

Compact Type High Purity Air Operated Chemical Liquid Valve

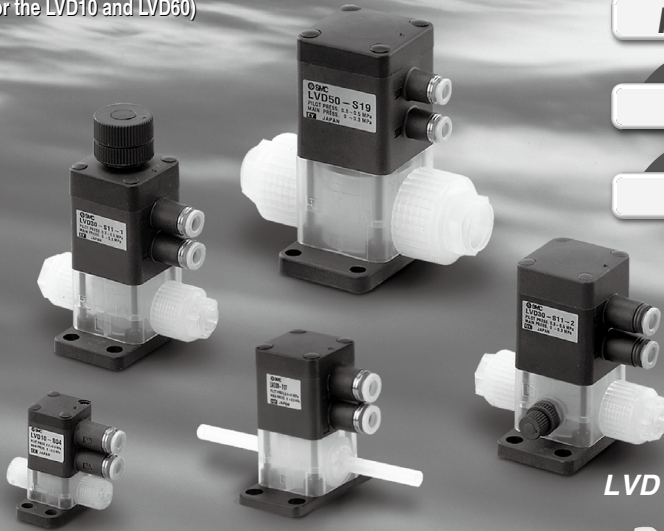
LVD Series

Clean Wet Series

RoHS

Space saving, compact model available

Compact type model is introduced as a new series to complement current LVC series with integrated fittings. Select a series according to the flow rate and installation requirements. Mounting base dimensions conform to SEMI Standard, F65-1101. (Except for the LVD10 and LVD60)



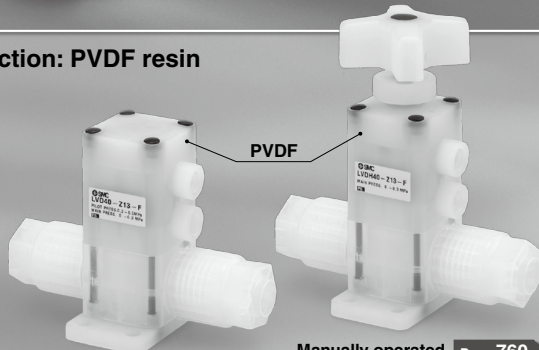
- Body
New PFA
- Diaphragm
PTFE
- Actuator section
PPS

LVD Series Page 740

Material of actuator section: PVDF resin

- Body
New PFA
- Diaphragm
PTFE
- Actuator section
PVDF

Choice of buffer materials
FKM, EPDM



Air operated Page 750

Manually operated Page 760

LVD-F/FN Series

LVC
LVA
LVH
LVD
LVQ
LVP
LVW
LQ1
LQ3
LVN
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH

Air Operated

LVD-F_{FN} Series Page 750

Manually Operated

LVDH-F_{FN} Series Page 760

Body: PFA

Actuator section: PVDF

Buffer: FKM/EPDM (Selection)

Type of fitting: Either "LQ1", "LQ3" or "tube extensions" can be selected.

Japan's Export Trade Control Order
Not applicable for list control

* Only the LVD50 and 60 apply to the list control.

Pilot port can be selected from 4 directions.

* Inapplicable to the LVD60.

Options: With flow rate adjustment, With bypass, With indicator, High back pressure (0.5 MPa)



LVD40-Z13-F1
With flow rate adjustment



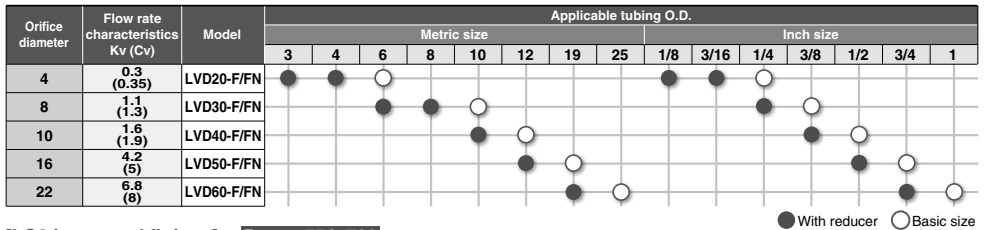
LVD40-Z13-F



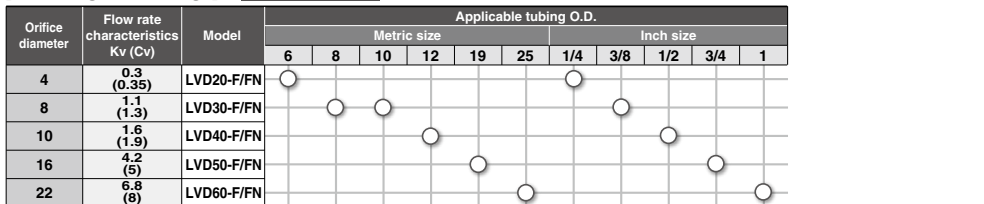
LVDH40-Z13-F

Variations

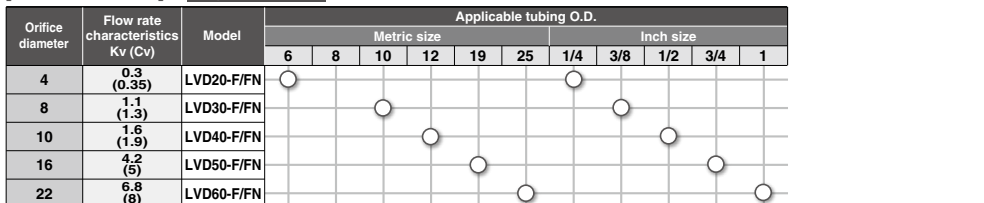
[LQ1 integrated fittings]... Pages 750, 760



[LQ3 integrated fittings]... Pages 754, 762



[Tube extensions]... Pages 757, 764



- LVC
- LVA
- LVH
- LVD
- LVQ
- LVP
- LVW
- LQ1
- LQ3
- LVN
- LQHB
- TL
- TIL
- TLM
- TILM
- TD
- TID
- TH
- TIH

Air Operated Insert Bushing, Integrated Fittings LVD Series

RoHS

How to Order

LVD 1 0 - S 03

Body class

Symbol	Body class	Orifice dia.
1	1	ø2
2	2	ø4
3	3	ø8
4	4	ø10
5	5	ø16

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 bypass
3	With flow rate adjustment & bypass

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	Note
Nil	PFA	PPS	PTFE	—
N	PFA	PPS	PTFE	Ammonium hydroxide compatible

LQ1 integrated fittings

Applicable tubing size

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

○ Basic size ● With reducer

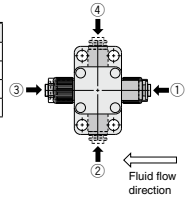
Note) Refer to page 769 for details on the applicable tubing sizes.

Pilot port type

Symbol	Body class	Type
Nil	1	ø4 One-touch fitting
	2, 3, 4, 5	ø6 One-touch fitting
2	1, 2, 3, 4, 5	M5 x 0.8

Pilot port position

Symbol	Position
Nil	①
P2	②
P3	③
P4	④



Port B (OUT) different diameter size

Symbol	Application
Nil	Ports A & B same size
	Different diameter tubings can be selected within the same body class.
	Different diameter tubing can not be selected for the body size 1.

Variations

Type	Symbol	Model	Orifice diameter				
			Tubing O.D.				
			LVD10	LVD20	LVD30	LVD40	LVD50
			ø2	ø4	ø8	ø10	ø16
			Metric				
			3, 4	3, 4, 6	6, 8, 10	10, 12	12, 19
			Inch				
			1/8	1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4
Basic		N.C.	○	○	○	○	○
			N.O.	○	○	○	○
			Double acting	○	○	○	○
With flow rate adjustment		N.C.	○	○	○	○	○
			Double acting	○	○	○	○
			Double acting	○	○	○	○
With bypass		N.C.	—	○	○	○	○
			Double acting	—	○	○	○
			Double acting	—	○	○	○
With flow rate adjustment & bypass		N.C.	—	○	○	○	○
			Double acting	—	○	○	○
			Double acting	—	○	○	○

Standard Specifications



Model		LVD10	LVD20	LVD30	LVD40	LVD50
Tubing O.D. (Note)	Metric	3, 4	3, 4, 6	6, 8, 10	10, 12	12, 19
	Inch	1/8	1/8, 3/16, 1/4	1/4, 3/8	3/8, 1/2	1/2, 3/4
Orifice diameter		ø2	ø4	ø8	ø10	ø16
Flow rate characteristics	Kv	0.07	0.3	1.1	1.6	4.2
	Cv	0.09	0.35	1.3	1.9	5
Withstand pressure [MPa]		1				
Operating pressure [MPa]	A→B flow	0 to 0.5		0 to 0.3		
	B→A flow	0 to 0.2		0 to 0.1		
Back pressure [MPa]		0.3 or less			0.2 or less	
Valve leakage [cm ³ /min]		0 (With water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5				
Pilot port size	One-touch fitting	ø4 x ø3 tubing	ø6 x ø4 tubing			
	Threaded	M5 x 0.8				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				
Weight [kg]		0.04	0.09	0.16	0.19	0.40

Note) Refer to page 769 for details of the applicable tubing sizes.

