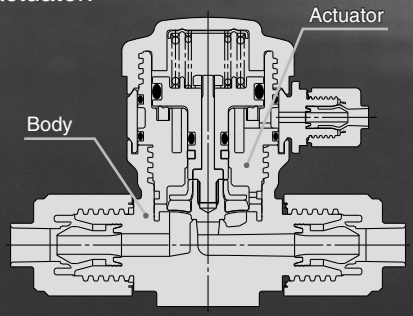
High Purity Chemical Liquid Valve Non-Metallic Exterior

LVQ Series

Clean Wet Series

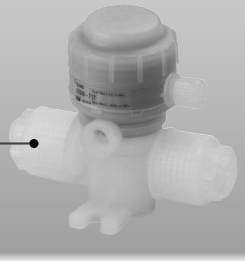
Screwless construction

Non-metallic construction without using metal screws to fasten the body of the actuator.

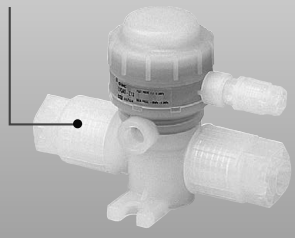


Additional Variations for the *LVQ* Series!

● **Insert bushing, LQ1 integrated fitting type Hyper fitting *LVQ-V Series***

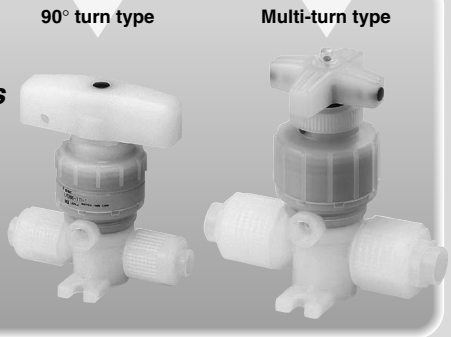


● **Flare, LQ3 integrated fitting type Hyper fitting *LVQ-Z Series***



● **Manually operated *LVQH Series***

90° turn type　　Multi-turn type



● **Tube extension type *LVQ-T Series***

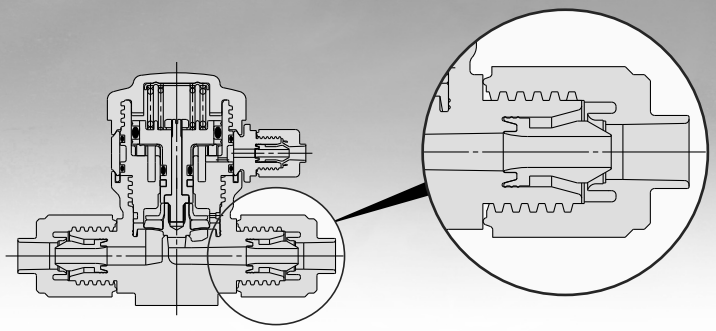
● **High purity chemical liquid valves, High back pressure (0.5 MPa) tolerant　Added the *LVQ□□H* series.**

● **Additional options**

High temperature (Max. 170°C), Buffer material FFKM, Ammonium hydroxide compatible, High flow type

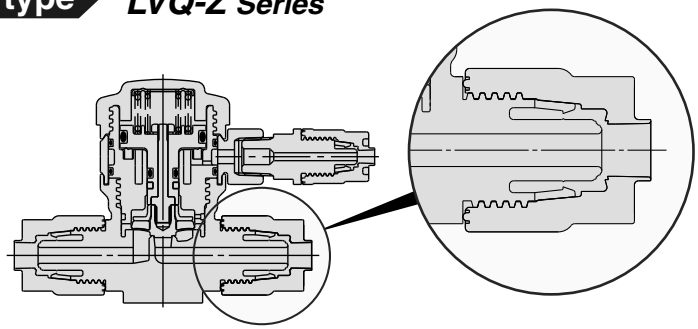
Insert bushing/Flare, integrated fitting types are available.

Insert bushing, Integrated fitting type *LVQ-V/LVQ-S Series*



Hyper fitting
***LQ1* Series**
(*LVQ-V* Series)
***LQ2* Series**
(*LVQ-S* Series)
- Insert bushing type
- Quadruple seal construction

Flare, Integrated fitting type *LVQ-Z Series*

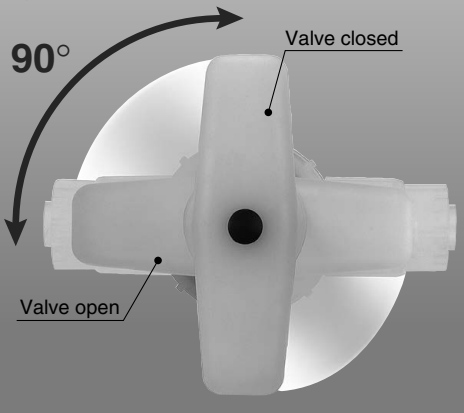


Hyper fitting
Flare type
***LQ3* Series**
- Grip seal construction with Flare type
- Triple seal construction

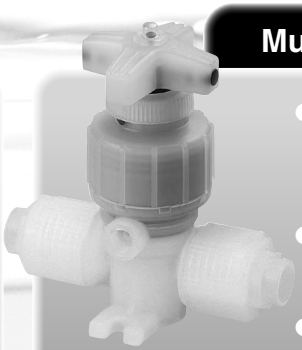
Added manual type. Two types of handle operation methods can be selected.

90° turn type

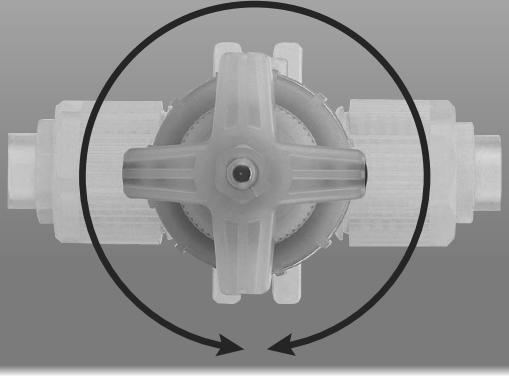
- Enables quick valve open/ close switching operation.

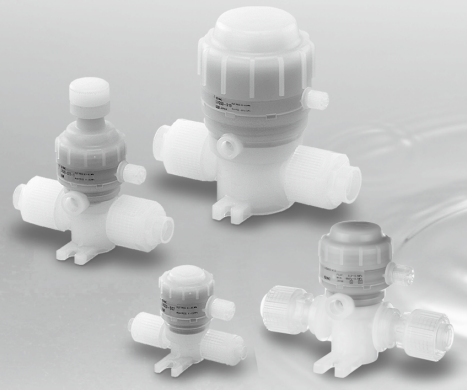


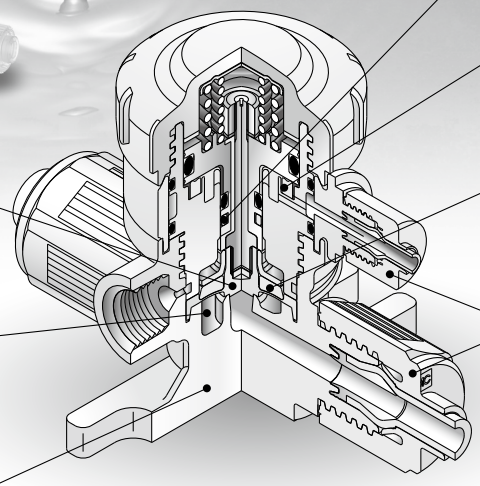
Multi-turn type



- The handle will spin loosely at the fully-open and fully-closed positions of the valve. This prevents overtightening.
- An indicator enables easy visual check of the open/ closed state of the valve.
- The valve opening position can be freely set using a lock nut.







Guide ring

Eliminates lateral motion of the poppet which reduces internal leakage.

Piston damper

Absorbs piston momentum to minimize impact-induced particle generation.

Buffer

Protects diaphragm from deformation and damage due to back pressure.

Integrated fitting construction

Offers quadruple seal construction. Nut lock mechanism—no additional tightening required. High flexural strength. Different tubing sizes can be selected.

Diaphragm (PTFE)

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

Minimal residual liquid

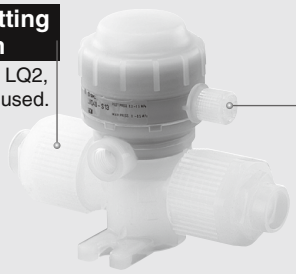
Residual liquid is minimized by the tapered shape and integrated fitting construction, allowing liquid to flow smoothly, achieving improved flow-through characteristics.

Body (New PFA)

Compatible with chemicals such as acids, bases and super pure water.

Integrated fitting construction

Hyper fitting/LQ1, LQ2, LQ3 series is used.

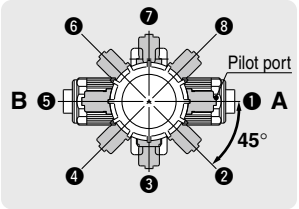


Integrated fitting construction

Hyper fitting/LQ1, LQ3 series is used.
Can select female thread.

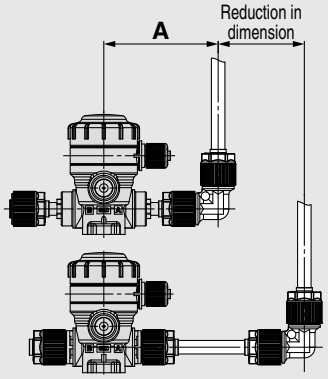
Piping from 8 directions are possible.

Pilot port



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

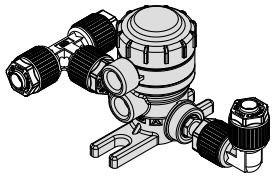
Space saving type



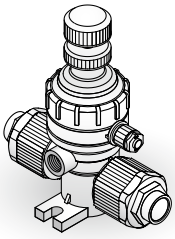
(mm)

Model	A	Reduction in dimension
LVQ20	56.5	40.5 or more
LVQ30	70	49.5 or more
LVQ40	80	61.5 or more
LVQ50	104.5	64.5 or more
LVQ60	114.5	73.5 or more

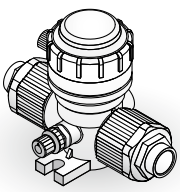
Piping example



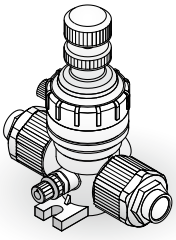
Options



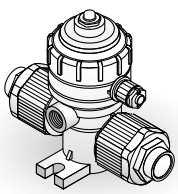
With flow rate adjustment



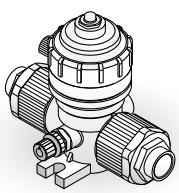
With by-pass



With flow rate adjustment & by-pass



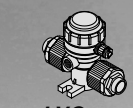
With indicator



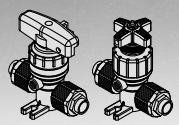
With indicator & by-pass

Variations

Insert Bushing, Integrated Fitting Type *LVQ/LVQH Series*



LVQ Series



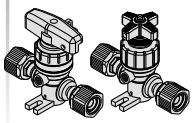
LVQH Series

Orifice diameter	Flow rate characteristics Kv (Cv)	Series	Applicable 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
ø4	0.3 (0.35)	LVQ(H)20	●	●	○						●	●	○				
ø8	1.1 (1.3)	LVQ(H)30			●	●	○						●	○			
ø10	1.6 (1.9)	LVQ(H)40					●	○						●	○		
ø16	4.2 (5)	LVQ(H)50						●	○						●	○	
ø22	6.8 (8)	LVQ(H)60							●	○						●	○

● With reducer ○ Basic size

Insert Bushing, Integrated Fitting Type Space Saving/Space Saving Connection *LVQS/LVQHS Series*

LVQS Series

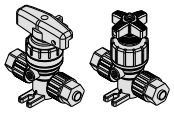


LVQHS Series

Orifice diameter	Flow rate characteristics Kv (Cv)	Series	Fitting size				
			2	3	4	5	6
ø4	0.3 (0.35)	LVQ(H)S20	●				
ø8	1.1 (1.3)	LVQ(H)S30		●			
ø10	1.6 (1.9)	LVQ(H)S40			●		
ø16	4.2 (5)	LVQ(H)S50				●	
ø22	6.8 (8)	LVQ(H)S60					●

Flare, Integrated Fitting Type *LVQ-Z/LVQH-Z Series*

LVQ-Z Series

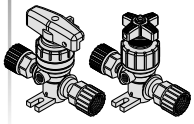


LVQH-Z Series

Orifice diameter	Flow rate characteristics Kv (Cv)	Series	Applicable 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
ø4	0.3 (0.35)	LVQ20(H)-Z	●	●	●						●		●				
ø8	1.1 (1.3)	LVQ30(H)-Z					●							●			
ø10	1.6 (1.9)	LVQ40(H)-Z						●							●		
ø16	4.2 (5)	LVQ50(H)-Z							●							●	
ø22	6.8 (8)	LVQ60(H)-Z								●							●

Flare, Integrated Fitting Type Space Saving/Space Saving Connection *LVQS-Z/LVQHS-Z Series*

LVQS-Z Series



LVQHS-Z Series

Orifice diameter	Flow rate characteristics Kv (Cv)	Series	Fitting size				
			2	3	4	5	6
ø4	0.3 (0.35)	LVQ20(H)S-Z	●				
ø8	1.1 (1.3)	LVQ30(H)S-Z		●			
ø10	1.6 (1.9)	LVQ40(H)S-Z			●		
ø16	4.2 (5)	LVQ50(H)S-Z				●	
ø22	6.8 (8)	LVQ60(H)S-Z					●

Tube Extension Type *LVQ-T/LVQH-T Series*

LVQ-T Series

LVQH-T Series

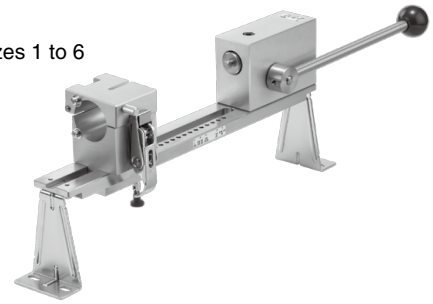
Orifice diameter	Flow rate characteristics Kv (Cv)	Series	Tubing size									
			Metric size					Inch size				
			6	10	12	19	25	1/4	3/8	1/2	3/4	1
ø4	0.3 (0.35)	LVQ20(H)-T	●					●				
ø8	1.1 (1.3)	LVQ30(H)-T		●					●			
ø10	1.6 (1.9)	LVQ40(H)-T			●					●		
ø16	4.2 (5)	LVQ50(H)-T				●					●	
ø22	6.8 (8)	LVQ60(H)-T					●					●

Guide to Pamphlet on Fluoropolymer Fitting Installation Methods

* The pamphlets can be downloaded from the SMC home page. https://www.smcworld.com

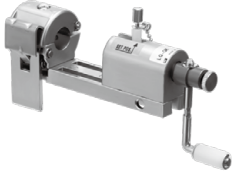
LQ1/2 Series Installation Method

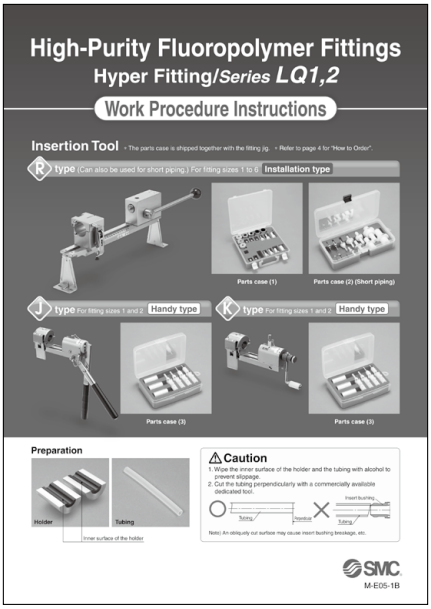
R type
For fitting sizes 1 to 6



J type
For fitting sizes 1 and 2

K type
For fitting sizes 1 and 2



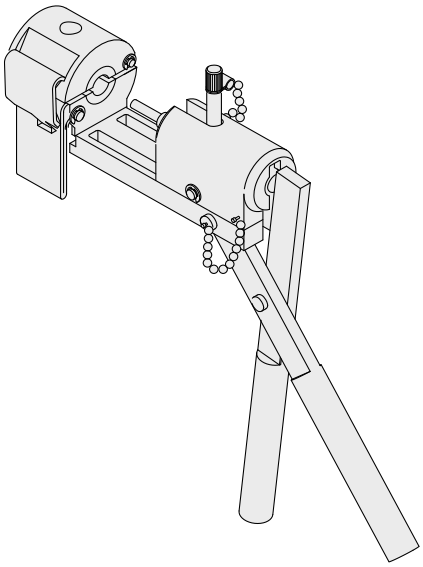


M-E05-1

LQ3 Series Installation Method

For fitting sizes 2 to 6

For fitting size 1



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Insert Bushing, Integrated Fitting Type

Flare, Integrated Fitting Type

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❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Fitting type

Symbol	Fitting type	Body class
V	LQ1	2, 3, 4, 5, 6
S	LQ2	2, 3, 4, 5

Note) Insert bushing is used in common.

❹ Applicable tubing size Note)

Symbol	Connection 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

Note) Refer to page 150 for details of the applicable tubing sizes.

❺ Port B (OUT) different dia. size

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

❻ Pilot port type

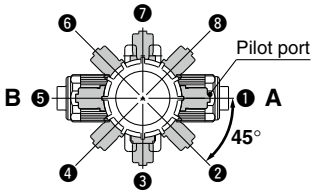
Nil	LQ1 integrated fitting	Connection tubing size 1/8" x 0.086"(3 x 2) Note)
M	LQ1 integrated fitting	Connection tubing size 4 x 3 Note)
R	Threaded	Rc1/8
N	Threaded	NPT1/8

Note) Refer to page 150 for details of the applicable tubing sizes.

❼ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❽ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
5	High back pressure (0.42 MPa)
6	High back pressure with flow rate adjustment
7	High back pressure with by-pass
8	High back pressure with flow rate adjustment & by-pass
9	High back pressure with indicator
24	With indicator & by-pass

Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined each other.

❾ Option 2

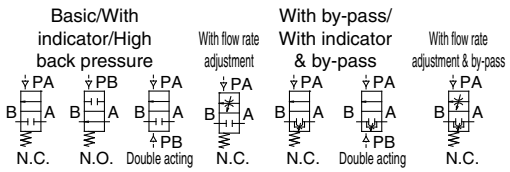
Symbol	Applicable option											Buffer material	Note
	Nil	1	2	3	4	5	6	7	8	9	24		
Nil	○	○	○	○	○	○	○	○	○	○	○	FKM	—
J	○	○	—	—	—	—	—	—	—	—	—	FKM	For high temperature
K	○	○	○	○	○	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	○	—	—	—	—	—	FKM	High flow type **LVQ6**□ only

Note 1) Options 2 in the same table cannot be combined each other.
Note 2) Only option 1 (with flow rate adjustment) is available for use in high-temperature environments. However, it cannot be used in combination with any of the high back pressure specifications.

Variations

Type	Symbol	Tubing O.D. / Valve type	Model	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
			Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Metric		6	10	12	19	25
		Inch		1/4	3/8	1/2	3/4	1
Basic N.C. / N.O. Double acting	PA B A N.C. / PB B A N.O. / PA PB B A Double acting		N.C.	○	○	○	○	○
			N.O.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjustment	PA B A N.C.		N.C.	○	○	○	○	○
With by-pass Double acting	PA B A N.C. / PA PB B A Double acting		N.C.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjustment & by-pass	PA B A N.C.		N.C.	○	○	○	○	○
With indicator	PA B A N.C.		N.C.	○	○	○	○	○
High back pressure	PA B A N.C.		N.C.	○	○	○	○	○
With indicator & by-pass	PA B A N.C.		N.C.	○	○	○	○	○

Symbol



⚠ Specific Product Precautions

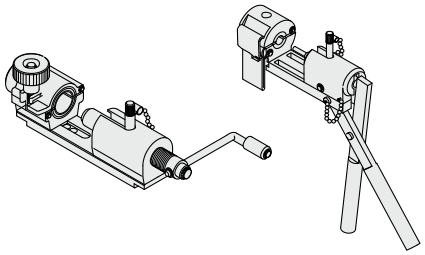
Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Connect tubing by special tools.

For information on tubing connection and special tools, please see the pamphlet "High Purity Fluoropolymer Fittings Hyper Fitting LQ1/2 Series Work Procedure Instructions" (M-E05-1). (The pamphlet can be downloaded from the SMC home page.)



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

Tightening Torque for Piping

Body class	Torque (N·m)	
	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 9.0
5	2.5 to 3.0	11.0 to 13.0
6	5.5 to 6.0	—

Standard Specifications

Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Tubing O.D. Note 1)	**Metric**	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Fitting type	**IN/OUT port**	LQ1 or LQ2				LQ1
	Pilot port	LQ1				
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	**Kv**	0.3	1.1	1.6	4.2	6.8 (8.1) Note 2)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 2)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	**Standard**	–98 kPa to 0.5 MPa Note 3)			–98 kPa to 0.4 MPa Note 3)	
	High temperature	–98 kPa to 0.3 MPa Note 3)				
Back pressure (MPa)	**Standard**	0.3 or less			0.2 or less	
	High back pressure	0.42 or less				
	High temperature	0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)	**Standard**	0 to 100				
	High temperature	0 to 170				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.08	0.17	0.22	0.70	0.81

Note 1) Refer to page 150 for details of the applicable tubing sizes.
Note 2) ( ): High flow type
Note 3) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

Applicable Different Diameter Tubings with Reducer

Different diameter tubings can be selected (within the same body class) by using a nut and an insert bushing (reducer).

● With reducer

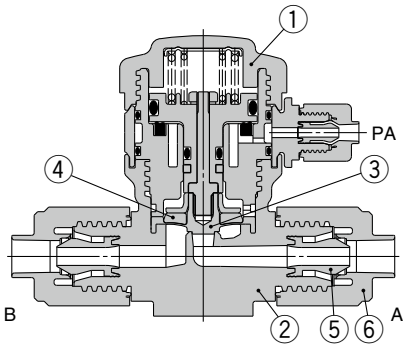
Body class	Connection tubing O.D.														
	Metric size								Inch size						
	3	4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

Note) Refer to page 99 for information on changing tubing sizes.

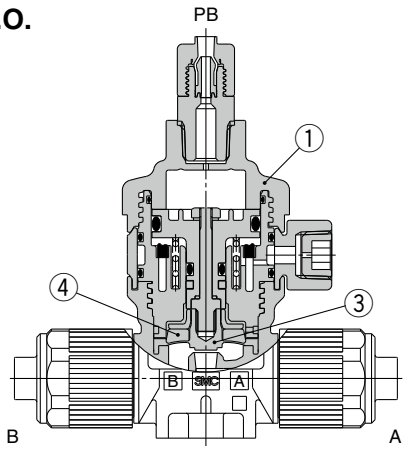
Construction

Basic

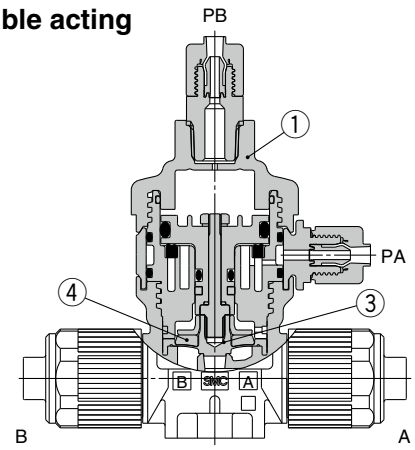
N.C.

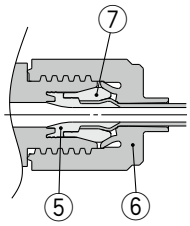


N.O.



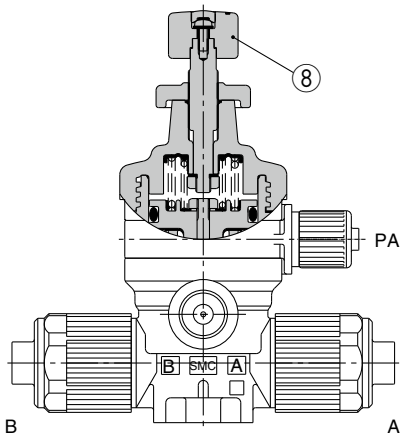
Double acting



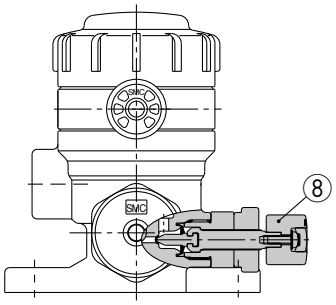


With reducer

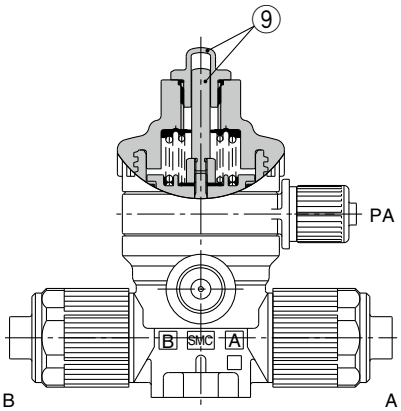
With flow rate adjustment



With by-pass



With indicator

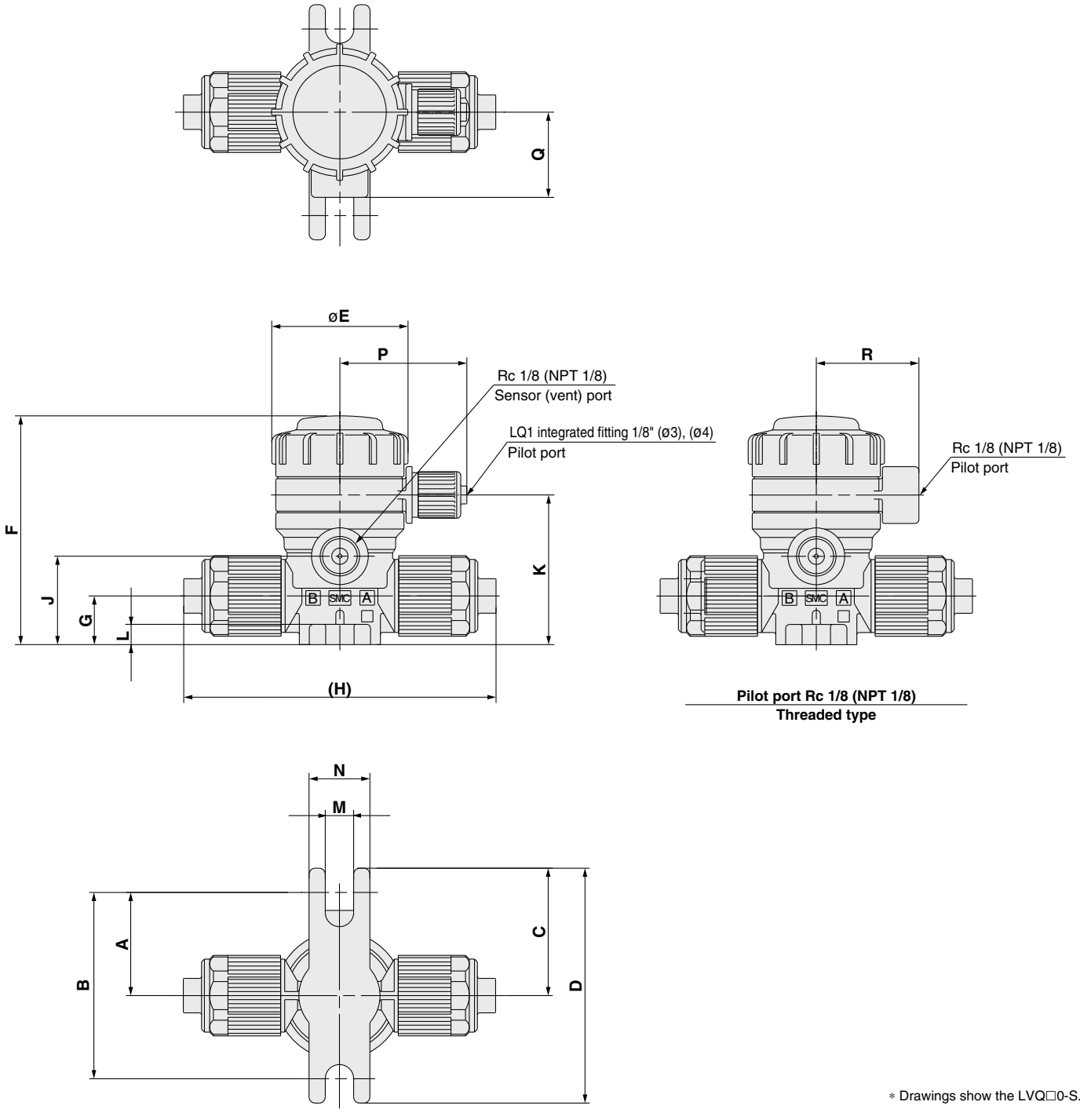


Component Parts

No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Insert bushing**	PFA
6	**Nut**	PFA
7	**Collar**	PFA
8	**Flow rate adjuster**	PVDF
9	**Indicator/Cover**	PP

Dimensions

Basic, High back pressure
N.C. valve



∗ Drawings show the LVQ□0-S.

