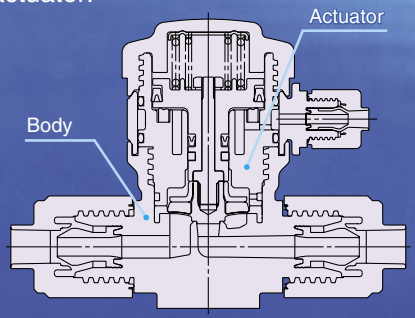
High Purity Chemical Valve
Non-Metallic Exterior

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!

New

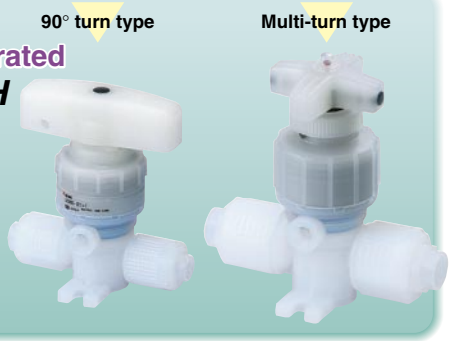
- Insert bushing, LQ1 integral fitting type Hyper fitting
  Series LVQ-V

New

- Flare, LQ3 integral fitting type Hyper fitting
  Series LVQ-Z

New

- Manually operated
  Series LVQH



New

- Tube extension integral fitting type
  Series LVQ-T

- **High purity chemical valves, High back pressure (0.5 MPa) tolerant**
  Added to *LVQ□□H* series.
- **Additional options**
  High temperature (Max. 170°C), Buffer material FFKM, Ammonium hydroxide compatible, High flow type

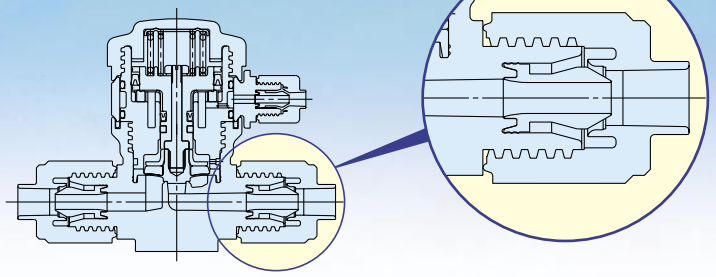
Series LVQ

SMC

CAT.EUS70-25B-UK

Insert bushing/Flare and integral fitting types are available.

Insert bushing, Integral fitting type — Series LVQ-V/LVQ-S



Hyper fitting

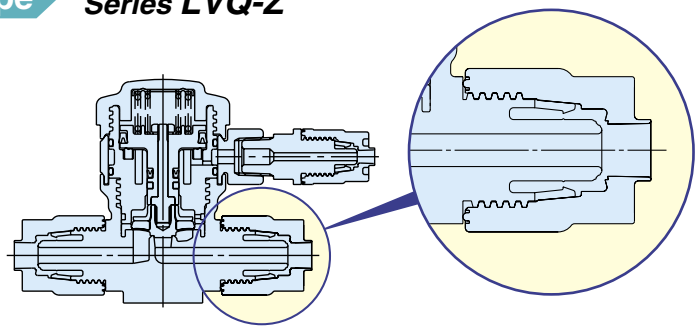
New

Series LQ1
(Series LVQ-V)
Series LQ2
(Series LVQ-S)

- Insert bushing type
- Quadruple seal construction

New

Flare, Integral fitting type — Series LVQ-Z



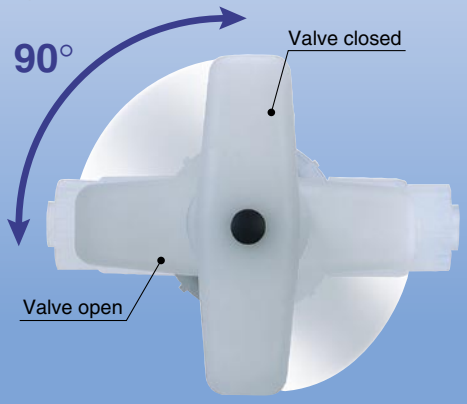
Hyper fitting
Flare type
Series LQ3

- Grip seal construction with Flare type
- Triple seal construction

Manual type added. New
Two types of handle operation methods can be selected.

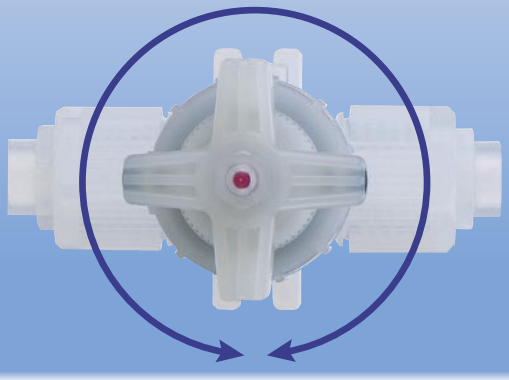
90° turn type

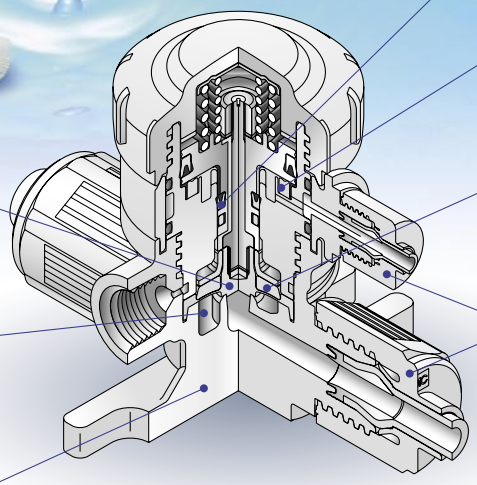
- Enables quick valve open/ close switching operation.



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 the piston momentum to minimise impact-induced particle generation.

Buffer

Protects the diaphragm from deformation and damage due to back pressure.

Integral fitting construction

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

Diaphragm (PTFE)

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

Minimal residual liquid

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

Body (New PFA)

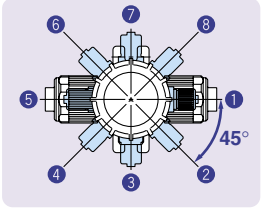
Compatible with chemicals such as acids, bases and ultra pure water.

Integral fitting construction

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

Piping from 8 directions is possible.

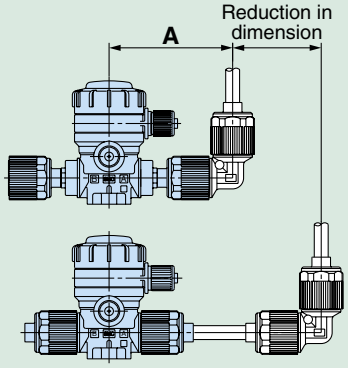
Pilot port



Integral fitting construction

Hyper fitting/LQ1, LQ3 series is used.
Select female thread can be selected.

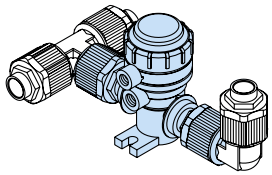
Space saving type



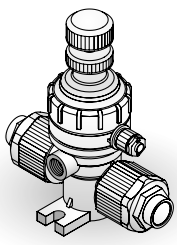
(mm)

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

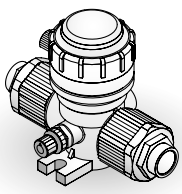
Piping example



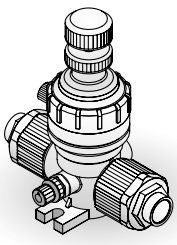
Options



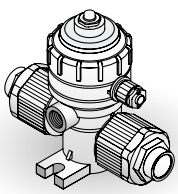
With flow rate adjustment



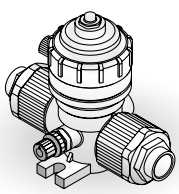
With by-pass



With flow rate adjustment & by-pass



With indicator

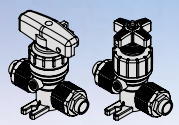


With indicator & by-pass

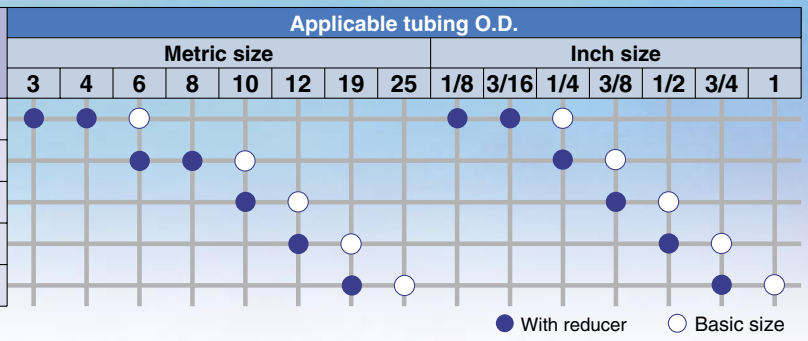
Variations

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


Series LVQ

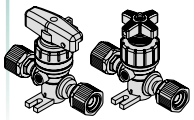

Series LVQH

Orifice diameter	Flow characteristics Av x 10^{-6} m^2 (Cv)	Series
ø4	8.4 (0.35)	LVQ(H)20
ø8	31.2 (1.3)	LVQ(H)30
ø10	45.6 (1.9)	LVQ(H)40
ø16	120 (5)	LVQ(H)50
ø22	192 (8)	LVQ(H)60

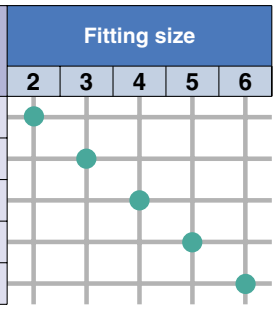


Insert Bushing, Integral Fitting Type Space Saving/Space Saving Connection *Series LVQS/LVQHS*