Different Diameter Tubing Applicable with Reducer

Different diameter tubing can be selected (within a body class) by using a nut and insert bushing (reducer). Different diameter tubing cannot be selected for the body size 1.

● With reducer

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

Note) Refer to page 766 for information on changing tubing sizes.

⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

LVC

LVA

LVB

LVD

LVE

LVF

LVG

LVI

LQ1

LQ3

LVN

LQHB

TL

TIL

TID

TIH

LVD Series

Suck Back

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

Pilot port with One-touch fittings

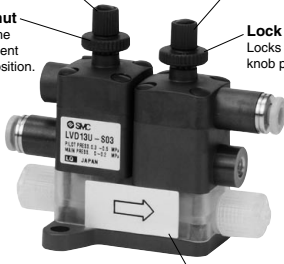
Adjustment knob
Adjusts the flow rate.

Adjustment knob
Adjusts the amount of suck back.

Lock nut
Locks the adjustment knob position.

Lock nut
Locks the adjustment knob position.

Symbol



Suck back body

Pilot port threaded type



Standard Specifications

Model		LVD13U
Tubing O.D. <small>(Note)</small>	Metric size	3, 4
	Inch size	1/8
Orifice diameter		ø2
Flow rate characteristics	Kv	0.07
	Cv	0.09
Withstand pressure [MPa]		1
Operating pressure [MPa]		0 to 0.2
Maximum suck back volume [cm ³]		0.03
Pilot air pressure [MPa]		0.3 to 0.5
Pilot port size	One-touch fitting	ø4 x ø3 tubing
	Threaded	M5 x 0.8
Fluid temperature [°C]		0 to 100
Ambient temperature [°C]		0 to 60
Weight [kg]		0.07

(Note) Refer to page 769 for details on the applicable tubing sizes.

How to Order

LVD 1 3 U - S 03

Body class

Symbol	Body class
1	1

Valve type

3	Suck back valve
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Applicable tubing size (Note)

Symbol	Connecting tubing size
03	3 x 2, 1/8" x 0.086"
04	4 x 3

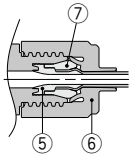
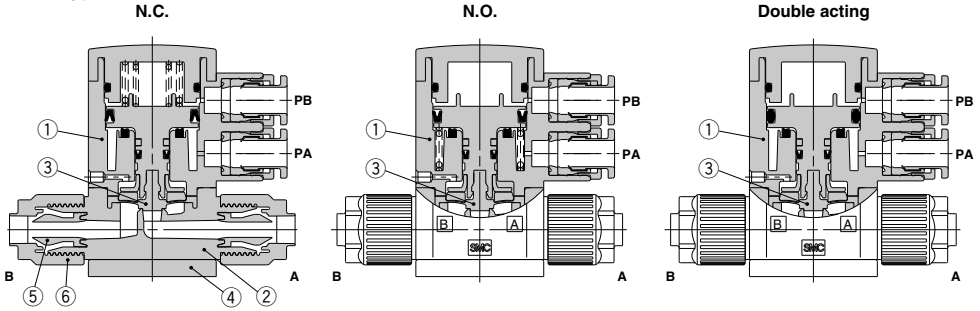
(Note) Refer to page 769 for details on the applicable tubing sizes.

Pilot port configuration

Nil	ø4 One-touch fitting
2	M5 x 0.8

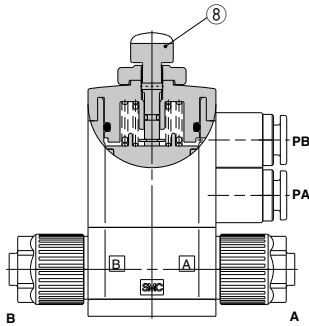
Construction

Basic type

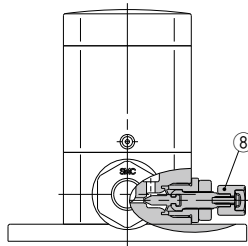


With reducer

With flow rate adjustment



With bypass



LVC
LVA
LVH
LVD
LVQ
LVP
LVW
LQ1
LQ3
LVN
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH

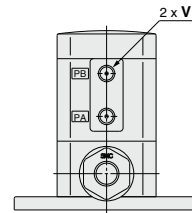
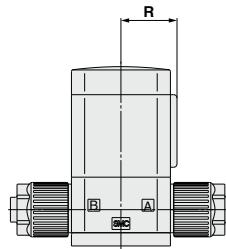
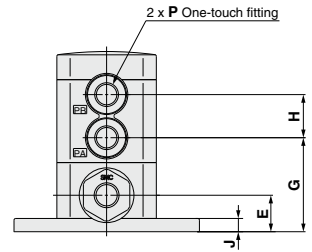
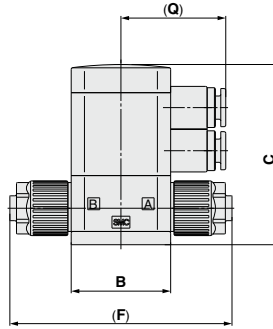
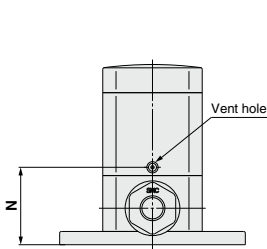
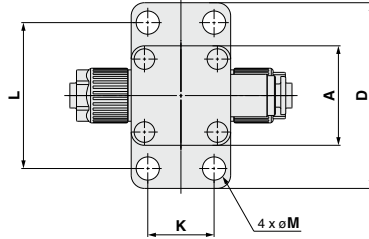
Component Parts

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

LVD Series

Dimensions

Basic type



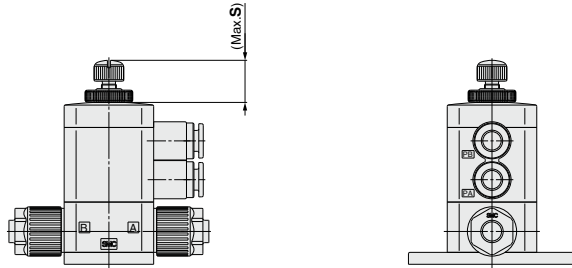
Pilot port threaded type

Dimensions

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	V
LVD1□-S□	20	20	45	39	9.5	46	23	11.5	4.5	11	30	5	21	ø4 (5/32")	28	22.5	M5 x 0.8
LVD2□-S□	30	30	54.5	56	11	67	28.5	13	4	20	44	7	23.5	ø6	31.5	17.5	M5 x 0.8
LVD3□-S□	35	35	79.5	62	17.5	83	42.4	17.5	6	22	50	7	36.8	ø6	36	21	M5 x 0.8
LVD4□-S□	35	35	82	62	20	93	44.9	17.5	6	22	50	7	39.3	ø6	36	21	M5 x 0.8
LVD5□-S□	45	45	105.7	76	25	114	65.2	17.5	8	32	64	7	52.2	ø6	38.5	25	M5 x 0.8

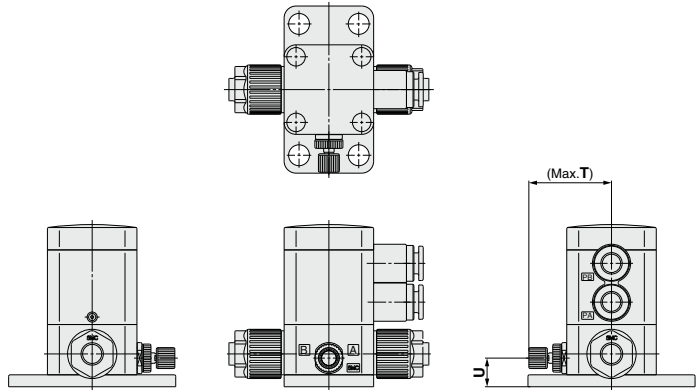
With flow rate adjustment

Dimensions [mm]	
Model	S
LVD1□-S□	14
LVD2□-S□	12.5
LVD3□-S□	26
LVD4□-S□	26
LVD5□-S□	29.5



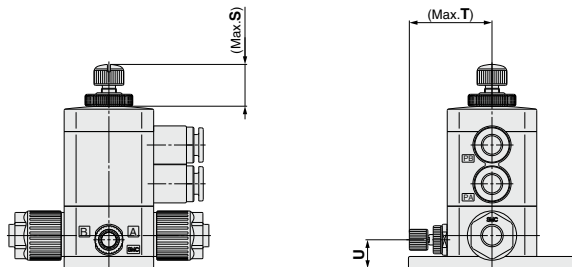
With bypass

Dimensions [mm]		
Model	T	U
LVD2□-S□	28	9.6
LVD3□-S□	34	17.5
LVD4□-S□	35	20
LVD5□-S□	57	25



With flow rate adjustment & bypass

Dimensions [mm]			
Model	S	T	U
LVD2□-S□	12.5	28	9.6
LVD3□-S□	26	34	17.5
LVD4□-S□	26	35	20
LVD5□-S□	29.5	57	25



- LVC
- LVA
- LVB
- LVD**
- LVQ
- LVP
- LVV
- LQ1
- LQ3
- LVN
- LQHB
- TL
- TIL
- TLM
- TILM
- TD
- TID
- TH
- TIH

Air Operated Tube Extensions **LVD-T Series**



How to Order

LVD **2** **0** - T **06** -

Body class

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

Valve type

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

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

Tubing O.D.