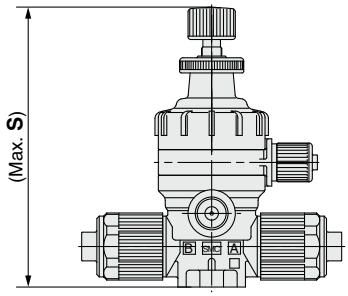
LVQ□0-$^{V}_{S}$□ Dimensions (N.C. Valve) (mm)

Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R
								V□	S□								
LVQ20-$^{V}_{S}$□	25.5	46	31.5	58	33.6	56.5	12	70	77	21.8	37	5	7	15	31.3	21	25.3
LVQ30-$^{V}_{S}$□	28.5	57	34.5	69	45.4	77	16.5	83	95	32	50	6	7	20	37.2	25	31.2
LVQ40-$^{V}_{S}$□	28.5	57	34.5	69	45.4	82.5	22	95	109	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50-$^{V}_{S}$□	42	84	48	96	75	127	25	130	141	50.2	78.2	10	7	20	50.8	38.5	45
LVQ60-V□∗	42	84	48	96	75	136.8	32	150	—	60	88	10	7	20	50.8	38.5	45

∗ The LVQ60 is available only with "V".

Dimensions

With flow rate adjustment, High back pressure with flow rate adjustment
N.C. valve

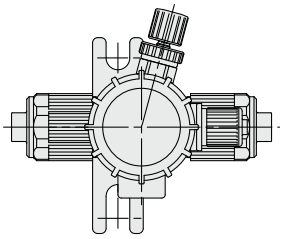


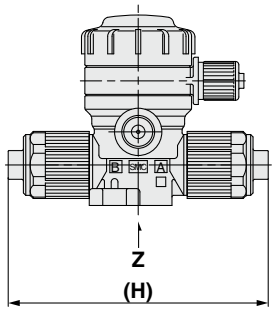
Dimensions (mm)

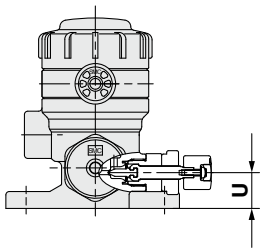
Model	S
LVQ20-$^{V}_{S}$□-1	83
LVQ30-$^{V}_{S}$□-1	113.5
LVQ40-$^{V}_{S}$□-1	119
LVQ50-$^{V}_{S}$□-1	171.5
LVQ60-V□-1∗	182.5

∗ The LVQ60 is available only with "V".

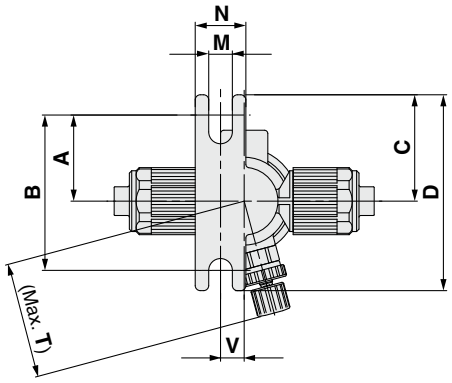
With by-pass, High back pressure with by-pass
N.C. valve



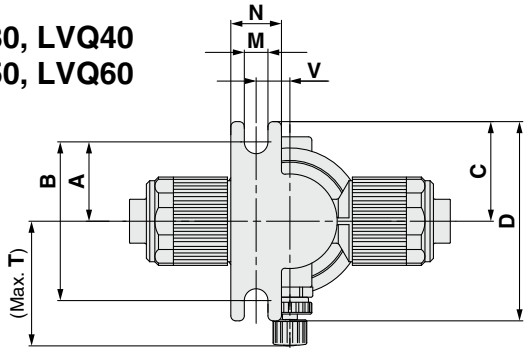




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

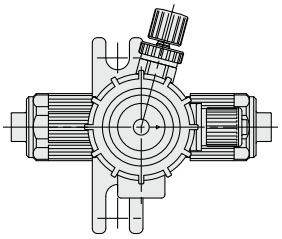
∗ Drawings show the LVQ□0-S.

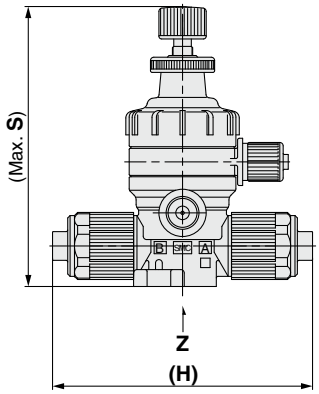
Dimensions (mm)

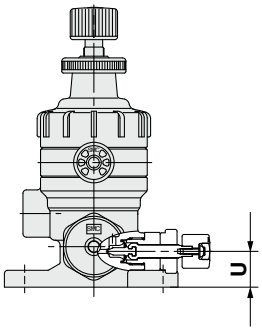
Model	A	B	C	D	M	N	T	U	V	H	
										V□	S□
LVQ20-$^{V}_{S}$□-2	25.5	46	31.5	58	7	15	34.3	10.6	7	64	77
LVQ30-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	36.9	16.5	10	83	95
LVQ40-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	37.9	22	10	95	109
LVQ50-$^{V}_{S}$□-2	38	76	44	88	7	20	64	25	17	130	141
LVQ60-V□-2∗	38	76	44	88	7	20	66	32	17	150	—

∗ The LVQ60 is available only with "V".

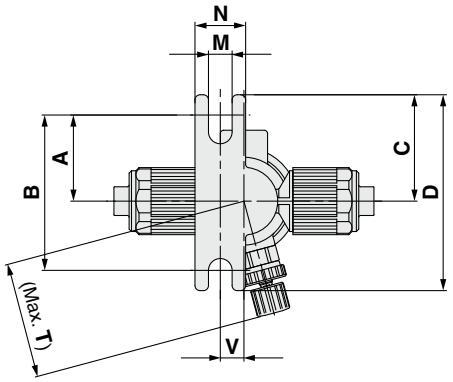
With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve



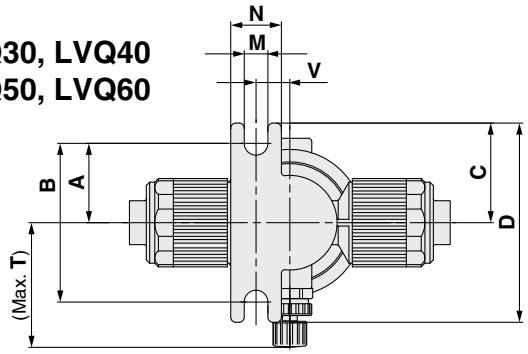




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

∗ Drawings show the LVQ□0-S.

Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V	H	
											V□	S□
LVQ20-$^{V}_{S}$□-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7	64	77
LVQ30-$^{V}_{S}$□-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10	83	95
LVQ40-$^{V}_{S}$□-3	25.5	51	31.5	63	7	15	119	37.9	22	10	95	109
LVQ50-$^{V}_{S}$□-3	38	76	44	88	7	20	171.5	64	25	17	130	141
LVQ60-V□-3∗	38	76	44	88	7	20	182.5	66	32	17	150	—

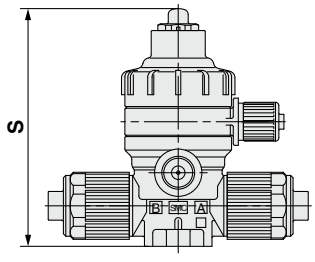
∗ The LVQ60 is available only with "V".

With indicator, High back pressure with indicator
N.C. valve

Dimensions (mm)

Model	S
LVQ20-$^{V}_{S}$□-4	70.5
LVQ30-$^{V}_{S}$□-4	88.5
LVQ40-$^{V}_{S}$□-4	94
LVQ50-$^{V}_{S}$□-4	134.5
LVQ60-V□-4∗	144

∗ The LVQ60 is available only with "V".

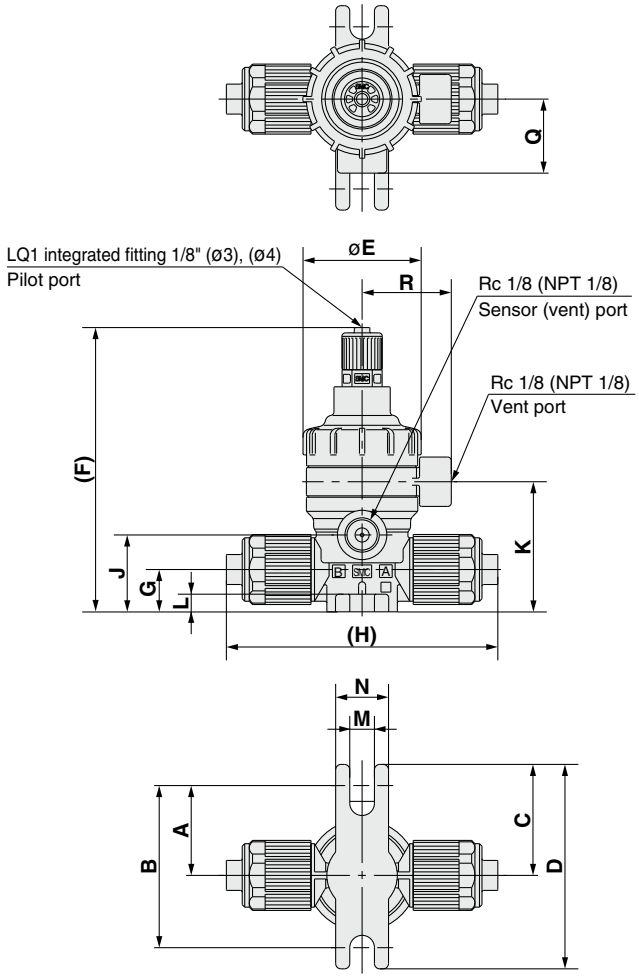


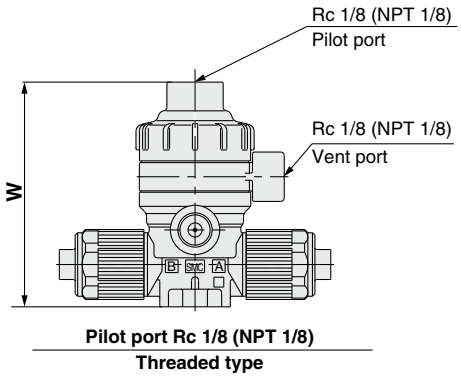
∗ Drawings show the LVQ□0-S.

Dimensions

Basic

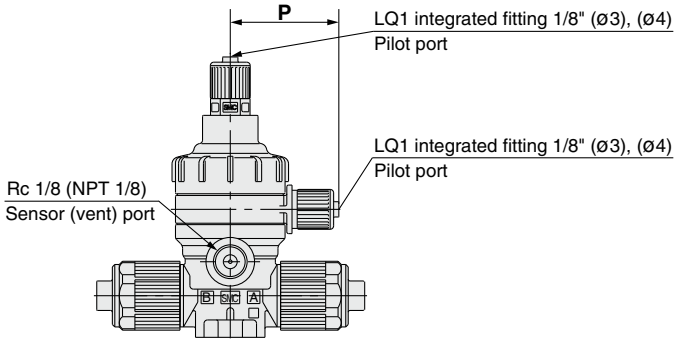
N.O. valve

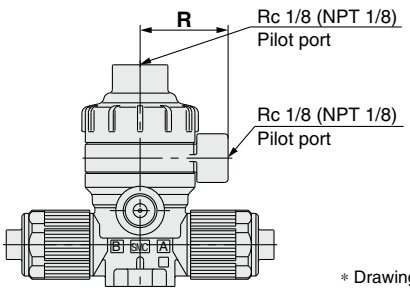




∗ Drawings show the LVQ□0-S.

Double acting valve





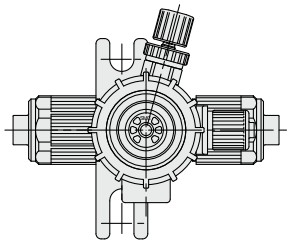
∗ Drawings show the LVQ□0-S.

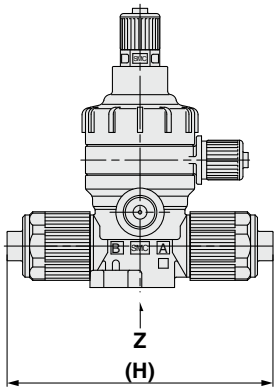
LVQ□$^{1}_{2}$-$^{V}_{S}$□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

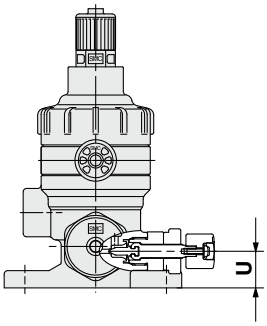
Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R	W
								V□	S□									
LVQ2$^{1}_{2}$-$^{V}_{S}$□	25.5	46	31.5	58	33.6	81	12	70	77	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3$^{1}_{2}$-$^{V}_{S}$□	28.5	57	34.5	69	45.4	99	16.5	83	95	32	50	6	7	20	37.2	25	31.2	82
LVQ4$^{1}_{2}$-$^{V}_{S}$□	28.5	57	34.5	69	45.4	104.5	22	95	109	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5$^{1}_{2}$-$^{V}_{S}$□	42	84	48	96	75	145	25	130	141	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6$^{1}_{2}$-V□∗	42	84	48	96	75	154.5	32	150	—	60	88	10	7	20	50.8	38.5	45	137.5

∗ The LVQ60 is available only with "V".

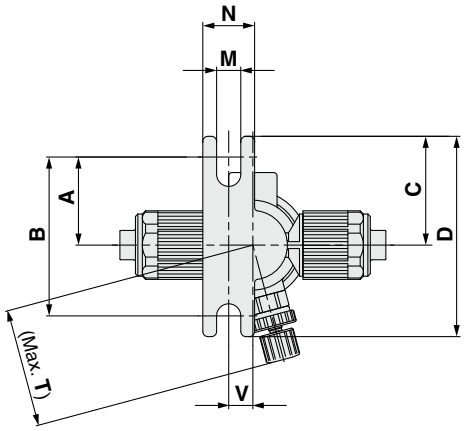
With by-pass
Double acting valve



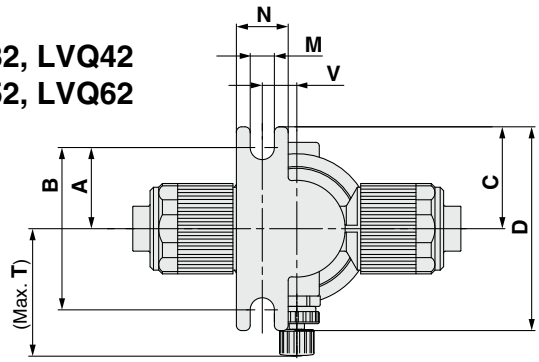




LVQ22



LVQ32, LVQ42
LVQ52, LVQ62



View **Z**

∗ Drawings show the LVQ□0-S.

Dimensions (Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V	H	
										V□	S□
LVQ22-$^{V}_{S}$□-2	25.5	46	31.5	58	7	15	34.3	10.6	7	64	77
LVQ32-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	36.9	16.5	10	83	95
LVQ42-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	37.9	22	10	95	109
LVQ52-$^{V}_{S}$□-2	38	76	44	88	7	20	64	25	17	130	141
LVQ62-V□-2∗	38	76	44	88	7	20	66	32	17	150	—

∗ The LVQ60 is available only with “V”.

Air Operated
Insert Bushing, Integrated Fitting Type
Space Saving/Space Saving Connection
LVQS Series

RoHS

How to Order

LVQ 2 0 S – V 07 □ □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Body type

S	Space saving connection

❹ Fitting type

Symbol	Fitting type	Body class
V	LQ1	2, 3, 4, 5, 6

❺ Applicable fitting size

Symbol	Fitting size	Body class				
		2	3	4	5	6
07	2	○				
11	3		○			
13	4			○		
19	5				○	
25	6					○

Note) Refer to page 81 for How to Order fitting parts. Select a tube with the same size as the valve side fitting.

❻ Pilot port type

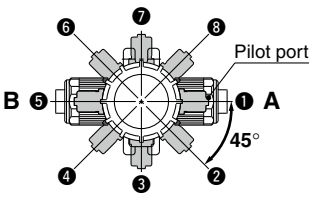
Nil	LQ1 integrated fitting	Connection tubing size 1/8" x 0.086" (3 x 2) Note)
M	LQ1 integrated fitting	Connection tubing size 4 x 3 Note)
R	Threaded	Rc1/8
N	Threaded	NPT1/8

Note) Refer to page 150 for details of the applicable tubing sizes.

❼ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



∗ Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❽ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
5	High back pressure (0.42 MPa)
6	High back pressure with flow rate adjustment
7	High back pressure with by-pass
8	High back pressure with flow rate adjustment & by-pass
9	High back pressure with indicator
24	With indicator & by-pass

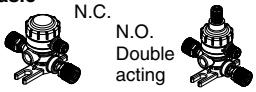
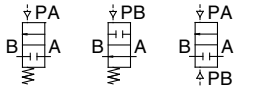
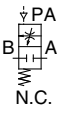
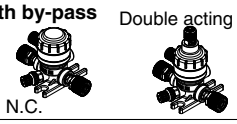
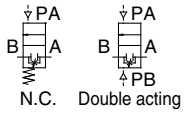
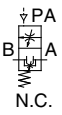
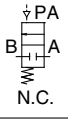
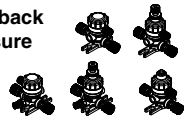
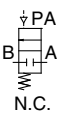
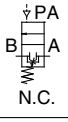
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined each other.

❾ Option 2

Symbol	Applicable option											Buffer material	Note
	Nil	1	2	3	4	5	6	7	8	9	24		
Nil	○	○	○	○	○	○	○	○	○	○	○	FKM	—
J	○	○	—	—	—	—	—	—	—	—	—	FKM	For high temperature
K	○	○	○	○	○	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	○	—	—	—	—	—	FKM	High flow type **LVQ6**□ only

Note 1) Options 2 in the same table cannot be combined each other.
Note 2) Only option 1 (with flow rate adjustment) is available for use in high-temperature environments. However, it cannot be used in combination with any of the high back pressure specifications.

Variations

Type	Symbol	Model / Orifice diameter / Applicable fitting size / Valve type	LVQ20 ø4 2	LVQ30 ø8 3	LVQ40 ø10 4	LVQ50 ø16 5	LVQ60 ø22 6
Basic N.C. / N.O. / Double acting 		N.C.	○	○	○	○	○
		N.O.	○	○	○	○	○
		Double acting	○	○	○	○	○
With flow rate adjustment 		N.C.	○	○	○	○	○
With by-pass Double acting 		N.C.	○	○	○	○	○
		Double acting	○	○	○	○	○
With flow rate adjustment & by-pass 		N.C.	○	○	○	○	○
With indicator 		N.C.	○	○	○	○	○
High back pressure 		N.C.	○	○	○	○	○
With indicator & by-pass 		N.C.	○	○	○	○	○

How to Order Space Saving Fittings

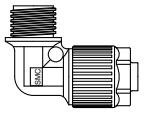
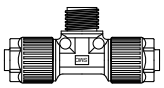
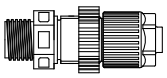
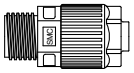
LQ1 E 61 – SN –

Packaging

Symbol	Packaging
Nil	Clean packaging equivalent to Class M3.5
1	Standard packaging equivalent to Class M5.5

One (including insert bushing) of the nuts is not attached.

Fitting type

E	T
Union elbow	Union tee
	
P	**U**
Panel mount union	Union
	

Applicable tubing size Note 1) Note 2)

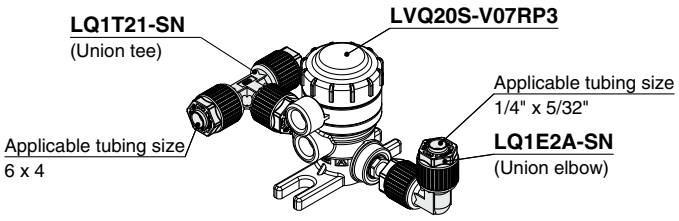
Size	No.	Applicable tubing size (mm)	Reducing
2	**1**	6 x 4	○
2	**2**	4 x 3	●
3	**1**	10 x 8	○
3	**2**	8 x 6	●
3	**3**	6 x 4	●
4	**1**	12 x 10	○
4	**2**	10 x 8	●
5	**1**	19 x 16	○
5	**2**	12 x 10	●
6	**1**	25 x 22	○
6	**2**	19 x 16	●

Size	Symbol	Applicable tubing size (inch)	Reducing
2	**A**	1/4" x 5/32"	○
2	**B**	3/16" x 1/8"	●
2	**C**	1/8" x 0.086"	●
3	**A**	3/8" x 1/4"	○
3	**B**	1/4" x 5/32"	●
4	**A**	1/2" x 3/8"	○
4	**B**	3/8" x 1/4"	●
5	**A**	3/4" x 5/8"	○
5	**B**	1/2" x 3/8"	●
6	**A**	1" x 7/8"	○
6	**B**	3/4" x 5/8"	●

○ Basic size ● With reducer

Note 1) Select the same size as the fitting on the valve.
Note 2) Refer to page 150 for details of the applicable tubing sizes.

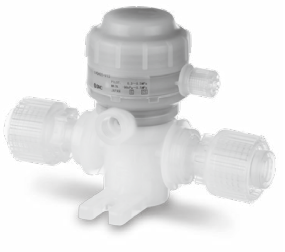
Piping Example



Ordering Example

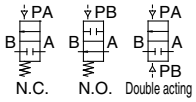
LVQ20S-V07RP3 1
LQ1T21-SN (Union tee) 1
LQ1E2A-SN (Union elbow) 1

Note) For shipment, the valve and fittings are individually packaged and dispatched together in 1 box.



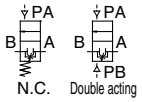
Symbol

Basic/With indicator/
High back pressure

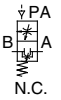


With flow rate adjustment

With by-pass/
With indicator & by-pass



With flow rate adjustment & by-pass



Standard Specifications

Model		LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
Connection fitting size		2	3	4	5	6
Fitting type	**IN/OUT port**	LQ1				
	Pilot port	LQ1				
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	**Kv**	0.3	1.1	1.6	4.2	6.8 (8.1) Note 1)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 1)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	**Standard**	–98 kPa to 0.5 MPa Note 3)			–98 kPa to 0.4 MPa Note 3)	
	High temperature	–98 kPa to 0.3 MPa Note 3)				
Back pressure (MPa)	**Standard**	0.3 or less			0.2 or less	
	High back pressure	0.42 or less				
	High temperature	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 (High back pressure: 0.45 to 0.55)				
Pilot port size Note 2)		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)	**Standard**	0 to 100				
	High temperature	0 to 170				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.085	0.175	0.223	0.725	0.835

Note 1) ( ): High flow type
Note 2) Refer to page 150 for details of the applicable tubing sizes.
Note 3) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Take extra care with the insert bushing when connecting the fittings.

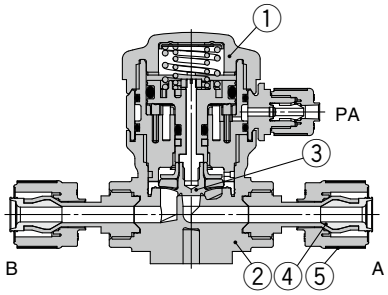
2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

Tightening Torque for Piping

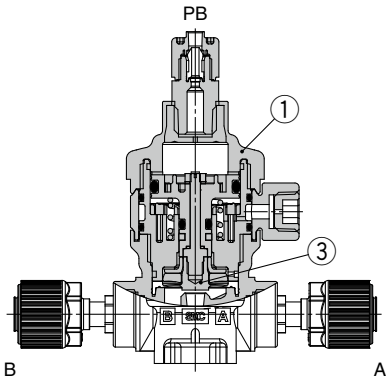
Body class	Torque (N·m)
	LQ1
2	0.3 to 0.4
3	0.8 to 1.0
4	1.0 to 1.2
5	2.5 to 3.0
6	5.5 to 6.0

Construction

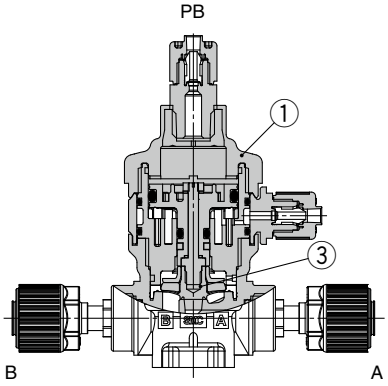
Basic
N.C.



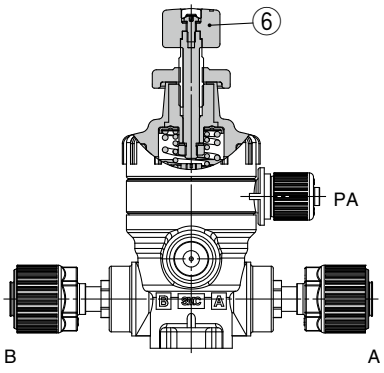
Basic
N.O.