Series LVQS

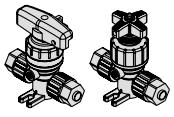

Series LVQHS

Orifice diameter	Flow characteristics Av x 10^{-6} m^2 (Cv)	Series
ø4	8.4 (0.35)	LVQ(H)S20
ø8	31.2 (1.3)	LVQ(H)S30
ø10	45.6 (1.9)	LVQ(H)S40
ø16	120 (5)	LVQ(H)S50
ø22	192 (8)	LVQ(H)S60

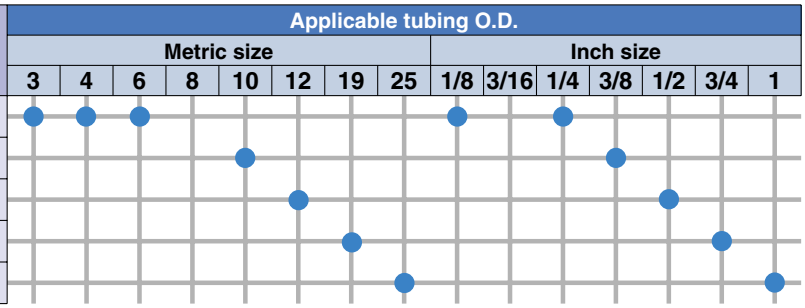


Flare, Integral Fitting Type *Series LVQ-Z/LVQH-Z*


Series LVQ-Z

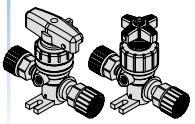

Series LVQH-Z

Orifice diameter	Flow characteristics Av x 10^{-6} m^2 (Cv)	Series
ø4	8.4 (0.35)	LVQ20(H)-Z
ø8	31.2 (1.3)	LVQ30(H)-Z
ø10	45.6 (1.9)	LVQ40(H)-Z
ø16	120 (5)	LVQ50(H)-Z
ø22	192 (8)	LVQ60(H)-Z

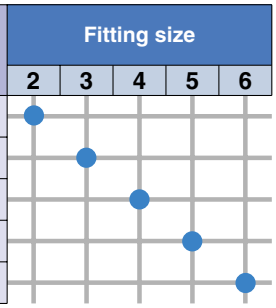


Flare, Integral Fitting Type Space Saving/Space Saving Connection *Series LVQS-Z/LVQHS-Z*

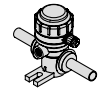

Series LVQS-Z

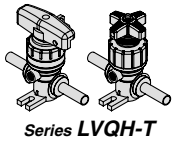

Series LVQHS-Z

Orifice diameter	Flow characteristics Av x 10^{-6} m^2 (Cv)	Series
ø4	8.4 (0.35)	LVQ20(H)S-Z
ø8	31.2 (1.3)	LVQ30(H)S-Z
ø10	45.6 (1.9)	LVQ40(H)S-Z
ø16	120 (5)	LVQ50(H)S-Z
ø22	192 (8)	LVQ60(H)S-Z

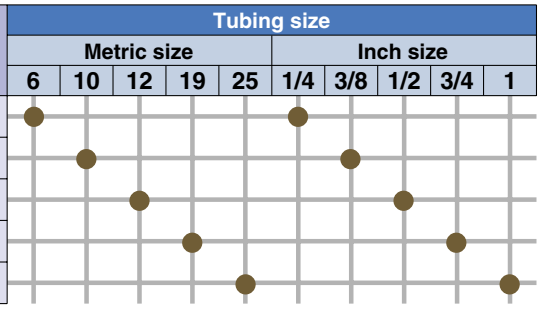


Tube Extension Integral Fitting Type *Series LVQ-T/LVQH-T*


Series LVQ-T


Series LVQH-T

Orifice diameter	Flow characteristics Av x 10^{-6} m^2 (Cv)	Series
ø4	8.4 (0.35)	LVQ20(H)-T
ø8	31.2 (1.3)	LVQ30(H)-T
ø10	45.6 (1.9)	LVQ40(H)-T
ø16	120 (5)	LVQ50(H)-T
ø22	192 (8)	LVQ60(H)-T

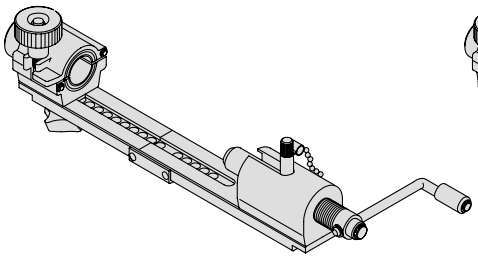


Guide to Pamphlet on Fluoropolymer Fitting Installation Methods

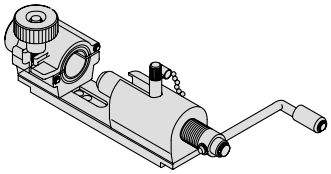
* The pamphlets can be downloaded from the SMC home page. http://www.smcworld.com

LQ1/2 Series Installation Method

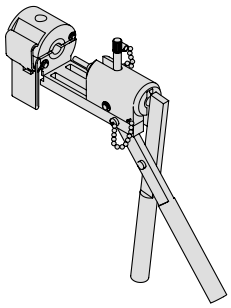
M type (For short pipes)
For fitting sizes 1 to 6



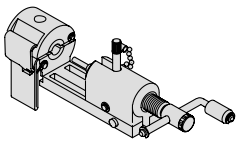
L type
For fitting sizes 1 to 6

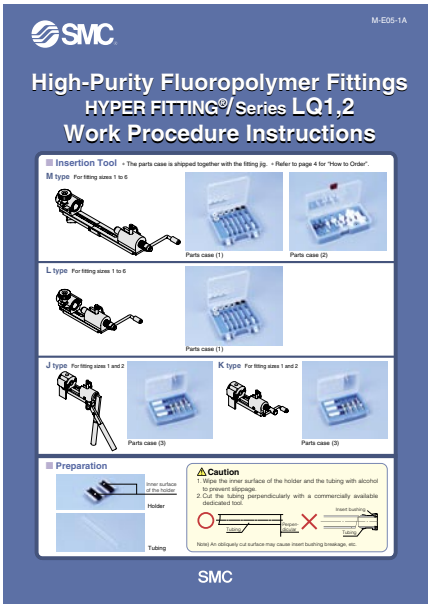


J type
For fitting sizes 1 and 2



K type
For fitting sizes 1 and 2



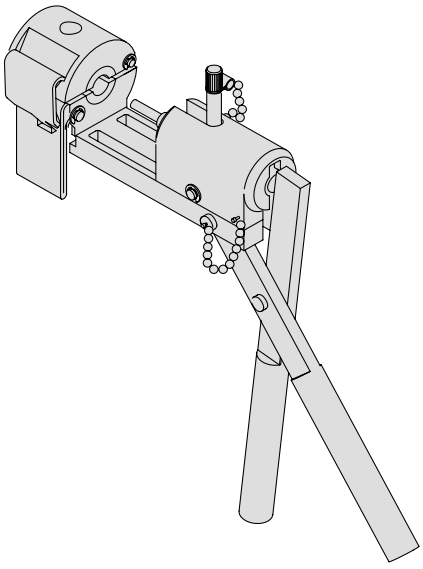


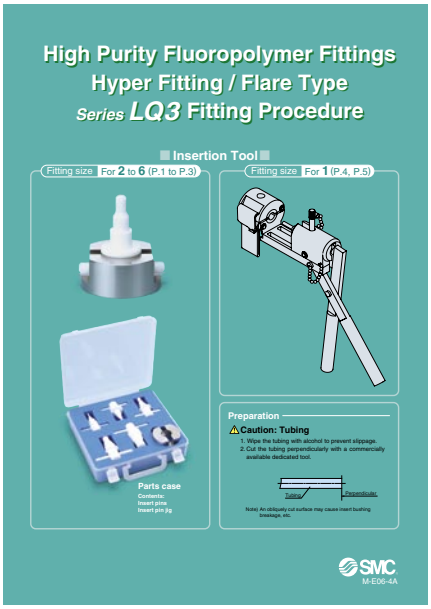
M-E05-1

LQ3 Series Installation Method

For fitting sizes 2 to 6

For fitting size 1





M-E06-4

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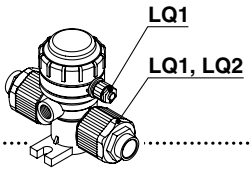
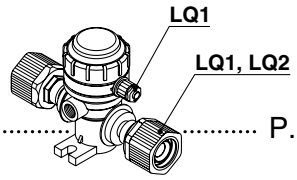
Insert Bushing, Integral Fitting Type

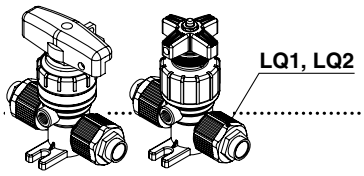
Air Operated
Insert Bushing, Integral Fitting Type
Hyper Fitting
● ***Series LVQ*** P.1



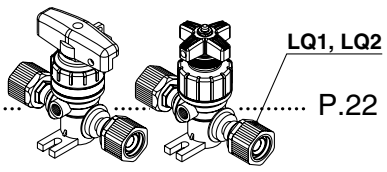
Air Operated
Insert Bushing, Integral Fitting Type
Space Saving/Space Saving Connection
● ***Series LVQS*** P.9



Manually Operated
Insert Bushing, Integral Fitting Type
Hyper Fitting
● ***Series LVQH*** P.18



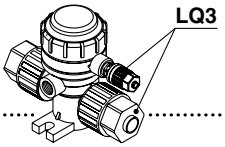
Manually Operated
Insert Bushing, Integral Fitting Type
Space Saving/Space Saving Connection
● ***Series LVQHS*** P.22