Symbol	Tubing O.D.	Body class				
		2	3	4	5	
Metric size						
06	ø6	○				
10	ø10		○			
12	ø12			○		
19	ø19				○	
Inch size						
07	1/4"	○				
11	3/8"		○			
13	1/2"			○		
19	3/4"				○	

Option

Nil	None
1	With flow rate adjustment

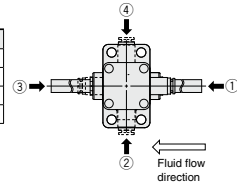
Note) Refer to "Variations" in the table below for option combinations.

Material

Symbol	Body	Actuator section End plate	Diaphragm	Note
Nil	PFA	PPS	PTFE	—
N	PFA	PPS	PTFE	Ammonium hydroxide compatible

Pilot port position


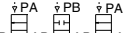
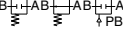
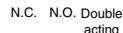

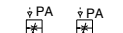
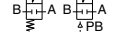
Symbol	Position
Nil	①
P2	②
P3	③
P4	④



Pilot port type

Symbol	Type
Nil	ø6 One-touch fitting
2	M5 x 0.8

Variations

	Model	Orifice diameter					
		LVD20-T	LVD30-T	LVD40-T	LVD50-T		
		Tubing O.D.					
		Metric		Inch		Valve type	
Type	Symbol	1/4"	3/8"	1/2"	3/4"		
Basic 		N.C.	○	○	○	○	
		N.O.	○	○	○	○	
		N.C. N.O. Double acting	○	○	○	○	
With flow rate adjustment 		N.C.	○	○	○	○	
		N.C. Double acting	○	○	○	○	

- LVC
- LVA
- LVB
- LVD
- LVD
- LVD
- LVP
- LWV
- LQ1
- LQ3
- LVN
- LQHB
- TL
- TIL
- TLM
- TILM
- TD
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- TIH

LVD-T Series



⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

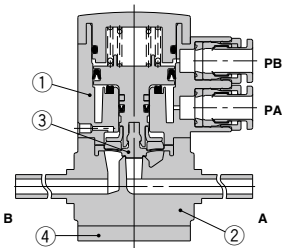
Standard Specifications

Model		LVD20	LVD30	LVD40	LVD50
Tubing O.D.	Metric	6	10	12	19
	Inch	1/4	3/8	1/2	3/4
Orifice diameter		ø4	ø8	ø10	ø16
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2
	Cv	0.35	1.3	1.9	5
Withstand pressure [MPa]		1			
Operating pressure [MPa]	A→B flow	0 to 0.5		0 to 0.3	
	B→A flow	0 to 0.2		0 to 0.1	
Back pressure [MPa]		0.3 or less		0.2 or less	
Valve leakage [cm ³ /min]		0 (With water pressure)			
Pilot air pressure [MPa]		0.3 to 0.5			
Pilot port size	One-touch fitting	ø6 x ø4 tube			
	Threaded	M5 x 0.8			
Fluid temperature [°C]		0 to 100			
Ambient temperature [°C]		0 to 60			
Weight [kg]		0.09	0.15	0.17	0.36

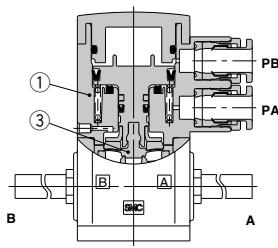
Construction

Basic type

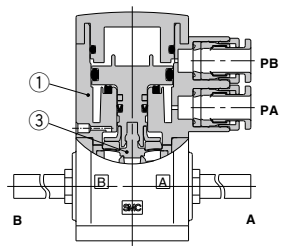
N.C.



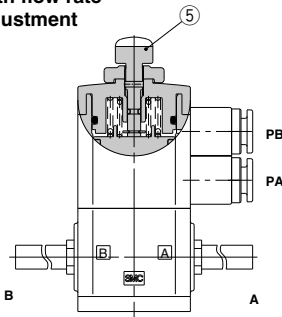
N.O.



Double acting



With flow rate adjustment

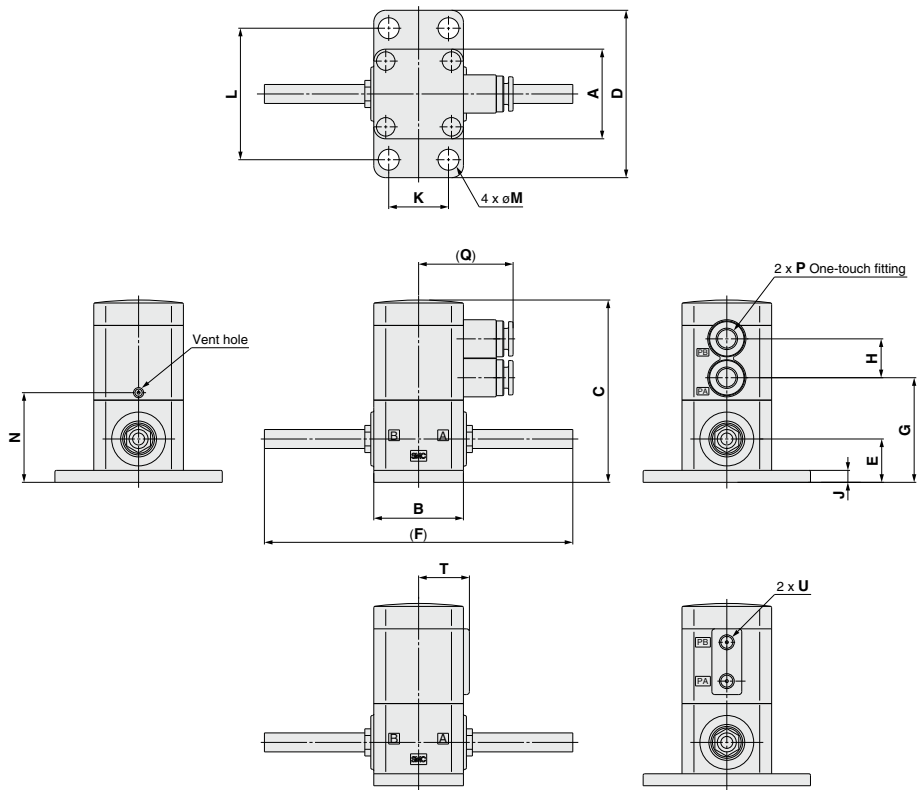


Component Parts

No.	Description	Material
1	Actuator section	PPS
2	Body	PFA
3	Diaphragm	PTFE
4	End plate	PPS
5	Flow rate adjuster section	PPS

Dimensions

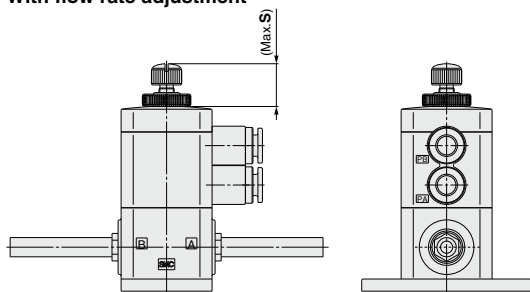
Basic type



- LVC
- LVA
- LVH
- LVD**
- LVQ
- LVP
- LVW
- LQ1
- LQ3
- LVN
- LQHB
- TL
- TIL
- TLM
- TILM
- TD
- TID
- TH
- TIH

With flow rate adjustment

Pilot port threaded type



Dimensions [mm]

Model	S
LVD2□-T□	12.5
LVD3□-T□	26
LVD4□-T□	26
LVD5□-T□	29.5

Dimensions

[mm]

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	T	U
LVD2□-T□	30	30	61	56	14.5	103	35	13	4	20	44	7	30	ø6	31.5	17.5	M5 x 0.8
LVD3□-T□	35	35	79.5	62	17.5	136	42.4	17.5	6	22	50	7	36.8	ø6	36	21	M5 x 0.8
LVD4□-T□	35	35	82	62	20	137	44.9	17.5	6	22	50	7	39.3	ø6	36	21	M5 x 0.8
LVD5□-T□	45	45	105.7	76	25	169.5	65	17.5	8	32	64	7	52.2	ø6	38.5	25	M5 x 0.8

Air Operated Insert Bushing, Integrated Fittings **LVD-F/FN Series** RoHS

How to Order Valves

LVD 2 0 - V 07 - FN

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

Fitting type

Symbol	Model
V	LQ1

Applicable tubing size

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

○ Basic size ● With reducer

Port B (OUT) different diameter size

Symbol	Application
Nil	Ports A & B same size
Refer to the applicable tubing table shown above.	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
5	High back pressure (0.5 MPa) tolerant
6	High back pressure with flow rate adjustment
7	High back pressure with bypass
8	High back pressure with flow rate adjustment & bypass
9	High back pressure with indicator
24	With bypass & indicator

Note 1) With flow rate adjustment: Only available with N.C. valve and double acting valve, With indicator: Only available with N.C. valve, With bypass: Only available with N.C. valve and double acting valve.