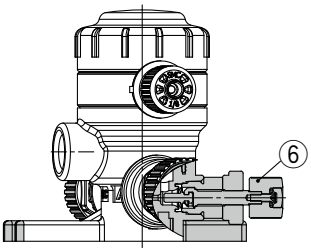
Basic
Double acting



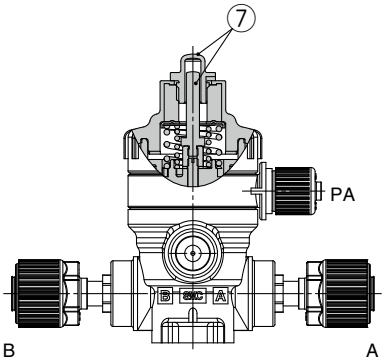
With flow rate adjustment



With by-pass



With indicator

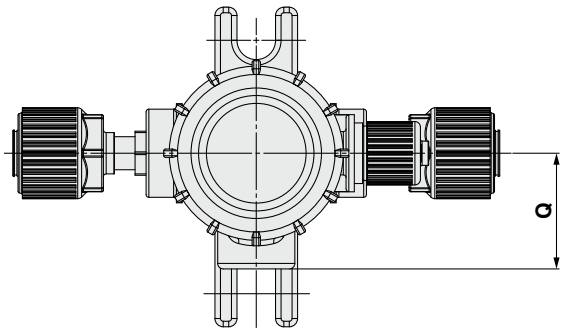


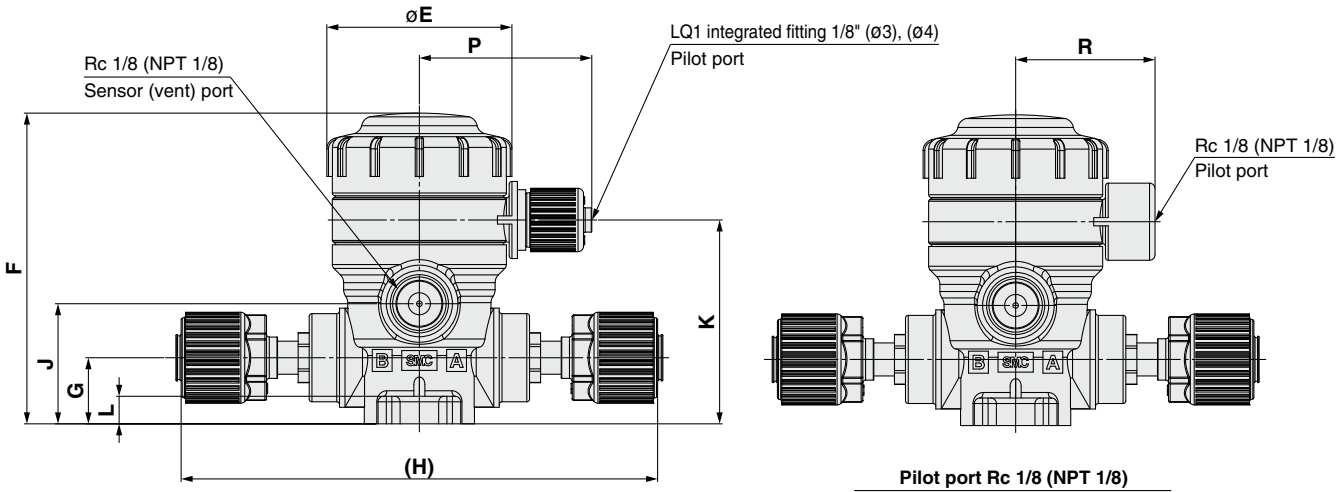
Component Parts

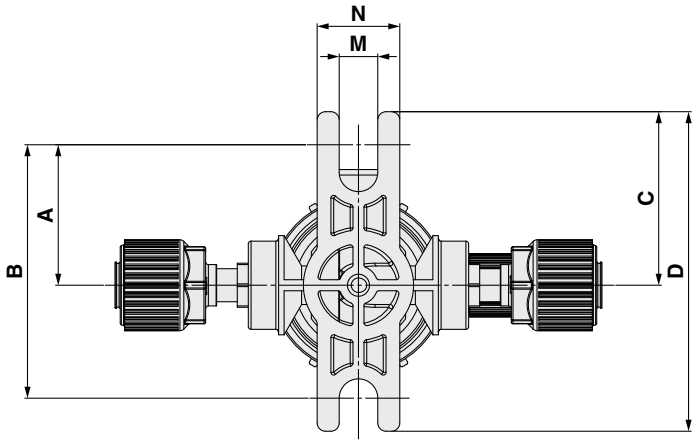
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Insert bushing**	PFA
5	**Nut**	PFA
6	**Flow rate adjuster**	PVDF
7	**Indicator/Cover**	PP

Dimensions

Basic, High back pressure
N.C. valve







∗ Drawings show the LVQ□0-S.

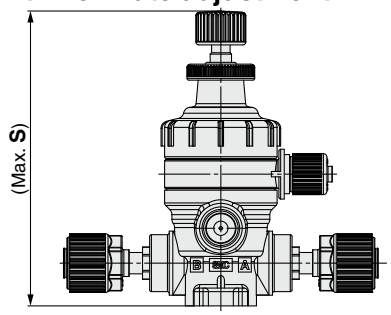
LVQ□0S-V□ Dimensions (N.C. Valve) (mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20S-V07	25.5	46	31.5	58	33.6	56.5	12	89	21.8	37	5	7	15	31.3	21	25.3
LVQ30S-V11	28.5	57	34.5	69	45.4	77	16.5	106	32	50	6	7	20	37.2	25	31.2
LVQ40S-V13	28.5	57	34.5	69	45.4	82.5	22	120	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50S-V19	42	84	48	96	75	127	25	164	50.2	78.2	10	7	20	50.8	38.5	45
LVQ60S-V25	42	84	48	96	75	136.8	32	177	60	88	10	7	20	50.8	38.5	45

With flow rate adjustment, High back pressure with flow rate adjustment N.C. valve

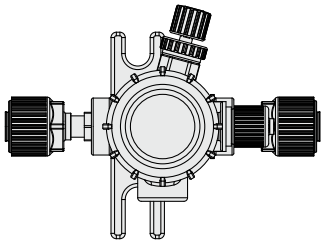
Dimensions (mm)

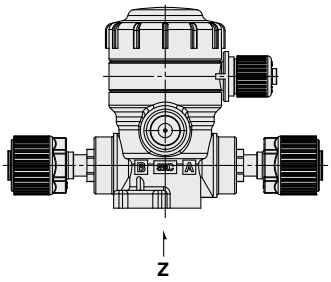
Model	S
LVQ20S-V07-1	83
LVQ30S-V11-1	113.5
LVQ40S-V13-1	119
LVQ50S-V19-1	171.5
LVQ60S-V25-1	182.5

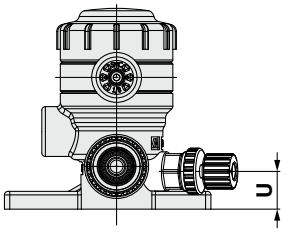


∗ Drawing shows the LVQ□0-S.

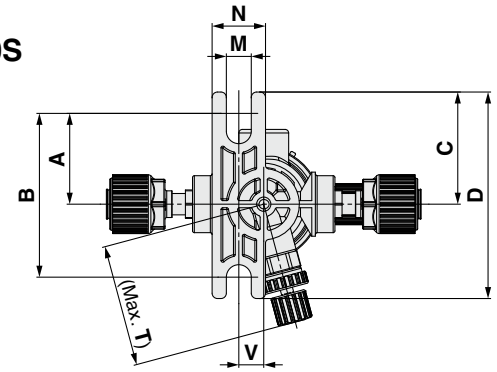
With by-pass, High back pressure with by-pass N.C. valve



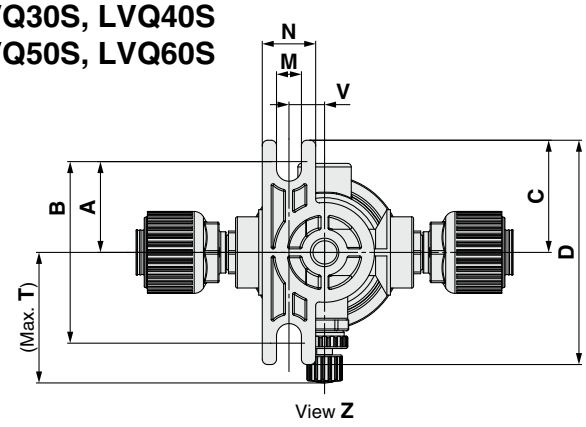




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S



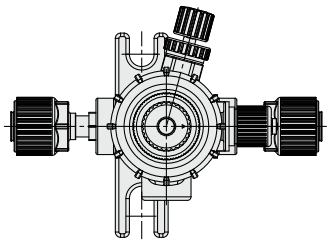
Dimensions (mm)

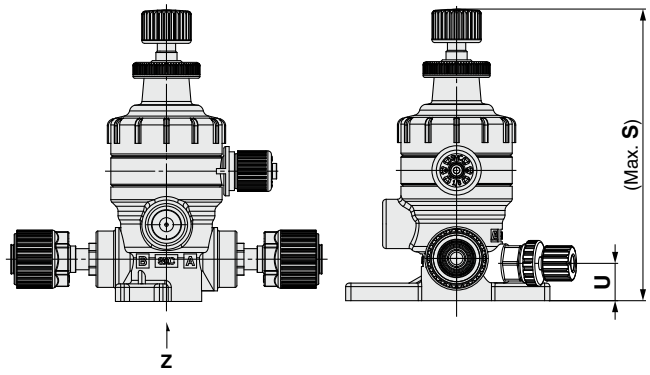
Model	A	B	C	D	M	N	T	U	V
LVQ20S-V07-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30S-V11-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40S-V13-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50S-V19-2	38	76	44	88	7	20	64	25	17
LVQ60S-V25-2	38	76	44	88	7	20	66	32	17

∗ Drawings show the LVQ□0-S.

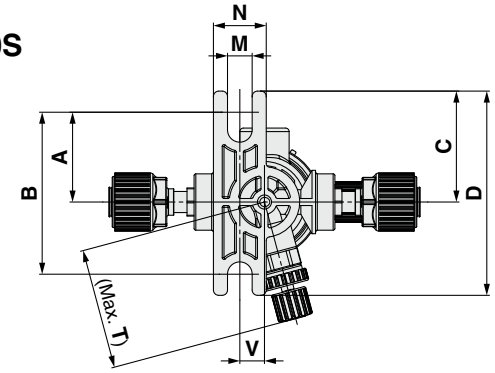
Dimensions

With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve

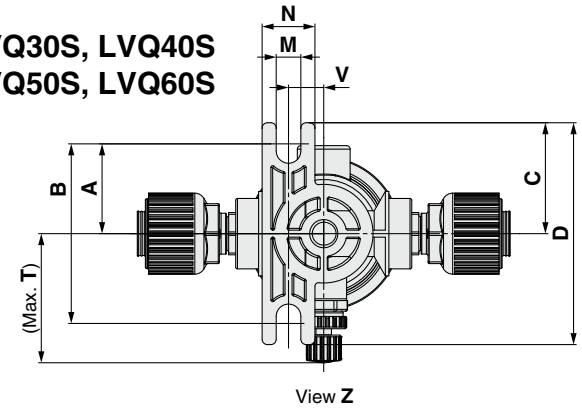




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S



∗ Drawings show the LVQ□0-S.

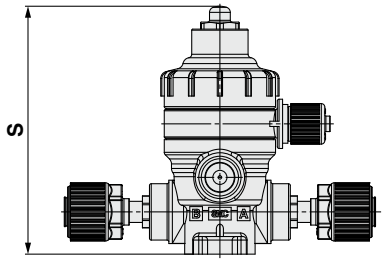
Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V
LVQ20S-V07-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7
LVQ30S-V11-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10
LVQ40S-V13-3	25.5	51	31.5	63	7	15	119	37.9	22	10
LVQ50S-V19-3	38	76	44	88	7	20	171.5	64	25	17
LVQ60S-V25-3	38	76	44	88	7	20	182.5	66	32	17

With indicator, High back pressure with indicator
N.C. valve

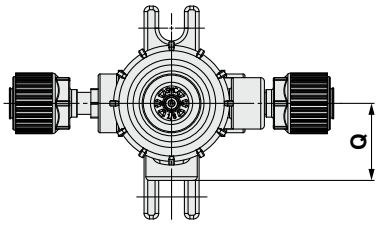
Dimensions (mm)

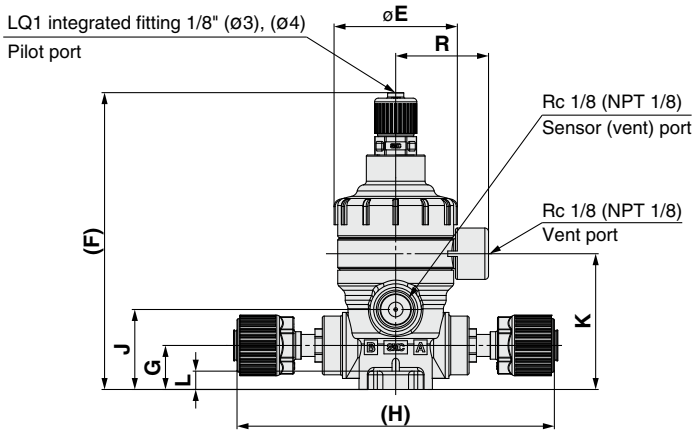
Model	S
LVQ20S-V07-4	70.5
LVQ30S-V11-4	88.5
LVQ40S-V13-4	94
LVQ50S-V19-4	134.5
LVQ60S-V25-4	144

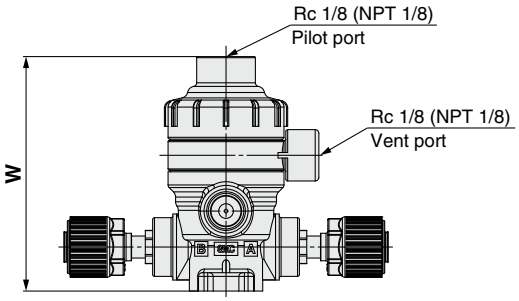


∗ Drawing shows the LVQ□0-S.

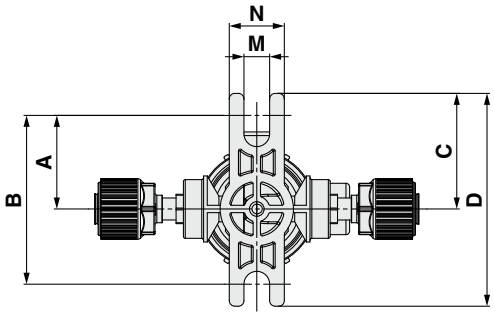
Basic
N.O. valve





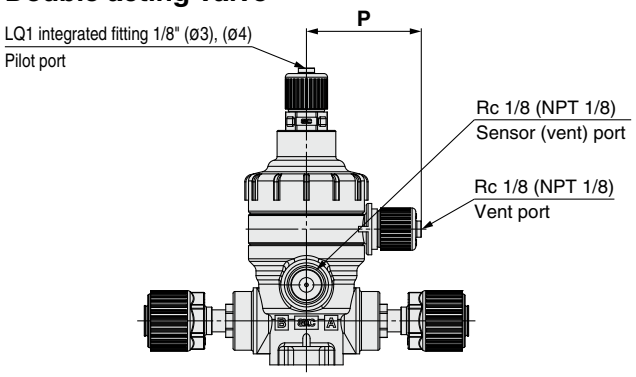


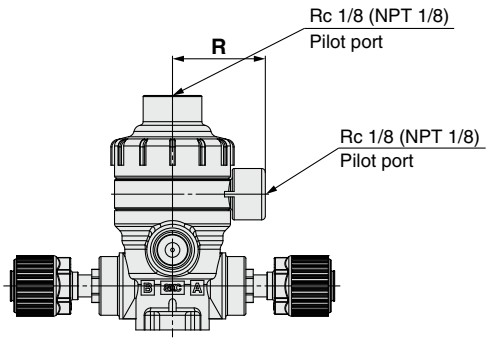
Pilot port Rc 1/8 (NPT 1/8)
Threaded type



∗ Drawings show the LVQ□0-S.

Double acting valve





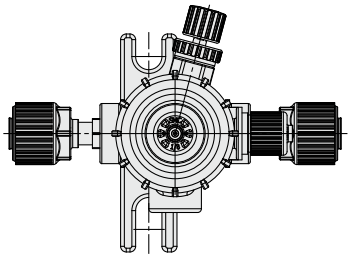
∗ Drawings show the LVQ□0-S.

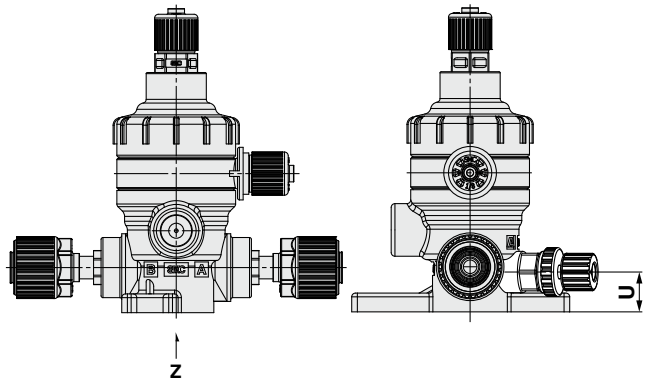
LVQ□½S-V□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R	W
								V□	S□									
LVQ2½S-V07	25.5	46	31.5	58	33.6	81	12	89	92	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3½S-V11	28.5	57	34.5	69	45.4	99	16.5	106	112	32	50	6	7	20	37.2	25	31.2	82
LVQ4½S-V13	28.5	57	34.5	69	45.4	104.5	22	120	126	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5½S-V19	42	84	48	96	75	145	25	164	168	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6½S-V25	42	84	48	96	75	154.5	32	177	—	60	88	10	7	20	50.8	38.5	45	137.5

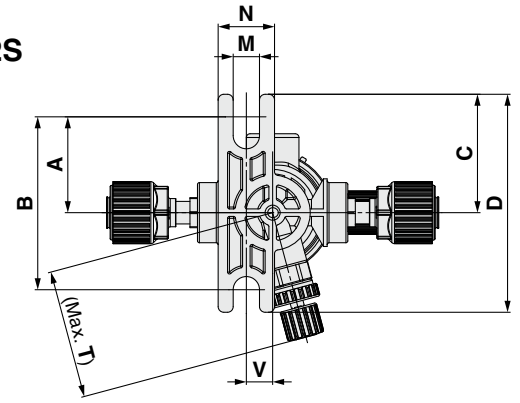
Dimensions

With by-pass
Double acting valve

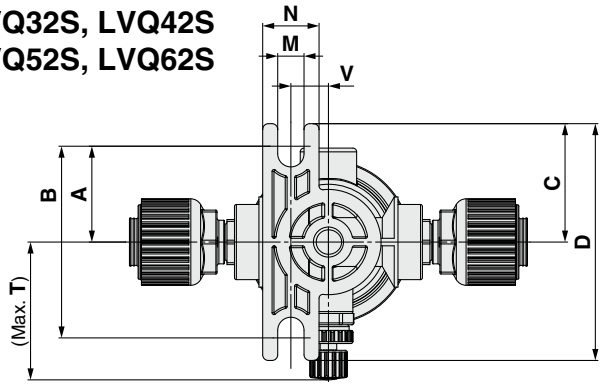




LVQ22S



LVQ32S, LVQ42S
LVQ52S, LVQ62S



View **Z**

Dimensions (Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ22S-V07-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ32S-V11-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ42S-V13-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ52S-V19-2	38	76	44	88	7	20	64	25	17
LVQ62S-V25-2	38	76	44	88	7	20	66	32	17

Manually Operated
Insert Bushing, Integrated Fitting Type
Hyper Fitting
LVQH Series

RoHS

How to Order

LVQH 2 0 – S 07 □ □ – 1 – □

Body class

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

Option

Symbol	Buffer material	Note
Nil	FKM	—
K	FFKM	—
N	EPDM	For ammonium hydroxide

Note) Options cannot be combined each other.

Fitting type

Symbol	Fitting type	Body class
V	LQ1	2, 3, 4, 5, 6
S	LQ2	2, 3, 4, 5

Handle operation

1	90° turn type
4	Multi-turn type (With indicator)

Applicable tubing size[Note)]

Symbol	Connection 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

Note) Refer to page 150 for details of the applicable tubing sizes.

Vent port type

Nil	Threaded	NPT 1/8
R	Threaded	Rc 1/8

Port B (OUT) different dia. size

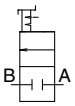
Symbol	Application
Nil	Ports A & B same size
Refer to the applicable tubing table to the left.	Different diameter tubings can be selected within the same body class.

Variations

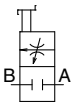
Type	Symbol	Model	LVQH20	LVQH30	LVQH40	LVQH50	LVQH60
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Tubing O.D. / Metric	6	10	12	19	25
		Tubing O.D. / Inch	1/4	3/8	1/2	3/4	1
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

Symbol

90° turn type



Multi-turn type



Standard Specifications

Model		LVQH20	LVQH30	LVQH40	LVQH50	LVQH60
Tubing O.D. Note 1)	Metric	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Fitting type		LQ1 or LQ2				LQ1
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				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa Note 2)			–98 kPa to 0.4 MPa Note 2)	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)	LVQH□0-1	0.12	0.27	0.31	1.10	1.16
	LVQH□0-4	0.11	0.20	0.22	0.67	0.87

Note 1) Refer to page 150 for details of the applicable tubing sizes.
Note 2) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

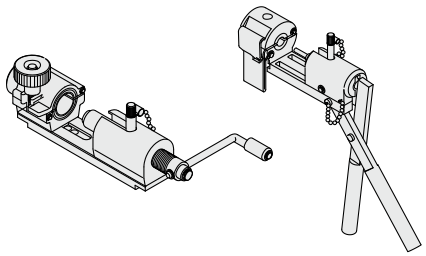
Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Connect tubing by special tools.

For information on tubing connection and special tools, please see the pamphlet "High Purity Fluoropolymer Fittings Hyper Fitting LQ1/2 Series Work Procedure Instructions" (M-E05-1). (The pamphlet can be downloaded from the SMC home page.)



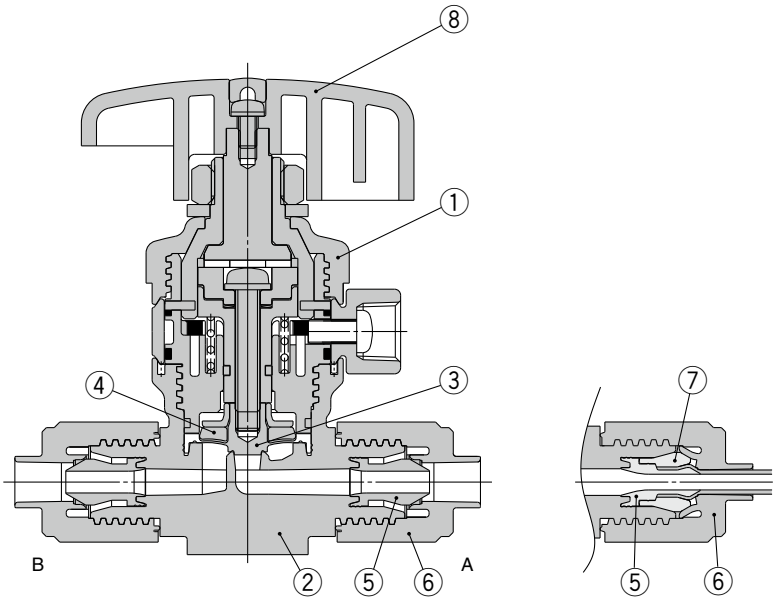
2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

Tightening Torque for Piping

Body class	Torque (N·m)	
	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 9.0
5	2.5 to 3.0	11.0 to 13.0
6	5.5 to 6.0	—

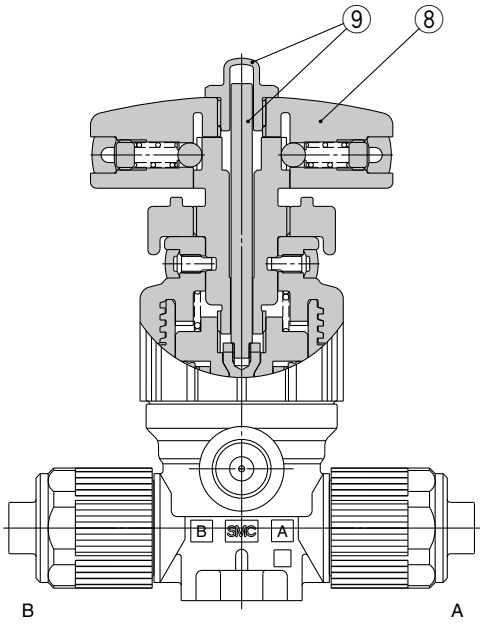
Construction

90° turn type



With reducer

Multi-turn type (With indicator)

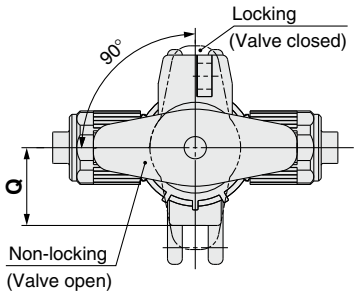


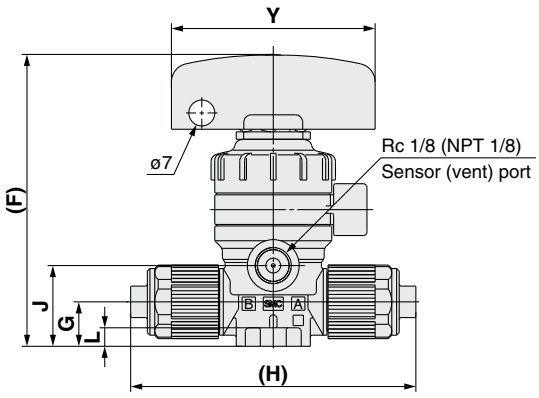
Component Parts

No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Insert bushing**	PFA
6	**Nut**	PFA
7	**Collar**	PFA
8	**Handle**	PVDF
9	**Indicator/Cover**	PP

Dimensions

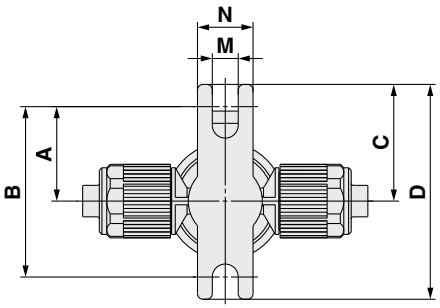
90° turn type





Dimensions (mm)

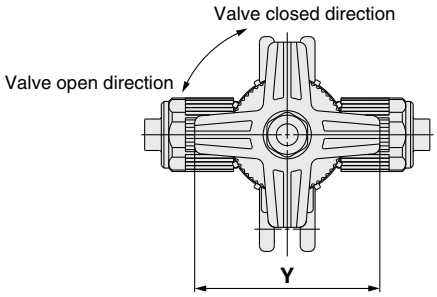
Model	A	B	C	D	F	G	H	
							V□	S□
LVQH20-$^{V}_{S}$□-1	25.5	46	31.5	58	79	12	70	77
LVQH30-$^{V}_{S}$□-1	28.5	57	34.5	69	103	16.5	83	95
LVQH40-$^{V}_{S}$□-1	28.5	57	34.5	69	108	22	95	109
LVQH50-$^{V}_{S}$□-1	42	84	48	96	165	25	130	141
LVQH60-V□-1*	42	84	48	96	175	32	150	—

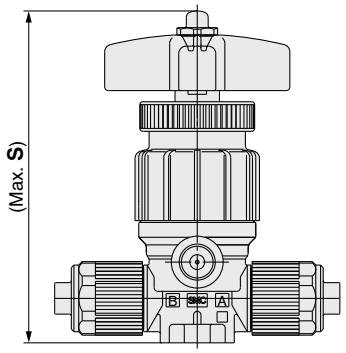


Model	J	K	L	M	N	Q	Y
LVQH20-$^{V}_{S}$□-1	21.8	37	5	7	15	21	55
LVQH30-$^{V}_{S}$□-1	32	50	6	7	20	25	80
LVQH40-$^{V}_{S}$□-1	37.5	55.5	6	7	20	25	80
LVQH50-$^{V}_{S}$□-1	50.2	78.2	10	7	20	38.5	110
LVQH60-V□-1*	60	88	10	7	20	38.5	110

* The LVQ60 is available only with "V".
* Drawings show the LVQ□0-S.

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20-$^{V}_{S}$□-4	93.6	50
LVQH30-$^{V}_{S}$□-4	111.2	50
LVQH40-$^{V}_{S}$□-4	116.7	50
LVQH50-$^{V}_{S}$□-4	170.7	71
LVQH60-V□-4*	180.2	71

* The LVQ60 is available only with "V".
* Drawings show the LVQ□0-S.

Manually Operated
Insert Bushing, Integrated Fitting Type
Space Saving/Space Saving Connection
LVQHS Series

RoHS

How to Order

LVQH 2 0 S – V 07 □ – 1 – □

Body class

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

Body type

S	Space saving connection

Fitting type

Symbol	Fitting type	Body class
V	LQ1	2, 3, 4, 5, 6

Vent port type

Nil	Threaded	NPT 1/8
R	Threaded	Rc1 /8

Applicable fitting size

Symbol	Fitting size	Body class				
		2	3	4	5	6
07	2	○				
11	3		○			
13	4			○		
19	5				○	
25	6					○

Note) Refer to page 95 for How to Order applicable fittings.
Select the same size as the fitting on the valve.

