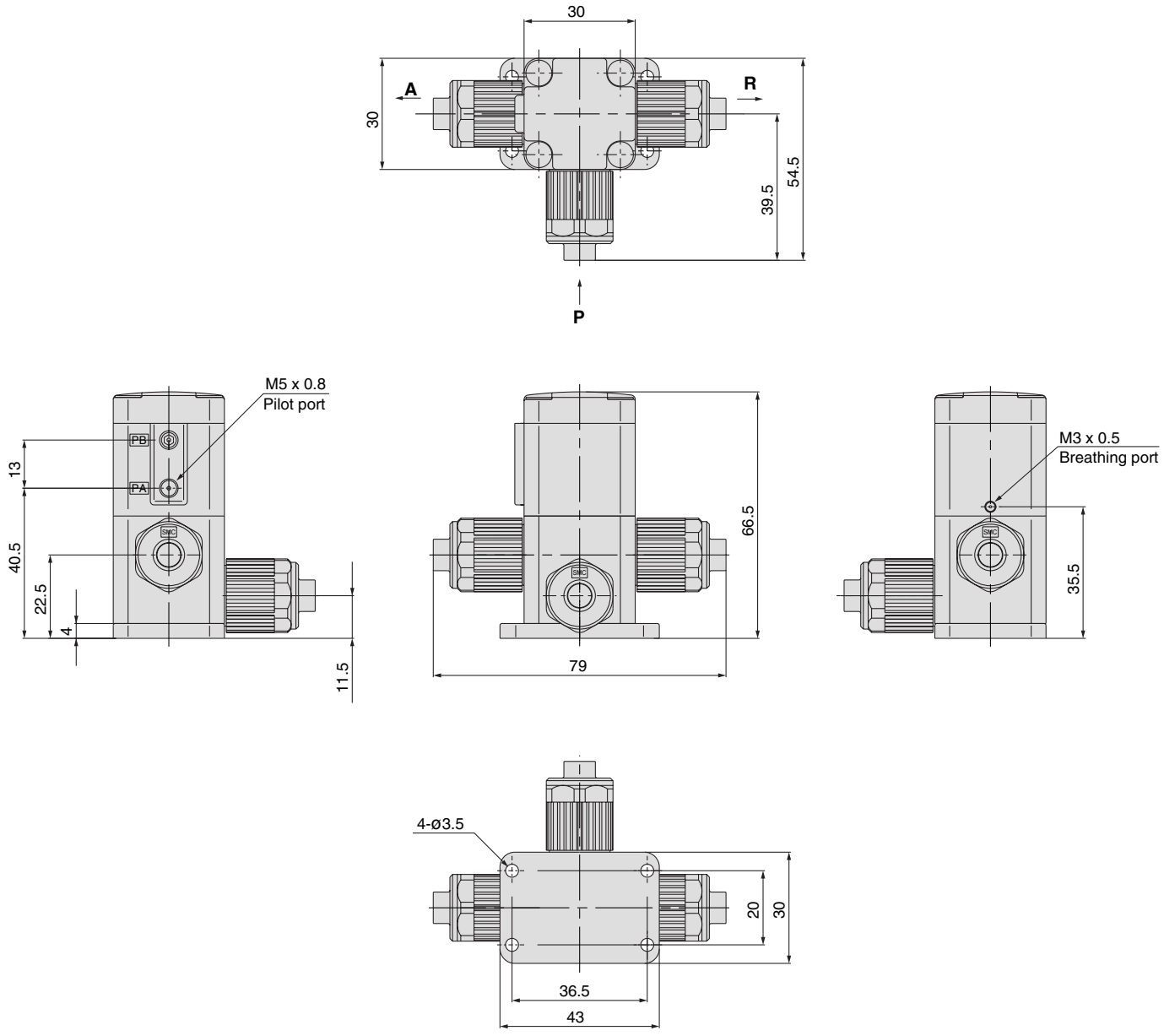
Construction



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

Dimensions


30
A
R
30
54.5
39.5
P
M5 x 0.8
Pilot port
PB
PA
13
40.5
22.5
4
11.5
66.5
79
M3 x 0.5
Breathing port
35.5
4-ø3.5
20
30
36.5
43

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	
01	1/8	2
02	1/4	
02	1/4	3
03	3/8	
03	3/8	4
04	1/2	
04	1/2	5
06	3/4	
10	1	6

Thread type

Symbol	Thread type
Nil	Rc
N	NPT

Option

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
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	Diaphragm	Applicable option: 1	2	3	4	Note
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

Type	Symbol	Valve type	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
			Body material Note 1) Stainless steel (SUS316)	○	○	○	○	○	○	○	○	○	○	○
			PPS	○	○	—	○	—	○	—	○	—	○	—
			PFA	—	—	—	○	—	○	—	○	—	○	○
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 by-pass	N.C. Double acting	N.C.		—	—	—	—	—	○	—	○	—	○	—
		Double acting		—	—	—	—	—	○	—	○	—	○	—
With flow rate adjustment & by-pass	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}m²	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 (cm³/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					
Weight (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 pages 35 through 37 for safety instructions and 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.

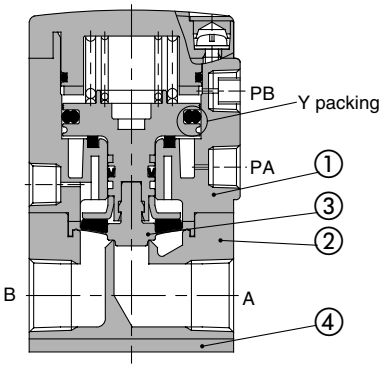
Adjustment knob
Adjusts the flow rate.

Lock nut
Locks the adjustment knob position.

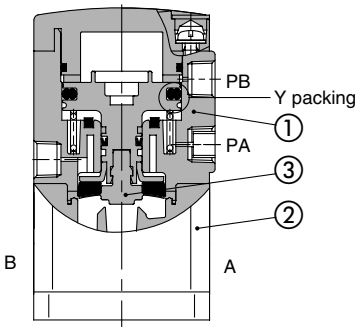
Construction

Standard type

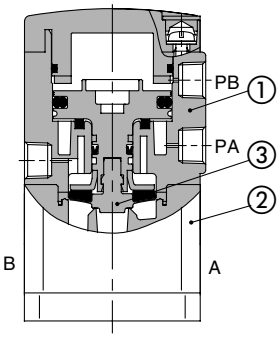
N.C. type



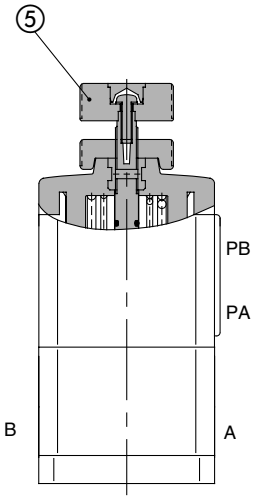
N.O. type



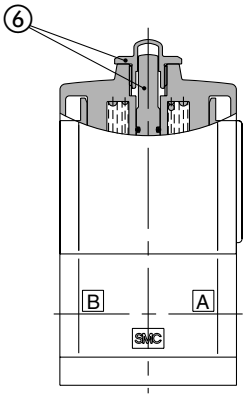
Double acting type



With flow rate adjustment



With indicator



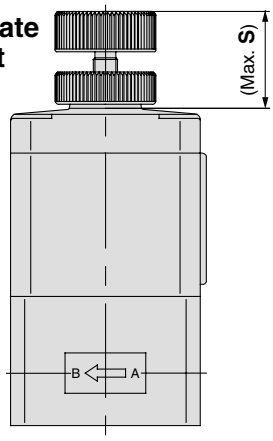
Parts list

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: Stainless steel
Basic type

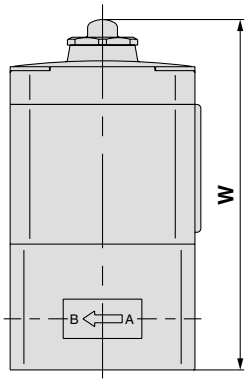
With flow rate adjustment



Dimensions (mm)