Note 2) "With bypass" type is not available for the LVD2□ and LVD6□.

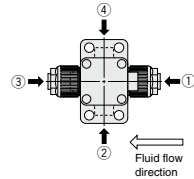
Material

Symbol	Body	Actuator section	Diaphragm	Seal	Buffer
		End plate			
F	PFA	PVDF	PTFE	FKM	
FN	PFA	PVDF	PTFE	EPDM	

Pilot port position

Symbol	Position
Nil	①
P2	②
P3	③
P4	④

Note) P2 and P4 are not available for the LVD6□.



Pilot port thread type

Nil	Rc1/8
N	NPT1/8

Standard Specifications

Model		LVD20	LVD30	LVD40	LVD50	LVD60
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
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa]	Standard	A→B flow	0 to 0.5		0 to 0.3	0 to 0.4
		B→A flow	0 to 0.2		0 to 0.1	
	High back pressure	A→B flow	0 to 0.5			
		B→A flow	0 to 0.4			
Back pressure [MPa]	Standard	N.C./N.O.	0.3 or less	0.2 or less		0.2 or less
		Double acting				0.3 or less
	High back pressure	N.C./N.O./Double acting	0.5 or less			
Valve leakage [cm ³ /min]		0 (With water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5 (High back pressure: 0.5 to 0.8)				
Pilot port size		Rc1/8, NPT1/8				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

Different Diameter Tubing Applicable with Reducer

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

● With reducer

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

Note) Refer to page 766 for information on changing tubing sizes.

LVC

LVA

LVB

LVD

LVQ

LVP

LVV

LQ1

LQ3

LVN

LQHB

TL

TIL

TLM

TILM

TD

TID

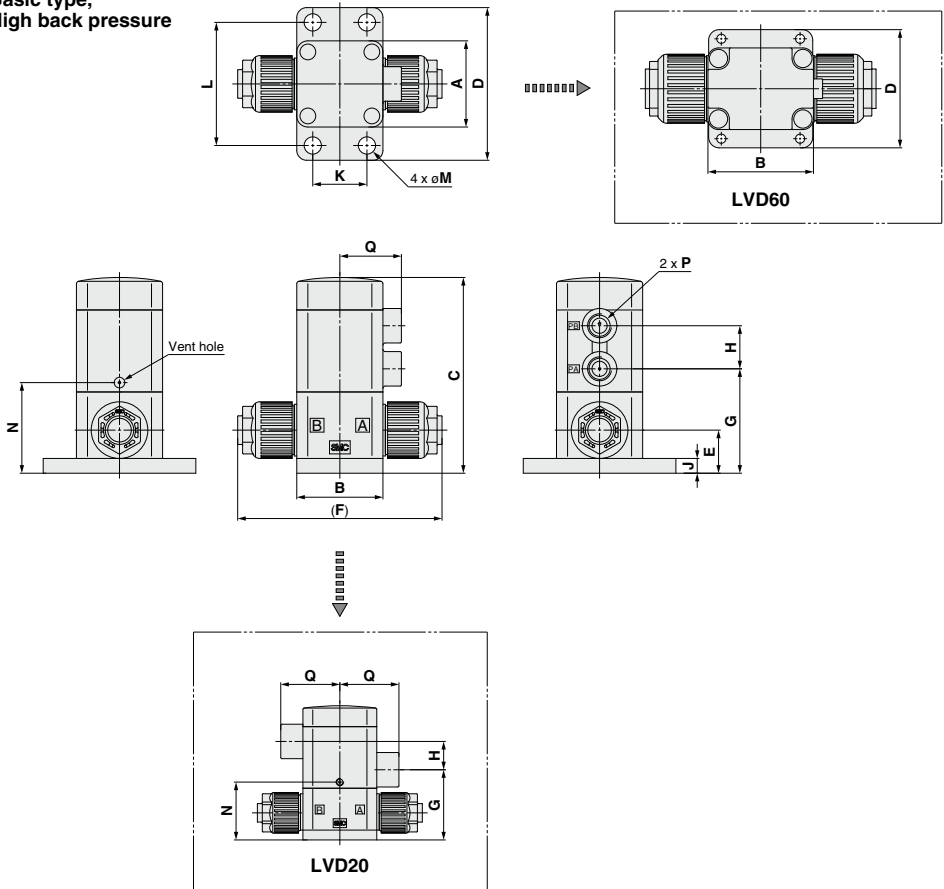
TH

TIH

LVD-F/FN Series

Dimensions

Basic type,
High back pressure



Dimensions

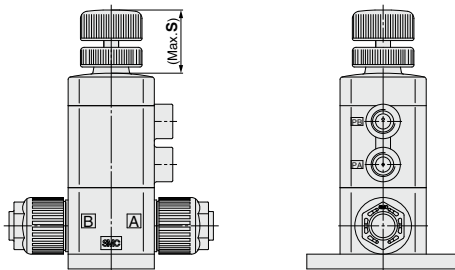
[mm]

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
LVD2□-V□-F□	30	30	54.5	56	11	67	28.5	11.5	4	20	44	7	23.5	Rc1/8 NPT1/8	24
LVD3□-V□-F□	35	35	79.5	62	17.5	83	42.4	17.5	6	22	50	7	36.8	Rc1/8 NPT1/8	25
LVD4□-V□-F□	35	35	82	62	20	93	44.9	17.5	6	22	50	7	39.3	Rc1/8 NPT1/8	25
LVD5□-V□-F□	45	45	105.7	76	25	114	65.2	17.5	8	32	64	7	52.2	Rc1/8 NPT1/8	27.5
LVD6□-V□-F□	58	74	137.8	84	32	164	76.8	27.5	8	56	71	6.5	70.8	Rc1/8 NPT1/8	44

Dimensions

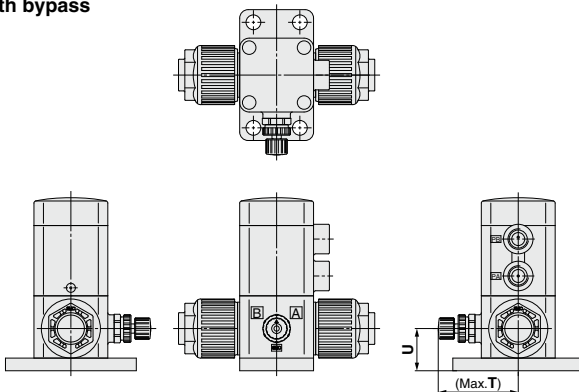
With flow rate adjustment, High back pressure with flow rate adjustment

Dimensions [mm]	
Model	S
LVD2□-V□-F1	18.5
LVD3□-V□-F1	28.5
LVD4□-V□-F1	28.5
LVD5□-V□-F1	30.1
LVD6□-V□-F1	38



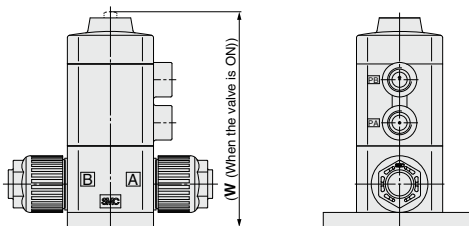
With bypass, High back pressure with bypass

Dimensions [mm]		
Model	T	U
LVD3□-V□-F2	36.9	17.5
LVD4□-V□-F2	37.9	20
LVD5□-V□-F2	60.6	25



With indicator, High back pressure with indicator

Dimensions [mm]	
Model	W
LVD20-V□-F4	56.4
LVD30-V□-F4	87.3
LVD40-V□-F4	89.8
LVD50-V□-F4	114.6
LVD60-V□-F4	149.4



LVC
LVA
LVH
LVD
LVQ
LVP
LVW
LQ1
LQ3
LVN
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH

Air Operated Flare, Integrated Fittings LVD-F/FN Series

RoHS

How to Order Valves

LVD **2** **0** - Z **07** **□** **□** - FN **□**

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

Fitting type

Symbol	Model
Z	LQ3

Applicable tubing size

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

Option

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

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

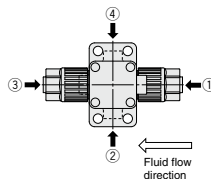
Material

Symbol	Body	Actuator section			
		End plate	Diaphragm	Seal	Buffer
F	PFA	PVDF	PTFE	FKM	
FN	PFA	PVDF	PTFE	EPDM	

Pilot port position

Symbol	Position
Nil	①
P2	②
P3	③
P4	④

Note) P2 and P4 are not available for the LVD6□.