Handle operation

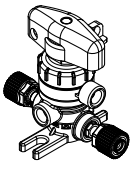
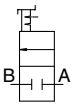
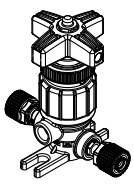
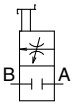
1	90° turn type
4	Multi-turn type (With indicator)

Option

Symbol	Buffer material	Note
Nil	FKM	—
K	FFKM	—
N	EPDM	For ammonium hydroxide

Note) Options cannot be combined each other.

Variations

Type / Symbol		Model	LVQH20S	LVQH30S	LVQH40S	LVQH50S	LVQH60S
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Connection fitting size	2	3	4	5	6
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

How to Order Space Saving Fittings

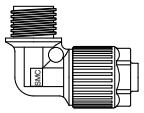
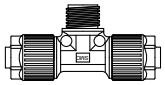
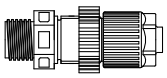
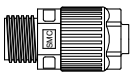
LQ1 E 61 – SN – □

Packaging

Symbol	Packaging
Nil	Clean packaging equivalent to Class M3.5
1	Standard packaging equivalent to Class M5.5

One (including insert bushing) of the nuts is not attached.

Fitting type

E	T
Union elbow	Union tee
	
P	**U**
Panel mount union	Union
	

Applicable tubing size

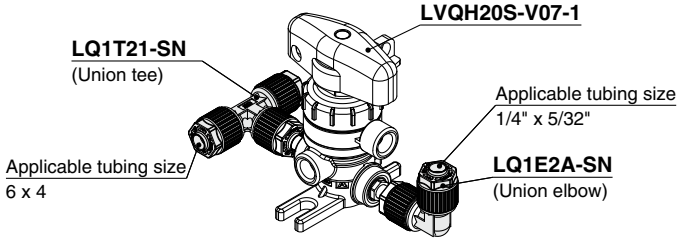
Size	No.	Applicable tubing size (mm)	Reducing
2	**1**	6 x 4	○
2	**2**	4 x 3	●
3	**1**	10 x 8	○
3	**2**	8 x 6	●
3	**3**	6 x 4	●
4	**1**	12 x 10	○
4	**2**	10 x 8	●
5	**1**	19 x 16	○
5	**2**	12 x 10	●
6	**1**	25 x 22	○
6	**2**	19 x 16	●

Size	Symbol	Applicable tubing size (mm)	Reducing
2	**A**	1/4" x 5/32"	○
2	**B**	3/16" x 1/8"	●
2	**C**	1/8" x 0.086"	●
3	**A**	3/8" x 1/4"	○
3	**B**	1/4" x 5/32"	●
4	**A**	1/2" x 3/8"	○
4	**B**	3/8" x 1/4"	●
5	**A**	3/4" x 5/8"	○
5	**B**	1/2" x 3/8"	●
6	**A**	1" x 7/8"	○
6	**B**	3/4" x 5/8"	●

○ Basic size ● With reducer

Note 1) Select the same size as the fitting on the valve.

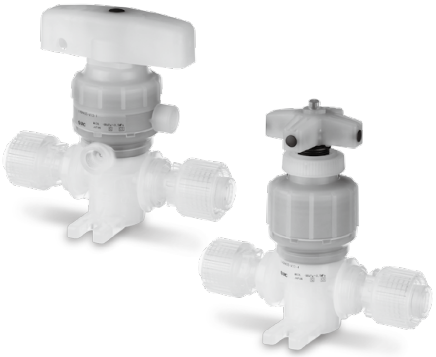
Piping Example



Ordering Example

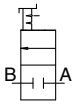
LVQH20S-V07-1 1
LQ1T21-SN (Union tee) 1
LQ1E2A-SN (Union elbow) 1

Note) For shipment, the valve and fittings are individually packaged and dispatched together in 1 box.

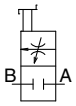


Symbol

90° turn type



Multi-turn type



Standard Specifications

Model		LVQH20S	LVQH30S	LVQH40S	LVQH50S	LVQH60S
Connection fitting size		2	3	4	5	6
Fitting type		LQ1				
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				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa Note)			–98 kPa to 0.4 MPa Note)	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)	**LVQH□0S-1**	0.14	0.30	0.33	1.14	1.18
	LVQH□0S-4	0.13	0.23	0.24	0.71	0.89

Note) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Take extra care with the insert bushing when connecting the fittings.

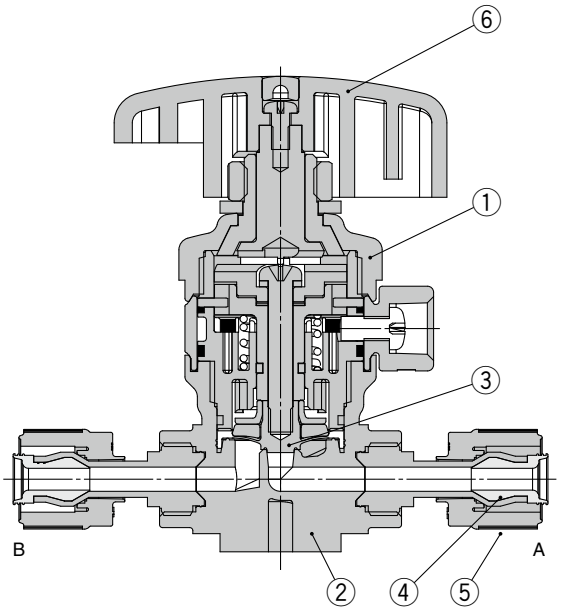
2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

Tightening Torque for Piping

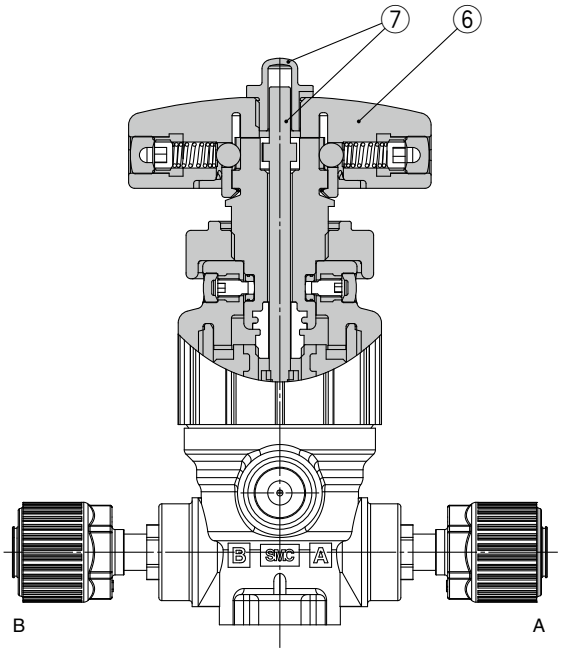
Body class	Torque (N·m)
	LQ1
2	0.3 to 0.4
3	0.8 to 1.0
4	1.0 to 1.2
5	2.5 to 3.0
6	5.5 to 6.0

Construction

90° turn type



Multi-turn type (With indicator)

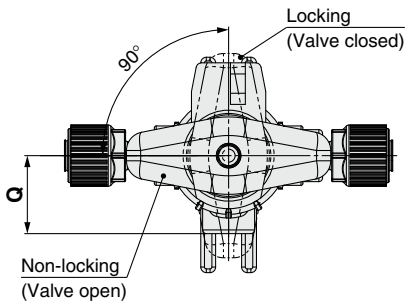


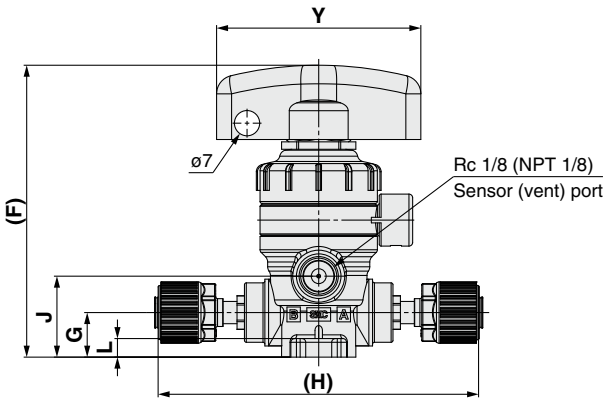
Component Parts

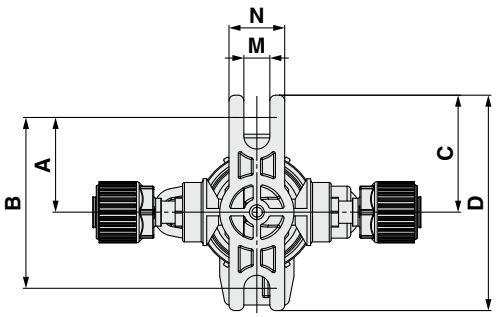
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Insert bushing**	PFA
5	**Nut**	PFA
6	**Handle**	PVDF
7	**Indicator/Cover**	PP

Dimensions

90° turn type







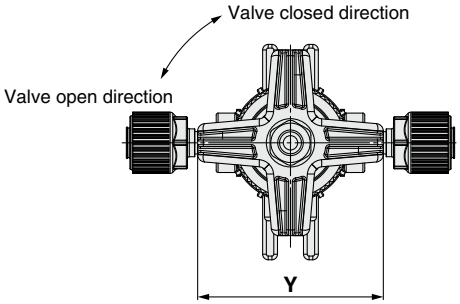
Dimensions (mm)

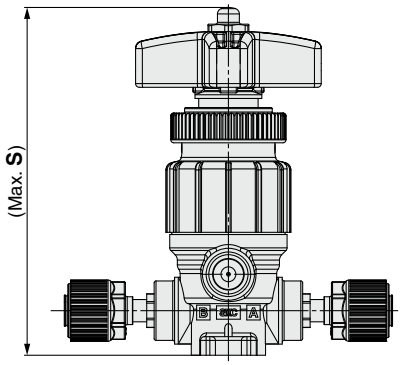
Model	A	B	C	D	F	G	H
LVQH20S-V□-1	25.5	46	31.5	58	79	12	89
LVQH30S-V□-1	28.5	57	34.5	69	103	16.5	106
LVQH40S-V□-1	28.5	57	34.5	69	108	22	120
LVQH50S-V□-1	42	84	48	96	165	25	164
LVQH60S-V□-1	42	84	48	96	175	32	177

Model	J	L	M	N	Q	Y
LVQH20S-V□-1	21.8	5	7	15	21	55
LVQH30S-V□-1	32	6	7	20	25	80
LVQH40S-V□-1	37.5	6	7	20	25	80
LVQH50S-V□-1	50.2	10	7	20	38.5	110
LVQH60S-V□-1	60	10	7	20	38.5	110

∗ Drawings show the LVQ□0-S.

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20S-V□-4	93.6	50
LVQH30S-V□-4	111.2	50
LVQH40S-V□-4	116.7	50
LVQH50S-V□-4	170.7	71
LVQH60S-V□-4	180.2	71

∗ Drawings show the LVQ□0-S.

LVQ Series
Fittings and Special Tools

Fittings

How to Change Tubing Sizes

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

Body class	Connection tubing O.D.													
	Metric size							Inch size						
	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	—	—	—	—	—	●	○	—	—	—	—	—	●	○

Parts Composition

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

⚠ Caution

1. Connect tubing by special tools.

For information on tubing connection and special tools, please see the pamphlet "High Purity Fluoropolymer Fittings Hyper Fitting LQ1/2 Series Work Procedure Instructions" (M-E05-1). (The pamphlet can be downloaded from the SMC home page.)

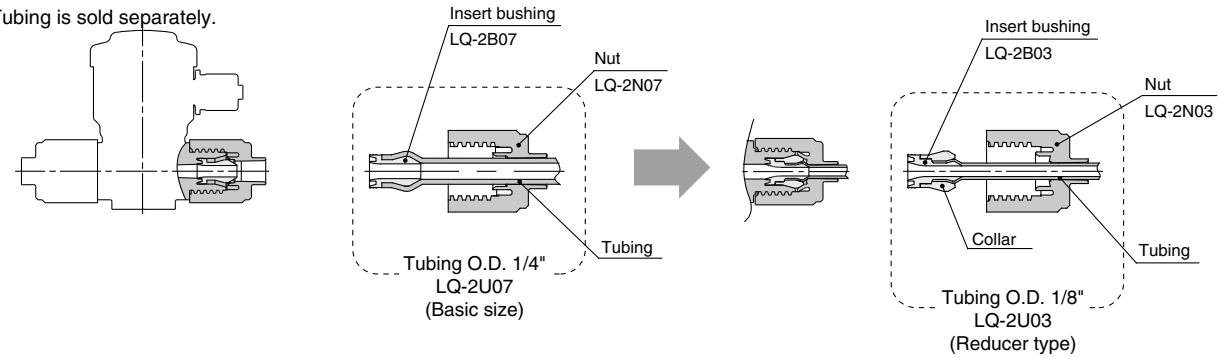
Changing the tubing size

Example) Changing the tubing from an O.D. 1/4" to O.D. 1/8" within the body class 2.

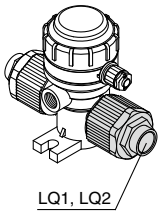
Prepare an insert bushing and nut for 1/8" O.D. tubing (LQ-2U03) and change the tubing size.

(Refer to How to Order Fitting Parts.)

Note) Tubing is sold separately.



How to Order Fitting Parts



LQ □ – 2 U 03

∗ U type is recommended when changing tubing sizes.

Fitting type

Symbol	Applicable fitting
Nil	LQ2
1	LQ1

Body class (fittings)

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

Parts type

Symbol	Parts type
U	Nut & Insert bushing
B	Insert bushing
N	Nut

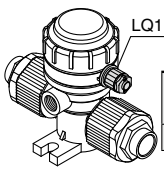
Tubing size Note)

Symbol	Tubing size	Body class (fittings)	Applicable fitting
03	1/8" x 0.086"(3 x 2)	2	LQ1 LQ2
04	4 x 3		
05	3/16" x 1/8"		
06	6 x 4		
07	1/4" x 5/32"		
06	6 x 4	3	
08	8 x 6		
10	10 x 8		
07	1/4" x 5/32"		
11	3/8" x 1/4"		

Symbol	Tubing size	Body class (fittings)	Applicable fitting
10	10 x 8	4	LQ1 LQ2
12	12 x 10		
11	3/8" x 1/4"		
13	1/2" x 3/8"		
12	12 x 10	5	
13	1/2" x 3/8"		
19	3/4" x 5/8", 19 x 16		
19	3/4" x 5/8", 19 x 16	6	LQ1
25	1" x 7/8", 25 x 22		

Note) Refer to page 150 for details of the applicable tubing sizes.

For pilot port



LQ1 – 1 U 03

Body class (fittings)

Symbol	Body class (fittings)	Applicable fitting
1	1	LQ1

Parts type

Symbol	Parts type
U	Nut & Insert bushing
B	Insert bushing
N	Nut

Tubing size Note 1) Note 2)

Symbol	Tubing size	Body class (fittings)
03	1/8" x 0.086"(3 x 2)	1
04	4 x 3	

Note 1) Cannot change to tubing with different diameter.
Note 2) Refer to page 150 for details of the applicable tubing sizes.

Air Operated
Flare, Integrated Fitting Type
Hyper Fitting
LVQ-Z Series

RoHS

How to Order

LVQ 2 0 – Z 07 ☐ ☐ – ☐ – ☐

❶ ❷ ❸ ❹ ❺ ❻ ❼

● LQ3 integrated fitting

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Applicable tubing size Note)

Symbol	Connection 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"	○				
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"					○

Note) Refer to page 150 for details of the applicable tubing sizes.

❹ Pilot port type

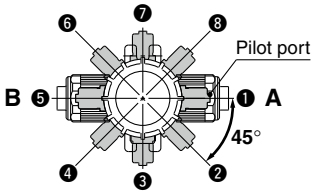
Nil	With LQ3 fitting	Connection tubing size 1/8" x 0.086" (3 x 2) Note)
M	With LQ3 fitting	Connection tubing size 4 x 3 Note)
R	Threaded	Rc1/8
N	Threaded	NPT1/8

Note) Refer to page 150 for details of the applicable tubing sizes.

❺ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

SMC

❻ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
5	High back pressure (0.42 MPa)
6	High back pressure with flow rate adjustment
7	High back pressure with by-pass
8	High back pressure with flow rate adjustment & by-pass
9	High back pressure with indicator
24	With indicator & by-pass

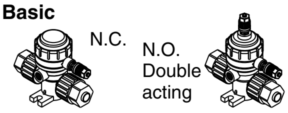
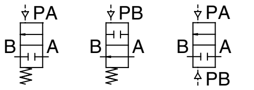
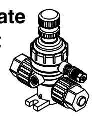
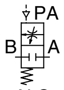
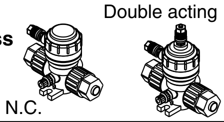
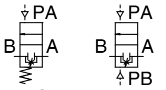
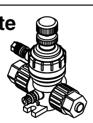
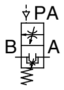
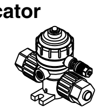
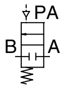
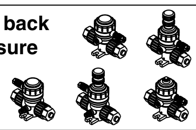
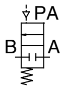
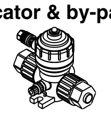
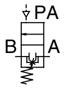
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined each other.

❼ Option 2

Symbol	Applicable option											Buffer material	Note
	Nil	1	2	3	4	5	6	7	8	9	24		
Nil	○	○	○	○	○	○	○	○	○	○	○	FKM	—
J	○	○	—	—	—	—	—	—	—	—	—	FKM	For high temperature
K	○	○	○	○	○	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	○	—	—	—	—	—	FKM	High flow type **LVQ6□** only

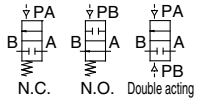
Note 1) Options 2 in the same table cannot be combined each other.
Note 2) Only option 1 (with flow rate adjustment) is available for use in high-temperature environments. However, it cannot be used in combination with any of the high back pressure specifications.

Variations

Type	Symbol	Valve type	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Model			LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Orifice diameter			ø4	ø8	ø10	ø16	ø22
Tubing O.D.		Metric	6	10	12	19	25
Tubing O.D.		Inch	1/4	3/8	1/2	3/4	1
Basic N.C. / N.O. Double acting 	 PA B A N.C. / PB B A N.O. / PA B A PB Double acting	N.C.	○	○	○	○	○
		N.O.	○	○	○	○	○
		Double acting	○	○	○	○	○
With flow rate adjustment 	 PA B A N.C.	N.C.	○	○	○	○	○
With by-pass N.C. / Double acting 	 PA B A N.C. / PA B A PB Double acting	N.C.	○	○	○	○	○
		Double acting	○	○	○	○	○
With flow rate adjustment & by-pass 	 PA B A N.C.	N.C.	○	○	○	○	○
With indicator 	 PA B A N.C.	N.C.	○	○	○	○	○
High back pressure 	 PA B A N.C.	N.C.	○	○	○	○	○
With indicator & by-pass 	 PA B A N.C.	N.C.	○	○	○	○	○

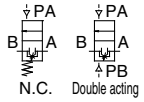
Symbol

Basic/With indicator/
High back pressure



With flow rate adjustment

With by-pass/
With indicator & by-pass



With flow rate adjustment & by-pass

Standard Specifications

Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Tubing O.D. Note 1)	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 (8.1) Note 2)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 2)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa Note 3)			–98 kPa to 0.4 MPa Note 3)	
	High temperature	–98 kPa to 0.3 MPa Note 3)				
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42 or less				
	High temperature	0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size		1/8" (ø3), Rc 1/8, NPT 1/8				
Fluid temperature (°C)	Standard	0 to 100				
	High temperature	0 to 170				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.08	0.18	0.22	0.72	0.87

Note 1) Refer to page 150 for details of the applicable tubing sizes.
Note 2) ( ): High flow type
Note 3) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

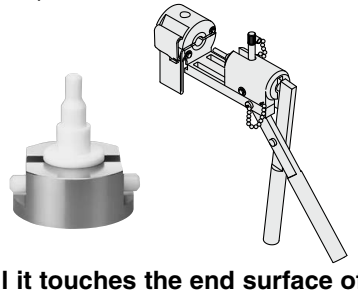
Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Connect tubing by special tools.

For information on tubing fittings and special tools, please see the pamphlet “High Purity Fluoropolymer Fittings Hyper Fitting/Flare Type LQ3 Series Fitting Procedure” (M-E06-4). (The pamphlet can be downloaded from the SMC home page.)



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

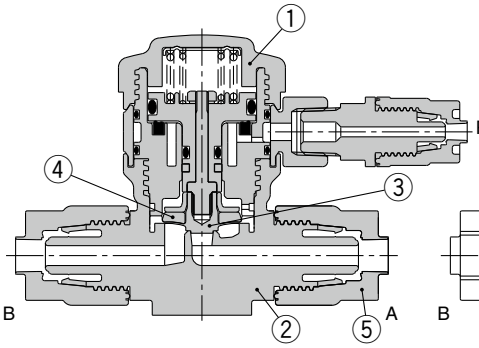
Tightening Torque for Piping

Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

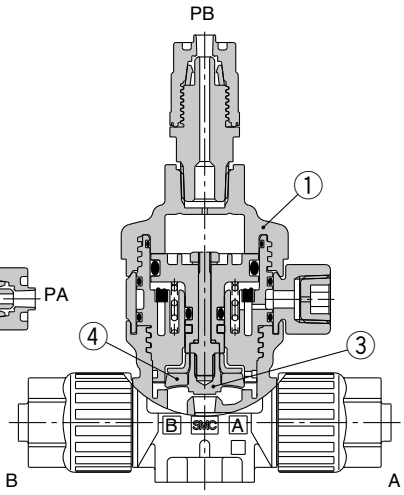
Construction

Basic

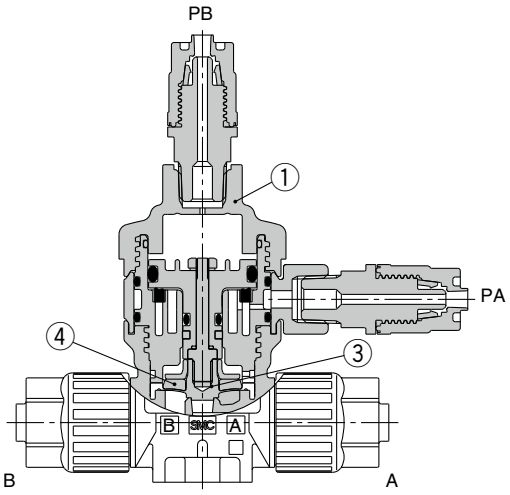
N.C.



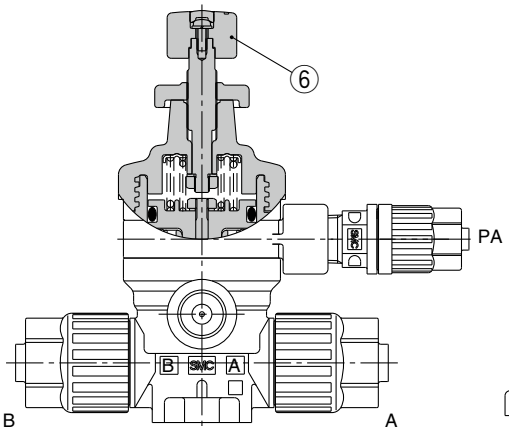
N.O.



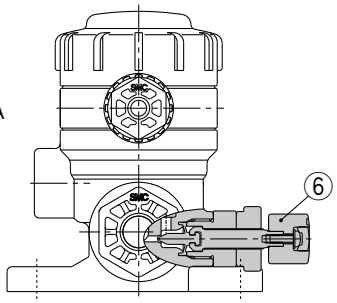
Double acting



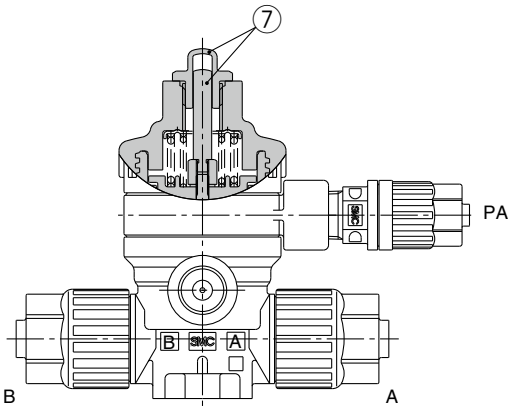
With flow rate adjustment



With by-pass



With indicator

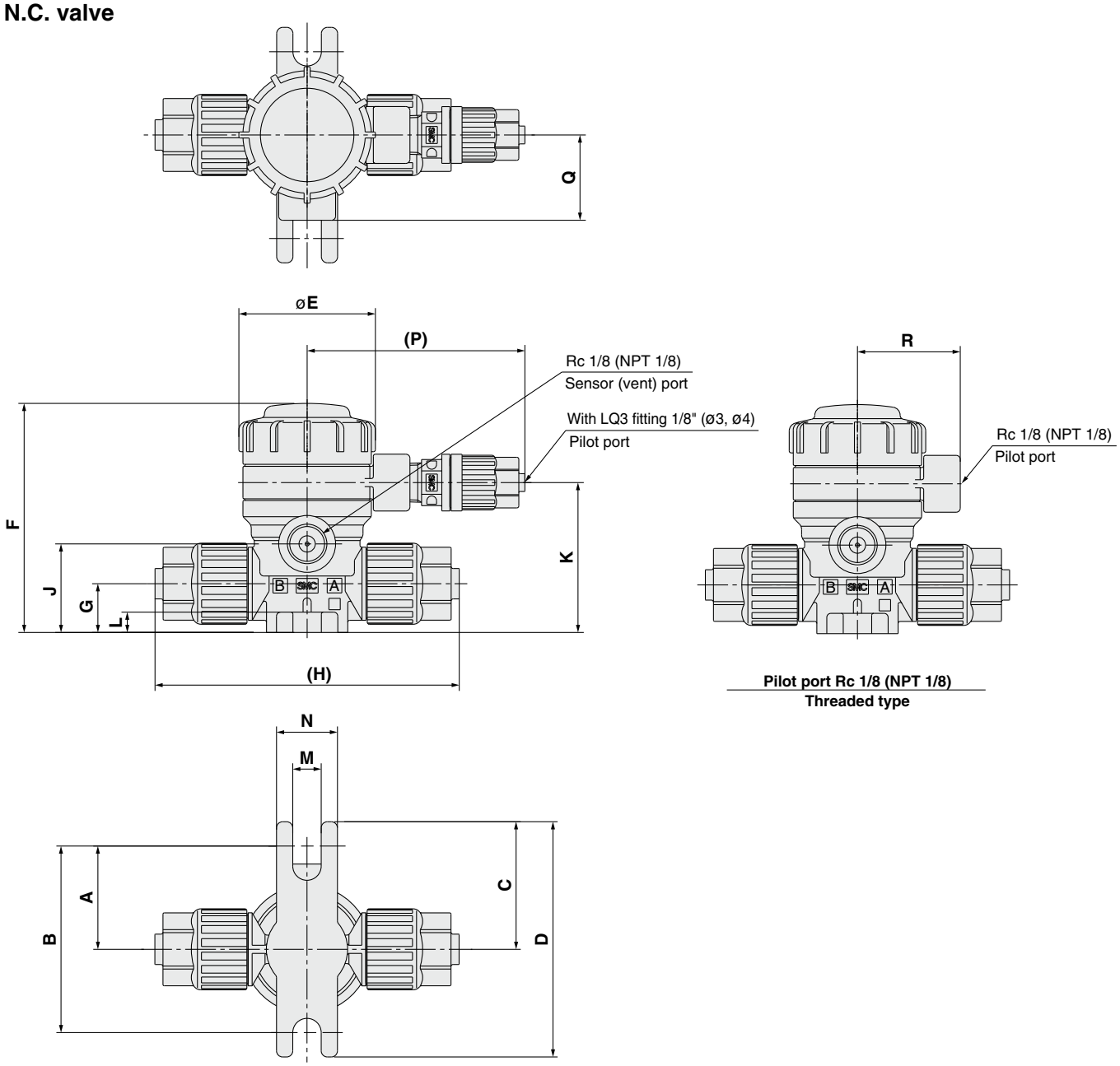


Component Parts

No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Nut**	PFA
6	**Flow rate adjuster**	PVDF
7	**Indicator/Cover**	PP