Model	S
LVA2□	11.5
LVA3□	24
LVA4□	29
LVA5□	34.5
LVA6□	36

With indicator



Dimensions (mm)

Model	W
LVA20	66.5
LVA30	89.5
LVA40	110
LVA50	140.5
LVA60	148

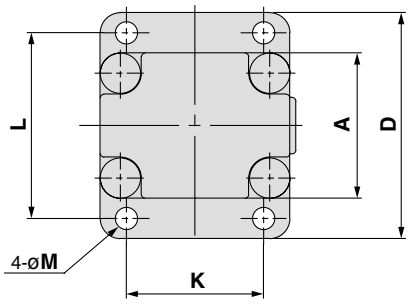
Dimensions (mm)

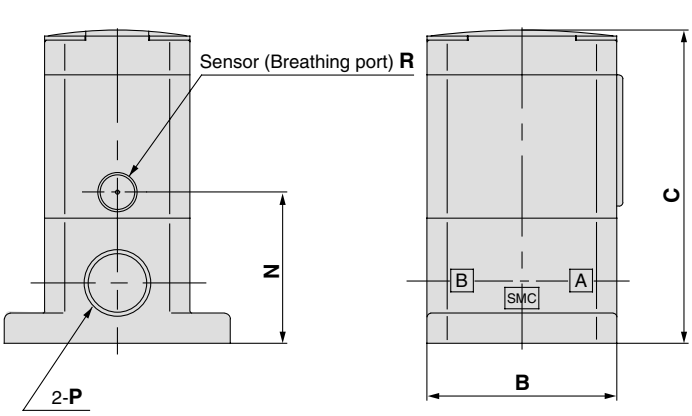
Model	A	B	C	E	F	G	H	K	L	N	P	Q	R
LVA1□	20	33	49.5	10	M5 x 0.8	27.5	11	—	13	27.5	Rc 1/8, 1/4 NPT 1/8, 1/4	M5 x 0.8	4.2
LVA2□	30	33	57	10	M5 x 0.8	31	13	22	22	26			M3 x 0.5
LVA3□	36	47	78.5	13	M6 x 1.0	42.5	17.5	37	26	38.5	Rc 1/4, 3/8 NPT 1/4, 3/8	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8
LVA4□	46	60	95.5	16	M8 x 1.25	54.5	18	47.5	33.5	47.5	Rc 3/8, 1/2 NPT 3/8, 1/2		
LVA5□	58	75	122.5	19	M8 x 1.25	61.5	27.5	60	43	55.5	Rc 1/2, 3/4 NPT 1/2, 3/4		
LVA6□	58	85	130	24	M8 x 1.25	69	27.5	60	43	63	Rc 1 NPT 1		

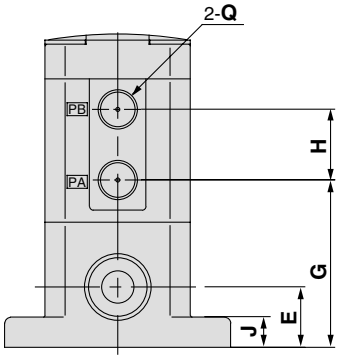
Dimensions

Body material: PPS

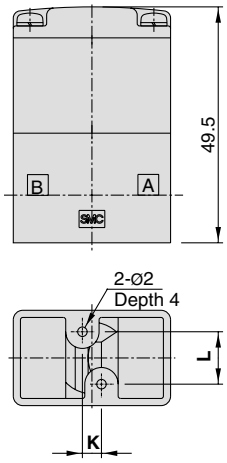
Basic type



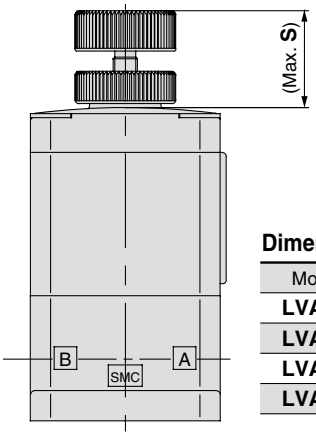




LVA10



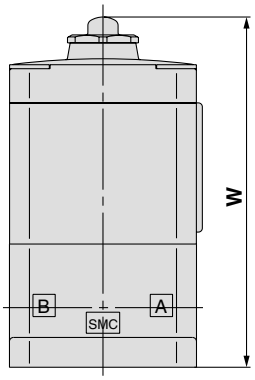
With flow rate adjustment



Dimensions (mm)

Model	S
LVA2□	11.5
LVA3□	24
LVA4□	29
LVA5□	34.5

With indicator



Dimensions (mm)

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

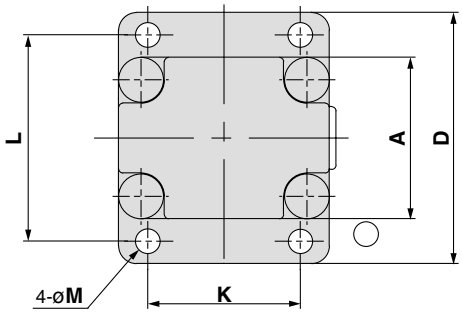
Dimensions (mm)

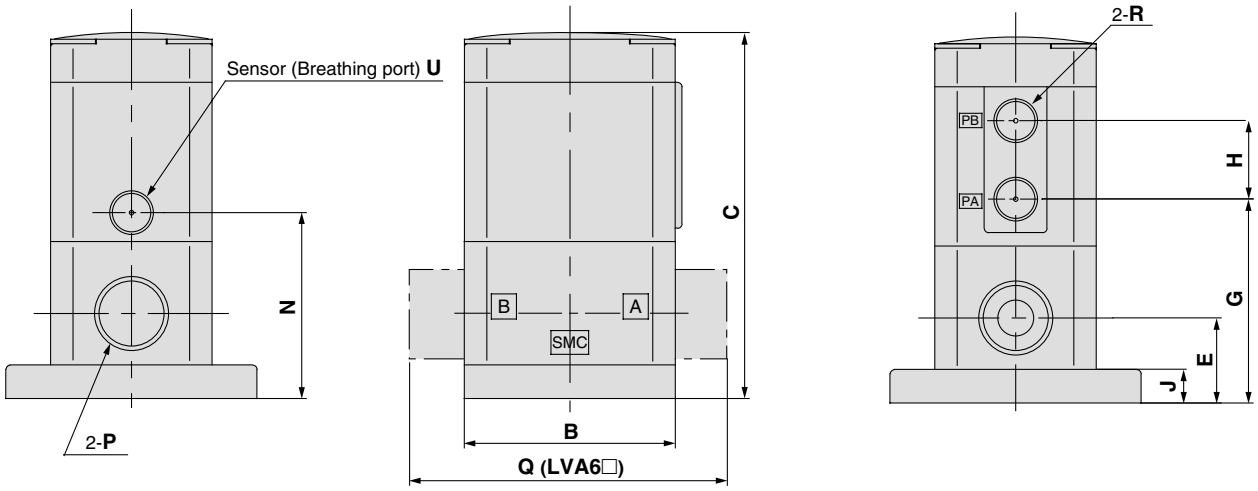
Model	A	B	C	D	E	G	H	J	K	L	M	N	P	Q	R
LVA1□	20	33	49.5	—	10	27.5	11	—	4	11	—	27.5	Rc 1/8, 1/4 NPT 1/8, 1/4	M5 x 0.8	4.2
LVA2□	30	36	57.5	44	11	31.5	13	4	20	37	3.5	26.5	Rc 1/4 NPT 1/4		M3 x 0.5
LVA3□	36	47	77.5	56	15	41.5	17.5	7.5	34	46	5.5	37.5	Rc 3/8 NPT 3/8	Rc 1/8 NPT 1/8	Rc 1/8 NPT 1/8
LVA4□	46	60	96	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		