Pilot port thread type

Nil	Rc1/8
N	NPT1/8

Standard Specifications

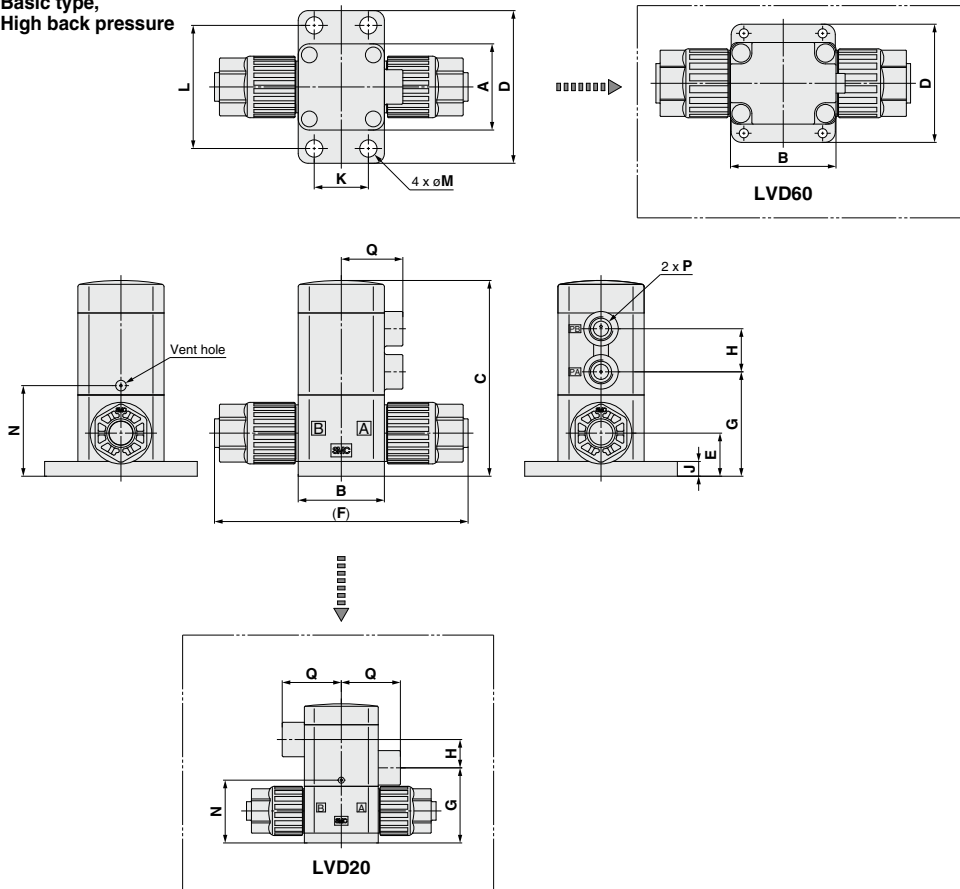
Model		LVD20	LVD30	LVD40	LVD50	LVD60
Tubing O.D.	Metric	6	8, 10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa]	Standard	A→B flow	0 to 0.5	0 to 0.3		0 to 0.4
		B→A flow	0 to 0.2	0 to 0.1		
	High back pressure	A→B flow	0 to 0.5			
		B→A flow	0 to 0.4			
Back pressure [MPa]	Standard	N.C./N.O.	0.3 or less	0.2 or less		0.2 or less
		Double acting	0.3 or less			
	High back pressure	N.C./N.O./Double acting	0.5 or less			
Valve leakage [cm ³ /min]		0 (With water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5 (High back pressure: 0.5 to 0.8)				
Pilot port size		Rc1/8, NPT1/8				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

⚠️ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

Dimensions

Basic type,
High back pressure



LVC

LVA

LVH

LVD

LVQ

LVP

LVW

LQ1

LQ3

LVN

LQHB

TL

TIL

TLM

TILM

TD

TID

TH

TIH

Dimensions

[mm]

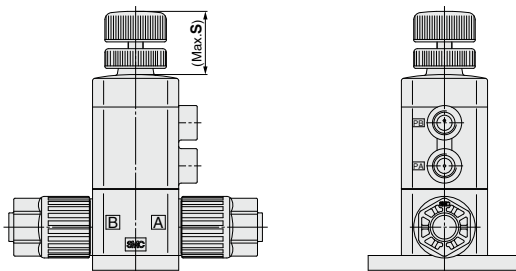
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
LVD2□-Z□-F□	30	30	56.5	56	13	77	30.5	11.5	4	20	44	7	25.5	Rc1/8 NPT1/8	24
LVD3□-Z□-F□	35	35	79.5	62	17.5	103	42.4	17.5	6	22	50	7	36.8	Rc1/8 NPT1/8	25
LVD4□-Z□-F□	35	35	82	62	20	112	44.9	17.5	6	22	50	7	39.3	Rc1/8 NPT1/8	25
LVD5□-Z□-F□	45	45	105.7	76	25	134	65.2	17.5	8	32	64	7	52.2	Rc1/8 NPT1/8	27.5
LVD6□-Z□-F□	58	74	137.8	84	32	181	76.8	27.5	8	56	71	6.5	70.8	Rc1/8 NPT1/8	44

LVD-F/FN Series

Dimensions

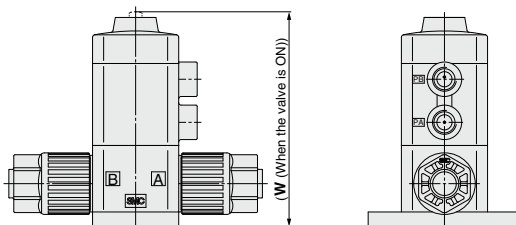
With flow rate adjustment, High back pressure with flow rate adjustment

Dimensions [mm]	
Model	S
LVD2□-Z□-F1	18.5
LVD3□-Z□-F1	28.5
LVD4□-Z□-F1	28.5
LVD5□-Z□-F1	30.1
LVD6□-Z□-F1	38



With indicator, High back pressure with indicator

Dimensions [mm]	
Model	W
LVD20-Z□-F4	58.4
LVD30-Z□-F4	87.3
LVD40-Z□-F4	89.8
LVD50-Z□-F4	114.6
LVD60-Z□-F4	149.4



Air Operated Tube Extensions LVD-T-F/FN Series

RoHS

How to Order Valves

LVD 2 0 - T 07 [] [] - FN []

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

Fitting type

Symbol	Type
T	Tube extensions

Option

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

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

Material

Symbol	Body	Actuator section End plate	Diaphragm	Seal	Buffer
F	PFA	PVDF	PTFE	FKM	
FN	PFA	PVDF	PTFE	EPDM	

Tube O.D.

Symbol	Tubing O.D.	Body class					
		2	3	4	5	6	
Metric size							
06	ø6	○					
10	ø10		○				
12	ø12			○			
19	ø19				○		
25	ø25					○	
Inch size							
07	1/4	○					
11	3/8		○				
13	1/2			○			
19	3/4				○		
25	1					○	

Pilot port position

Symbol	Position
Nil	①
P2	②
P3	③
P4	④

Note) P2 and P4 are not available for the LVD6□.