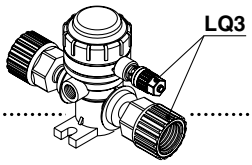
Fittings and Special Tools P.27

Flare, Integral Fitting Type

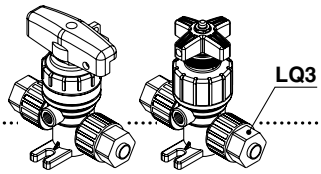
Air Operated
Flare, Integral Fitting Type
Hyper Fitting
● ***Series LVQ-Z*** P.28



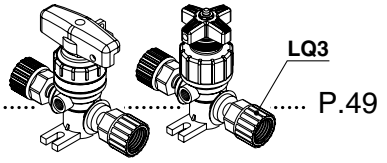
Air Operated
Flare, Integral Fitting Type
Space Saving/Space Saving Connection
● ***Series LVQS-Z*** P.36



Manually Operated
Flare, Integral Fitting Type
Hyper Fitting
● ***Series LVQH-Z*** P.45



Manually Operated
Flare, Integral Fitting Type
Space Saving/Space Saving Connection
● ***Series LVQHS-Z*** P.49



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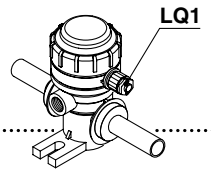
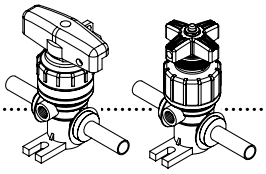
Tube Extension Integral Fitting Type

Air Operated
Tube Extension Integral Fitting Type
● ***Series LVQ-T*** P.54

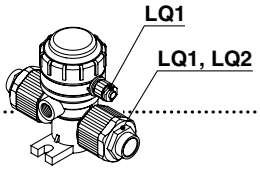


Manually Operated
Tube Extension Integral Fitting Type
● ***Series LVQH-T*** P.61



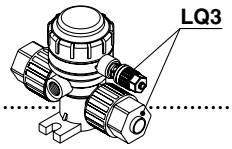
Insert Bushing, Integral Fitting Type

Air Operated, 0.5 MPa Back Pressure Tolerant
Insert Bushing, Integral Fitting Type
Hyper Fitting
● ***Series LVQ□□H*** P.64



Flare, Integral Fitting Type

Air Operated, 0.5 MPa Back Pressure Tolerant
Flare, Integral Fitting Type
Hyper Fitting
● ***Series LVQ□□H-Z*** P.65



Applicable Fluids P.67

Safety Instructions ..... Back page 1, 2

Specific Product Precautions ..... Back page 3, 4

Air Operated
Insert Bushing, Integral Fitting Type
Hyper Fitting
Series LVQ

How to Order

LVQ 2 0 – S 07 □ □ – □ – □

Body class

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

Valve type

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

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

Fitting type

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

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	●				
05	3/16	●				
07	1/4	○	●			
11	3/8		○	●		
13	1/2			○	●	
19	3/4				○	●
25	1					○

○ Basic size ● With reducer

Port B (OUT) different dia. size

Symbol	Application
—	Ports A & B same size
Refer to the applicable tubing size (table above)	Different diameter tubings can be selected within the same body class

Pilot port type

—	LQ1 integral fitting	Connection tubing O.D. 1/8" (ø3)
M	LQ1 integral fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

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

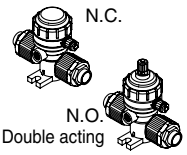
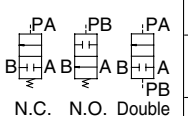
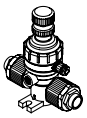
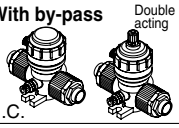
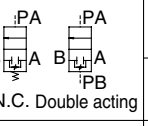
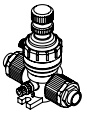
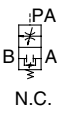
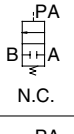
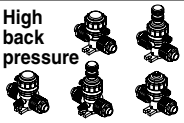
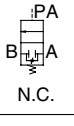
Option 2

Symbol	Applicable option 1	2	3	4	5	6	7	8	9	24	Option
—	○	○	○	○	○	○	○	○	○	○	None
J	○	—	—	—	○	○	—	—	—	—	For high temperature
K	○	○	○	○	○	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	○	—	—	—	—	—	High flow type **LVQ6**□ only

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

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

Variations

Type	Symbol	Valve type	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
		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
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.	○	○	○	○	○
High back pressure 		N.C.	○	○	○	○	○
With indicator & by-pass 		N.C.	○	○	○	○	○

SMC

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
Fitting type	IN/OUT port	LQ1 or LQ2				LQ1
	Pilot port	LQ1				
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
	High temperature	–98 kPa to 0.3 MPa				
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42				
	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		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) ( ): High flow type

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 27 for information on changing tubing sizes.

⚠ Specific Product Precautions

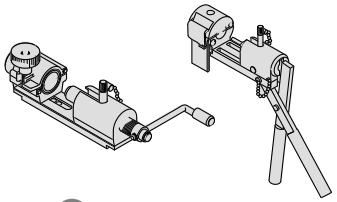
Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

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



⚠ Caution

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

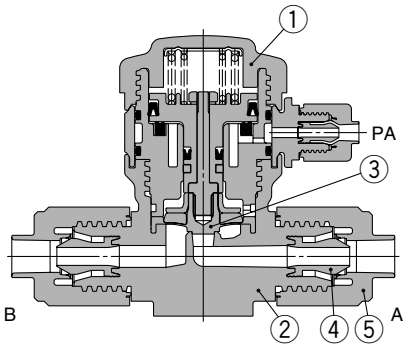
Tightening Torque for Piping

Body class	Torque (N·m)	
	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	—

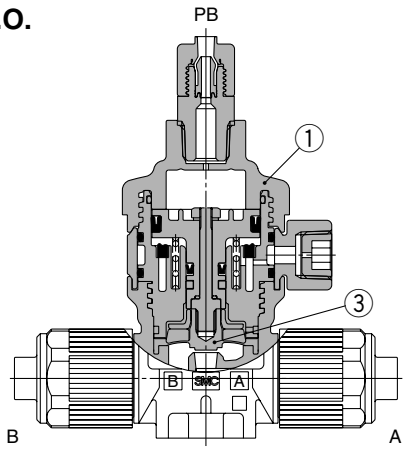
Construction

Basic

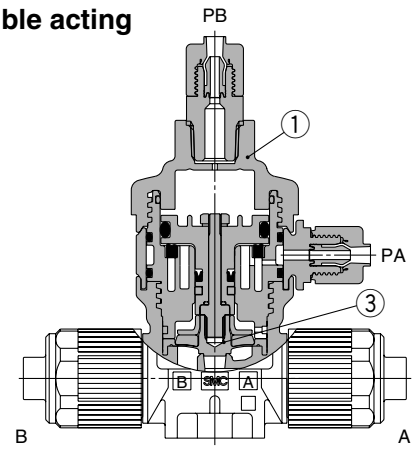
N.C.

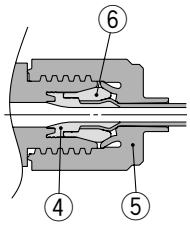


N.O.