Dimensions

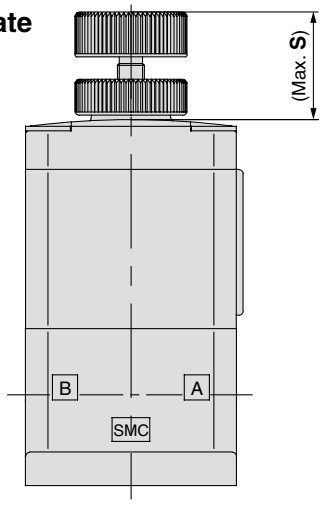
Body material: PFA

Basic type





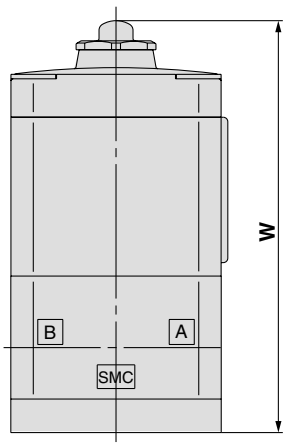
With flow rate adjustment



Dimensions (mm)

Model	S
LVA2□	11.5
LVA3□	24
LVA4□	29
LVA5□	34.5
LVA6□	36

With indicator



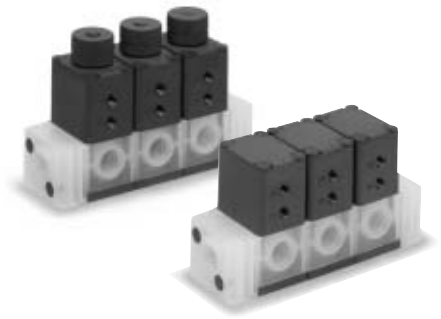
Dimensions (mm)

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

Dimensions (mm)

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

A	Stacking type

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

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

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

Thread type

Symbol	Thread type
Nil	Rc
N	NPT

Option

Nil	None
1	With flow rate adjustment
4	With indicator

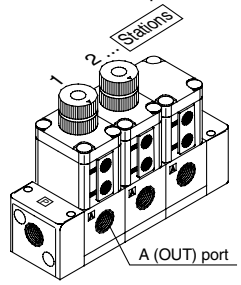
Note) Options can not be combined each other.

Material

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

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.

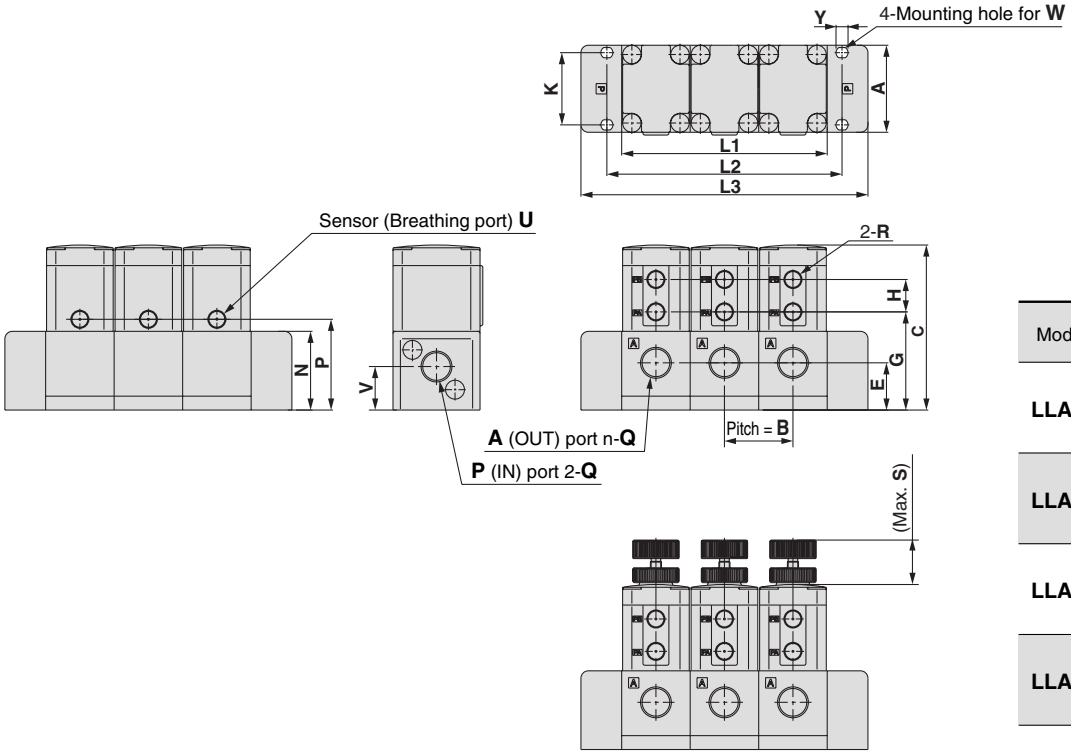
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

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
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	○	○	○	○

Dimensions

LLA□A- Stations -□□-C



Dimensions (mm)

Model	S
LLA2A	11.5
LLA3A	24
LLA4A	29
LLA5A	34.5

(mm)

Model	Station / Symbol	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 (mm)

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

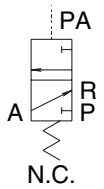
Series LVA
3 Port

Standard Specifications

Model		LVA200
Orifice diameter		ø4
Port size		1/4
Flow characteristics	Av x 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
Weight (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