Dimensions

Basic, High back pressure
N.C. valve



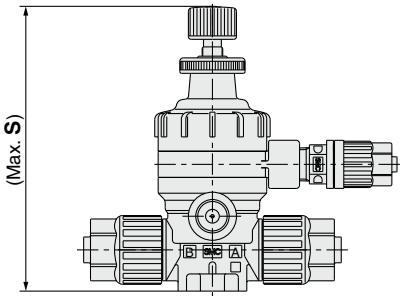
LVQ□0-Z□□ Dimensions (N.C. Valve) (mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20-Z□□	25.5	46	31.5	58	33.6	56.5	12	75	21.8	37	5	7	15	53.5	21	25.3
LVQ30-Z□□	28.5	57	34.5	69	45.4	77	16.5	103	32	50	6	7	20	59.5	25	31.2
LVQ40-Z□□	28.5	57	34.5	69	45.4	82.5	22	114	37.5	55.5	6	7	20	59.5	25	31.2
LVQ50-Z□□	42	84	48	96	75	127	25	150	50.2	78.2	10	7	20	73	38.5	45
LVQ60-Z□□	42	84	48	96	75	136.8	32	167	60	88	10	7	20	73	38.5	45

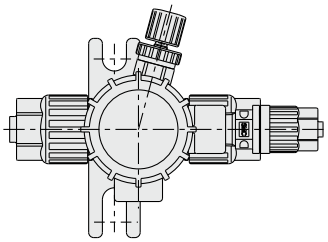
With flow rate adjustment
N.C. valve

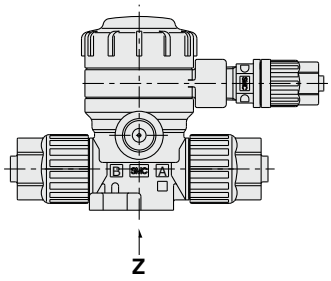
Dimensions (mm)

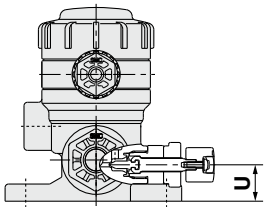
Model	S
LVQ20-Z□□-1	83
LVQ30-Z□□-1	113.5
LVQ40-Z□□-1	119
LVQ50-Z□□-1	171.5
LVQ60-Z□□-1	182.5



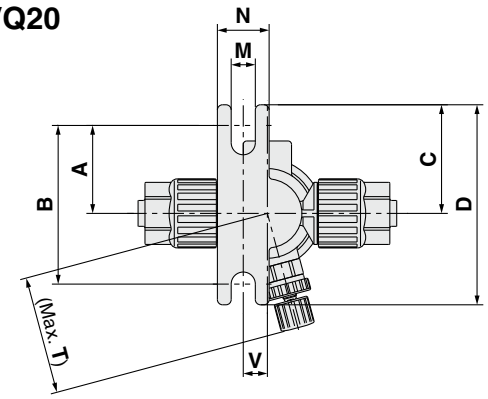
With by-pass
N.C. valve



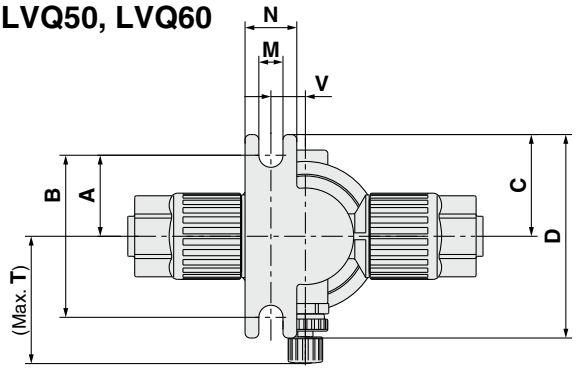




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



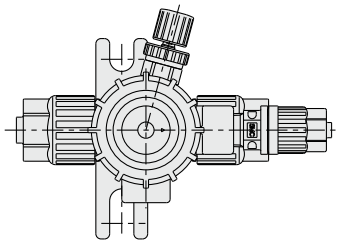
View **Z**

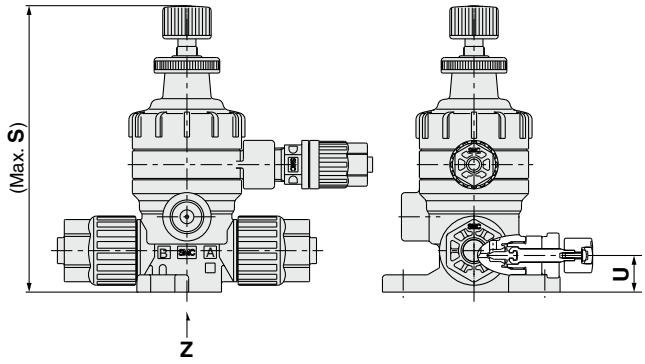
Dimensions (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ20-Z□□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30-Z□□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40-Z□□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50-Z□□-2	38	76	44	88	7	20	64	25	17
LVQ60-Z□□-2	38	76	44	88	7	20	66	32	17

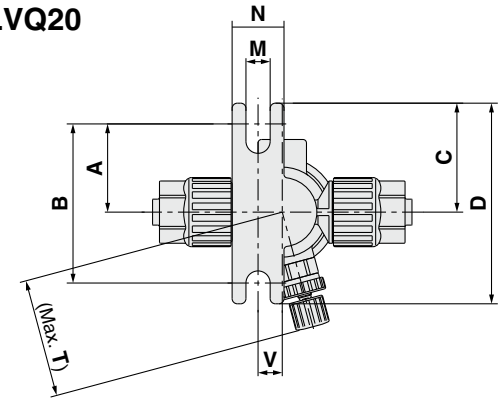
Dimensions

With flow rate adjustment & by-pass
N.C. valve

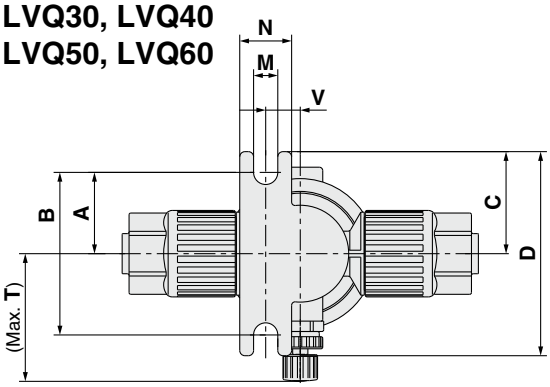




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

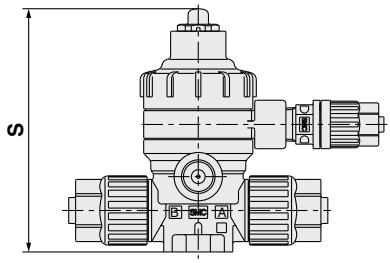
Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V
LVQ20-Z□□-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7
LVQ30-Z□□-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10
LVQ40-Z□□-3	25.5	51	31.5	63	7	15	119	37.9	22	10
LVQ50-Z□□-3	38	76	44	88	7	20	171.5	64	25	17
LVQ60-Z□□-3	38	76	44	88	7	20	182.5	66	32	17

With indicator
N.C. valve

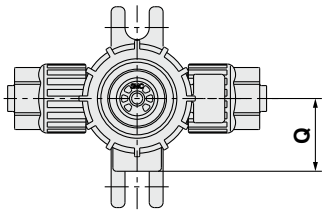
Dimensions (mm)

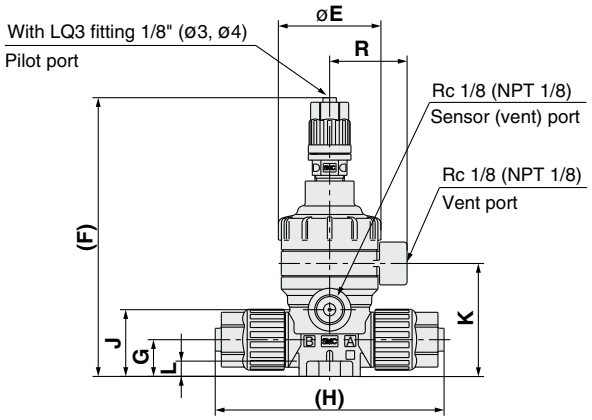
Model	S
LVQ20-Z□□-4	70.5
LVQ30-Z□□-4	88.5
LVQ40-Z□□-4	94
LVQ50-Z□□-4	134.5
LVQ60-Z□□-4	144

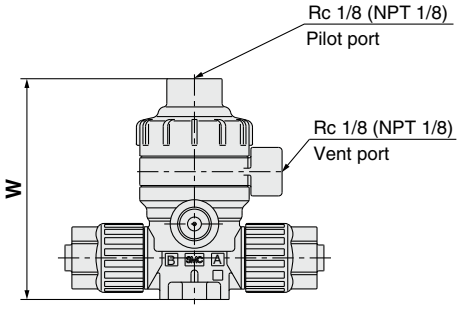


Basic

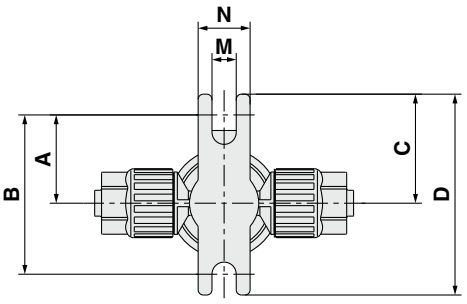
N.O. valve



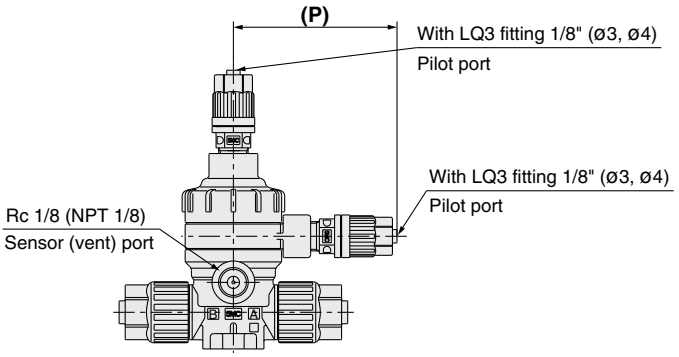


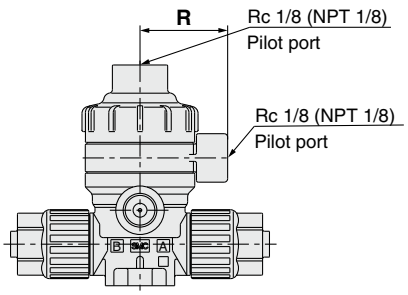


Pilot port Rc 1/8 (NPT 1/8)
Threaded type



Double acting valve



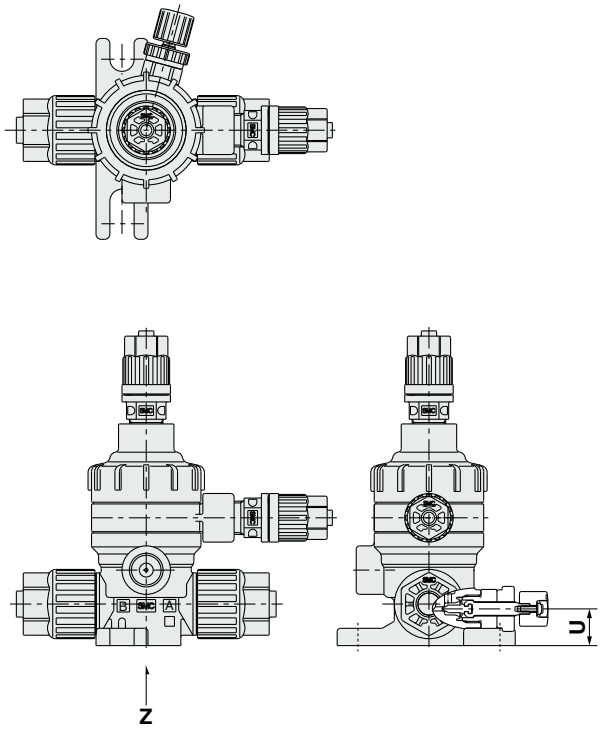


LVQ□$\frac{1}{2}$-Z□□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

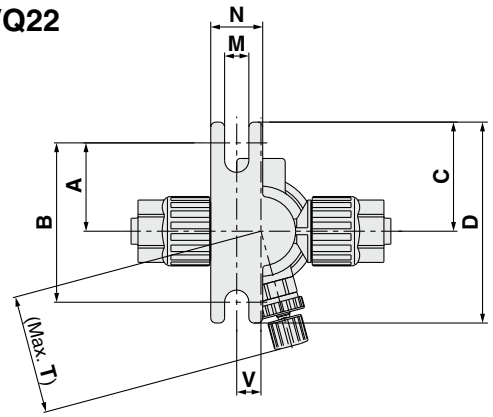
Model	A	B	B	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2$\frac{1}{2}$-Z□□	25.5	46	31.5	58	33.6	89.5	12	75	21.8	37	5	7	15	53.5	21	25.3	64
LVQ3$\frac{1}{2}$-Z□□	28.5	57	34.5	69	45.4	107.5	16.5	103	32	50	6	7	20	59.5	25	31.2	82
LVQ4$\frac{1}{2}$-Z□□	28.5	57	34.5	69	45.4	113	22	114	37.5	55.5	6	7	20	59.5	25	31.2	87.5
LVQ5$\frac{1}{2}$-Z□□	42	84	48	96	75	153.2	25	150	50.2	78.2	10	7	20	73	38.5	45	128
LVQ6$\frac{1}{2}$-Z□□	42	84	48	96	75	163	32	167	60	88	10	7	20	73	38.5	45	137.5

Dimensions

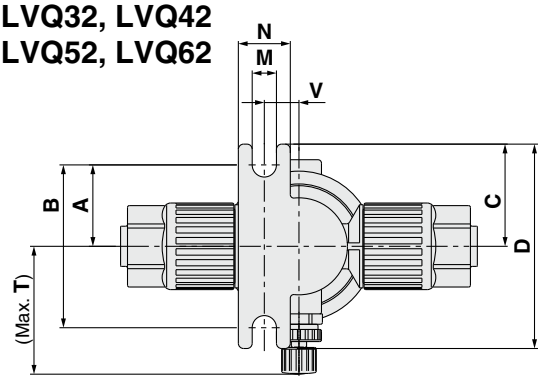
With by-pass
Double acting valve



LVQ22



LVQ32, LVQ42
LVQ52, LVQ62



View **Z**

Dimensions (Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ22-Z□□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ32-Z□□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ42-Z□□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ52-Z□□-2	38	76	44	88	7	20	64	25	17
LVQ62-Z□□-2	38	76	44	88	7	20	66	32	17

Air Operated
Flare, Integrated Fitting Type
Space Saving/Space Saving Connection
LVQS-Z Series

RoHS

How to Order

LVQ 2 0 S – Z 07 □ □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

LQ3 integrated fitting

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Body type

S	Space saving connection

❹ Applicable fitting size

Symbol	Fitting size	Body class				
		2	3	4	5	6
07	2	○				
11	3		○			
13	4			○		
19	5				○	
25	6					○

Note) Refer to page 113 for How to Order fitting parts. Select a tube with the same size as the valve side fitting.

❺ Pilot port type

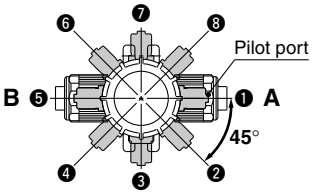
Nil	With LQ3 fitting	Connection tubing size 1/8" x 0.086" (3 x 2) Note)
M	With LQ3 fitting	Connection tubing size 4 x 3 Note)
R	Threaded	Rc1/8
N	Threaded	NPT1/8

Note) Refer to page 150 for details of the applicable tubing sizes.

❻ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❼ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
5	High back pressure (0.42 MPa)
6	High back pressure with flow rate adjustment
7	High back pressure with by-pass
8	High back pressure with flow rate adjustment & by-pass
9	High back pressure with indicator
24	With indicator & by-pass

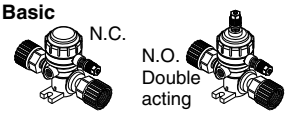
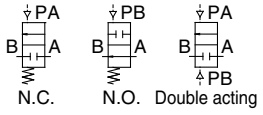
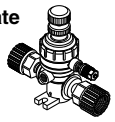
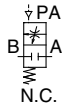
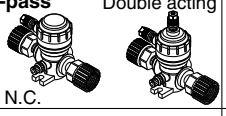
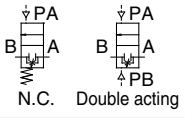
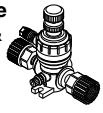
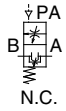
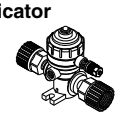
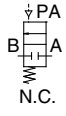
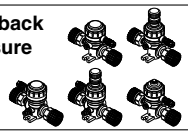
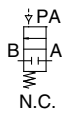
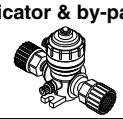
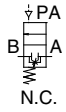
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined each other.

❽ Option 2

Symbol	Applicable option											Buffer material	Note
	Nil	1	2	3	4	5	6	7	8	9	24		
Nil	○	○	○	○	○	○	○	○	○	○	○	FKM	—
J	○	○	—	—	—	—	—	—	—	—	—	FKM	For high temperature
K	○	○	○	○	○	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	○	—	—	—	—	—	FKM	High flow type **LVQ6**□ only

Note 1) Options 2 in the same table cannot be combined each other.
Note 2) Only option 1 (with flow rate adjustment) is available for use in high-temperature environments. However, it cannot be used in combination with any of the high back pressure specifications.

Variations

Type / Symbol	Valve type	LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
	Orifice diameter	ø4	ø8	ø10	ø16	ø22
	Connection fitting size	2	3	4	5	6
Basic  	N.C.	○	○	○	○	○
	N.O.	○	○	○	○	○
	Double acting	○	○	○	○	○
With flow rate adjustment  	N.C.	○	○	○	○	○
With by-pass Double acting  	N.C.	○	○	○	○	○
	Double acting	○	○	○	○	○
With flow rate adjustment & by-pass  	N.C.	○	○	○	○	○
With indicator  	N.C.	○	○	○	○	○
High back pressure  	N.C.	○	○	○	○	○
With indicator & by-pass  	N.C.	○	○	○	○	○

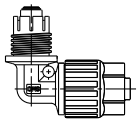
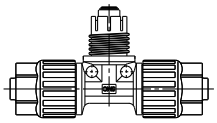
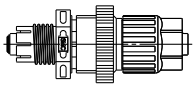
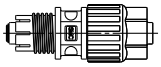
How to Order Space Saving Fittings

LQ3 [E] [6A] – SN – [ ]

Packaging

Symbol	Packaging
Nil	Clean packaging equivalent to Class M3.5
1	Standard packaging equivalent to Class M5.5

Fitting type

E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

One of the nuts is not attached.

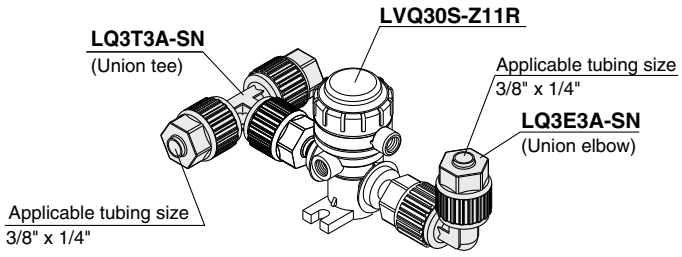
Applicable tubing size Note 1) Note 2)

Size	Symbol	Applicable tubing size (mm)
2	**1**	6 x 4
3	**1**	10 x 8
3	**2**	8 x 6
4	**1**	12 x 10
5	**1**	19 x 16
6	**1**	25 x 22

Size	Symbol	Applicable tubing size (inch)
2	**A**	1/4" x 5/32"
3	**A**	3/8" x 1/4"
4	**A**	1/2" x 3/8"
5	**A**	3/4" x 5/8"
6	**A**	1" x 7/8"

Note 1) Select the same size as the fitting on the valve.
Note 2) Refer to page 150 for details of the applicable tubing sizes.

Piping Example



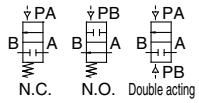
Ordering Example

LVQ30S-Z11R 1
LQ3T3A-SN (Union tee) 1
LQ3E3A-SN (Union elbow) 1

Note) For shipment, the valve and fittings are individually packaged and dispatched together in 1 box.

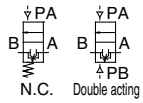
Symbol

Basic/With indicator/
High back pressure

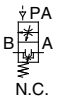


With flow rate
adjustment

With by-pass/
With indicator & by-pass



With flow rate
adjustment & by-pass



Standard Specifications

Model		LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
Connection fitting size		2	3	4	5	6
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow rate characteristics	**Kv**	0.3	1.1	1.6	4.2	6.8 (8.1) Note 1)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 1)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	**Standard**	–98 kPa to 0.5 MPa Note 3)			–98 kPa to 0.4 MPa Note 3)	
	High temperature	–98 kPa to 0.3 MPa Note 3)				
Back pressure (MPa)	**Standard**	0.3 or less			0.2 or less	
	High back pressure	0.42 or less				
	High temperature	0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size Note 2)		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)	**Standard**	0 to 100				
	High temperature	0 to 170				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.085	0.175	0.223	0.725	0.835

Note 1) ( ): High flow type
Note 2) Refer to page 150 for details of the applicable tubing sizes.
Note 3) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

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

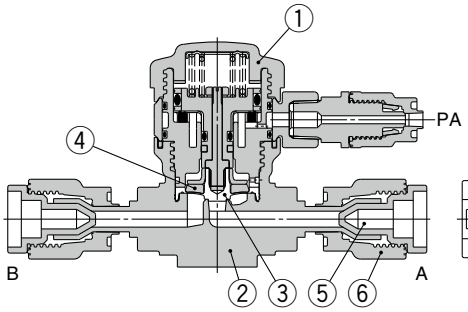
Tightening Torque for Piping

Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

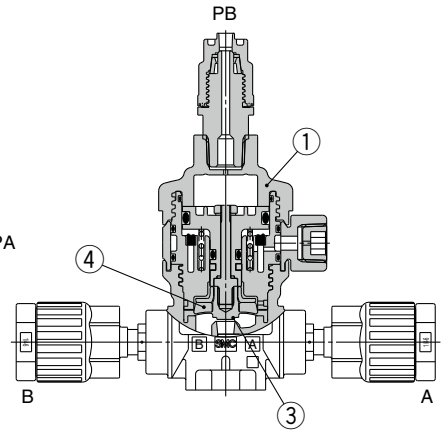
Construction

Basic

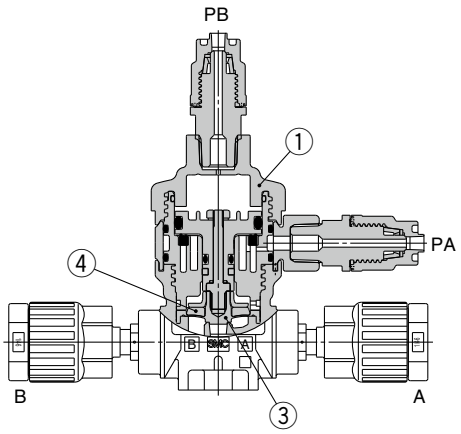
N.C.



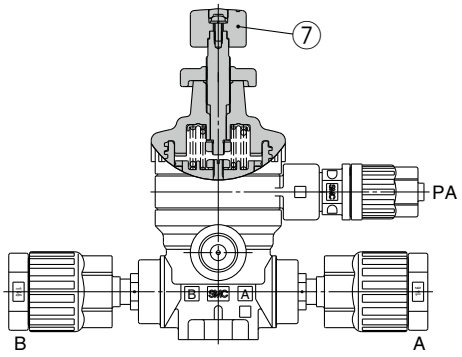
N.O.