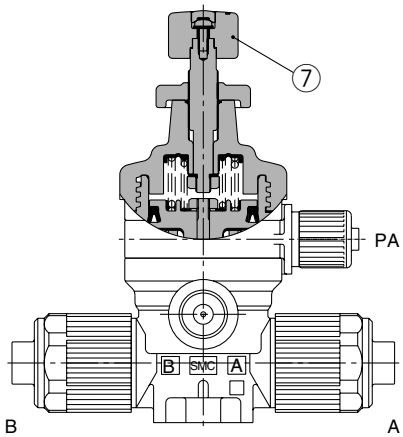
Double acting



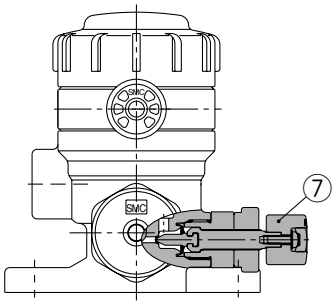


With reducer

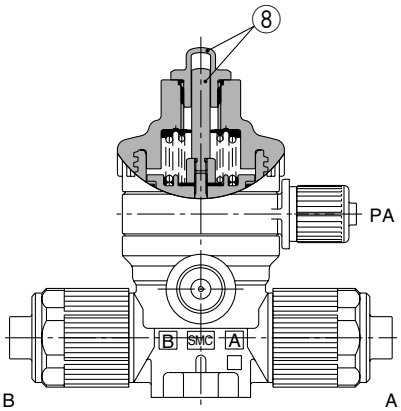
With flow rate adjustment



With by-pass



With indicator

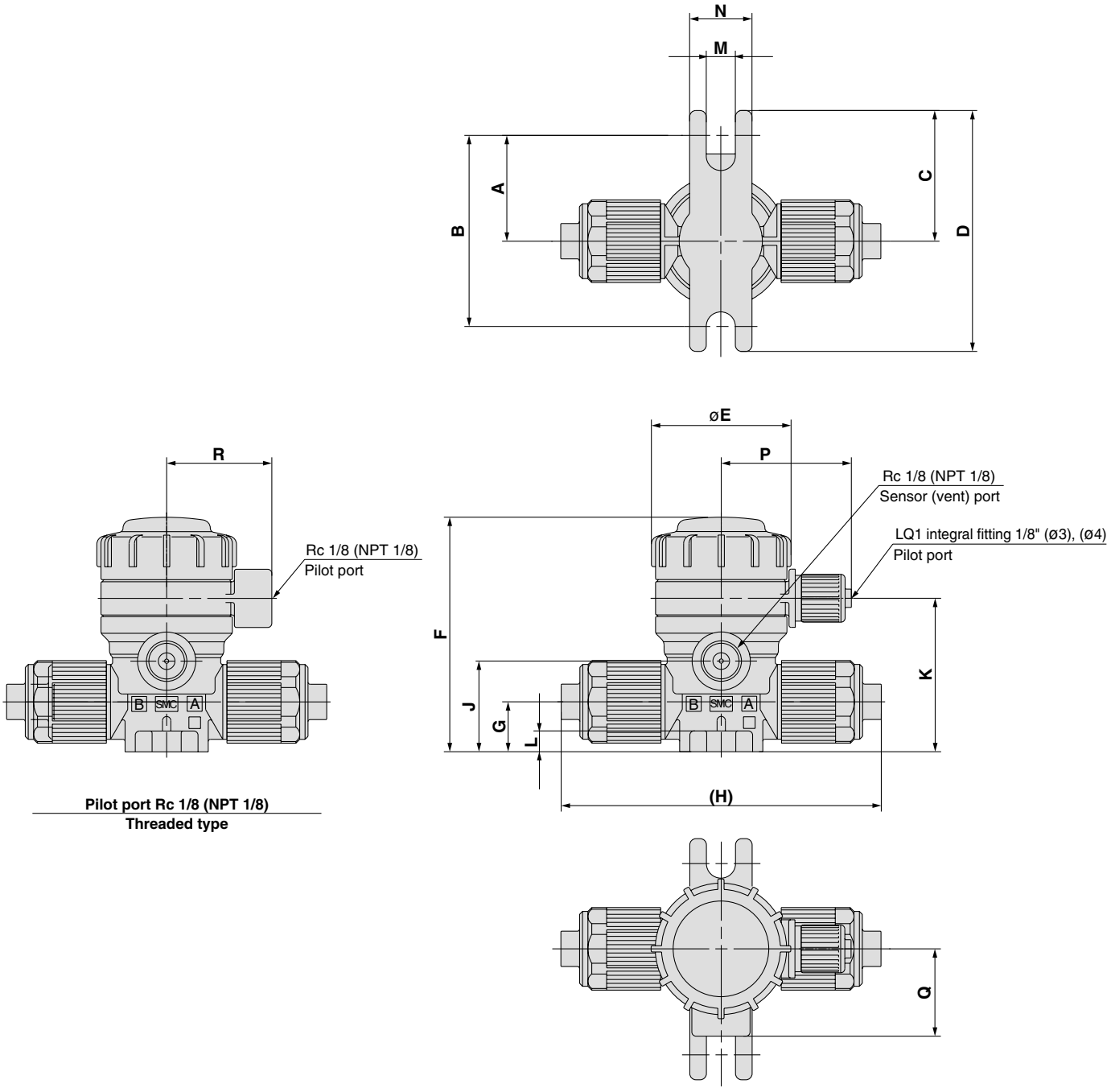


Component Parts

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

Dimensions

Basic, High back pressure
N.C. valve



∗ Drawings show LVQ□0-S.

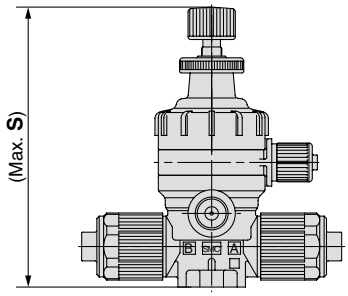
LVQ□0-$^{V}_{S}$□ Dimensions (N.C. Valve) (mm)

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

LVQ60 is available only with "V".

Dimensions

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

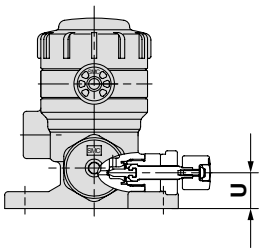


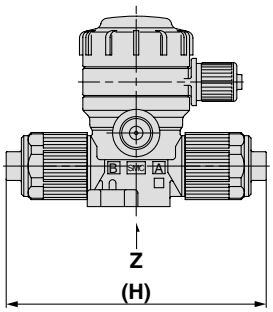
Dimensions (mm)

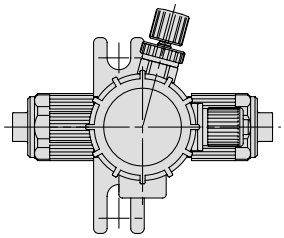
Model	S
LVQ20-$^{V}_{S}$□-1	83
LVQ30-$^{V}_{S}$□-1	113.5
LVQ40-$^{V}_{S}$□-1	119
LVQ50-$^{V}_{S}$□-1	171.5
LVQ60-V□-1*	182.5

LVQ60 is available only with "V".

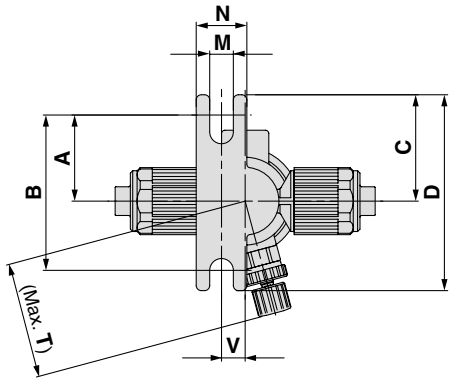
With by-pass, High back pressure with by-pass
N.C. valve



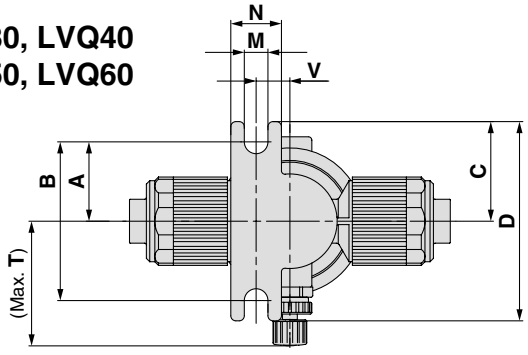




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

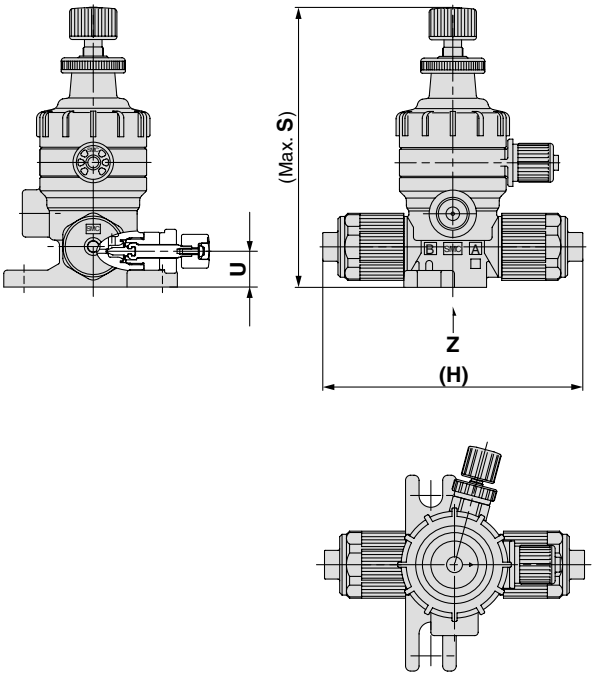
* Drawings show LVQ□0-S.

Dimensions (mm)

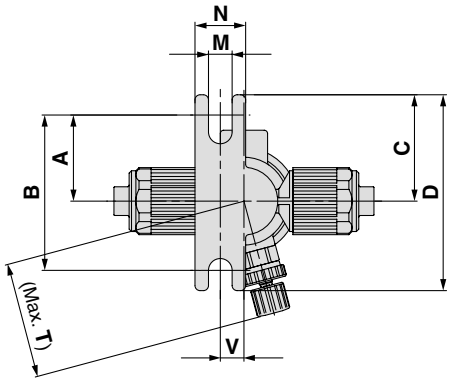
Model	A	B	C	D	M	N	T	U	V	H	
										V□	S□
LVQ20-$^{V}_{S}$□-2	25.5	46	31.5	58	7	15	34.3	10.6	7	64	77
LVQ30-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	36.9	16.5	10	83	95
LVQ40-$^{V}_{S}$□-2	25.5	51	31.5	63	7	15	37.9	22	10	95	109
LVQ50-$^{V}_{S}$□-2	38	76	44	88	7	20	64	25	17	130	141
LVQ60-V□-2*	38	76	44	88	7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

LVQ60 is available only with "V".

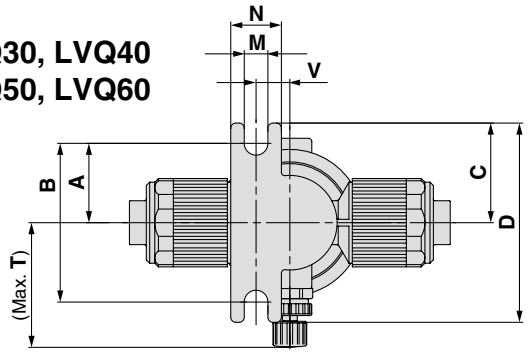
With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve



LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

∗ Drawings show 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	—

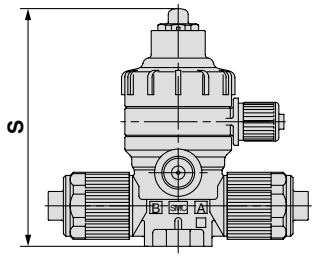
LVQ60 is available only with "V".

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

LVQ60 is available only with "V".