Port size

Symbol	Port size
02	1/4

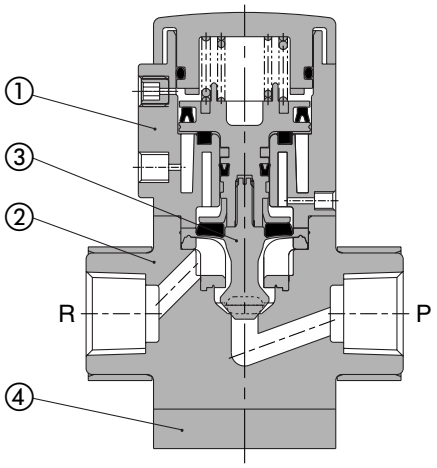
Thread type

Symbol	Thread type
Nil	Rc
N	NPT

Material

Symbol	Body	Actuator section	Diaphragm
C	PFA	PPS	PTFE

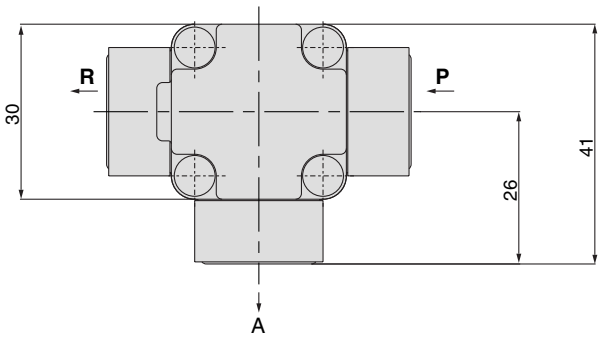
Construction

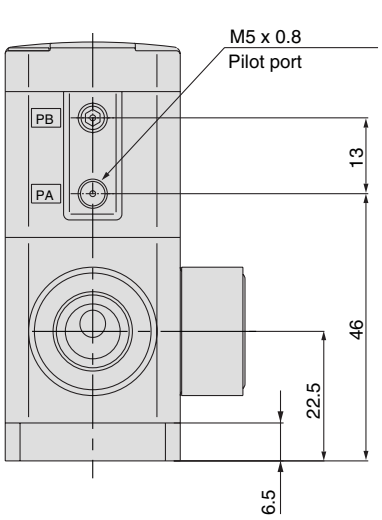


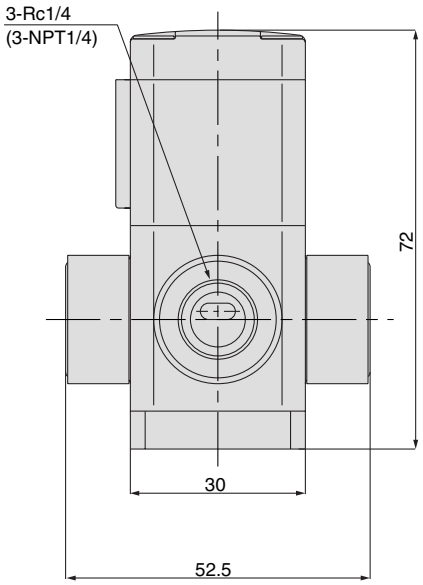
Parts list

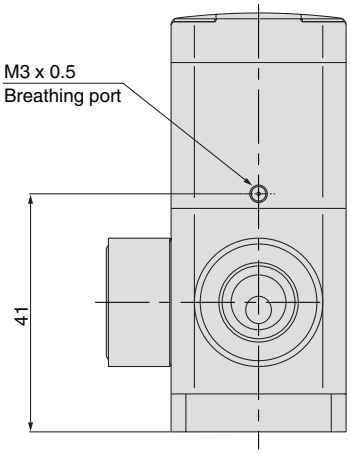
No.	Description	Material
1	**Actuator section**	PPS
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**End plate**	Stainless steel

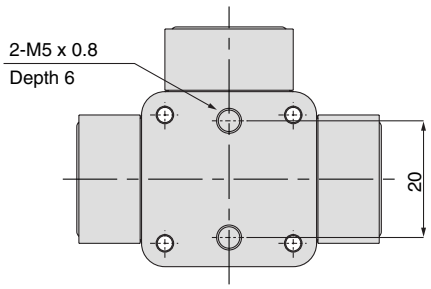
Dimensions


R
P
30
41
26
A


M5 x 0.8
Pilot port
PB
PA
13
46
22.5
6.5


3-Rc1/4
(3-NPT1/4)
72
30
52.5


M3 x 0.5
Breathing port
41


2-M5 x 0.8
Depth 6
20

Manually Operated
Series LVH

How to Order Valve (Single Type)

Integral fitting type LVH 2 0 □ – S 06 □

Threaded type LVH 2 0 □ – 02 □ – A

Body class

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

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.

Applicable tubing size

Symbol	Connecting tubing O.D.	Body class 2	3	4
Metric sizes				
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

Body class

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

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	

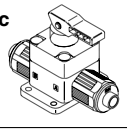
Material

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

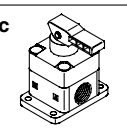
Pilot port thread type

Symbol	Thread type
Nil	Rc
N	NPT

Integral fitting type/Variations

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

Threaded type/Series variation

Type	Symbol	Model	LVH20				LVH30				LVH40			
		Orifice diameter	ø4				ø8				ø12			
		Port size	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	1/2	1/2	1/2
		Material	Stainless steel (SUS316)		PPS	PFA	Stainless steel (SUS316)		PPS	PFA	Stainless steel (SUS316)		PPS	PFA
Basic type		N.C.	○	○	○	○	○	○	○	○	○	○	○	○

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 x 10^{-6}m²	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		
Weight (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				
	4	6	8	10	12	1/8	3/16	1/4	3/8	1/2
2	●	○	—	—	—	●	●	○	—	—
3	—	●	●	○	—	—	—	●	○	—
4	—	—	—	●	○	—	—	—	●	○

Note) Refer to page 29 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 x 10^{-6}m²	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		
Weight (kg)	Stainless steel (SUS)	0.15	0.36	0.71
	PPS	0.04	0.09	0.17
	PFA	0.05	0.11	0.20

⚠ Specific Product Precautions

Be sure to read before handling. Refer to pages 35 through 37 for safety instructions and high purity chemical valve precautions.

Piping

⚠ Caution

Integral fitting type

1. Connect tubing with special tools.

Refer to pages 29 through 31 regarding tubing connection and special tools.

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 (Nm)
2	0.3 to 0.4
3	0.8 to 1.0
4	1.0 to 1.2

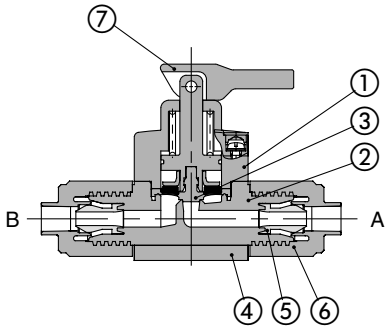
Threaded type

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

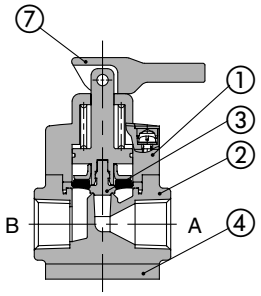
This can cause damage to the valve body.

Construction

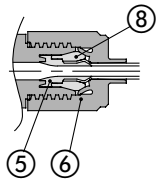
Integral fitting type



Threaded type



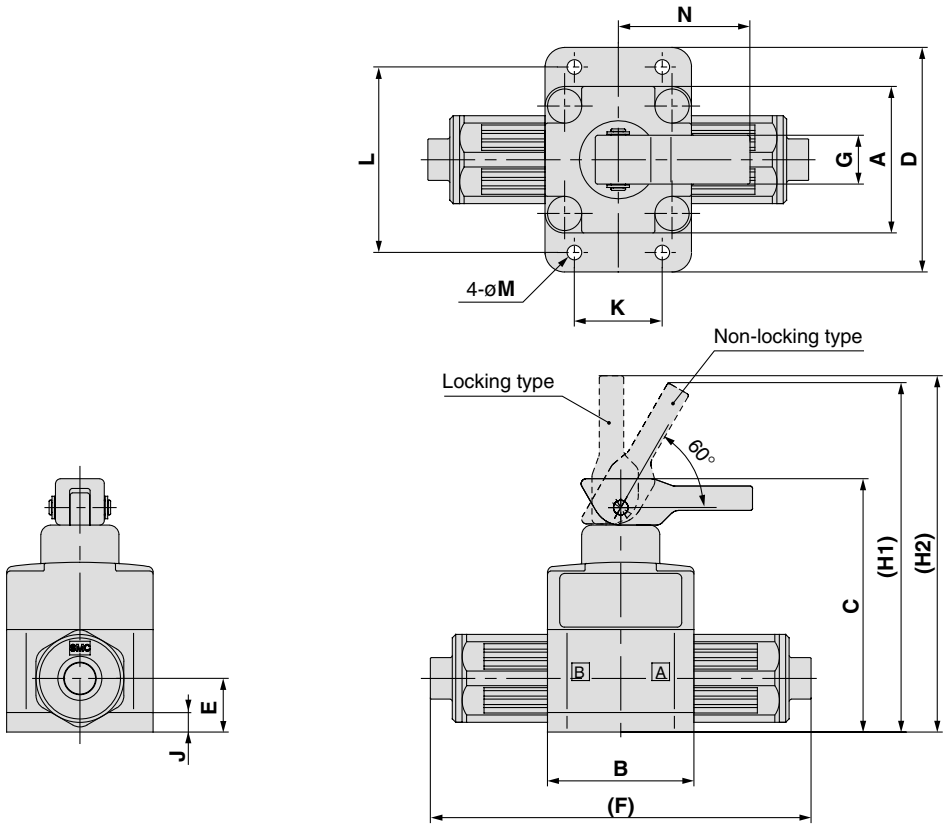
With reducer



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	–

Dimensions/Integral Fitting Type

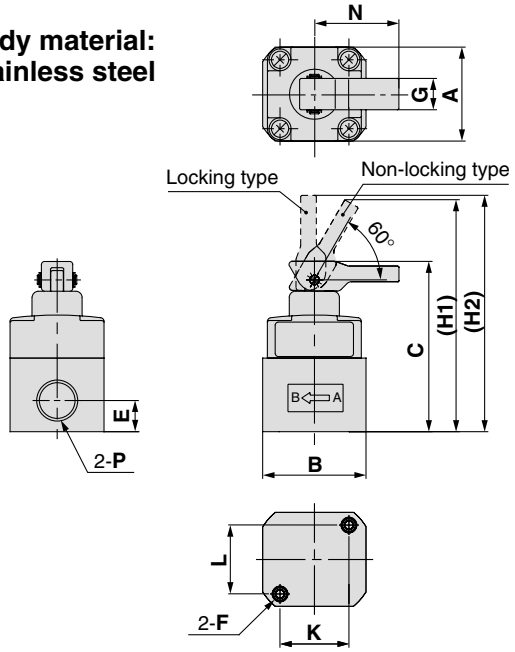


Dimensions (mm)