Pilot port thread type

Nil	Rc1/8
N	NPT1/8

⚠️ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

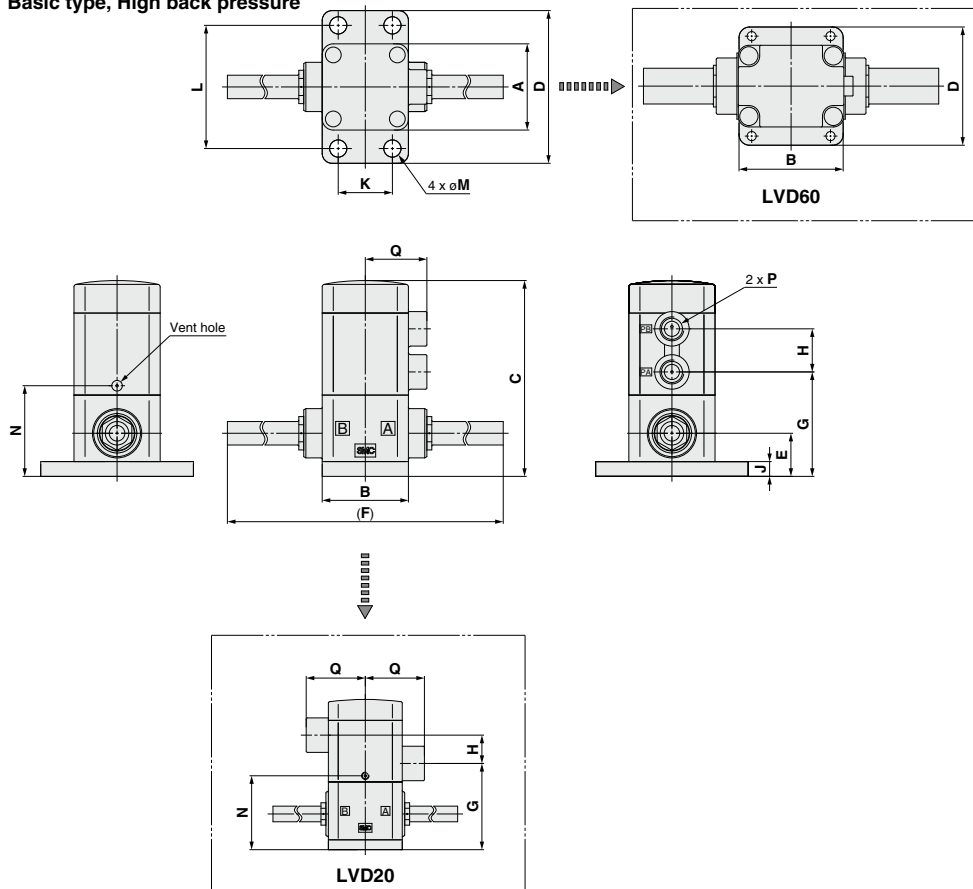
Standard Specifications

Model		LVD20	LVD30	LVD40	LVD50	LVD60
Tubing O.D.	Metric	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa]	Standard	A→B flow	0 to 0.5	0 to 0.3		0 to 0.4
		B→A flow	0 to 0.2	0 to 0.1		
	High back pressure	A→B flow	0 to 0.5			
		B→A flow	0 to 0.4			
Back pressure [MPa]	Standard	N.C./N.O.	0.3 or less	0.2 or less		0.2 or less
		Double acting	0.3 or less			
	High back press.	N.C./N.O./Double acting	0.5 or less			
Valve leakage [cm ³ /min]		0 (With water pressure)				
Pilot air pressure [MPa]		0.3 to 0.5 (High back pressure: 0.5 to 0.8)				
Pilot port size		Rc1/8, NPT1/8				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

LVD-T-F/FN Series

Dimensions

Basic type, High back pressure



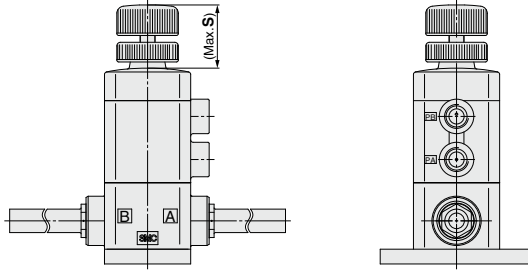
Dimensions

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
LVD2□-T□-F□	30	30	61	56	14.5	103	35	11.5	4	20	44	7	30	Rc1/8 NPT1/8	24
LVD3□-T□-F□	35	35	79.5	62	17.5	136	42.4	17.5	6	22	50	7	36.8	Rc1/8 NPT1/8	25
LVD4□-T□-F□	35	35	82	62	20	137	44.9	17.5	6	22	50	7	39.3	Rc1/8 NPT1/8	25
LVD5□-T□-F□	45	45	105.7	76	25	169.5	65.2	17.5	8	32	64	7	52.2	Rc1/8 NPT1/8	27.5
LVD6□-T□-F□	58	74	137.8	84	32	210	76.8	27.5	8	56	71	6.5	70.8	Rc1/8 NPT1/8	44

Dimensions

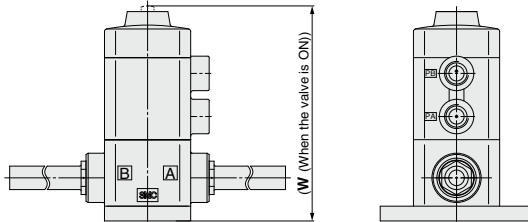
With flow rate adjustment, High back pressure with flow rate adjustment

Dimensions [mm]	
Model	S
LVD2□-T□-F1	18.5
LVD3□-T□-F1	28.5
LVD4□-T□-F1	28.5
LVD5□-T□-F1	30.1
LVD6□-T□-F1	38



With indicator, High back pressure with indicator

Dimensions [mm]	
Model	W
LVD20-T□-F4	62.9
LVD30-T□-F4	87.3
LVD40-T□-F4	89.8
LVD50-T□-F4	114.6
LVD60-T□-F4	149.4



LVC
LVA
LVB
LVD
LVDQ
LVP
LWV
LQ1
LQ3
LVN
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH

Manually Operated Insert Bushing, Integrated Fittings LVDH-F/FN Series RoHS

How to Order Valves

LVDH **2** 0 - V **07** - **FN**

Body class

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

Fitting type

Symbol	Model
V	LQ1

Material

Symbol	Body	Actuator section			
		End plate	Diaphragm	Seal	Buffer
F	PFA	PVDF	PTFE	FKM	
FN	PFA	PVDF	PTFE	EPDM	

Applicable tubing size

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

○ Basic size ● With reducer

Port B (OUT) different diameter 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.

Standard Specifications

Model		LVDH20	LVDH30	LVDH40	LVDH50	LVDH60
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
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa] A→B flow		0 to 0.5				
Valve leakage [cm ³ /min]		0 (With water pressure)				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

Different Diameter Tubing Applicable with Reducer

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

● With reducer

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

Note) Refer to page 766 for information on changing tubing sizes.

760



⚠️ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

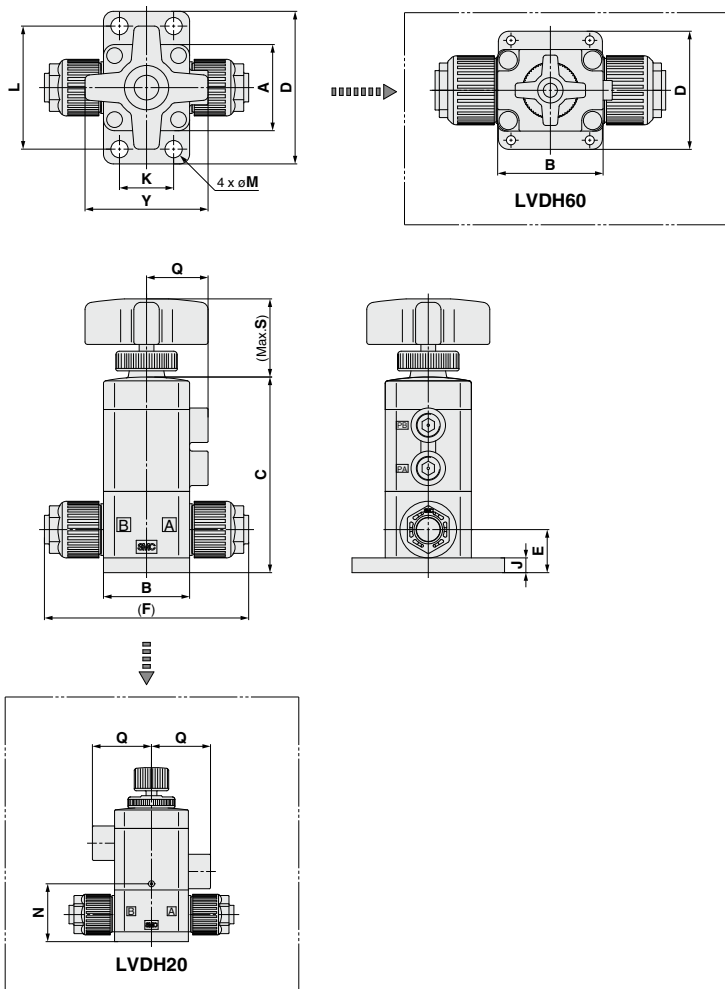
Handle Operation

In order to prevent valve breakage due to excessive handle operation, the number of handle rotations is shown in the table below as a guide for handle operation when opening or closing the valve.