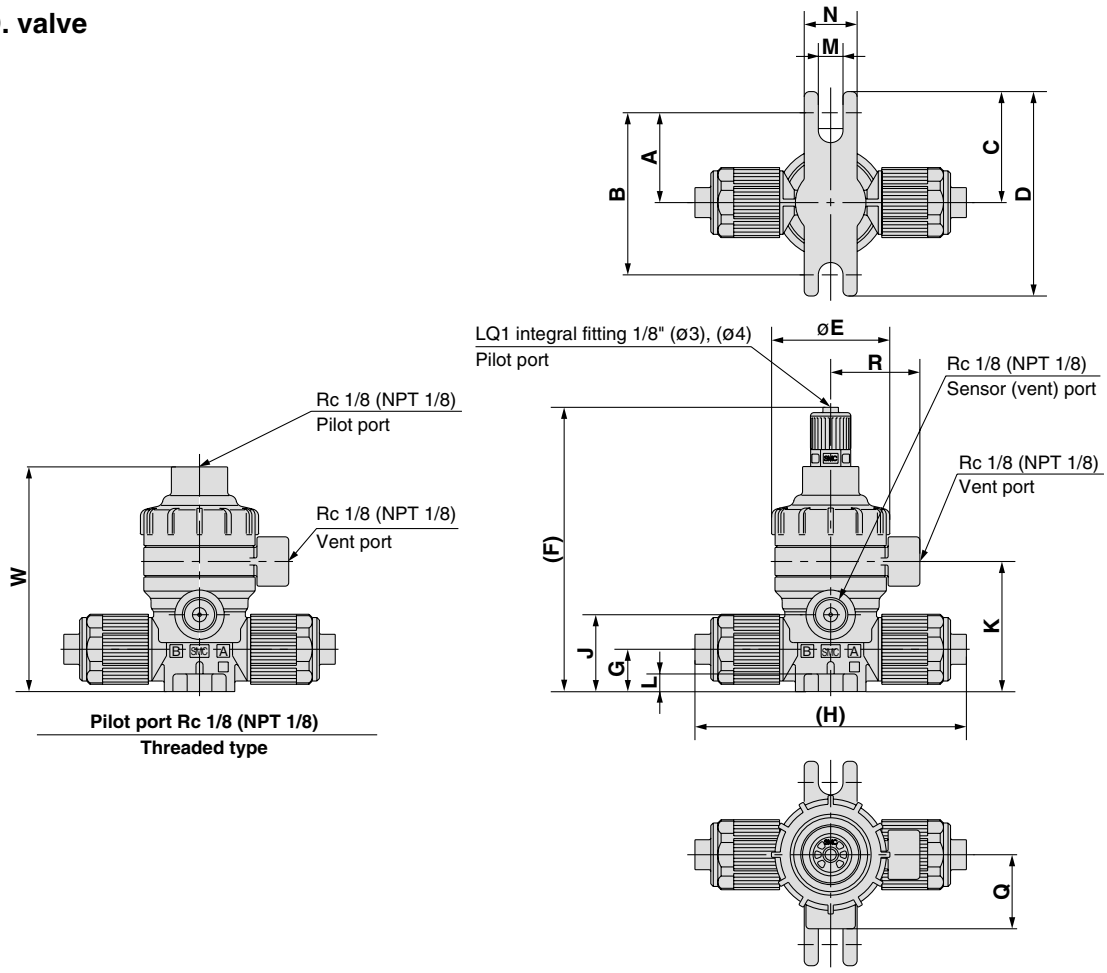


∗ Drawings show LVQ□0-S.

Dimensions

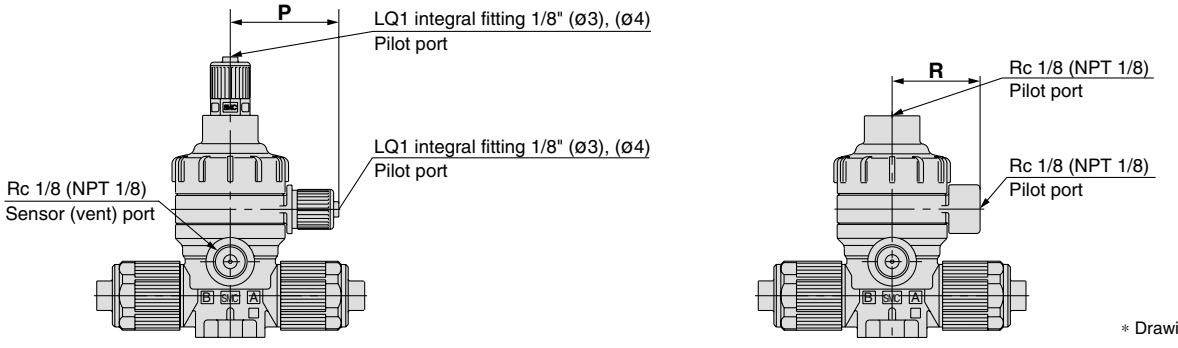
Basic

N.O. valve



∗ Drawings show LVQ□0-S.

Double acting valve



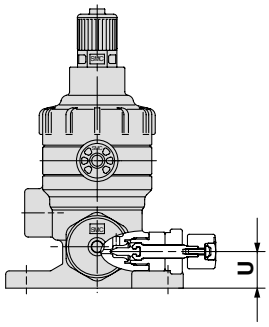
∗ Drawings show LVQ□0-S.

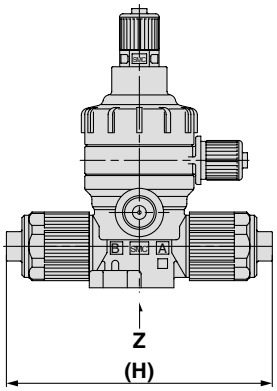
LVQ□$^{1}_{2}$-$^{V}_{S}$□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

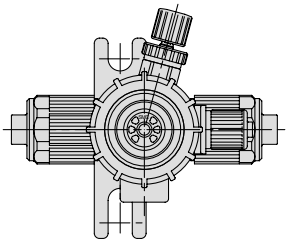
Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R	W
								V□	S□									
LVQ2$^{1}_{2}$-$^{V}_{S}$□	25.5	46	31.5	58	33.6	81	12	70	77	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3$^{1}_{2}$-$^{V}_{S}$□	28.5	57	34.5	69	45.4	99	16.5	83	95	32	50	6	7	20	37.2	25	31.2	82
LVQ4$^{1}_{2}$-$^{V}_{S}$□	28.5	57	34.5	69	45.4	104.5	22	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

LVQ60 is available only with "V".

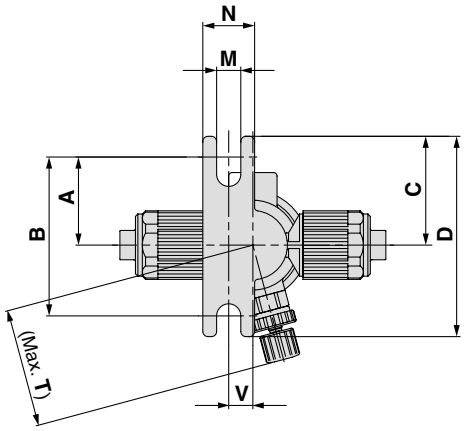
With by-pass
Double acting valve



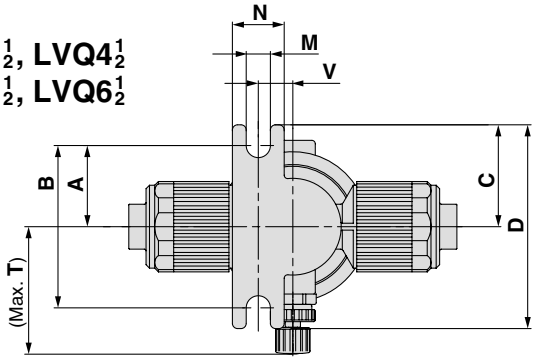




LVQ2$\frac{1}{2}$



LVQ3$\frac{1}{2}$, LVQ4$\frac{1}{2}$
LVQ5$\frac{1}{2}$, LVQ6$\frac{1}{2}$



View **Z**

∗ Drawings show LVQ□0-S.

Dimensions (N.O Valve, Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V	H	
										V□	S□
LVQ2$\frac{1}{2}$-$\frac{V}{S}$□-2	25.5	46	31.5	58	7	15	34.3	10.6	7	64	77
LVQ3$\frac{1}{2}$-$\frac{V}{S}$□-2	25.5	51	31.5	63	7	15	36.9	16.5	10	83	95
LVQ4$\frac{1}{2}$-$\frac{V}{S}$□-2	25.5	51	31.5	63	7	15	37.9	22	10	95	109
LVQ5$\frac{1}{2}$-$\frac{V}{S}$□-2	38	76	44	88	7	20	64	25	17	130	141
LVQ6$\frac{1}{2}$-V□-2∗	38	76	44	88	7	20	66	32	17	150	—

LVQ60 is available only with “V”.

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

How to Order

LVQ 2 0 S – S 07 □ – □ – □

Body class

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

Valve type

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

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

Body type

S	Space saving connection

Fitting type

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

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 10 for How to Order fitting parts.
Select a tube with the same size as the valve side fitting.

Pilot port type

—	LQ1 integral fitting	Connection tubing O.D. 1/8" (ø3)
M	LQ1 integral fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

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

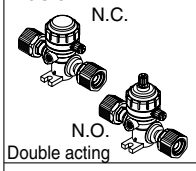
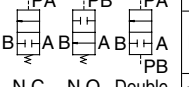
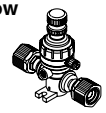
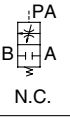
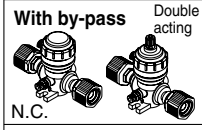
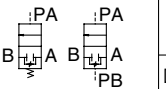
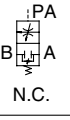
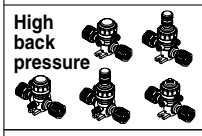
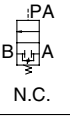
Note) Refer to variations in the table below for valve type and option 1 combinations.
Options in the same table can not be combined to each other.