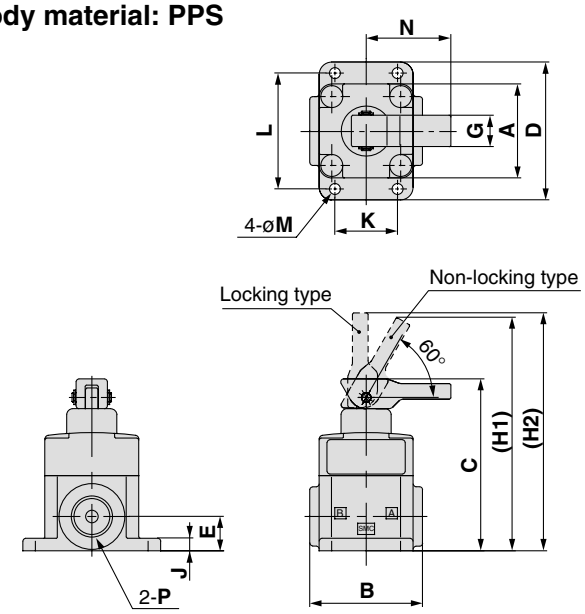
Model	A	B	C	D	E	F	G	H1	H2	J	K	L	M	N
LVH20□	30	30	52	44	11	79	10	72.5	74	4	20	37	3.5	27
LVH30□	36	47	81.5	56	16.5	106	19	111	113	7.5	34	46	5.5	37.5
LVH40□	46	60	100	68	22.5	131	20.5	139	143	8	42	57	5.5	50

Dimensions/Threaded Type

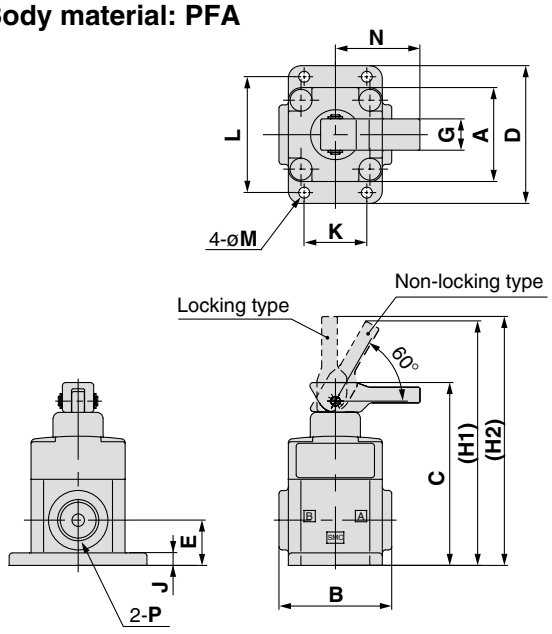
Body material: Stainless steel



Body material: PPS



Body material: PFA

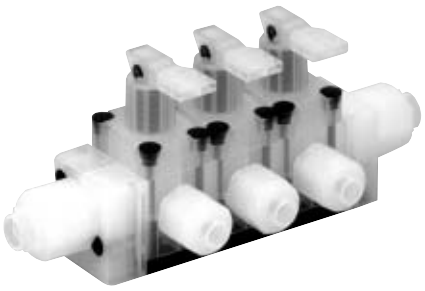


Dimensions

(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

A	Stacking type

Manifold stations

02	2 stations
⋮	⋮
05	5 stations

Tubing size for port P and L side connection

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

Tubing size for port P and R side connection

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

How to Order Valve

LVH 2 0 A □ – S07

Body class

Symbol	Body class	Orifice dia.
2	2	Ø4
3	3	Ø8
4	4	Ø12

Valve type

0	N.C.

Body type

A	Stacking type for manifold

Lever operation

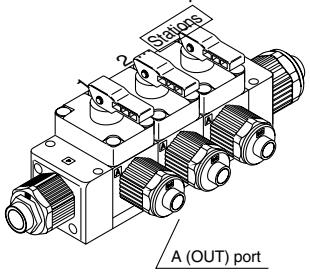
Symbol	Lever operation
Nil	Non-locking type (self-reset type)
L	Locking type

Tubing size

Symbol	Tubing size	Body class
S03	1/8"	2
S04	Ø4	
S05	3/16"	
S06	Ø6	
S07	1/4"	
S06	Ø6	3
S07	1/4"	
S08	Ø8	
S10	Ø10	
S11	3/8"	
S10	Ø10	4
S11	3/8"	
S12	Ø12	
S13	1/2"	

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.

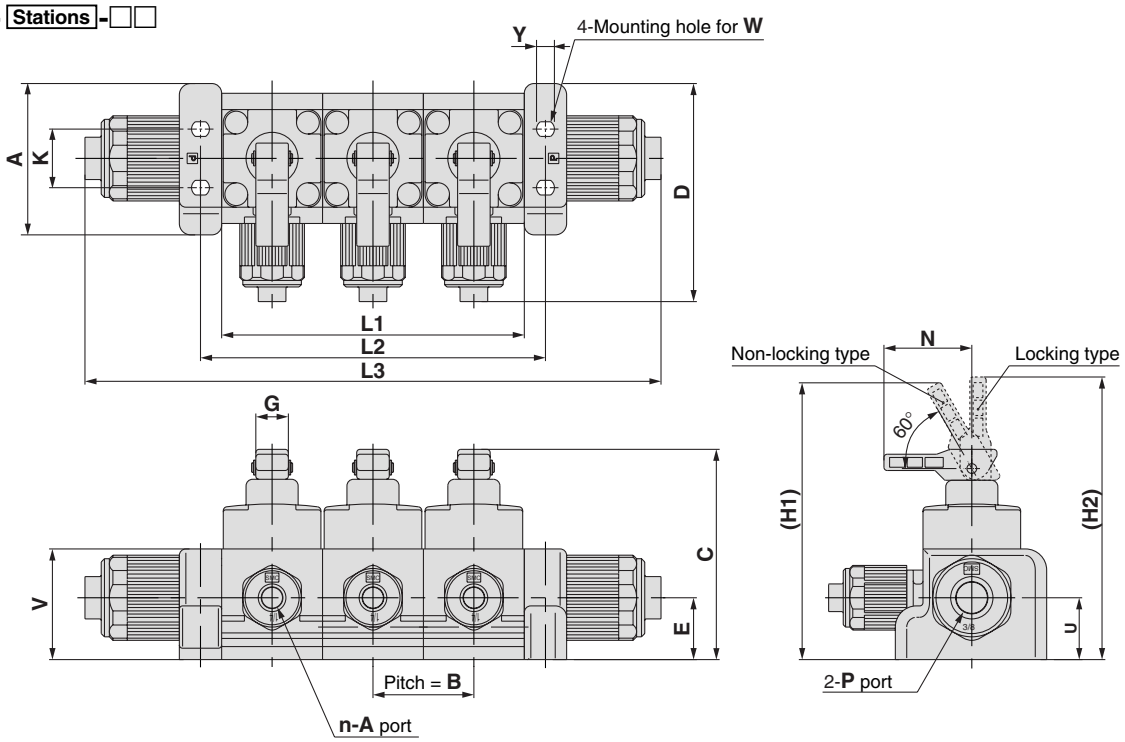
Enter together in order counting from station 1 on the left side, with the A (OUT) ports in front.

Threaded type manifold/Variations

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

Dimensions

LLH□A- Stations -□□



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	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.