Number of Handle Rotations (from fully open to fully closed)

Body class	Number of rotations
2	6 to 7
3	3 to 4
4	
5	5 to 6
6	

Dimensions



- LVQ
- LVA
- LVH
- LVD
- LVQ
- LVP
- LVW
- LQ1
- LQ3
- LVN
- LQHB
- TL
- TIL
- TLM
- TILM
- TD
- TID
- TH
- TIH

Dimensions

Model	A	B	C	D	E	F	J	K	L	M	N	Q	S	Y
LVDH20-V□-F□	30	30	54.5	56	11	67	4	20	44	7	23.5	24	18.5	—
LVDH30-V□-F□	35	35	79.5	62	17.5	83	6	22	50	7	36.8	25	34.6	50
LVDH40-V□-F□	35	35	82	62	20	93	6	22	50	7	39.3	25	34.6	50
LVDH50-V□-F□	45	45	105.7	76	25	114	8	32	64	7	52.2	27.5	36.2	50
LVDH60-V□-F□	58	74	137.8	84	32	164	8	56	71	6.5	70.8	44	39	50

[mm]

Manually Operated Flare, Integrated Fittings **LVDH-F/FN Series** RoHS

How to Order Valves

LVDH 2 0 - Z 07 - FN

Body class

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

Material

Symbol	Body	Actuator section		Diaphragm	Seal	Buffer
		End plate				
F	PFA	PVDF	PTFE	FKM		
FN	PFA	PVDF	PTFE	EPDM		

Fitting type

Symbol	Model
Z	LQ3

Applicable tubing size

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

Standard Specifications

Model		LVDH20	LVDH30	LVDH40	LVDH50	LVDH60
Tubing O.D.	Metric	6	8, 10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa] A→B flow		0 to 0.5				
Valve leakage [cm ³ /min]		0 (With water pressure)				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

Handle Operation

In order to prevent valve breakage due to excessive handle operation, the number of handle rotations is shown in the table below as a guide for handle operation when opening or closing the valve.

Number of Handle Rotations
(from fully open to fully closed)

Body class	Number of rotations
2	6 to 7
3	3 to 4
4	
5	5 to 6
6	

Manually Operated Tube Extensions **LVDH-T-F/FN Series**

RoHS

How to Order Valves

LVDH **2** 0 - T **07** - **FN**

Body class

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

Material

Symbol	Body	Actuator section		Diaphragm	Seal	Buffer
		End plate				
F	PFA	PVDF	PTFE		FKM	
FN	PFA	PVDF	PTFE		EPDM	

Fitting type

Symbol	Type
T	Tube extensions

Tubing O.D.

Symbol	Tubing O.D.	Body class					
		2	3	4	5	6	
Metric size							
06	ø6	○					
10	ø10		○				
12	ø12			○			
19	ø19				○		
25	ø25					○	
Inch size							
07	1/4	○					
11	3/8		○				
13	1/2			○			
19	3/4				○		
25	1					○	

Standard Specifications

Model		LVDH20	LVDH30	LVDH40	LVDH50	LVDH60
Tubing O.D.	Metric	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	Kv	0.3	1.1	1.6	4.2	6.8
	Cv	0.35	1.3	1.9	5	8
Withstand pressure [MPa]		1				
Operating pressure [MPa] A→B flow		0 to 0.5				
Valve leakage [cm ³ /min]		0 (With water pressure)				
Fluid temperature [°C]		0 to 100				
Ambient temperature [°C]		0 to 60				

⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, and pages 768 and 769 for Compact Type High Purity Air Operated Chemical Liquid Valve Precautions.

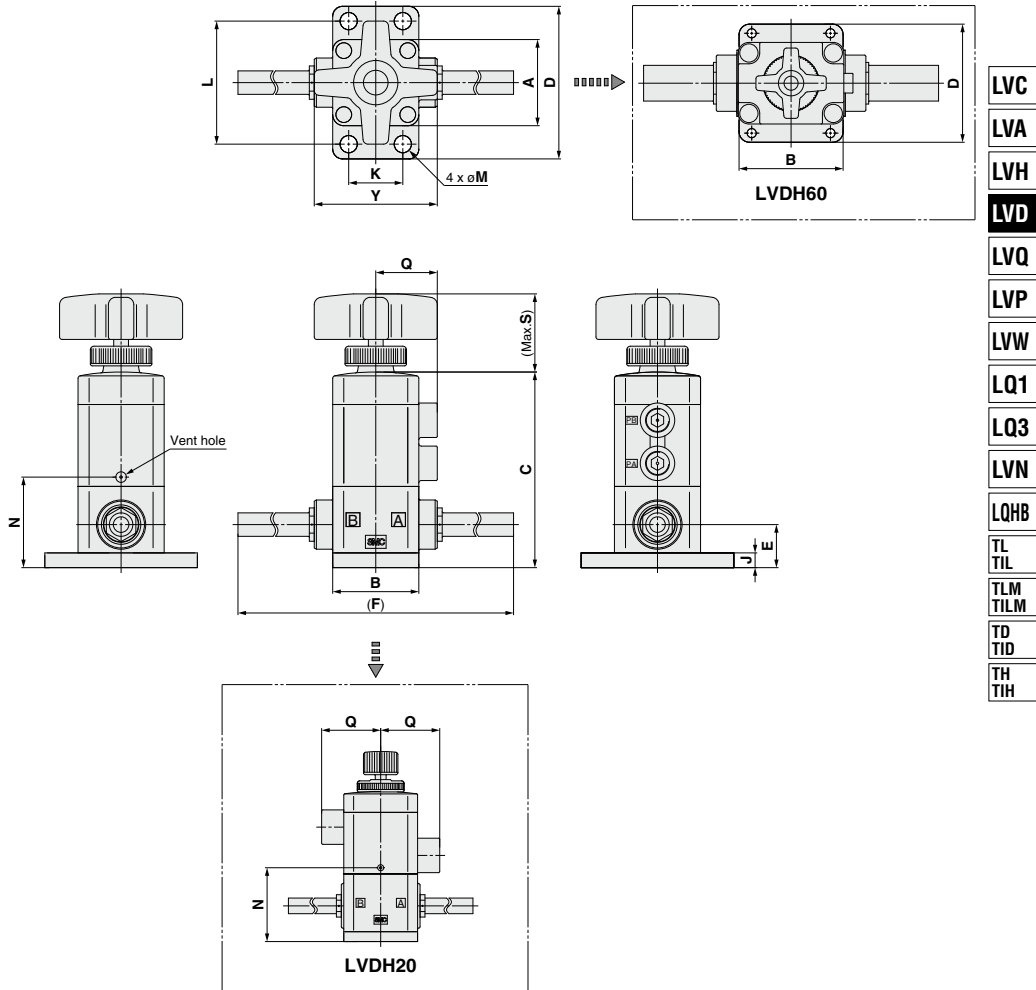
Handle Operation

In order to prevent valve breakage due to excessive handle operation, the number of handle rotations is shown in the table below as a guide for handle operation when opening or closing the valve.

Number of Handle Rotations
(from fully open to fully closed)

Body class	Number of rotations
2	6 to 7
3	3 to 4
4	
5	5 to 6
6	

Dimensions



Dimensions

Model	A	B	C	D	E	F	J	K	L	M	N	Q	S	Y
LVDH20-T□-F□	30	30	61	56	14.5	103	4	20	44	7	30	24	18.5	—
LVDH30-T□-F□	35	35	79.5	62	17.5	136	6	22	50	7	36.8	25	34.6	50
LVDH40-T□-F□	35	35	82	62	20	137	6	22	50	7	39.3	25	34.6	50
LVDH50-T□-F□	45	45	105.7	76	25	169.5	8	32	64	7	52.2	27.5	36.2	50
LVDH60-T□-F□	58	74	137.8	84	32	210	8	56	71	6.5	70.8	44	39	50

[mm]

Fittings

Changing Tubing Sizes

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

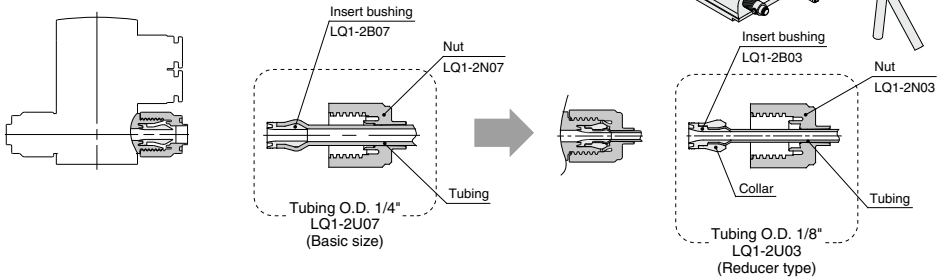
Body class	Tubing O.D.														
	Metric size							Inch size							
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
1	○	○	—	—	—	—	—	—	○	○	—	—	—	—	—
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	○	—	—	—	—
4	—	—	—	—	●	○	—	—	—	—	●	○	—	—	—
5	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
6	—	—	—	—	—	—	●	○	—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

Changing tubing sizes

Example) Changing the tubing from an outside diameter of 1/4" to 1/8" in body class 2.