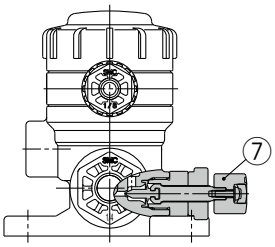
Double acting



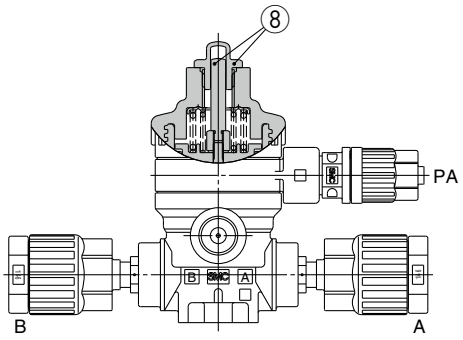
With flow rate adjustment



With by-pass



With indicator

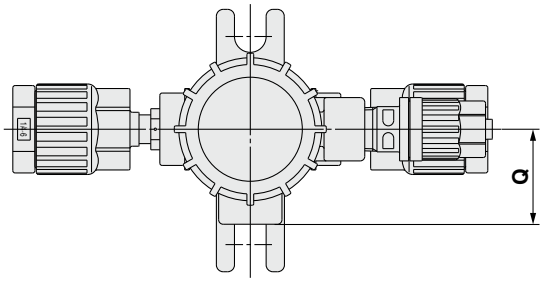


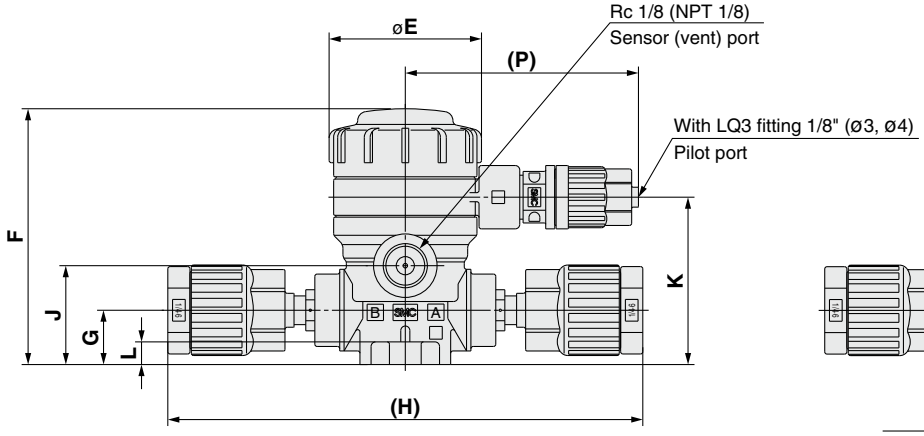
Component Parts

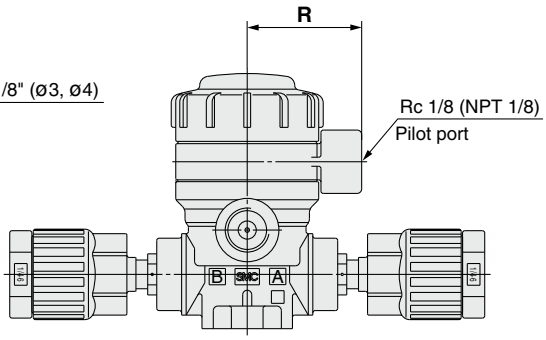
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Plug**	PP
6	**Nut**	PFA
7	**Flow rate adjuster**	PVDF
8	**Indicator/Cover**	PP

Dimensions

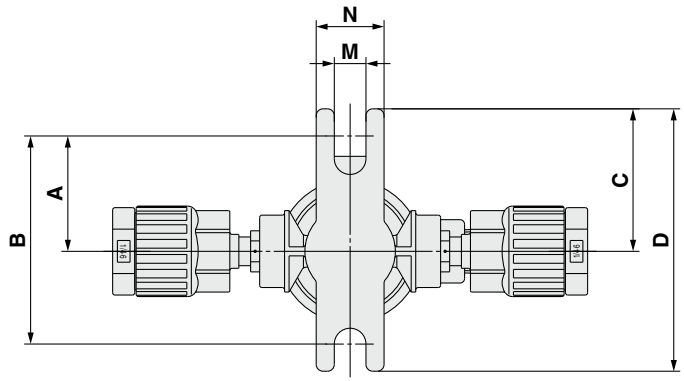
Basic, High back pressure
N.C. valve







Pilot port Rc 1/8 (NPT 1/8)
Threaded type



LVQ□0S-Z□ Dimensions (N.C. Valve) (mm)

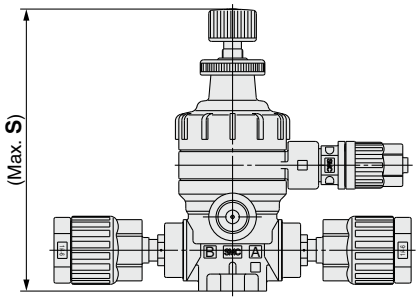
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20S-Z□	25.5	46	31.5	58	33.6	56.5	12	105	21.8	37	5	7	15	53.5	21	25.3
LVQ30S-Z□	28.5	57	34.5	69	45.4	77	16.5	137	32	50	6	7	20	59.5	25	31.2
LVQ40S-Z□	28.5	57	34.5	69	45.4	82.5	22	151	37.5	55.5	6	7	20	59.5	25	31.2
LVQ50S-Z□	42	84	48	96	75	127	25	202	50.2	78.2	10	7	20	73	38.5	45
LVQ60S-Z□	42	84	48	96	75	136.8	32	236	60	88	10	7	20	73	38.5	45

Dimensions

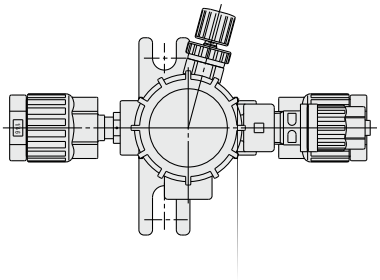
With flow rate adjustment, High back pressure with flow rate adjustment N.C. valve

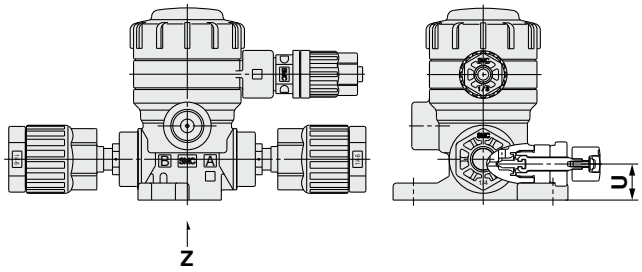
Dimensions (mm)

Model	S
LVQ20S-Z□-1	83
LVQ30S-Z□-1	113.5
LVQ40S-Z□-1	119
LVQ50S-Z□-1	171.5
LVQ60S-Z□-1	182.5

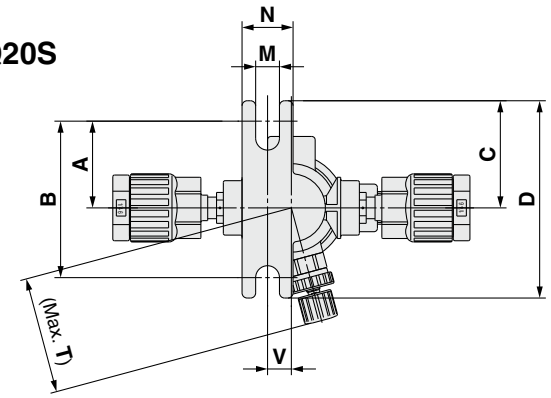


With by-pass, High back pressure with by-pass N.C. valve

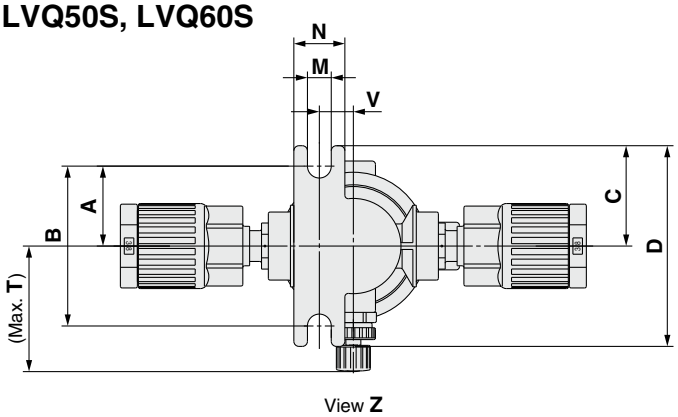




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S

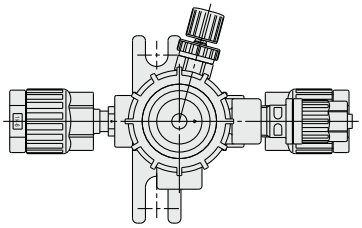


View **Z**

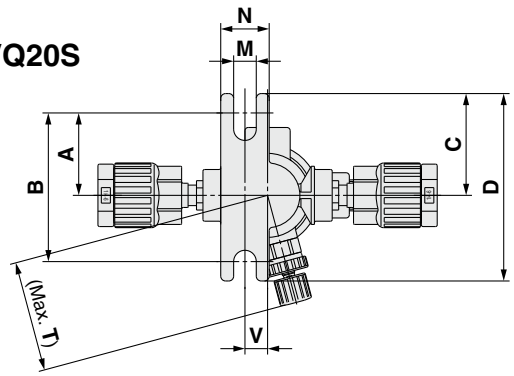
Dimensions (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ20S-Z□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30S-Z□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40S-Z□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50S-Z□-2	38	76	44	88	7	20	64	25	17
LVQ60S-Z□-2	38	76	44	88	7	20	66	32	17

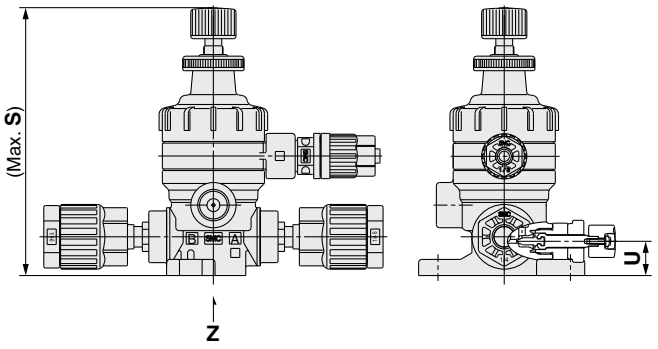
With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve

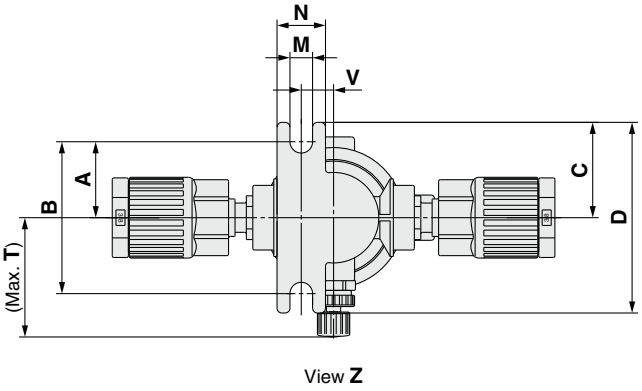


LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S





View **Z**

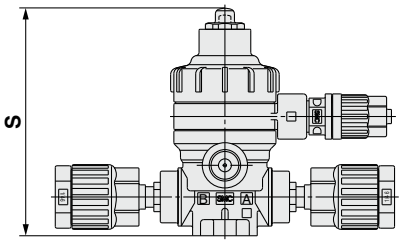
Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V
LVQ20S-Z□-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7
LVQ30S-Z□-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10
LVQ40S-Z□-3	25.5	51	31.5	63	7	15	119	37.9	22	10
LVQ50S-Z□-3	38	76	44	88	7	20	171.5	64	25	17
LVQ60S-Z□-3	38	76	44	88	7	20	182.5	66	32	17

With indicator, High back pressure with indicator
N.C. valve

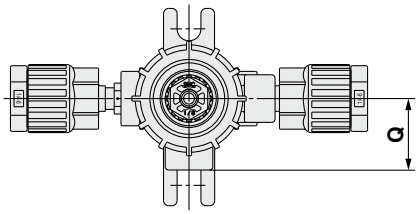
Dimensions (mm)

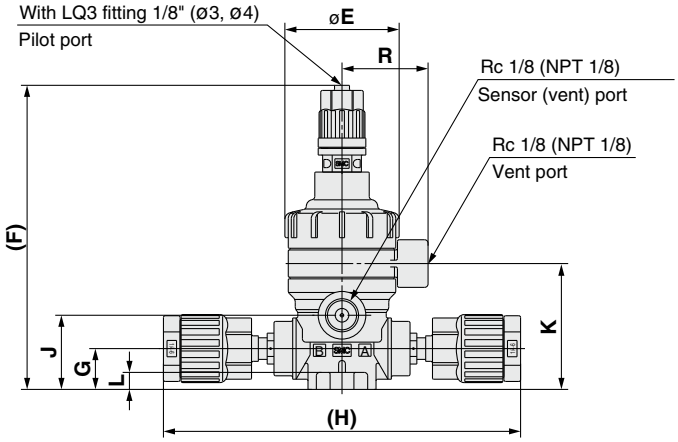
Model	S
LVQ20S-Z□-4	70.5
LVQ30S-Z□-4	88.5
LVQ40S-Z□-4	94
LVQ50S-Z□-4	134.5
LVQ60S-Z□-4	144

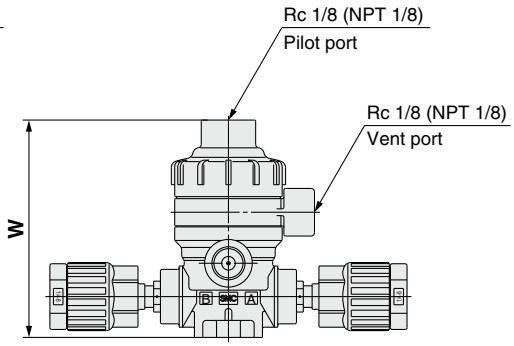


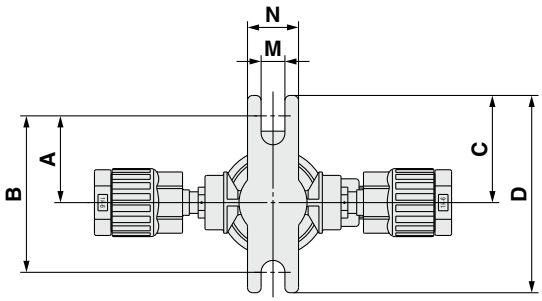
Dimensions

Basic
N.O. valve

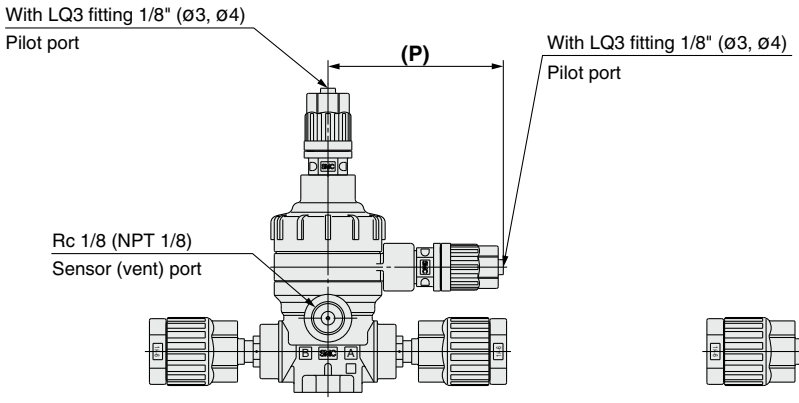


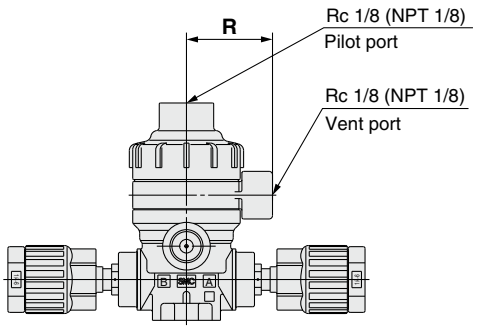






Double acting valve

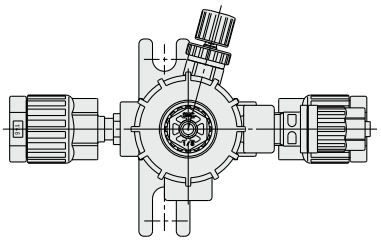




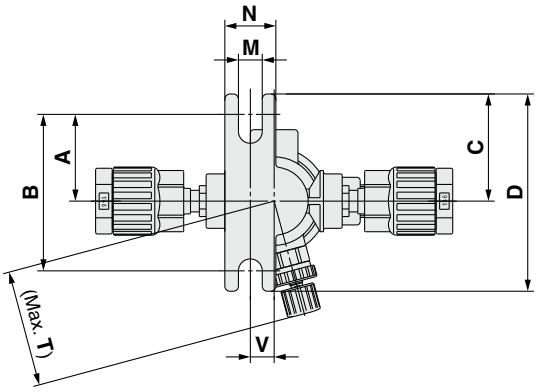
LVQ□$^{1}_{2}$S-Z□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2$^{1}_{2}$S-Z□	25.5	46	31.5	58	33.6	89.5	12	105	21.8	37	5	7	15	53.5	21	25.3	64
LVQ3$^{1}_{2}$S-Z□	28.5	57	34.5	69	45.4	107.5	16.5	137	32	50	6	7	20	59.5	25	31.2	82
LVQ4$^{1}_{2}$S-Z□	28.5	57	34.5	69	45.4	113	22	151	37.5	55.5	6	7	20	59.5	25	31.2	87.5
LVQ5$^{1}_{2}$S-Z□	42	84	48	96	75	153.2	25	202	50.2	78.2	10	7	20	73	38.5	45	128
LVQ6$^{1}_{2}$S-Z□	42	84	48	96	75	163	32	236	60	88	10	7	20	73	38.5	45	137.5

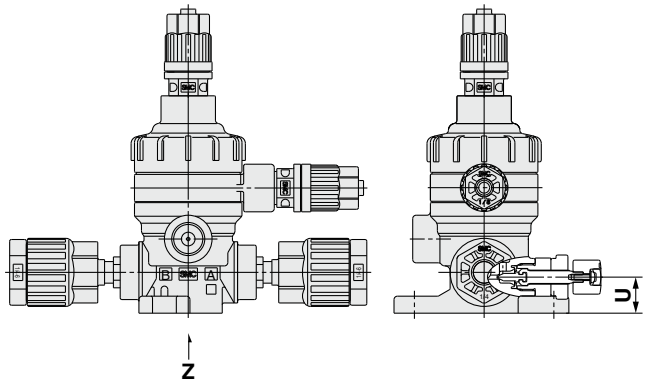
With by-pass
Double acting valve

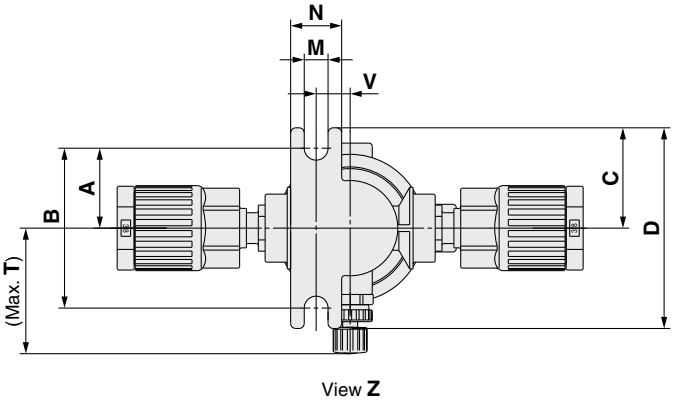


LVQ22S



LVQ32S, LVQ42S
LVQ52S, LVQ62S





Dimensions (Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ22-S-Z□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ32-S-Z□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ42-S-Z□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ52-S-Z□-2	38	76	44	88	7	20	64	25	17
LVQ62-S-Z□-2	38	76	44	88	7	20	66	32	17

Manually Operated
Flare, Integrated Fitting Type
Hyper Fitting
LVQH-Z Series

RoHS

How to Order

LVQH 2 0 – Z 07 □ – 1 – □

Body class

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

LQ3 integrated fitting

Applicable tubing size

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

Handle operation

1	90° turn type
4	Multi-turn type (With indicator)

Vent port type

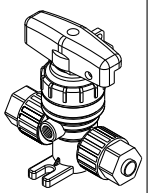
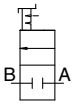
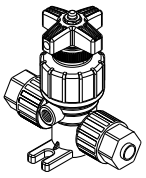
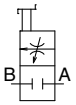
Nil	Threaded	NPT 1/8
R	Threaded	Rc1 /8

Option

Symbol	Buffer material	Note
Nil	FKM	—
K	FFKM	—
N	EPDM	For ammonium hydroxide

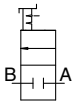
Note) Options cannot be combined each other.

Variations

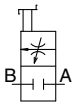
Type	Symbol	Model	LVQH20	LVQH30	LVQH40	LVQH50	LVQH60
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Tubing O.D. / Metric	6	10	12	19	25
		Tubing O.D. / Inch	1/4	3/8	1/2	3/4	1
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

Symbol

90° turn type



Multi-turn type



Standard Specifications

Model		LVQH20	LVQH30	LVQH40	LVQH50	LVQH60
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				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa Note)			–98 kPa to 0.4 MPa Note)	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)	LVQH□0-1	0.12	0.27	0.32	1.14	1.20
	LVQH□0-4	0.11	0.25	0.23	0.72	0.82

Note) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

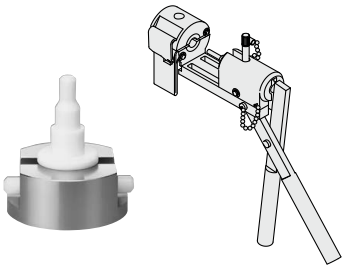
Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Connect tubing by special tools.

For information on tubing fittings and special tools, please see the pamphlet “High Purity Fluoropolymer Fittings Hyper Fitting Flare Type LQ3 Series Fitting Procedure” (M-E06-4). (The pamphlet can be downloaded from the SMC home page.)



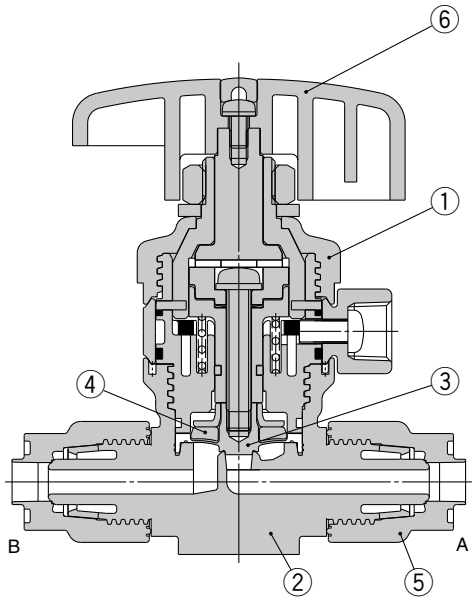
2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won’t turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

Tightening Torque for Piping

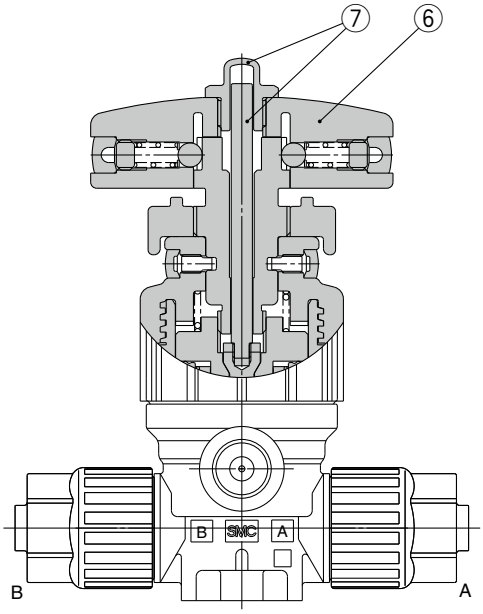
Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

Construction

90° turn type



Multi-turn type (With indicator)

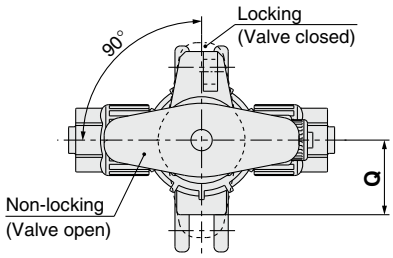


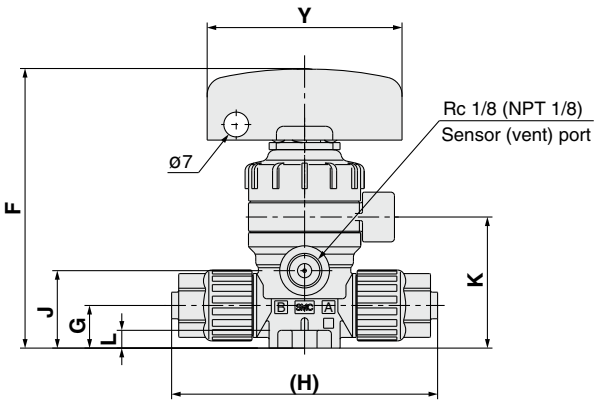
Component Parts

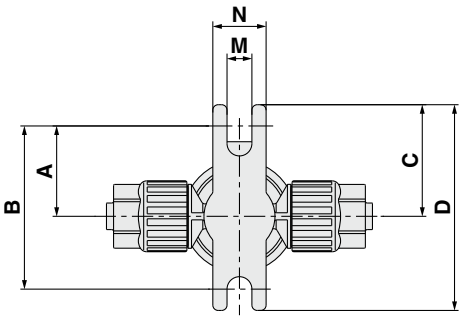
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Nut**	PFA
6	**Handle**	PVDF
7	**Indicator/Cover**	PP

Dimensions

90° turn type





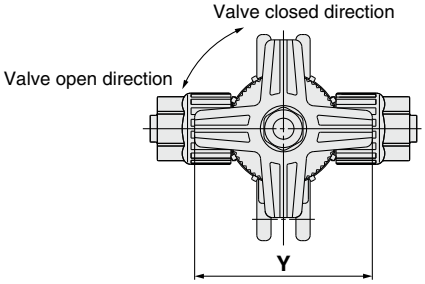


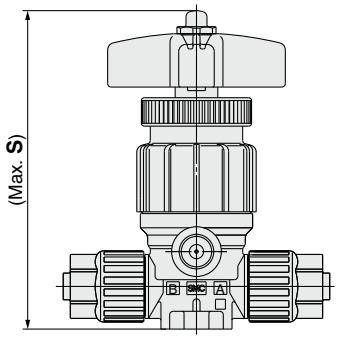
Dimensions (mm)

Model	A	B	C	D	F	G	H
LVQH20-Z□□-1	25.5	46	31.5	58	79	12	75
LVQH30-Z□□-1	28.5	57	34.5	69	103	16.5	103
LVQH40-Z□□-1	28.5	57	34.5	69	108	22	114
LVQH50-Z□□-1	42	84	48	96	165	25	150
LVQH60-Z□□-1	42	84	48	96	175	32	167

Model	J	K	L	M	N	Q	Y
LVQH20-Z□□-1	21.8	37	5	7	15	21	55
LVQH30-Z□□-1	32	50	6	7	20	25	80
LVQH40-Z□□-1	37.5	55.5	6	7	20	25	80
LVQH50-Z□□-1	50.2	78.2	10	7	20	38.5	110
LVQH60-Z□□-1	60	88	10	7	20	38.5	110

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20-Z□-4	93.6	50
LVQH30-Z□-4	111.2	50
LVQH40-Z□-4	116.7	50
LVQH50-Z□-4	170.7	71
LVQH60-Z□-4	180.2	71

Manually Operated
Flare, Integrated Fitting Type
Space Saving/Space Saving Connection
LVQHS-Z Series RoHS

How to Order

LVQH 2 0 S – Z 07 ☐ – 1 – ☐

Body class

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

Body type

S	Space saving connection

LQ3 integrated fitting

Vent port type

Nil	Threaded	NPT 1/8
R	Threaded	Rc 1/8

Applicable fitting size

Symbol	Fitting size	Body class				
		2	3	4	5	6
Inch size						
07	2	○				
11	3		○			
13	4			○		
19	5				○	
25	6					○

Note) Refer to page 126 for How to Order applicable fittings.
Select the same size as fitting on the valve.

Handle operation

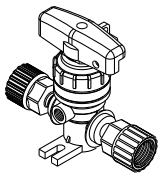
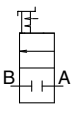
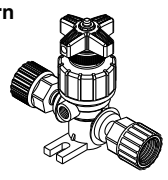
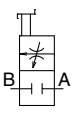
1	90° turn type
4	Multi-turn type (With indicator)

Option

Symbol	Buffer material	Note
Nil	FKM	—
K	FFKM	—
N	EPDM	For ammonium hydroxide

Note) Options cannot be combined each other.

Variations

Type / Symbol		Model	LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Connection fitting size	2	3	4	5	6
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

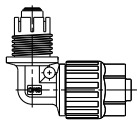
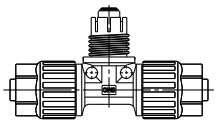
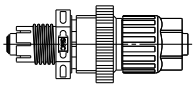
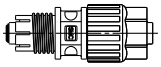
How to Order Space Saving Fittings

LQ3 E 6A – SN –

Packaging

Symbol	Packaging
Nil	Clean packaging equivalent to Class M3.5
1	Standard packaging equivalent to Class M5.5

Fitting type

E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

One of the nuts is not attached.

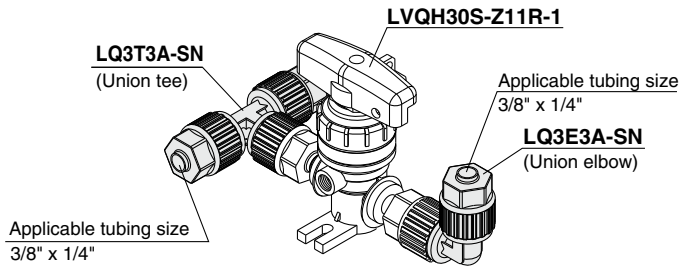
Applicable tubing size Note 1) Note 2)

Size	Symbol	Applicable tubing size (mm)
2	**1**	6 x 4
3	**1**	10 x 8
3	**2**	8 x 6
4	**1**	12 x 10
5	**1**	19 x 16
6	**1**	25 x 22

Size	Symbol	Applicable tubing size (inch)
2	**A**	1/4" x 5/32"
3	**A**	3/8" x 1/4"
4	**A**	1/2" x 3/8"
5	**A**	3/4" x 5/8"
6	**A**	1" x 7/8"

Note 1) Select the same size as the fitting on the valve.
Note 2) Refer to page 150 for details of the applicable tubing sizes.

Piping Example



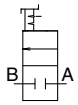
Ordering Example

LVQH30S-Z11R-1 1
LQ3T3A-SN (Union tee) 1
LQ3E3A-SN (Union elbow) 1

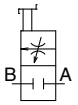
Note) For shipment, the valve and fittings are individually packaged and dispatched together in 1 box.