How to Order Manifold Base

LLH 2 A – 05 – 02 ☐ – C

Body class

Symbol	Body class
2	2
3	3
4	4

Base type

A	Stacking type

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

Material

Symbol	Manifold
C	PFA

How to Order Valve

Threaded type **LVH 2 0 A ☐ – 02 ☐ – C**

Body class

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

Valve type

0	N.C.

Body type

A	Stacking type for manifold

Lever operation

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

Port size (port A)

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

Thread type

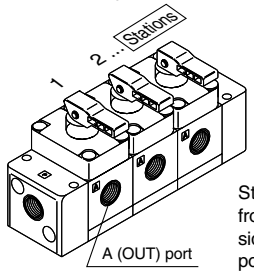
Symbol	Thread type
Nil	Rc
N	NPT

Material

Symbol	Body	Actuator section / End plate	Diaphragm
C	PFA	PP / PPS	PTFE

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)

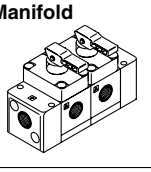
∗ LVH20AL-02-C ····· 1 set — 1 set Valve part no. (station 3)

• 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.

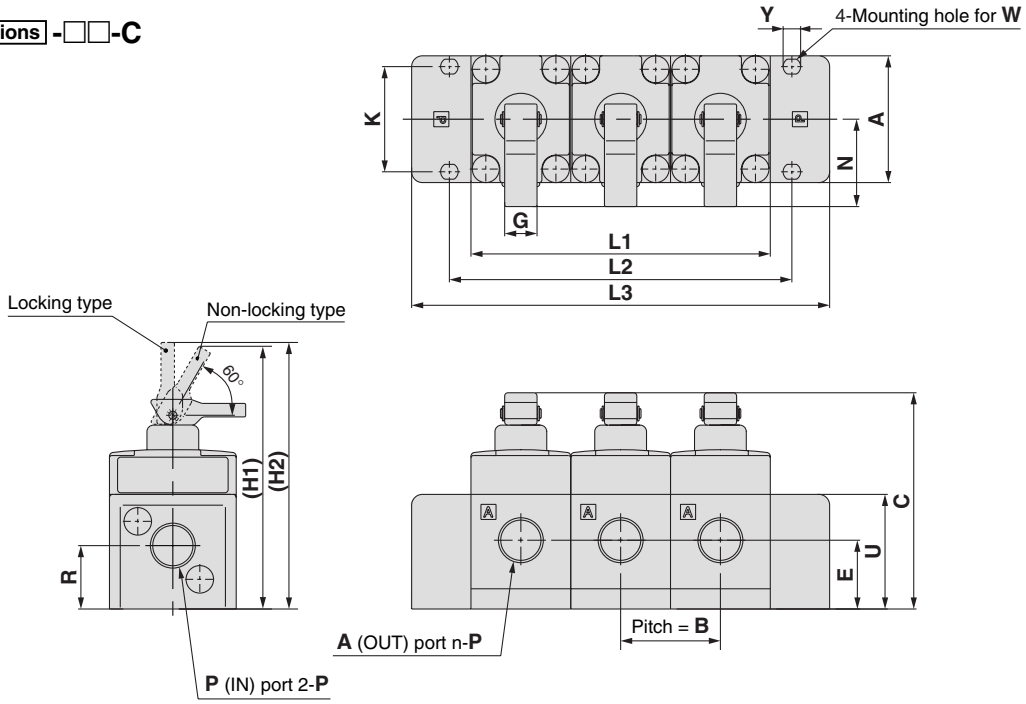
Threaded type manifold/Variations

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



Dimensions

LLH□A-Stations-□□-C



Dimensions

(mm)

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 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 sizes							Inch sizes						
	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 composition

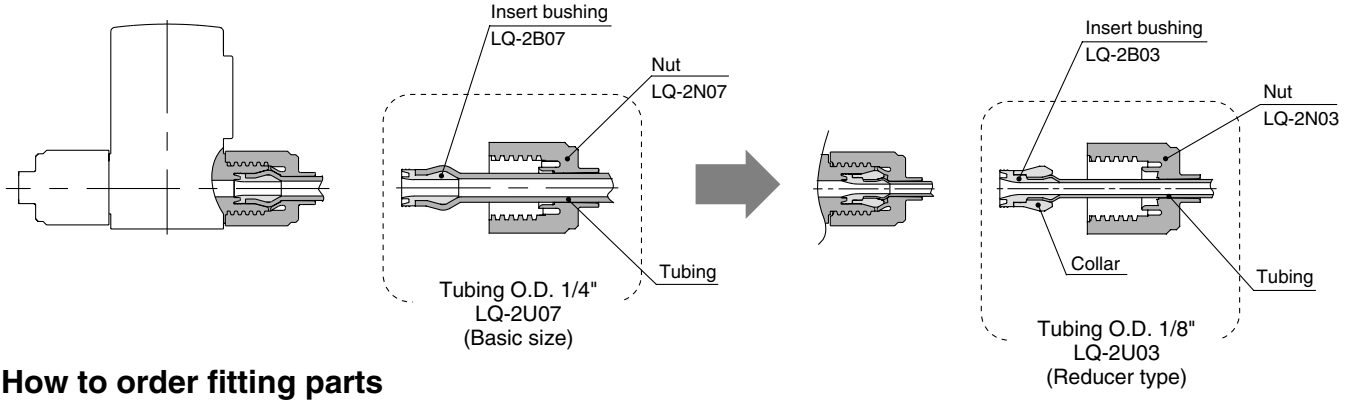
	Component parts		
	Nut	Insert	Collar (insert assembly)
○ Basic size	Yes	Yes	No
● Reducer type	Yes	Yes	Yes

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.



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"	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	5	
13	1/2"		
19	3/4", ø19		
19	3/4", ø19	6	LQ1
25	1", ø25		

Special Tools

How to order fitting jigs

LQ−G J □ −□ −□

Insert pin material

Nil	Resin
S	Stainless steel (J/K type ony)

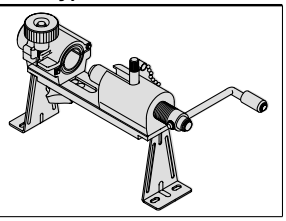
Insert pin/Holder type

Nil	Metric size
N	Inch size

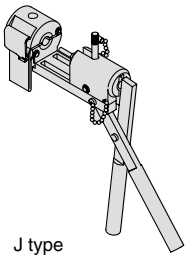
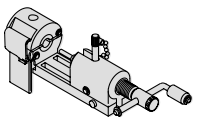
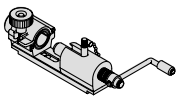
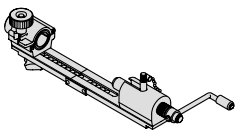
Note 1) Compatible pins and holders are included with all sizes. (with the parts case)

Option (L/M type only)

Symbol	Option
Nil	None
B	With bracket



Type

Symbol	Body class		
J / K	1, 2	 J type	 K type
L / M	1, 2, 3, 4, 5, 6	 L type	 M type (for short piping)

Option

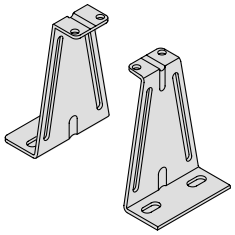
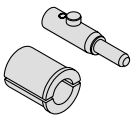
Description		Part No.
Bracket assembly		LQ-GBL

Table 1 Tubing size symbols

Type	Body Class	Tubing O.D.														
		Metric sizes								Inch sizes						
		ø3	ø4	ø6	ø8	ø10	ø12	ø19	ø25	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"
J	1	03	04	—	—	—	—	—	—	03	—	—	—	—	—	—
	2	—	04	06	—	—	—	—	—	03	05	07	—	—	—	—
L	1	03	04	—	—	—	—	—	—	03	—	—	—	—	—	—
	2	—	04	06	—	—	—	—	—	03	05	07	—	—	—	—
	3	—	—	06	08	10	—	—	—	—	—	07	11	—	—	—
	4	—	—	—	—	10	12	—	—	—	—	—	11	13	—	—
	5	—	—	—	—	—	12	19	—	—	—	—	—	13	19	—
	6	—	—	—	—	—	—	19	25	—	—	—	—	—	19	25