Option 2

Symbol	Applicable option										Option
	1	2	3	4	5	6	7	8	9	24	
—	○	○	○	○	○	○	○	○	○	○	None
J	○	—	—	—	○	○	—	—	—	—	For high temperature
K	○	○	○	○	○	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	○	—	—	—	—	—	High flow type **LVQ6**□ only

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

Variations

Type	Symbol	Model	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
		Orifice diameter	ø4	ø8	ø10	ø16	ø22
		Applicable fitting size	2	3	4	5	6
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.	○	○	○	○	○
High back pressure 		N.C.	○	○	○	○	○
With indicator & by-pass 		N.C.	○	○	○	○	○

How to Order Space Saving Fittings

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 (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"	●

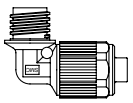
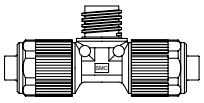
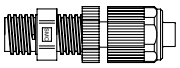
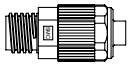
○ Basic size ● With reducer

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

LQ1 E 61 – S
LQ2 E 21 – S

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

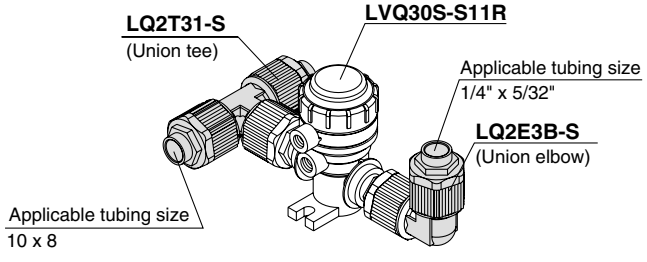
Size	No.	Applicable tubing size (mm)	Reducing
2	1	6 x 4	○
2	2	4 x 3	●
3	1	10 x 8	○
3	2	8 x 6	●
3	3	6 x 4	●
4	1	12 x 10	○
4	2	10 x 8	●
5	1	19 x 16	○
5	2	12 x 10	●

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"	●

○ Basic size ● With reducer

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

Piping Example



Ordering Example

LVQ30S-S11R 1
LQ2T31-S (Union tee) 1
LQ2E3B-S (Union elbow) 1

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

Standard Specifications

Model		LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
Connection fitting size		2	3	4	5	6
Fitting type	IN/OUT port	LQ1 or LQ2				LQ1
	Pilot port	LQ1				
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
	High temperature	–98 kPa to 0.3 MPa				
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42				
	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		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) ( ): High flow type

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

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

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

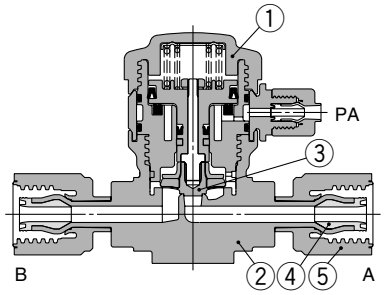
Tightening Torque for Piping

Body class	Torque (N·m)	
	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	—

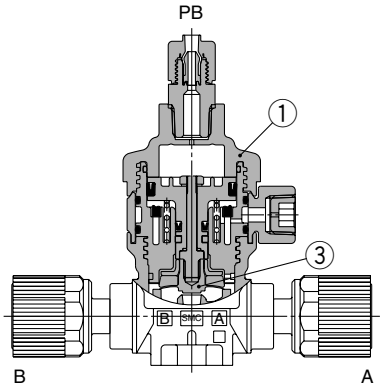
Construction

Basic

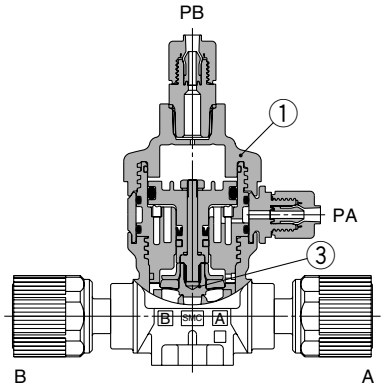
N.C.



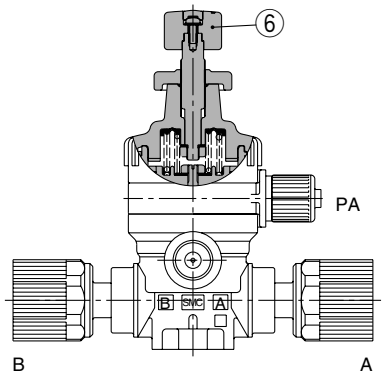
N.O.



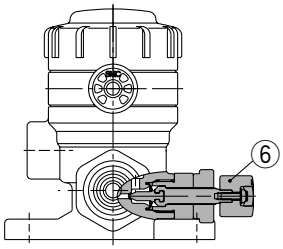
Double acting



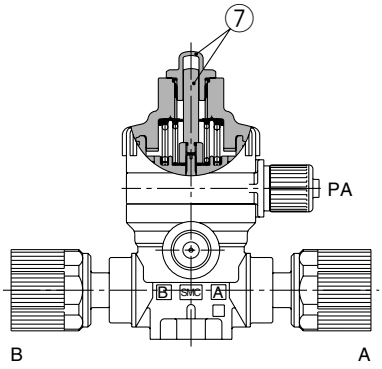
With flow rate adjustment



With by-pass



With indicator

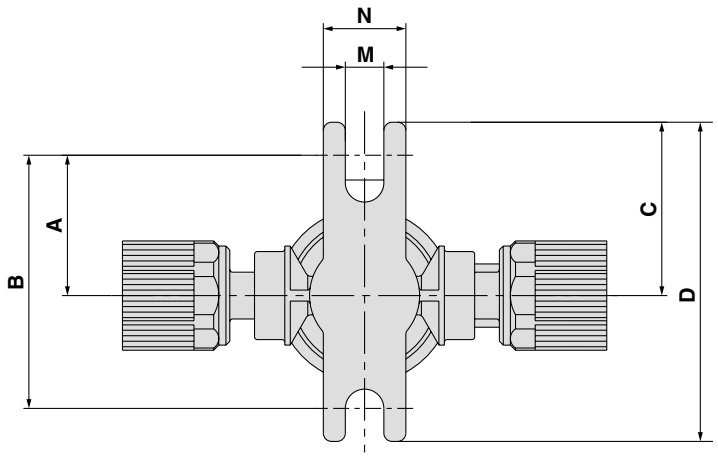


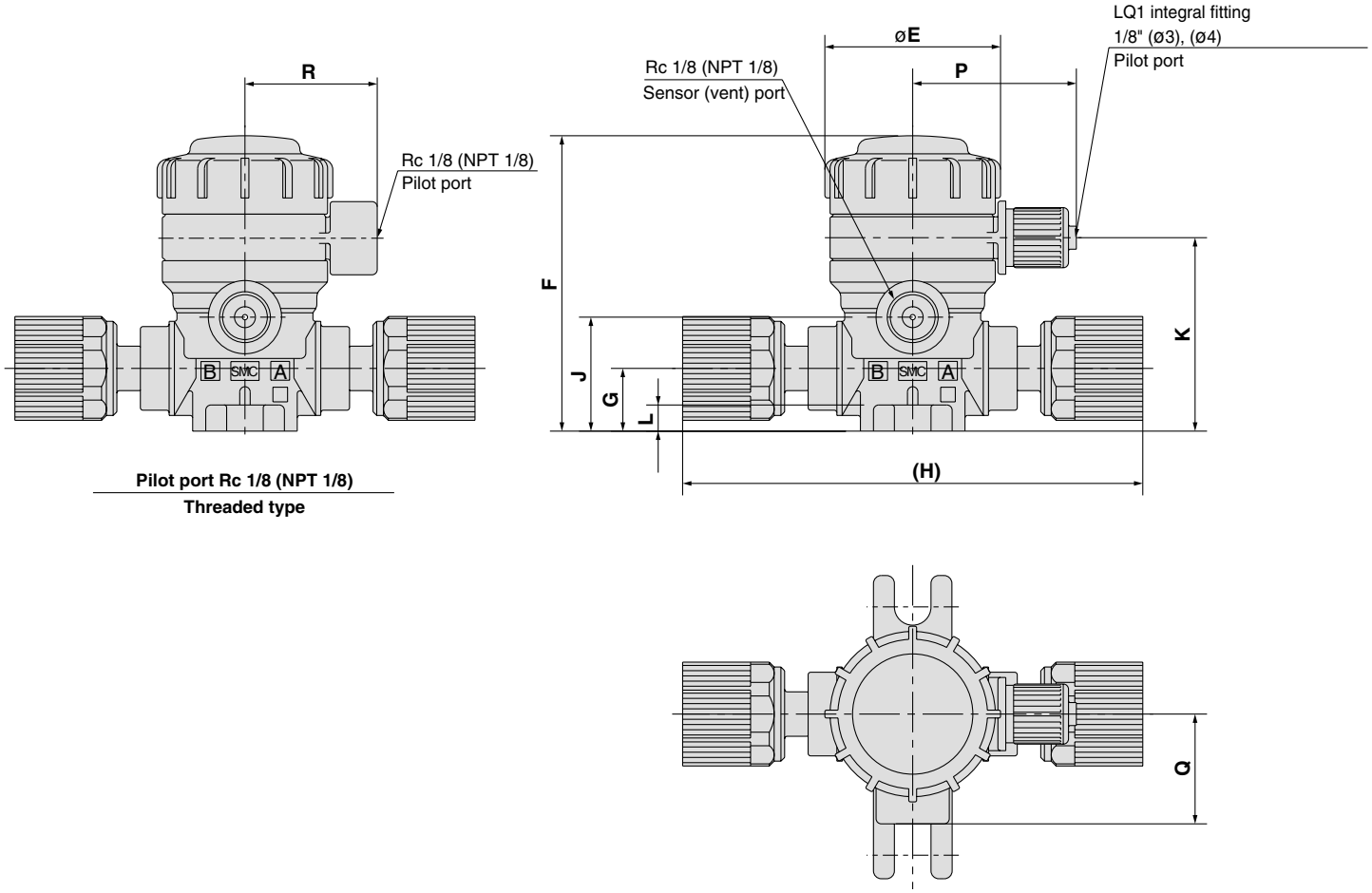
Component Parts

No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**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 LVQ□0-S.