Symbol

90° turn type



Multi-turn type



Standard Specifications

Model		LVQH20S	LVQH30S	LVQH40S	LVQH50S	LVQH60S
Connection fitting size		2	3	4	5	6
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				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa Note)			–98 kPa to 0.4 MPa Note)	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)	**LVQH□0S-1**	0.14	0.28	0.34	1.14	1.15
	LVQH□0S-4	0.13	0.21	0.25	0.72	0.86

Note) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

⚠ Specific Product Precautions

Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

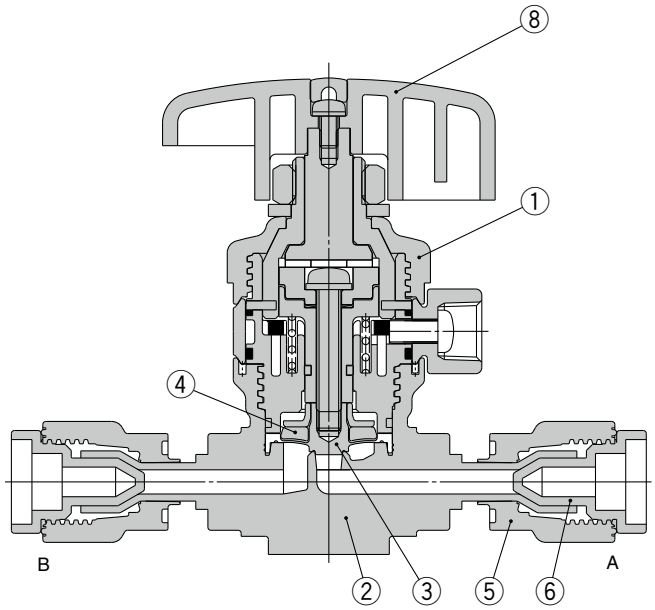
1. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. If the nut won't turn any further, then it means a sufficient tightening has occurred. Refer to the proper tightening torques shown below.

Tightening Torque for Piping

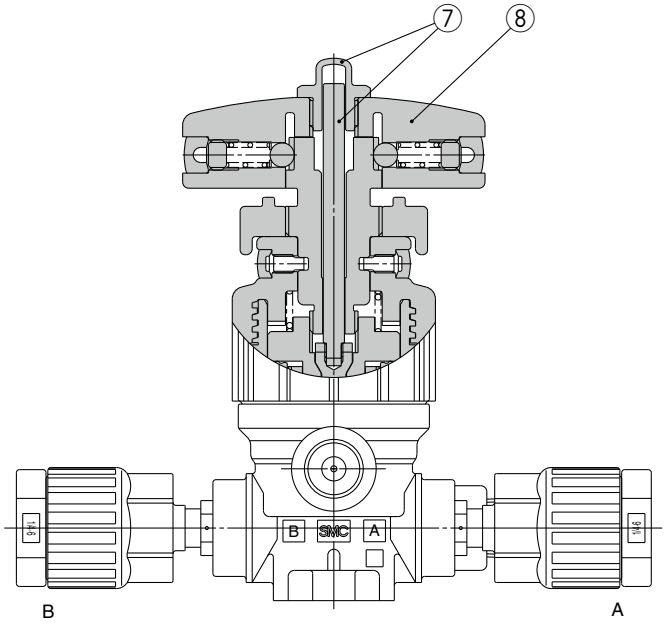
Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

Construction

90° turn type



Multi-turn type (With indicator)

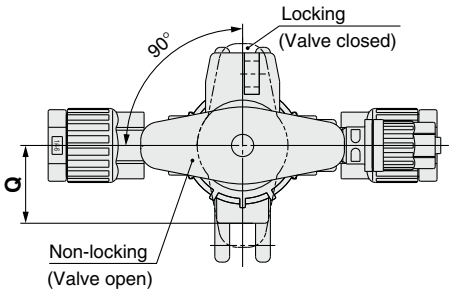


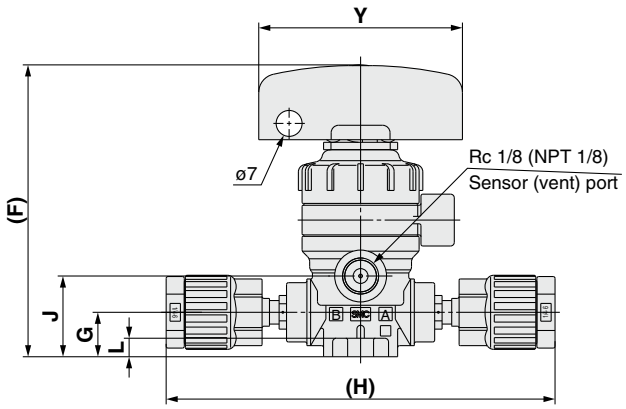
Component Parts

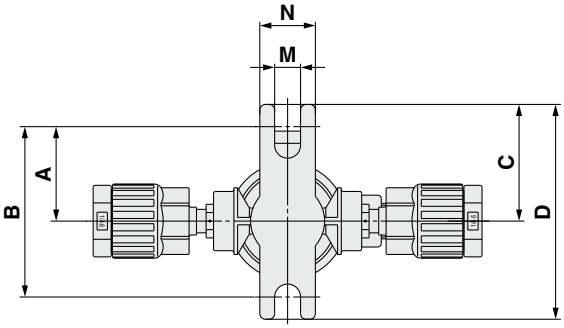
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Nut**	PFA
6	**Plug**	PP
7	**Indicator/Cover**	PP
8	**Handle**	PVDF

Dimensions

90° turn type





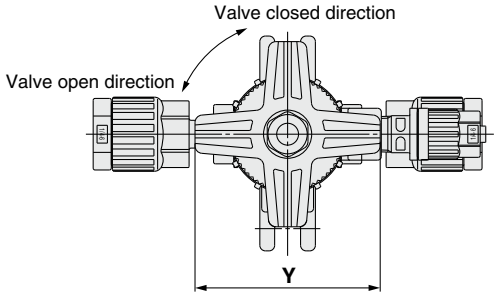


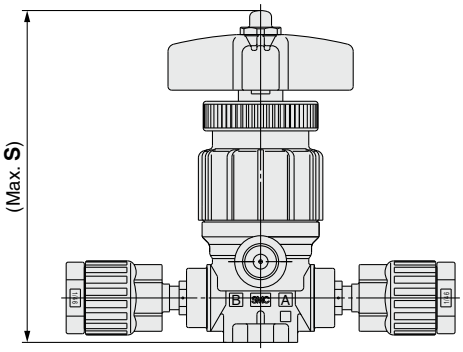
Dimensions (mm)

Model	A	B	C	D	F	G	H
LVQH20S-Z□-1	25.5	46	31.5	58	79	12	105
LVQH30S-Z□-1	28.5	57	34.5	69	103	16.5	137
LVQH40S-Z□-1	28.5	57	34.5	69	108	22	151
LVQH50S-Z□-1	42	84	48	96	165	25	202
LVQH60S-Z□-1	42	84	48	96	175	32	236

Model	J	K	L	M	N	Q	Y
LVQH20S-Z□-1	21.8	37	5	7	15	21	55
LVQH30S-Z□-1	32	50	6	7	20	25	80
LVQH40S-Z□-1	37.5	55.5	6	7	20	25	80
LVQH50S-Z□-1	50.2	78.2	10	7	20	38.5	110
LVQH60S-Z□-1	60	88	10	7	20	38.5	110

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20S-Z□-4	93.6	50
LVQH30S-Z□-4	111.2	50
LVQH40S-Z□-4	116.7	50
LVQH50S-Z□-4	170.7	71
LVQH60S-Z□-4	180.2	71

Air Operated
Tube Extension Type
LVQ-T Series

RoHS

How to Order

LVQ 2 0 – T 07 □ □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼

❸ Tube extension

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Applicable tubing size

Symbol	Connection 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					○

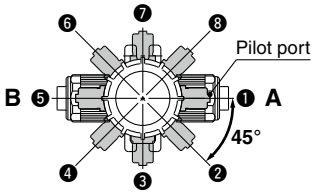
❹ Pilot port type

Nil	With LQ1 fitting	Connection tubing O.D. 1/8" (ø3)
M	With LQ1 fitting	Connection tubing O.D. ø4
R	Threaded	Rc1/8
N	Threaded	NPT1/8

❺ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❻ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
5	High back pressure (0.42 MPa)
6	High back pressure with flow rate adjustment
7	High back pressure with by-pass
8	High back pressure with flow rate adjustment & by-pass
9	High back pressure with indicator

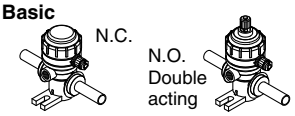
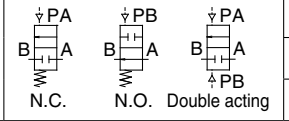
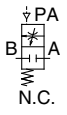
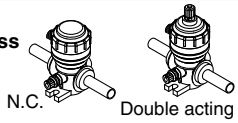
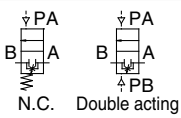
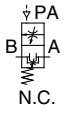
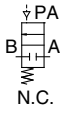
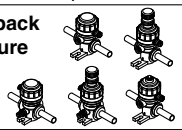
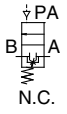
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined each other.

❼ Option 2

Symbol	Applicable option										Buffer material	Note
	Nil	1	2	3	4	5	6	7	8	9		
Nil	○	○	○	○	○	○	○	○	○	○	FKM	—
J	○	○	—	—	—	—	—	—	—	—	FKM	For high temperature
K	○	○	○	○	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	○	—	—	—	—	FKM	High flow type **LVQ6**□ only

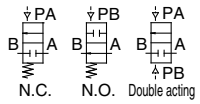
Note 1) Options 2 in the same table cannot be combined each other.
Note 2) Only option 1 (with flow rate adjustment) is available for use in high-temperature environments. However, it cannot be used in combination with any of the high back pressure specifications.

Variations

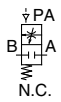
Type / Symbol	Model	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
	Orifice diameter	ø4	ø8	ø10	ø16	ø22
	Tubing O.D. Metric	6	10	12	19	25
	Tubing O.D. Inch	1/4	3/8	1/2	3/4	1
Basic N.C. / N.O. Double acting  	N.C.	○	○	○	○	○
	N.O.	○	○	○	○	○
	Double acting	○	○	○	○	○
With flow rate adjustment  	N.C.	○	○	○	○	○
With by-pass   N.C. Double acting	N.C.	○	○	○	○	○
	Double acting	○	○	○	○	○
With flow rate adjustment & by-pass  	N.C.	○	○	○	○	○
With indicator  	N.C.	○	○	○	○	○
High back pressure  	N.C.	○	○	○	○	○

Symbol

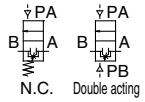
Basic/With indicator/
High back pressure



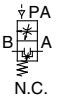
With flow rate adjustment



With by-pass/
With indicator & by-pass



With flow rate adjustment & by-pass



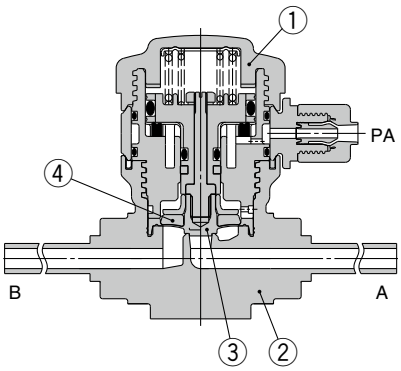
Standard Specifications

Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
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 (8.1) Note 1)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 1)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa Note 2)			–98 kPa to 0.4 MPa Note 2)	
	High temperature	–98 kPa to 0.3 MPa Note 2)				
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42 or less				
	High temperature	0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)	Standard	0 to 100				
	High temperature	0 to 170				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.08	0.15	0.16	0.60	0.70

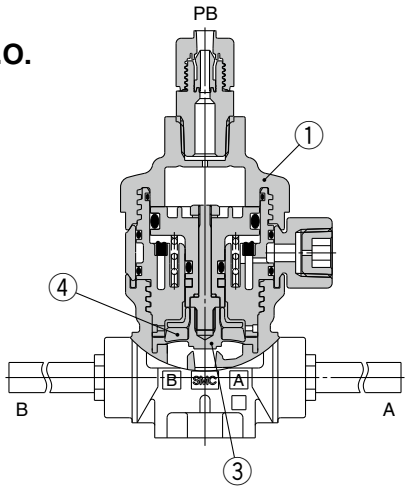
Note 1) ( ): High flow type
Note 2) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

Construction

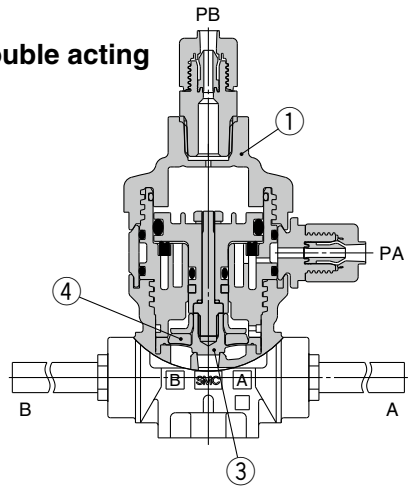
Basic
N.C.



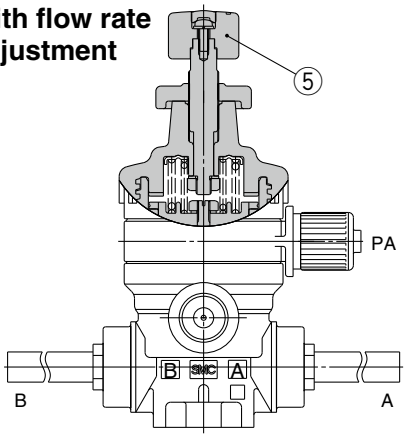
N.O.



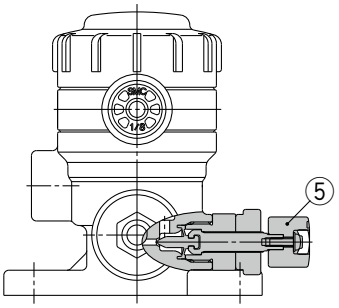
Double acting



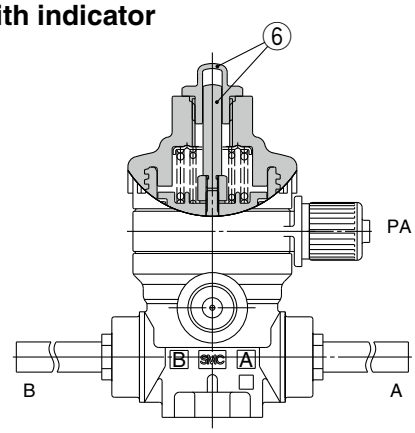
With flow rate adjustment



With by-pass



With indicator



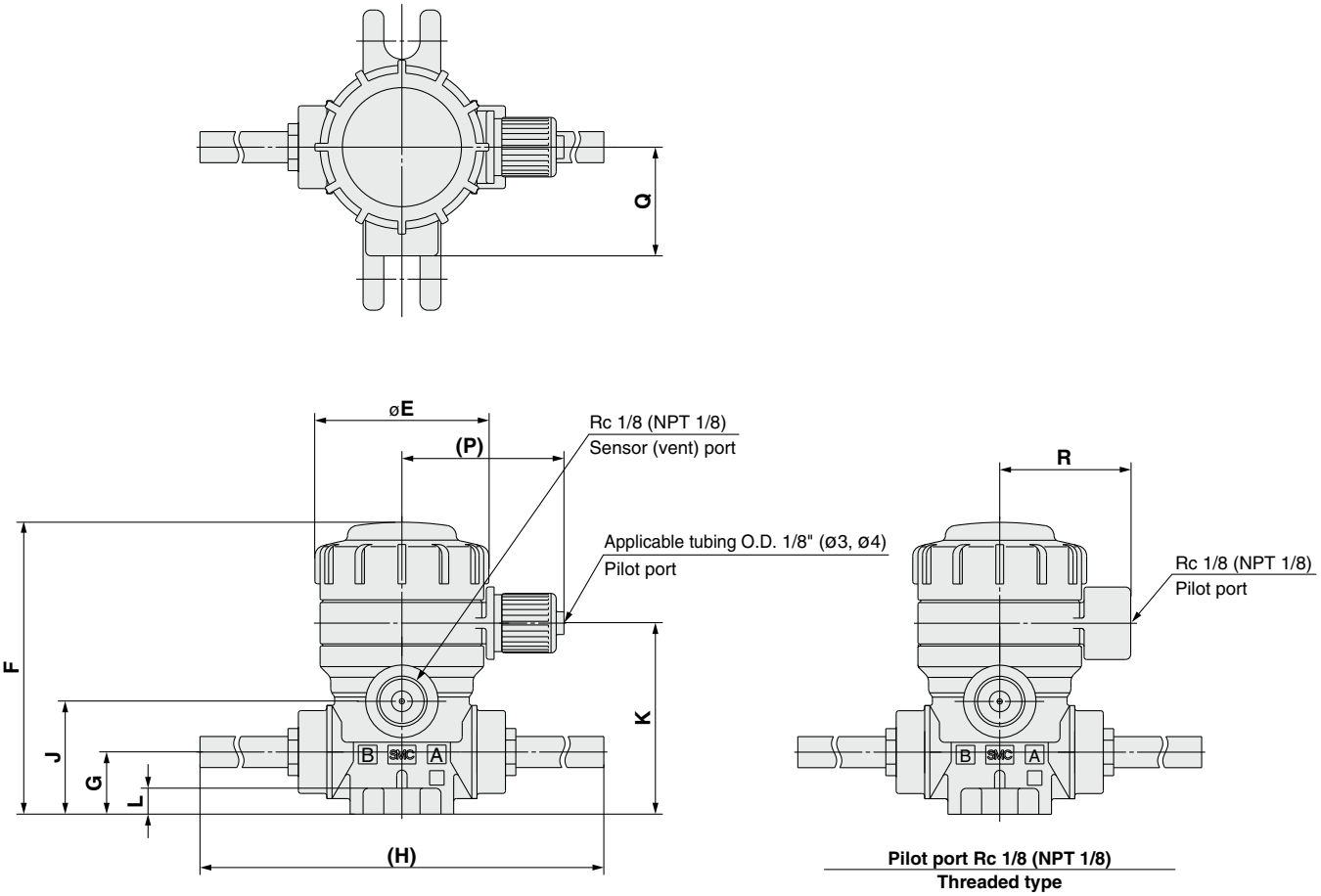
Component Parts

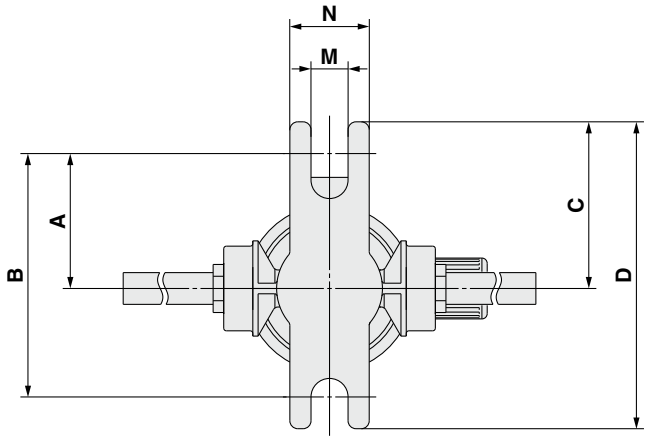
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE

No.	Description	Material
4	**Buffer**	FKM
		EPDM
		FFKM
5	**Flow rate adjuster**	PVDF
6	**Indicator/Cover**	PP

Dimensions

Basic, High back pressure
N.C. valve



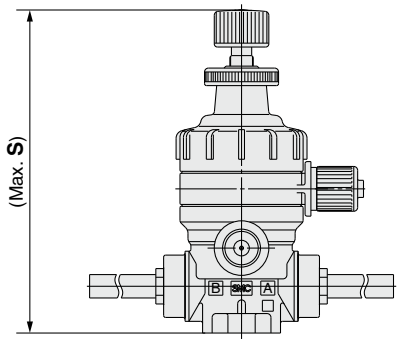


LVQ□0-T□ Dimensions (N.C. Valve) (mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20-T□	25.5	46	31.5	58	33.6	56.5	12	111.5	21.8	37	5	7	15	31.3	21	25.3
LVQ30-T□	28.5	57	34.5	69	45.4	77	16.5	136	32	50	6	7	20	37.2	25	31.2
LVQ40-T□	28.5	57	34.5	69	45.4	82.5	22	137	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50-T□	42	84	48	96	75	127	25	180	50.2	78.2	10	7	20	50.8	38.5	45
LVQ60-T□	42	84	48	96	75	137	32	189	60	88	10	7	20	50.8	38.5	45

Dimensions

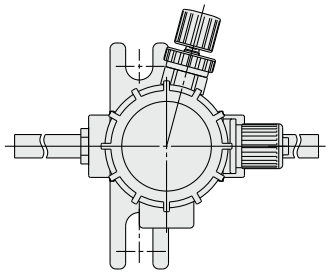
With flow rate adjustment, High back pressure with flow rate adjustment
N.C. valve

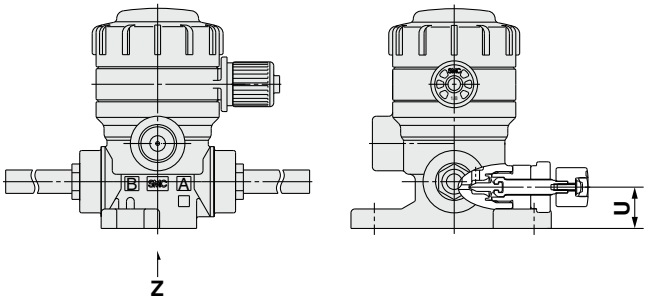


Dimensions (mm)

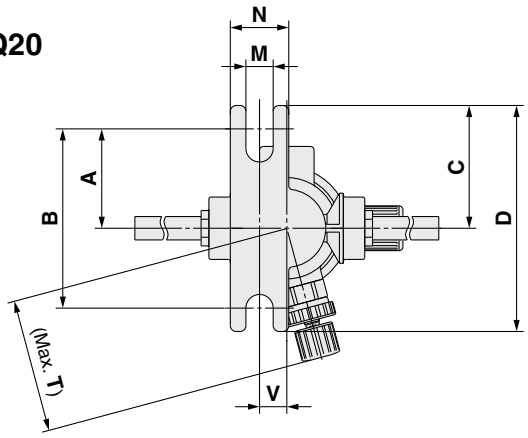
Model	S
LVQ20-T□-1	83
LVQ30-T□-1	113.5
LVQ40-T□-1	119
LVQ50-T□-1	171.5
LVQ60-T□-1	182.5

With by-pass, High back pressure with by-pass
N.C. valve

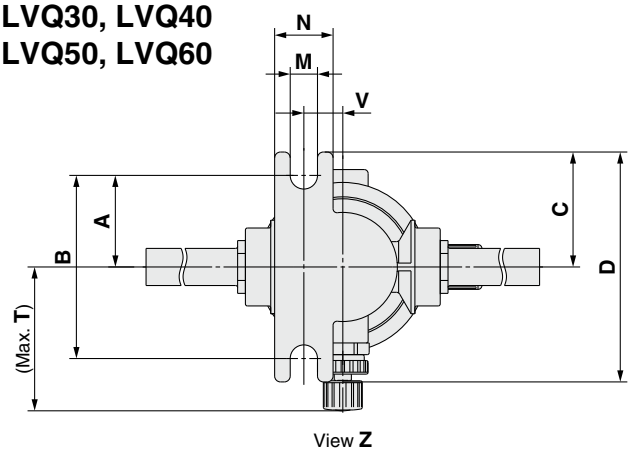




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60

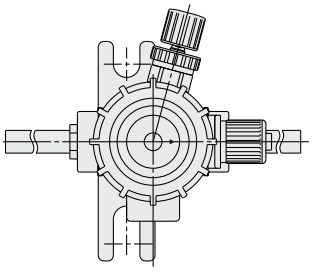


View **Z**

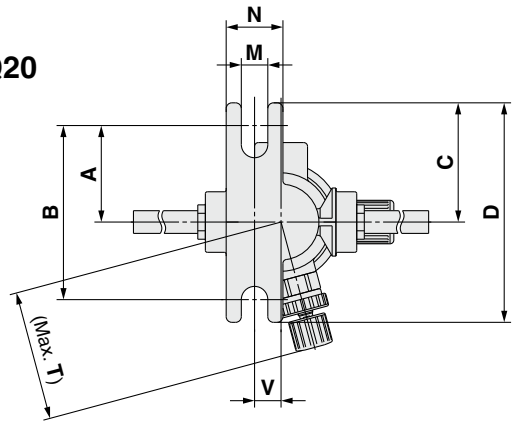
Dimensions (mm)

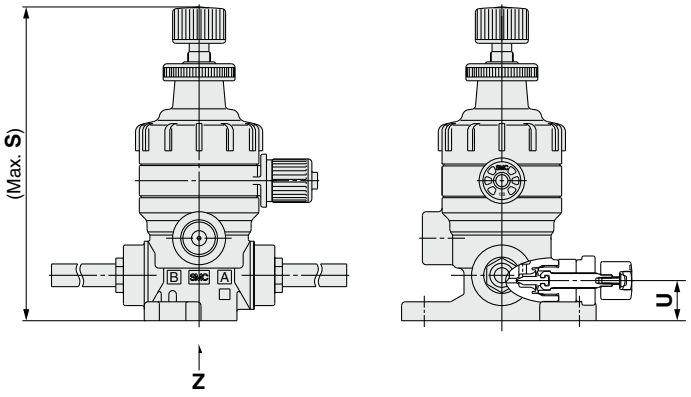
Model	A	B	C	D	M	N	T	U	V
LVQ20-T□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30-T□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40-T□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50-T□-2	38	76	44	88	7	20	64	25	17
LVQ60-T□-2	38	76	44	88	7	20	66	32	17

With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve

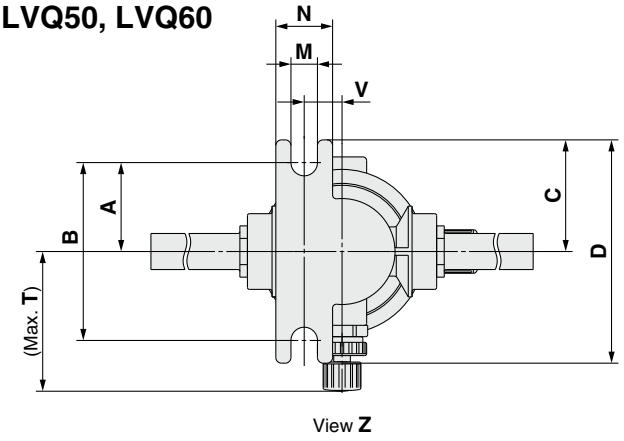


LVQ20





LVQ30, LVQ40
LVQ50, LVQ60



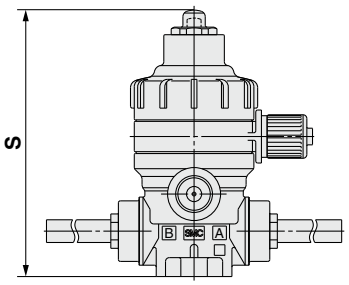
Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V
LVQ20-T□-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7
LVQ30-T□-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10
LVQ40-T□-3	25.5	51	31.5	63	7	15	119	37.9	22	10
LVQ50-T□-3	38	76	44	88	7	20	171.5	64	25	17
LVQ60-T□-3	38	76	44	88	7	20	182.5	66	32	17

With indicator, High back pressure with indicator
N.C. valve

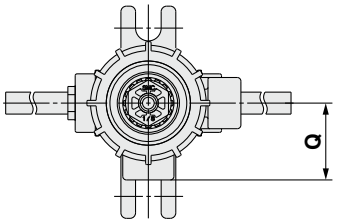
Dimensions (mm)

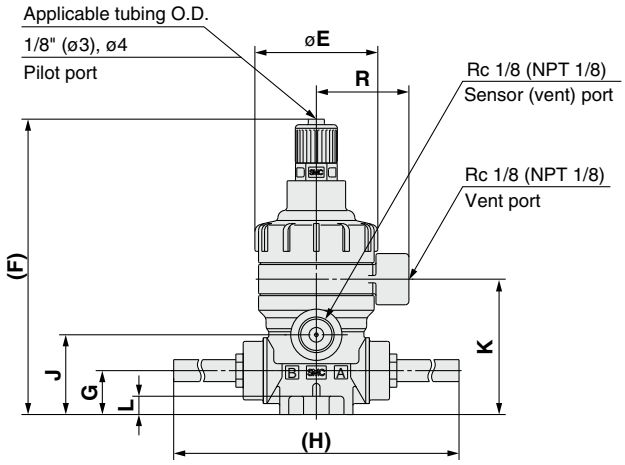
Model	S
LVQ20-T□-4	70.5
LVQ30-T□-4	88.5
LVQ40-T□-4	94
LVQ50-T□-4	134.5
LVQ60-T□-4	144