Replacement parts

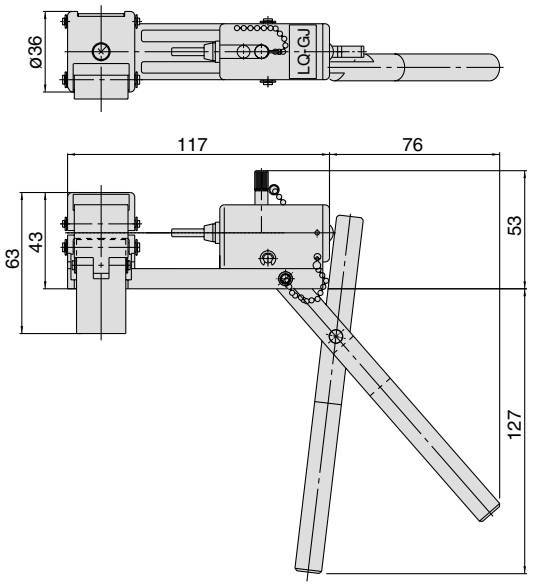
Description		Part No.
Insert pin holder assembly (with the parts case)		**LQ-GP J □ -□** Type Insert pin/ Holder type Insert pin material (J/K type only) **Nil** Resin **S** Stainless steel **Nil** Metric sizes **N** Inch sizes
Insert pin (single)		**LQ-GP 2 J □ -07** Body class (Refer to Table 1) Type Tubing size symbol (Refer to Table 1) Insert pin material (J/K type only) **Nil** Resin **S** Stainless steel
Holder (single)		**LQ-GH J - 07** Tubing size symbol (Refer to Table 1) Type

Note1) Replacement part type J shows the parts for LQ-GJ and LQ-GK.
Replacement part type L shows the parts for LQ-GL and LQ-GM.

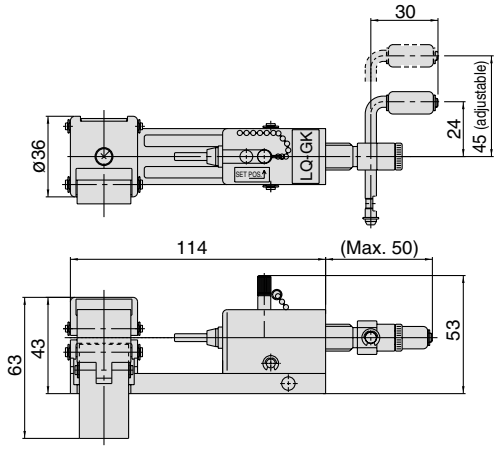
Special Tools

Dimensions

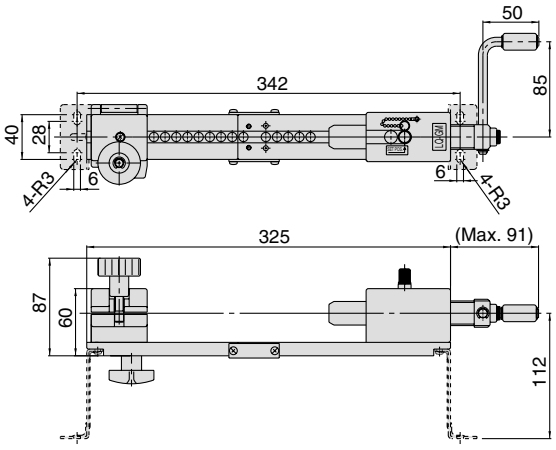
LQ-GJ



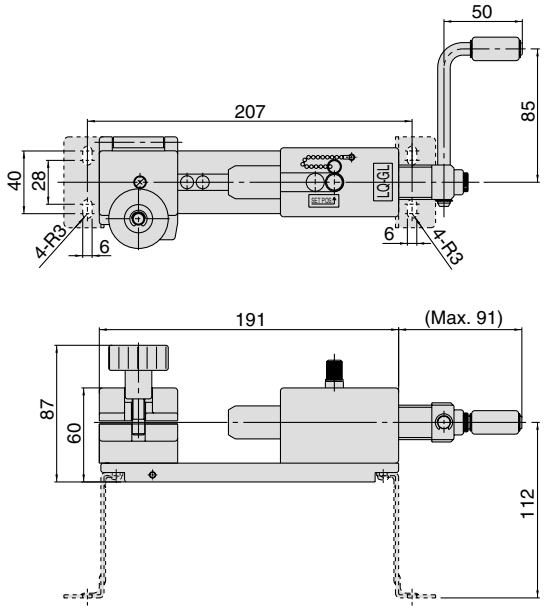
LQ-GK



LQ-GM



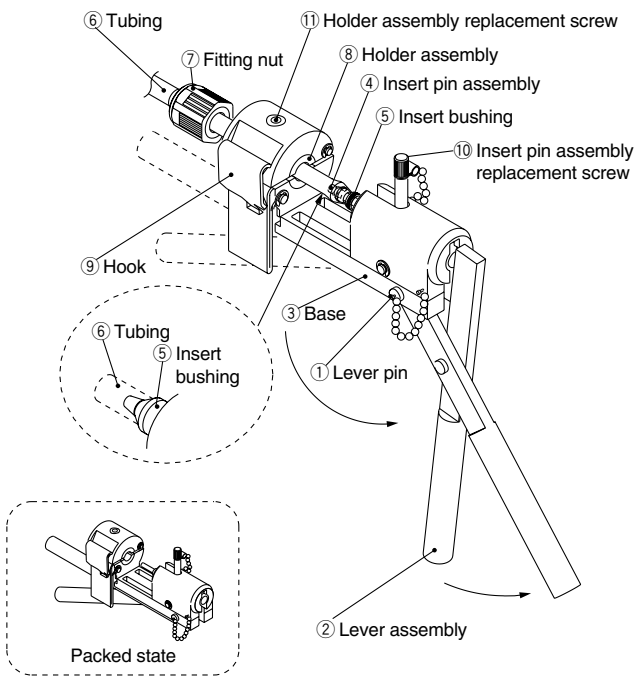
LQ-GL



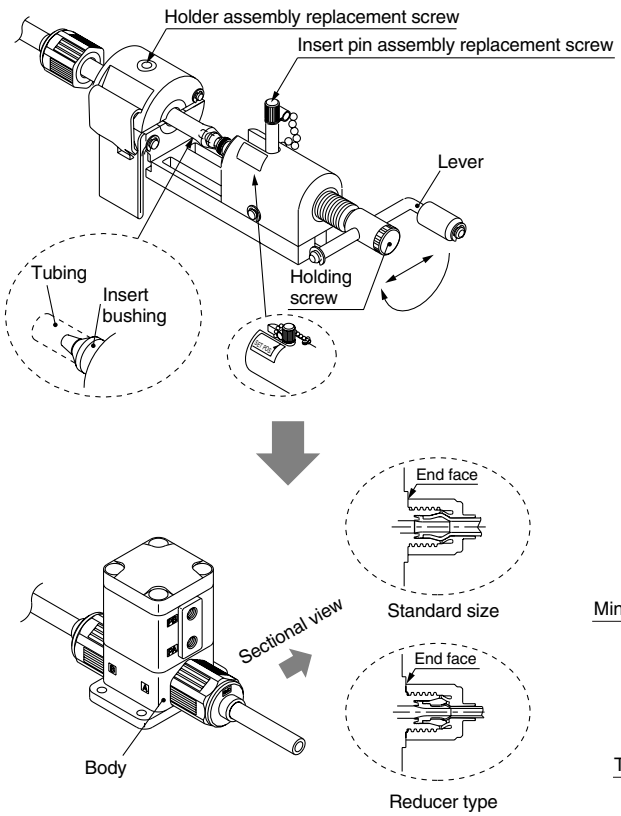
Fitting Assembly Procedure

Assemble fittings following the procedure shown below.