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

Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R
								V□	S□								
LVQ20S-$^{V}_{S}$07	25.5	46	31.5	58	33.6	56.5	12	89	92	21.8	37	5	7	15	31.3	21	25.3
LVQ30S-$^{V}_{S}$11	28.5	57	34.5	69	45.4	77	16.5	106	112	32	50	6	7	20	37.2	25	31.2
LVQ40S-$^{V}_{S}$13	28.5	57	34.5	69	45.4	82.5	22	120	126	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50S-$^{V}_{S}$19	42	84	48	96	75	127	25	164	168	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

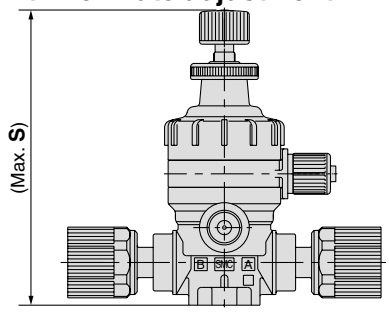
LVQ60 is available only with "V".

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

Dimensions (mm)

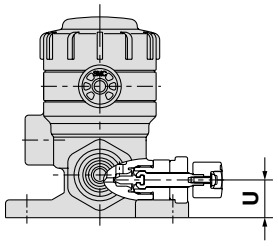
Model	S
LVQ20S-$^{V}_{S}$07-1	83
LVQ30S-$^{V}_{S}$11-1	113.5
LVQ40S-$^{V}_{S}$13-1	119
LVQ50S-$^{V}_{S}$19-1	171.5
LVQ60S-V25-1*	182.5

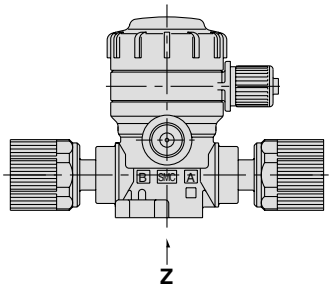
LVQ60 is available only with "V".

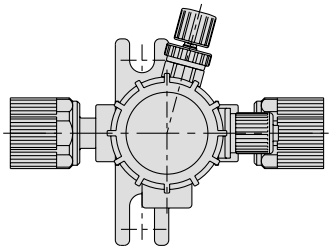


* Drawing shows LVQ□0-S.

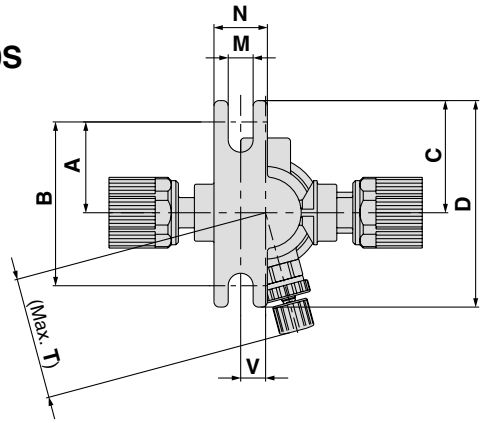
With by-pass, High back pressure with by-pass N.C. valve



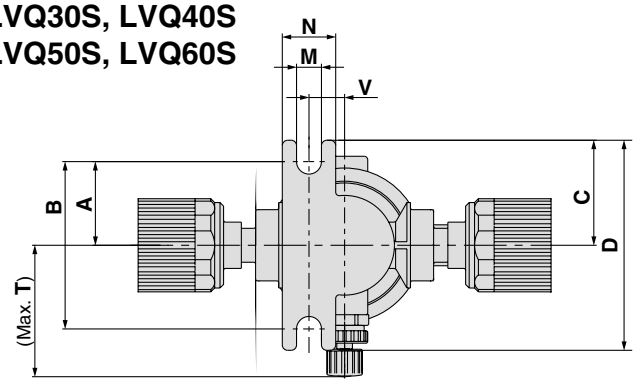




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S



View **Z**

Dimensions (mm)

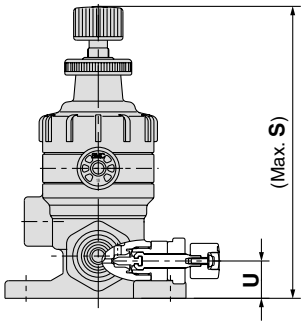
Model	A	B	C	D	M	N	T	U	V
LVQ20S-$^{V}_{S}$07-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30S-$^{V}_{S}$11-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40S-$^{V}_{S}$13-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50S-$^{V}_{S}$19-2	38	76	44	88	7	20	64	25	17
LVQ60S-V25-2*	38	76	44	88	7	20	66	32	17

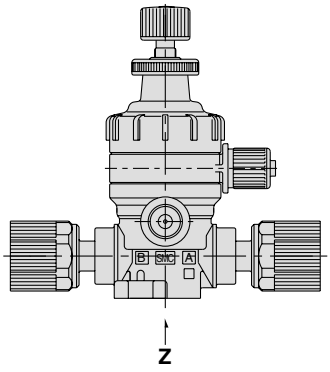
LVQ60 is available only with "V".

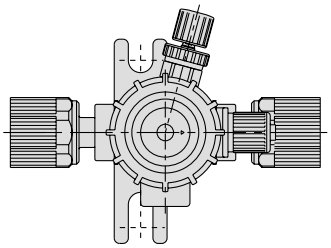
* Drawings show LVQ□0-S.

Dimensions

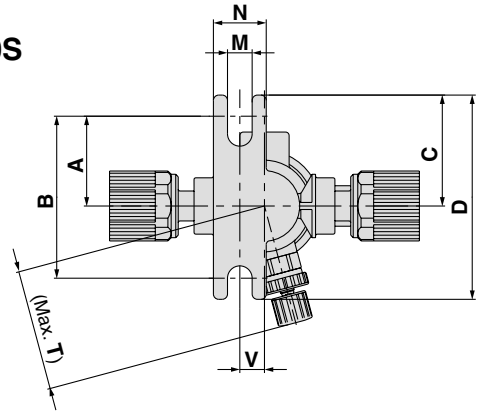
With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve



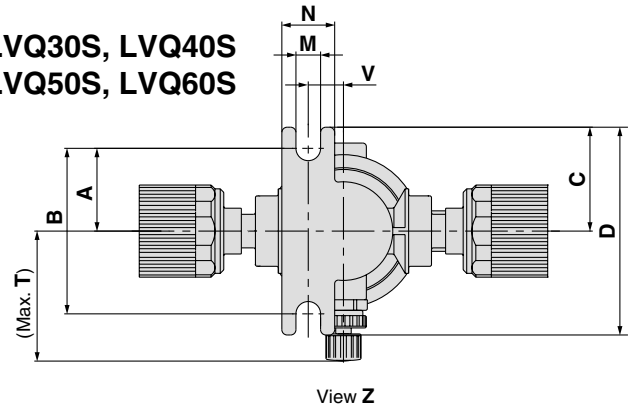




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S



View **Z**

∗ Drawings show LVQ□0-S.

Dimensions (mm)

Model	A	B	C	D	M	N	S	T	U	V
LVQ20S-$^{V}_{S}$07-3	25.5	46	31.5	58	7	15	83	34.3	10.6	7
LVQ30S-$^{V}_{S}$11-3	25.5	51	31.5	63	7	15	113.5	36.9	16.5	10
LVQ40S-$^{V}_{S}$13-3	25.5	51	31.5	63	7	15	119	37.9	22	10
LVQ50S-$^{V}_{S}$19-3	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

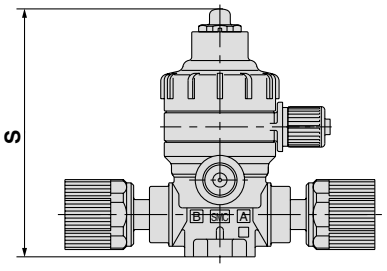
LVQ60 is available only with "V".

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

Dimensions (mm)

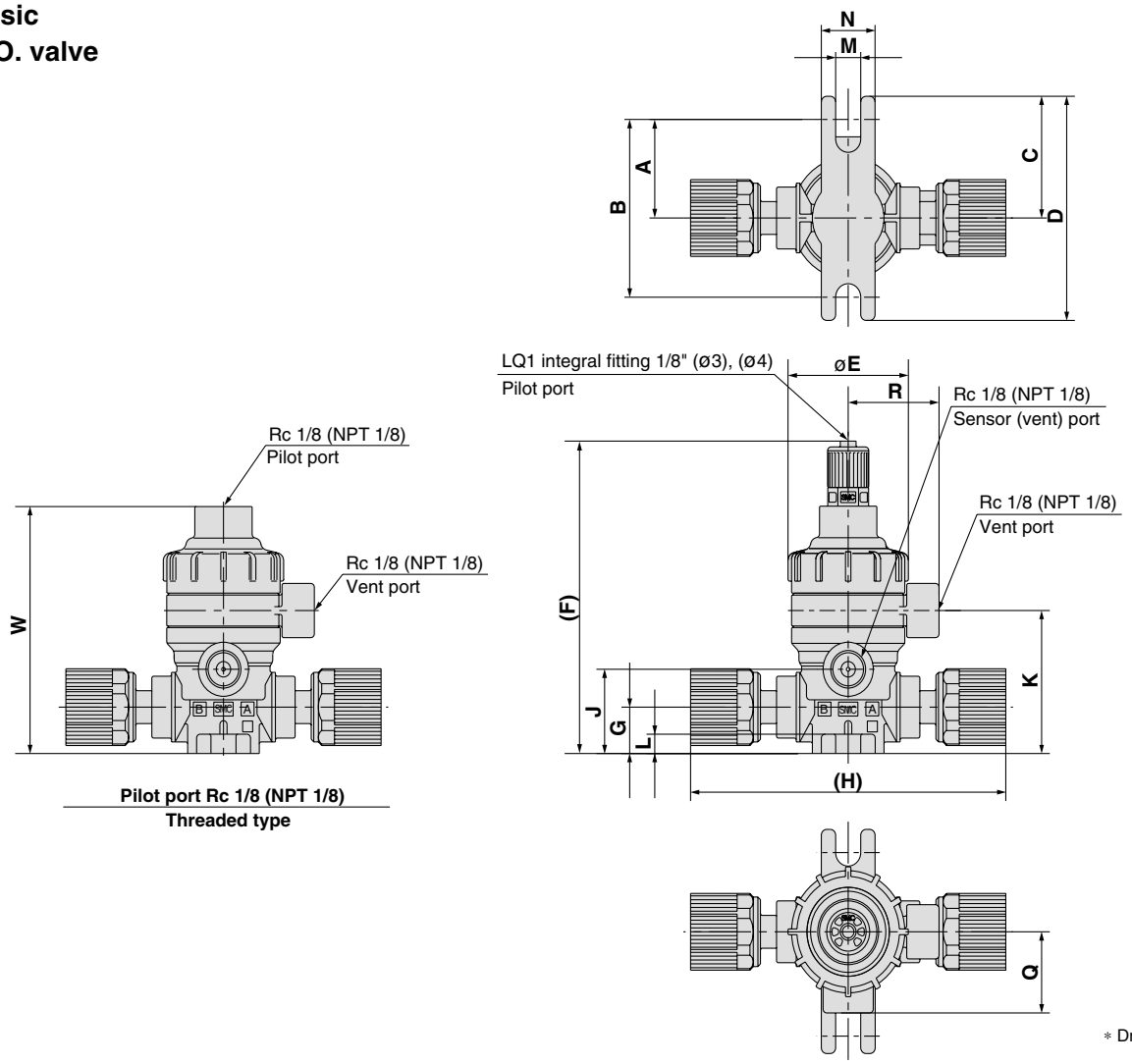
Model	S
LVQ20S-$^{V}_{S}$07-4	70.5
LVQ30S-$^{V}_{S}$11-4	88.5
LVQ40S-$^{V}_{S}$13-4	94
LVQ50S-$^{V}_{S}$19-4	134.5
LVQ60S-V25-4∗	144