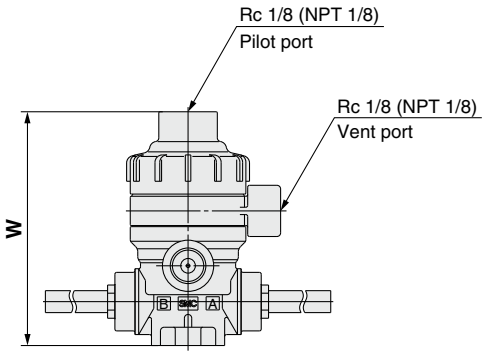


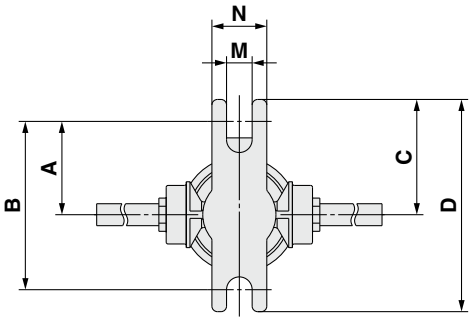
Dimensions

Basic
N.O. valve

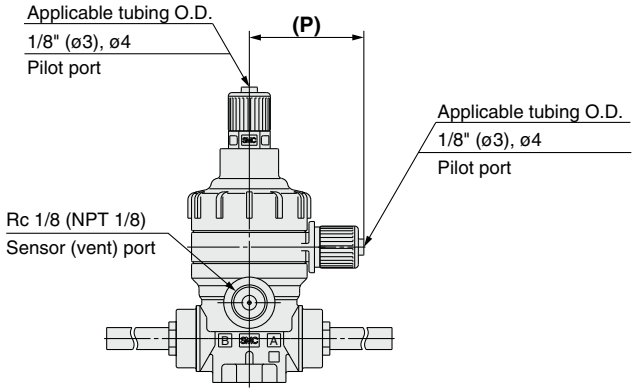


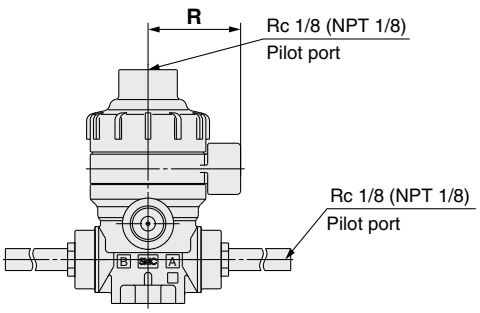






Double acting valve

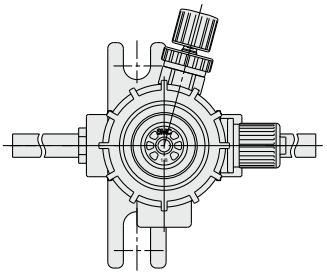




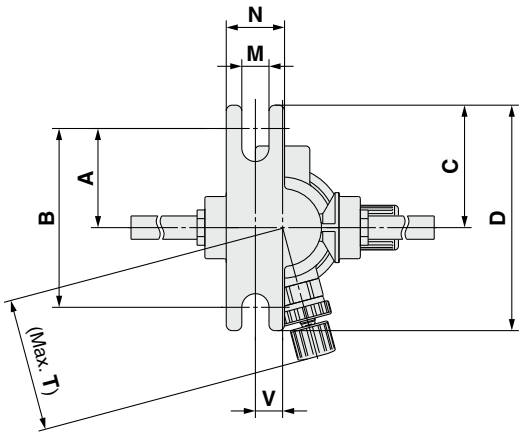
LVQ□$^{1}_{2}$-T□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2$^{1}_{2}$-T□	25.5	46	31.5	58	33.6	81	12	111.5	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3$^{1}_{2}$-T□	28.5	57	34.5	69	45.4	99	16.5	136	32	50	6	7	20	37.2	25	31.2	82
LVQ4$^{1}_{2}$-T□	28.5	57	34.5	69	45.4	104	22	137	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5$^{1}_{2}$-T□	42	84	48	96	75	144.5	25	180	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6$^{1}_{2}$-T□	42	84	48	96	75	154.5	32	189	60	88	10	7	20	50.8	38.5	45	137.5

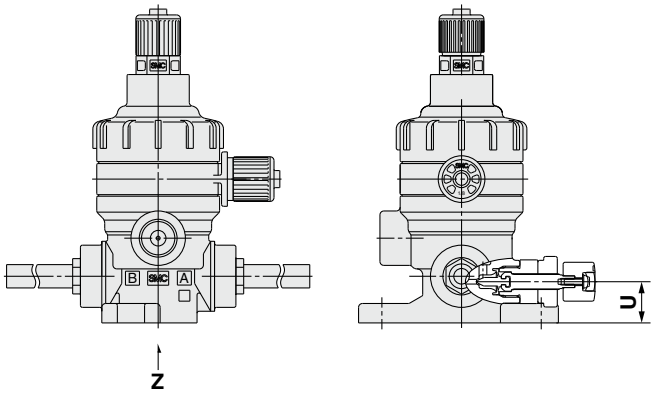
With by-pass
Double acting valve

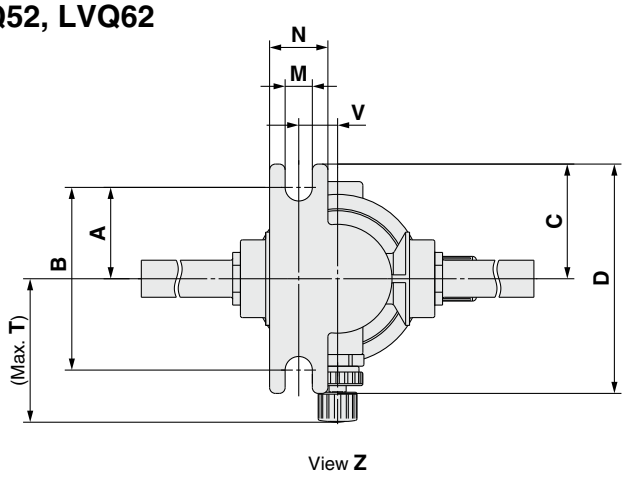


LVQ22



LVQ32, LVQ42
LVQ52, LVQ62





View **Z**

Dimensions (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ22-T□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ32-T□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ42-T□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ52-T□-2	38	76	44	88	7	20	64	25	17
LVQ62-T□-2	38	76	44	88	7	20	64	32	17

Manually Operated
Tube Extension Type
LVQH-T Series

RoHS

How to Order

LVQH 2 0 – T 07 □ – 1 – □

Body class

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

Tube extension

Applicable tubing size

Symbol	Connection 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					○

Vent port type

Nil	Threaded	NPT 1/8
R	Threaded	Rc 1/8

Handle operation

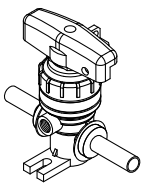
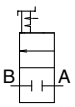
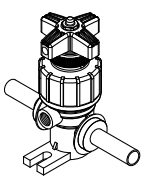
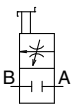
1	90° turn type
4	Multi-turn type (With indicator)

Option

Symbol	Buffer material	Note
Nil	FKM	—
K	FFKM	—
N	EPDM	For ammonium hydroxide

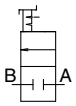
Note) Options cannot be combined each other.

Variations

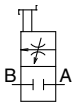
Type	Symbol	Model	LVQH20-T	LVQH30-T	LVQH40-T	LVQH50-T	LVQH60-T
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Tubing O.D. Metric	6	10	12	19	25
		Inch	1/4	3/8	1/2	3/4	1
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

Symbol

90° turn type



Multi-turn type



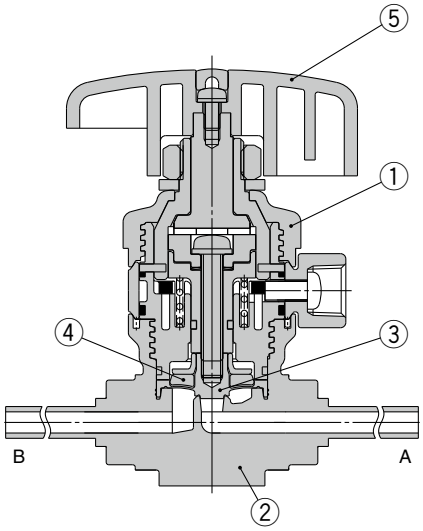
Standard Specifications

Model		LVQH20	LVQH30	LVQH40	LVQH50	LVQH60
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				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa Note)			–98 kPa to 0.4 MPa Note)	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm³/min)		0 (With water pressure)				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)	LVQH□0-1	0.12	0.25	0.28	1.04	1.05
	LVQH□0-4	0.11	0.18	0.19	0.62	0.73

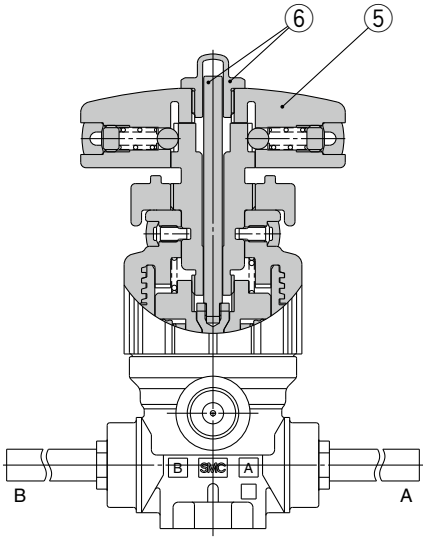
Note) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

Construction

90° turn type



Multi-turn type (With indicator)



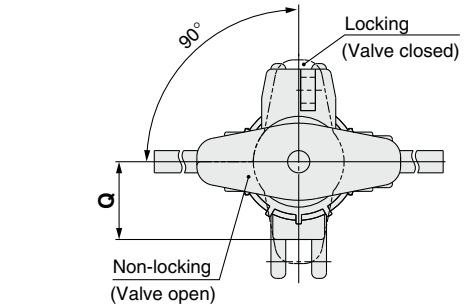
Component Parts

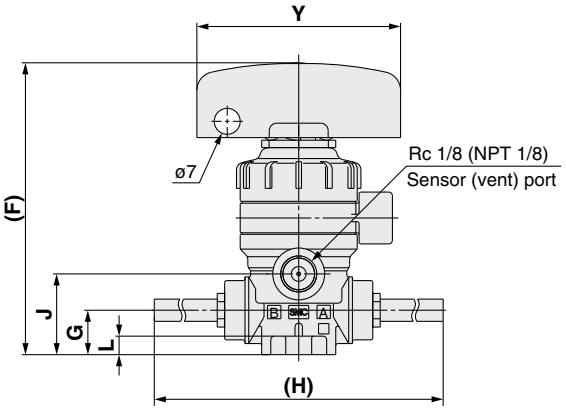
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Buffer**	FKM
		EPDM
		FFKM

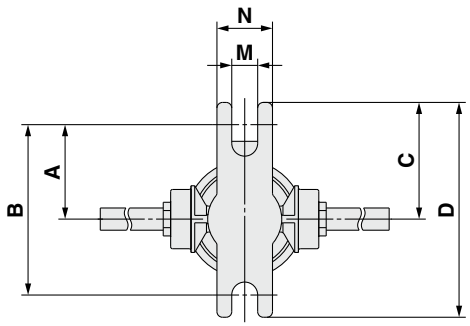
No.	Description	Material
5	**Handle**	PVDF
6	**Indicator/Cover**	PP

Dimensions

90° turn type





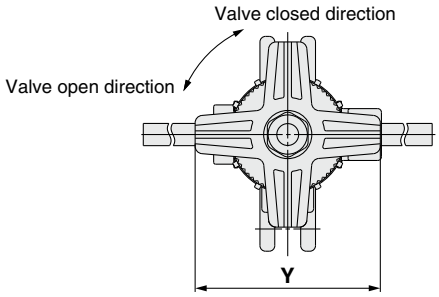


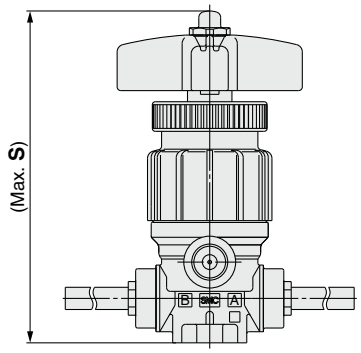
Dimensions (mm)

Model	A	B	C	D	F	G	H
LVQH20-T□-1	25.5	46	31.5	58	79	12	111.5
LVQH30-T□-1	28.5	57	34.5	69	103	16.5	136
LVQH40-T□-1	28.5	57	34.5	69	108	22	137
LVQH50-T□-1	42	84	48	96	165	25	180
LVQH60-T□-1	42	84	48	96	175	32	189

Model	J	K	L	M	N	Q	Y
LVQH20-T□-1	21.8	37	5	7	15	21	55
LVQH30-T□-1	32	50	6	7	20	25	80
LVQH40-T□-1	37.5	55.5	6	7	20	25	80
LVQH50-T□-1	50.2	78.2	10	7	20	38.5	110
LVQH60-T□-1	60	88	10	7	20	38.5	110

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20-T□-4	93.6	50
LVQH30-T□-4	111.2	50
LVQH40-T□-4	116.7	50
LVQH50-T□-4	170.7	71
LVQH60-T□-4	180.2	71

Air Operated, 0.5 MPa Back Pressure Tolerant Insert Bushing, Integrated Fitting Type Hyper Fitting

LVQ□□H Series

RoHS

How to Order

LVQ 2 0 H – S 07 □ □ □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Fitting type

Symbol	Fitting type	Body class
V	LQ1	2, 3, 4, 5, 6
S	LQ2	2, 3, 4, 5

Note) Insert bushing is used in common.

❹ Applicable tubing size Note)

Symbol	Connection 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

Note) Refer to page 150 for details of the applicable tubing sizes.

❺ Port B (OUT) different dia. size

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

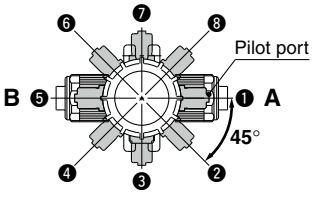
❻ Pilot port type

Nil	LQ1 integrated fitting	Connection tubing O.D. 1/8" (ø3)
M	LQ1 integrated fitting	Connection tubing O.D. ø4
R	Threaded	Rc1/8
N	Threaded	NPT1/8

❼ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❽ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
24	With indicator & by-pass

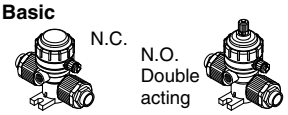
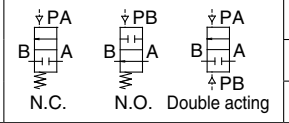
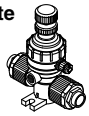
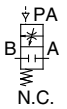
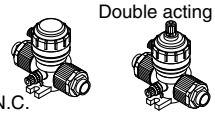
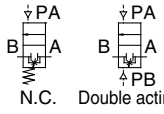
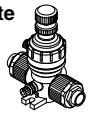
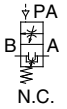
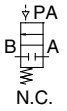
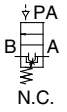
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table cannot be combined each other.

❾ Option 2

Symbol	Applicable option						Buffer material	Note
	Nil	1	2	3	4	24		
Nil	○	○	○	○	○	○	FKM	—
K	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	—	FKM	High flow type **LVQ6**□ only

Note) Options 2 in the same table cannot be combined each other.

Variations

Type	Symbol	Valve type	Model	LVQ20H	LVQ30H	LVQ40H	LVQ50H	LVQ60H
			Orifice diameter	ø4	ø8	ø10	ø16	ø22
			Tubing O.D. Metric	6	10	12	19	25
			Tubing O.D. Inch	1/4	3/8	1/2	3/4	1
Basic 			N.C.	○	○	○	○	○
			N.O.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjustment 			N.C.	○	○	○	○	○
With by-pass 			N.C.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjustment & by-pass 			N.C.	○	○	○	○	○
With indicator 			N.C.	○	○	○	○	○
With indicator & by-pass 			N.C.	○	○	○	○	○

Air Operated, 0.5 MPa Back Pressure Tolerant Flare, Integrated Fitting Type Hyper Fitting

LVQ□□H-Z Series

RoHS

How to Order

LVQ 2 0 H – Z 07 □ □ – □ – □

❶ ❷ ❸ ❹ ❺ ❻ ❼

❸ LQ3 integrated fitting

❶ Body class

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

❷ Valve type

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

Note) For valve type combinations, refer to variations on the next page.

❸ Applicable tubing size Note)

Symbol	Connection 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						
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"					○

Note) Refer to page 150 for details of the applicable tubing sizes.

❹ Pilot port type

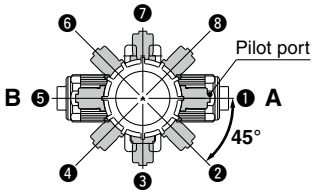
Nil	With LQ3 fitting	Connection tubing size 1/8" x 0.086" (3 x 2) Note)
M	With LQ3 fitting	Connection tubing size 4 x 3 Note)
R	Threaded	Rc1/8
N	Threaded	NPT1/8

Note) Refer to page 150 for details of the applicable tubing sizes.

❺ Pilot port direction

Symbol	Direction
Nil	❶
P2	❷
P3	❸
P4	❹
P5	❺
P6	❻
P7	❼
P8	❽

Pilot port piping direction



* Specify the piping direction by part number when ordering the product. Do not change the pilot port direction. (Refer to Precautions on page 150.)

❻ Option 1

Nil	None
1	With flow rate adjustment
2	With by-pass
3	With flow rate adjustment & by-pass
4	With indicator
24	With indicator & by-pass

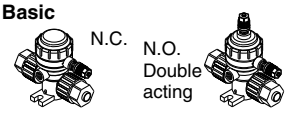
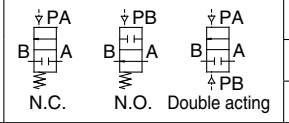
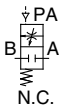
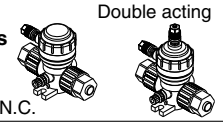
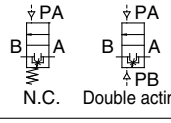
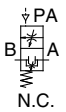
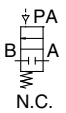
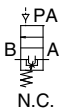
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table cannot be combined each other.

❼ Option 2

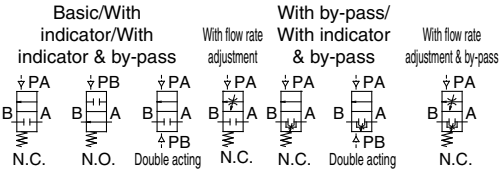
Symbol	Applicable option						Buffer material	Note
	Nil	1	2	3	4	24		
Nil	○	○	○	○	○	○	FKM	—
K	○	○	○	○	○	○	FFKM	—
N	○	○	○	○	○	○	EPDM	For ammonium hydroxide
P	○	—	—	—	○	—	FKM	High flow type **LVQ6**□ only

Note) Options 2 in the same table cannot be combined each other.

Variations

Type	Symbol	Valve type	Model	LVQ20H	LVQ30H	LVQ40H	LVQ50H	LVQ60H
			Orifice diameter	ø4	ø8	ø10	ø16	ø22
			Tubing O.D. Metric	6	10	12	19	25
			Tubing O.D. Inch	1/4	3/8	1/2	3/4	1
Basic 		N.C.		○	○	○	○	○
		N.O.		○	○	○	○	○
		Double acting		○	○	○	○	○
With flow rate adjustment 		N.C.		○	○	○	○	○
With by-pass 		N.C.		○	○	○	○	○
		Double acting		○	○	○	○	○
With flow rate adjustment & by-pass 		N.C.		○	○	○	○	○
With indicator 		N.C.		○	○	○	○	○
With indicator & by-pass 		N.C.		○	○	○	○	○

Symbol



⚠ Specific Product Precautions

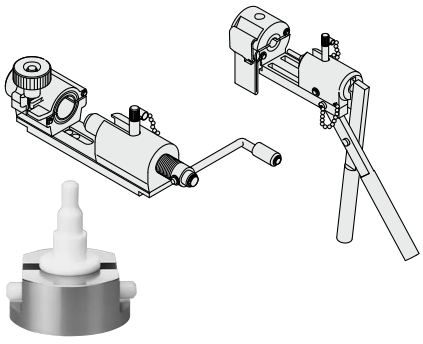
Be sure to read this before handling the products. Refer to page 501 for Safety Instructions and pages 149 and 150 for Air Operated Chemical Liquid Valve Precautions.

Piping

⚠ Caution

1. Connect tubing by special tools.

For information on tubing connection and special tools, please see the pamphlet "High Purity Fluoropolymer Fittings Hyper Fitting LQ1/2 Series Work Procedure Instructions" (M-E05-1) and "High Purity Fluoropolymer Fittings Hyper Fitting/Flare Type LQ3 Series Fitting Procedure" (M-E06-4). (The pamphlet can be downloaded from the SMC home page.)



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

Tightening Torque for Piping

Body class	Torque (N·m)		
	LQ1	**LQ2**	**LQ3**
2	0.3 to 0.4	1.5 to 2.0	1.6 to 1.8
3	0.8 to 1.0	3.0 to 3.5	3.2 to 3.5
4	1.0 to 1.2	7.5 to 9.0	5.0 to 5.3
5	2.5 to 3.0	11.0 to 13.0	10.0 to 10.5
6	5.5 to 6.0	—	22.5 to 23.0

Specifications

Model		LVQ20H	LVQ30H	LVQ40H	LVQ50H	LVQ60H
Tubing O.D. Note 1)	**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 (8.1) Note 1)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note 1)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>		–98 kPa to 0.5 MPa Note 3)				
Back pressure (MPa)		0.5 or less				
Valve leakage (cm³/min)		0 (With water pressure)				
Pilot air pressure (MPa)		0.5 to 0.8				
Pilot port size Note 2)		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.08	0.17	0.22	0.70	0.81

Note 1) ( ): High flow type
Note 2) Refer to page 150 for details of the applicable tubing sizes.
Note 3) This product cannot be used for vacuum retention. Also, connecting the vacuum to the B port may reduce the life of the product.

Dimensions

Dimensions are the same as those of the standard specifications.

Applicable Different Diameter Tubings with Reducer (LVQ□□H-$^{V}_{S}$)

Different diameter tubings can be selected (within the same body class) by using a nut and an insert bushing (reducer).

● With reducer

Body class	Connection tubing O.D.													
	Metric size							Inch size						
	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 99 for information on changing tubing sizes.

LVQ Series
Applicable Fluids

Material and Fluid Compatibility Check List for Air Operated Chemical Valves

Chemical	Compatibility
Acetone	○ Note 1, 2)
Ammonium hydroxide	○ Note 2)
Isobutyl alcohol	○ Note 1, 2)
Isopropyl alcohol	○ Note 1, 2)
Hydrochloric acid	○
Ozone (dry)	○
Hydrogen peroxide Concentration 5% or less, 50°C or less	○
Ethyl acetate	○ Note 1, 2)
Butyl acetate	○ Note 1, 2)
Nitric acid (except fuming nitric acid) Concentration 10% or less	○ Note 2)
Deionized water (pure water)	○
Sodium hydroxide (caustic soda) Concentration 50% or less	○
Nitrogen gas	○
Super pure water	○
Toluene	○ Note 1, 2)
Hydrofluoric acid	○ Note 2)
Sulfuric acid (except fuming sulfuric acid)	○ Note 2)
Phosphoric acid Concentration 80% or less	○

Table symbols
○ : Can be used
: Can be used in 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.
- Use a fluid with a viscosity of 300 cp or less. Failure to do so may cause valve closing failure.

LVQ Series
Air Operated Chemical Liquid Valve/Precautions 1

Be sure to read this before handling the products.

Design / Selection

⚠ Warning

1. Confirm the specifications.

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

2. Fluids

Operate after confirming the compatibility of the product's component materials with fluids, using the check list on page 148. 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 specified in this 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.

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

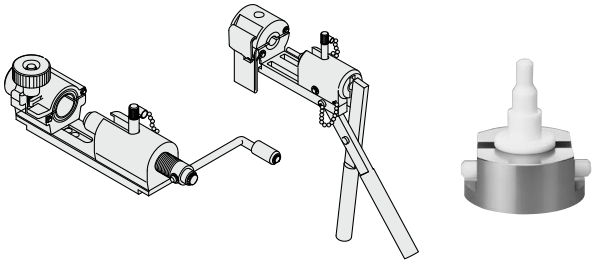
Tightening Torque for Pilot Port

Pilot port	Torque (N·m)
Rc, NPT 1/8	0.8 to 1.0

3. Metal fittings

In the case of threaded pilot port, do not pipe the metal fittings which can cause damage to the thread part.

4. For information on tubing connection and special tools, please see the pamphlet "High Purity Fluoropolymer Fittings Hyper Fitting LQ1/2 Series Work Procedure Instructions" (M-E05-1) or "High Purity Fluoropolymer Fittings Hyper Fitting/Flare Type LQ3 Series Fitting Procedure" (M-E06-4). (The pamphlets can be downloaded from the SMC home page.)



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.

LVQ Series
Air Operated Chemical Liquid Valve/Precautions 2

Be sure to read this before handling the products.

Use of Tubing

⚠ Caution

1. 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 sizes	ø3 x ø2	3.0	+0.2 −0.1	0.5	±0.06
	ø4 x ø3	4.0			
	ø6 x ø4	6.0		1.0	±0.1
	ø8 x ø6	8.0			
	ø10 x ø8	10.0			
	ø12 x ø10	12.0			
	ø19 x ø16	19.0	+0.3 −0.1	1.5	±0.15
	ø25 x ø22	25.0			
Inch sizes	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		1.6	±0.15
	1/2" x 3/8"	12.7			
	3/4" x 5/8"	19.0	+0.3 −0.1		
	1" x 7/8"	25.4			

Operating Environment

⚠ Warning

1. Do not use in a location having an explosive atmosphere.

2. Do not use in locations where vibration or impact occurs.

3. Do not use in locations where radiated heat will be received from nearby heat sources.

4. Do not use in environments which exceed the ambient temperature specifications of the product.

Maintenance

⚠ Warning

1. Maintenance should be performed in accordance with the procedures in the operation manual.

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

2. Before removing equipment or compressed air supply/exhaust devices, shut off the air and power supplies, and exhaust compressed air from the system.

Further, when restarting equipment after remounting or replacement, first confirm safety and then check the equipment for normal operation.

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

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

If disassembly is necessary, contact SMC.

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

Maintenance

⚠ Caution

1. Removal of drainage

Flush drainage from filters regularly.

Precautions

⚠ Warning

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

2. Do not change the pilot port direction. Products which have been disassembled cannot be guaranteed.

⚠ Caution

1. Please note that when the product is shipped from the factory, gases such as N_2 and air may leak from the valve at a rate of 1 cm^3/min (when pressurized).

2. When operated at a very low flow rate, the product with flow rate adjustment may vibrate, etc. depending on the operating conditions. Therefore, operate only after careful examination of the flow rate, pressure and piping conditions.

3. Water hammering may occur depending on the fluid pressure conditions. In most cases, improvement is possible by adjusting the pilot pressure with a speed controller, etc., but the flow rate, pressure and piping conditions should be reviewed.

4. To adjust the flow rate with flow rate adjustment and/or by-pass, open gradually starting from the fully closed condition.
Opening is accomplished by turning the adjustment knob counterclockwise.
Additionally, do not apply any unreasonable force to the adjustment handle when nearing a fully opened or closed condition. This may result in deformation of the orifice sheet surface or damage to the threaded part of the adjustment handle.
The handle is in the fully closed condition when the product is shipped from the factory.
In addition, do not apply excessive force to the adjustment knob even when the lock nut is in a tightened state. Operate the adjustment knob when the lock nut is in a loosened state.

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

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

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.