J type



K type



J type fitting assembly procedure

1. Pull out the lever **pin** ①. Rotate the **lever assembly** ② to align the holes on the **lever assembly** ② and the **base** ③. Insert the **lever pin** ① into the holes to fix the **lever assembly** ②.
2. Place the **insert bushing** ⑤ on the **insert pin assembly** ④.
3. Cut the end of the **tubing** ⑥ at a right angle and pass it through the **fitting nut** ⑦. After placing the **tubing** ⑥ in the **holder assembly** ⑧, push it onto the **insert bushing** ⑤ until it stops and clamp it with the **hook** ⑨.

   ⚠ Caution
   - **When the tubing ⑥ is curved, straighten it out before using it.**
   - **The tubing ⑥ may slip if there is oil or dust, etc., on the holder assembly ⑧. Remove the contamination using alcohol or another suitable cleaner.**
4. Press the **insert bushing** ⑤ into the **tubing** ⑥ by turning the **lever assembly** ②.
5. To replace the **insert pin assembly** ④ and **holder assembly** ⑧, use the **insert pin assembly replacement screw** ⑩ and the **holder assembly replacement screws** ⑪, respectively.

K type fitting assembly procedure

- For procedure to set and press fit the insert pin assembly, refer to L, M type fitting assembly procedures.
- For procedure to set the tubing, refer to J type procedure.

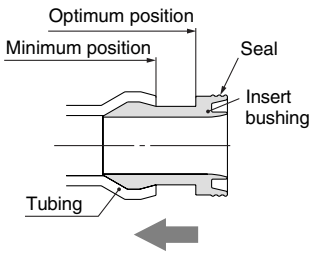
1 → 5 Refer to J type assembly procedure.

6. Tighten the **fitting nut** ⑦ until it reaches the prescribed position on the body (end face). As a guide, refer to the proper tightening torques shown below.

Nut tightening torque for piping

Body class	Torque (Nm)	
	LQ1	LQ2
2	0.3 to 0.4	1.5 to 2.0

Note 1) In case of body class 1, the nut should be tightened manually.



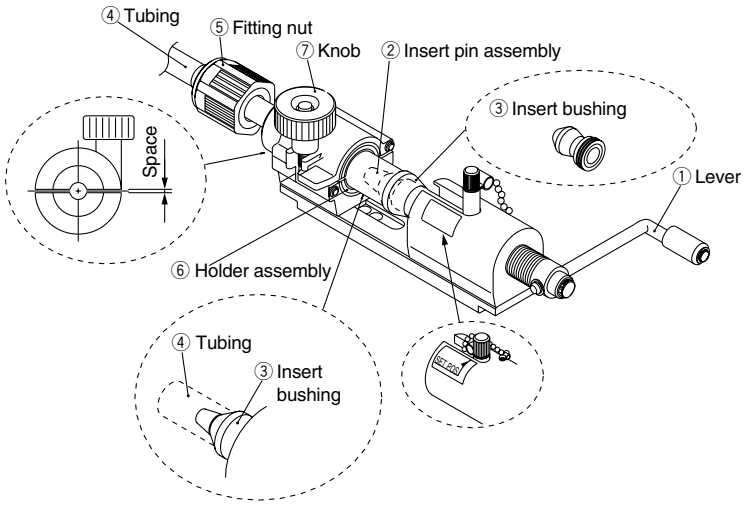
⚠ Precautions on installation

- **Be careful not to scratch or dent the seal of the insert bushing. (Refer to the illustration on the left.)**
- **When the insert bushing inserted, its tubing end should be closer to seal side than the minimum position. (Refer to the illustration on the left.)**

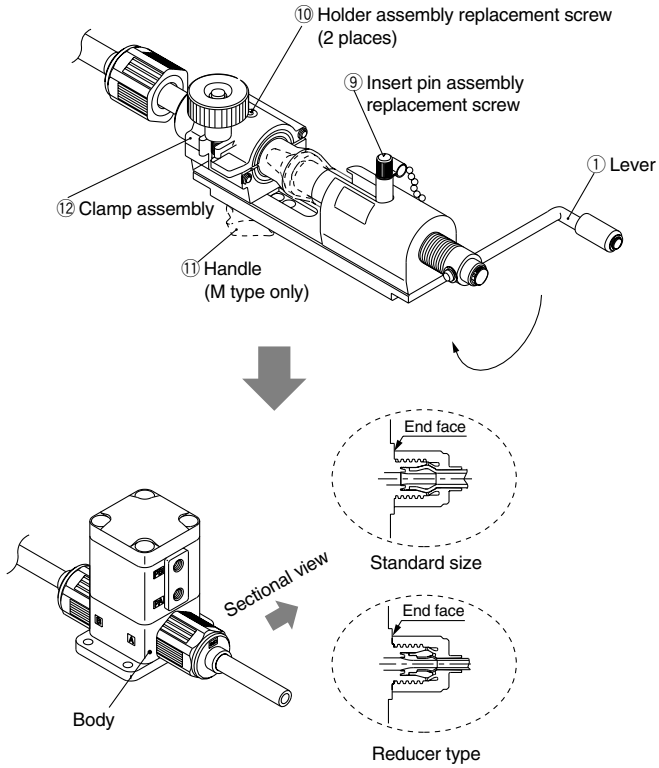
Fitting Assembly Procedure

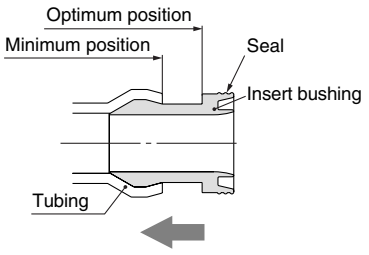
Assemble fittings following the procedure shown below.

L type



M type





L and M type fitting assembly procedure

1. Turn the **lever** ① and move to SET POS.
2. Place the **insert bushing** ③ on the **insert pin assembly** ②.
3. Cut the end of the **tubing** ④ at a right angle and pass it through the **fitting nut** ⑤.
   After placing the **tubing** ④ in the **holder assembly** ⑥, push it onto the **insert bushing** ③ until it stops and clamp it with the **knob** ⑦.
   When tightening the **tubing** ④ with the **knob** ⑦, maintain a uniform gap on both sides of the holder.

   ⚠ Caution
   - **When the tubing ④ is curved, straighten it out before using it.**
   - **The tubing ④ may slip if there is oil or dust, etc. on the holder assembly ⑥. Remove the contamination using alcohol or another suitable cleaner.**
4. Press the **insert bushing** ③ into the **tubing** ④ by turning the **lever** ①. (Pressing in can be accomplished with 2 or 3 turns of the **lever** ①.)
5. To replace the **insert pin assembly** ② and **holder assembly** ⑥, use the **insert pin assembly replacement screw** ⑨ and the **holder assembly replacement screws** ⑩, respectively.
6. In case of M type for short piping, remove the **handle** ⑪, slide the **clamp assembly** ⑫ to attain the specified length, then secure it again with the **handle** ⑪.
7. Tighten the **fitting nut** ⑤ to the prescribed position on the body (end face).
   As a guide, refer to the proper tightening torques shown below.

Nut tightening torque for piping

Body class	Torque (Nm)	
	LQ1	LQ2
2	0.3 to 0.4	1.5 to 2.0
3	0.8 to 1.0	3.0 to 3.5
4	1.0 to 1.2	7.5 to 9
5	2.5 to 3.0	11 to 13
6	5.5 to 6.0	—

Note 1) In case of body class 1, the nut should be tightened manually.

⚠ Precautions on installation

- **Be careful not to scratch or dent the seal of the insert bushing. (Refer to the illustration on the left.)**
- **When the insert bushing inserted, its tubing end should be closer to seal side than the minimum position. (Refer to the illustration on the left.)**

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.