Prepare an insert bushing and nut for tubing O.D. 1/8" (LQ1-2U03) and change the tubing size. (Refer to the section on how to order fitting parts.)

Note) Tubing is sold separately.



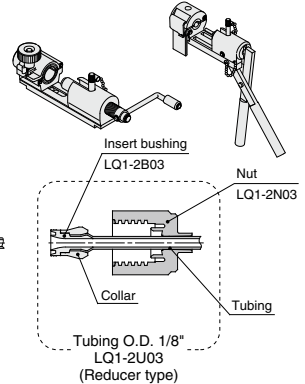
Part Composition

	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 website.)



How to Order Fitting Parts

LQ1-1U03

* Type U is recommended when changing tubing sizes.

Type of part		Tubing size ^{Note)}		
Symbol	Type of part	Symbol	Tubing size	Body class (fittings)
U	Nut & Insert bushing	03	1/8" x 0.086", 3 x 2	1
B	Insert bushing	04	4 x 3	
N	Nut	03	1/8" x 0.086"	2
		04	4 x 3	
		05	3/16" x 1/8"	3
		06	6 x 4	
		07	1/4" x 5/32"	4
		06	6 x 4	
		08	8 x 6	5
		10	10 x 8	
		07	1/4" x 5/32"	6
		11	3/8" x 1/4"	
		10	10 x 8	1
		12	12 x 10	
		11	3/8" x 1/4"	2
		13	1/2" x 3/8"	
		12	12 x 10	3
		13	1/2" x 3/8"	
		19	3/4" x 5/8", 19 x 16	4
		19	3/4" x 5/8", 19 x 16	
		25	1" x 7/8", 25 x 22	5

Note) Refer to page 769 for details on the applicable tubing sizes.



LVD Series Applicable Fluids

High Purity Air Operated Chemical Liquid Valve Material and Fluid Compatibility Check List

Chemical	Compatibility
Acetone	<input type="radio"/> Note 1) 2)
Ammonium hydroxide	<input type="radio"/> Note 2)
Isobutyl alcohol	<input type="radio"/> Note 1) 2)
Isopropyl alcohol	<input type="radio"/> Note 1) 2)
Hydrochloric acid	<input type="radio"/>
Ozone (dry)	<input type="radio"/>
Hydrogen peroxide	Concentration 5% or less, Temperature 50°C or less <input type="radio"/>
Ethyl acetate	<input type="radio"/> Note 1) 2)
Butyl acetate	<input type="radio"/> Note 1) 2)
Nitric acid (except fuming nitric acid)	Concentration 10% or less <input type="radio"/> Note 2)
DI water (deionized water)	<input type="radio"/>
Sodium hydroxide (caustic soda)	Concentration 50% or less <input type="radio"/>
Nitrogen gas	<input type="radio"/>
Ultrapure water	<input type="radio"/>
Toluene	<input type="radio"/> Note 1) 2)
Hydrofluoric acid	×
Sulfuric acid (except fuming sulfuric acid)	<input type="radio"/> Note 2)
Phosphoric acid	Concentration 80% or less <input type="radio"/>

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

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

Note 1) Since static electricity may be generated, implement suitable countermeasures.

Note 2) Use caution as permeation may occur. The permeated fluid may effect the parts of other materials.

- 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.

LVC
LVA
LVB
LVD
LVQ
LVP
LVW
LQ1
LQ3
LVN
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH



Compact Type High Purity Air Operated Chemical Liquid Valve Precautions 1

Be sure to read this before handling the products.

Design / Selection

Warning

1. Check the specifications.

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

2. Fluids

Operate after confirming the compatibility of the product's component materials with fluids, using the check list on page 767. Please contact SMC regarding fluids other than those in the check list. Operate within the indicated fluid temperature range.

3. Maintenance space

Ensure the necessary space for maintenance and inspections.

4. Fluid pressure range

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

5. Ambient environment

Install the product in an environment where there is no effect from radiant heat caused by heat sources, etc., and use 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. Operation Manual

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

Piping

Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly 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.

Piping

Caution

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

Tightening Torque for Operating Port

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

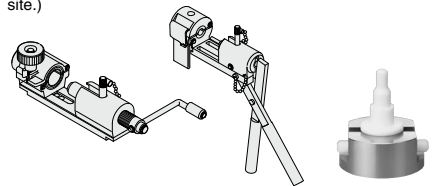
3. Use pilot ports and sensor (breathing) ports as indicated below.

	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.

4. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings Hyper Fitting/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) or "High Purity Fluoropolymer Fittings Hyper Fitting/Flare Type Series LQ3 Fitting Procedure" (M-E06-4) for connecting tubing and special tools. (Downloadable from our web site.)



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

Tightening Torque for Piping

Body class	Torque [N·m]	
	LQ1	LQ3
2	0.3 to 0.4	1.6 to 1.8
3	0.8 to 1.0	3.2 to 3.5
4	1.0 to 1.2	5.0 to 5.3
5	2.5 to 3.0	10.0 to 10.5
6	5.5 to 6.0	22.5 to 23.0

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.



Compact Type High Purity Air Operated Chemical Liquid Valve Precautions 2

Be sure to read this before handling the products.

Installation and Removal of Tubing for Pilot Port Section

⚠ Caution

1. Installation of tubing

- Using tube cutters TK-1, 2 or 3, take a tube having no flaws on its periphery and cut it off at a right angle. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection and leakage.
- Hold the tube and push it in slowly, inserting it securely all the way into the fitting.
- After inserting the tubing, pull on it tightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, problems such as leakage or disconnection of the tubing can occur.
- Grease is not used due to the KP series oil-free specification. For this reason, greater insertion force is required when tubing is installed. In particular, polyurethane tubing may fold when inserted due to its softness. Hold the end of the tubing, and insert it all the way in slowly and securely. Refer to dimension "M" in the dimension drawings for guidance on the insertion depth of tubing.

2. Removal of tubing

- Push in the release button sufficiently, pressing the collar evenly around its circumference.
- Pull out the tubing while holding down the release button so that it does not pop out. If the release button is not pressed down sufficiently, there will be increased bite on the tubing and it will become more difficult to pull it out.
- When the removed tubing is to be used again, first cut off the section of the tubing which has been chewed. Using the chewed portion of the tube as it is can cause problems such as leakage or difficulty in removing the tubing.

Precautions on Use of Other Tubing Brands

⚠ Caution

- When using tubing brands other than SMC, confirm that the tubing outside diameter tolerances satisfy the following specifications.

- | | |
|-------------------------|---|
| 1) Polyolefin tubing: | Within ± 0.1 mm |
| 2) Polyurethane tubing: | Within ± 0.15 mm,
Within -0.2 mm |
| 3) Nylon tubing: | Within ± 0.1 mm |
| 4) Soft nylon tubing: | Within ± 0.1 mm |

Do not use tubing if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or leakage or disconnection may occur after connection. Polyolefin tubing is recommended for use with clean room fittings. Note that while other types of tubing will satisfy performance standards for leakage and tubing pull-out strength, etc., the degree of cleanliness will deteriorate.

Operating Environment

⚠ Warning

- Do not use in a location having an explosive atmosphere.
- Do not operate in locations where vibration or impact occurs.

Operating Environment

⚠ Warning

- Do not use in locations where radiated heat will be received from nearby heat sources.
- Do not use in environments which exceed the ambient temperature specifications of the product.

Maintenance

⚠ Warning

- Maintenance should be performed in accordance with the procedures in the Operation Manual.

Incorrect handling can cause damage or malfunction of machinery and equipment, etc.

- 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.

- Perform work after removing residual chemicals and carefully replacing them with DI water or air, etc.

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

If disassembly is necessary, please contact SMC.

- In order to obtain optimum performance from valves, perform periodic inspections to confirm that there are no leaks from valves or fittings, etc.

⚠ Caution

- Removal of drainage

Flush drainage from filters regularly.

Use of Tubing

⚠ Caution

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

Applicable Tubing Sizes

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

LVC
LVA
LVB
LVD
LVO
LVP
LWV
LQ1
LQ3
LNV
LQHB
TL
TIL
TLM
TILM
TD
TID
TH
TIH



Compact Type High Purity Air Operated Chemical Liquid Valve Precautions 3

Be sure to read this before handling the products.

Return of Product

Warning

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

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

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

LVC

LVA

L VH

LVD

L VQ

LVP

L VV

LQ1

LQ3

LVN

LQHB

TL
TIL

TLM
TILM

TD
TID

TH
TIH