LVQ60 is available only with "V".



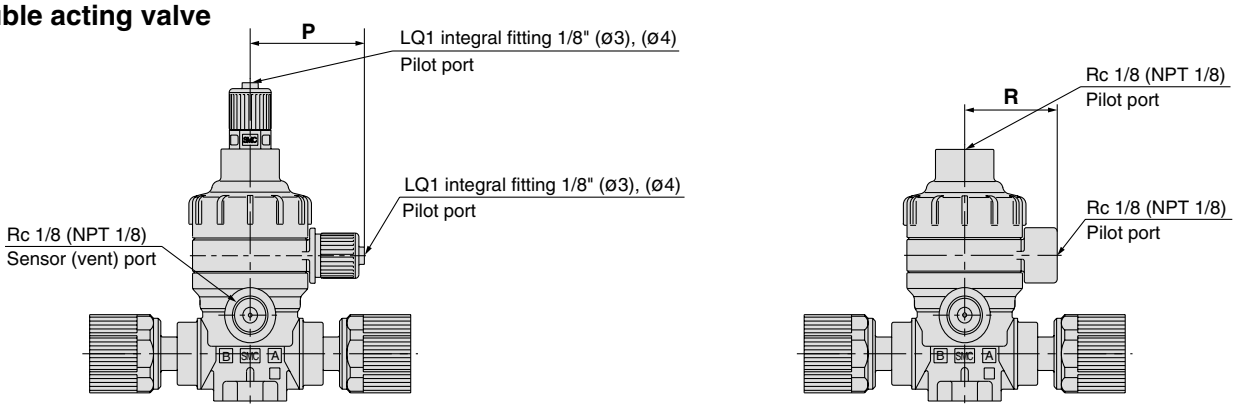
∗ Drawing shows LVQ□0-S.

Basic
N.O. valve



∗ Drawings show LVQ□0-S.

Double acting valve



∗ Drawings show LVQ□0-S.

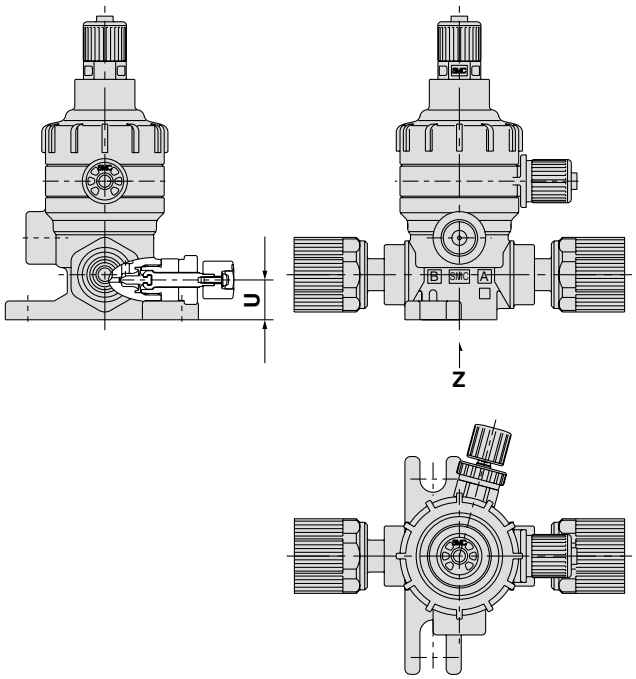
LVQ□$^{1}_{2}$S-$^{V}_{S}$□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

Model	A	B	C	D	E	F	G	H		J	K	L	M	N	P	Q	R	W
								V□	S□									
LVQ2$^{1}_{2}$S-$^{V}_{S}$07	25.5	46	31.5	58	33.6	81	12	89	92	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3$^{1}_{2}$S-$^{V}_{S}$11	28.5	57	34.5	69	45.4	99	16.5	106	112	32	50	6	7	20	37.2	25	31.2	82
LVQ4$^{1}_{2}$S-$^{V}_{S}$13	28.5	57	34.5	69	45.4	104.5	22	120	126	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5$^{1}_{2}$S-$^{V}_{S}$19	42	84	48	96	75	145	25	164	168	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6$^{1}_{2}$S-V25∗	42	84	48	96	75	154.5	32	177	—	60	88	10	7	20	50.8	38.5	45	137.5

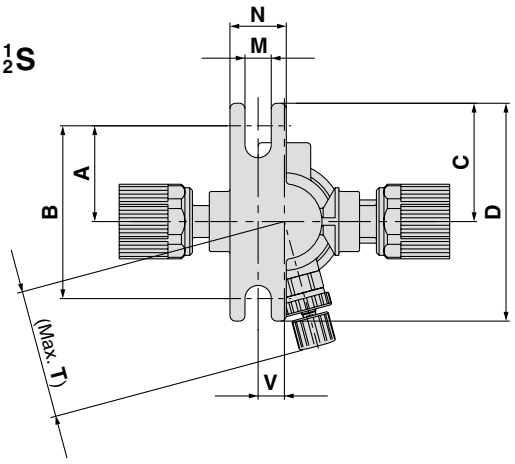
LVQ60 is available only with "V".

Dimensions

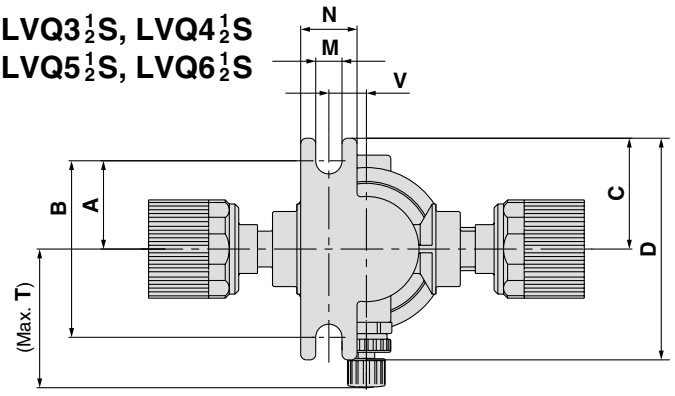
With by-pass
Double acting valve



LVQ2$\frac{1}{2}$S



LVQ3$\frac{1}{2}$S, LVQ4$\frac{1}{2}$S
LVQ5$\frac{1}{2}$S, LVQ6$\frac{1}{2}$S



View **Z**

∗ Drawings show LVQ□0-S.

Dimensions (N.O. Valve, Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ2$\frac{1}{2}$S-$\frac{V}{S}$07-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ3$\frac{1}{2}$S-$\frac{V}{S}$11-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ4$\frac{1}{2}$S-$\frac{V}{S}$13-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ5$\frac{1}{2}$S-$\frac{V}{S}$19-2	38	76	44	88	7	20	64	25	17
LVQ6$\frac{1}{2}$S-V25-2∗	38	76	44	88	7	20	66	32	17

LVQ60 is available only with “V”.

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

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	Option
—	None
K	Buffer material FFKM
N	For ammonium hydroxide

Note) Options cannot be combined to 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

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	●				
05	3/16	●				
07	1/4	○	●			
11	3/8		○	●		
13	1/2			○	●	
19	3/4				○	●
25	1					○

○ Basic size ● With reducer

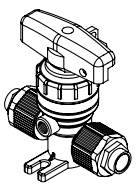
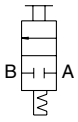
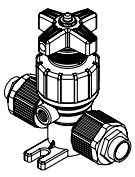
Vent port type

—	Threaded	NPT 1/8
R	Threaded	Rc 1/8

Port B (OUT) different dia. size

Symbol	Application
—	Ports A & B same size
Refer to the applicable tubing table (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			○	○	○	○	○

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
Fitting type		LQ1 or LQ2				LQ1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm^3/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) ( ): High flow type

⚠ Specific Product Precautions

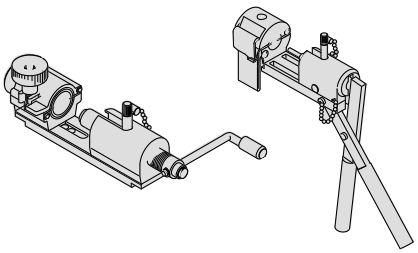
Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

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



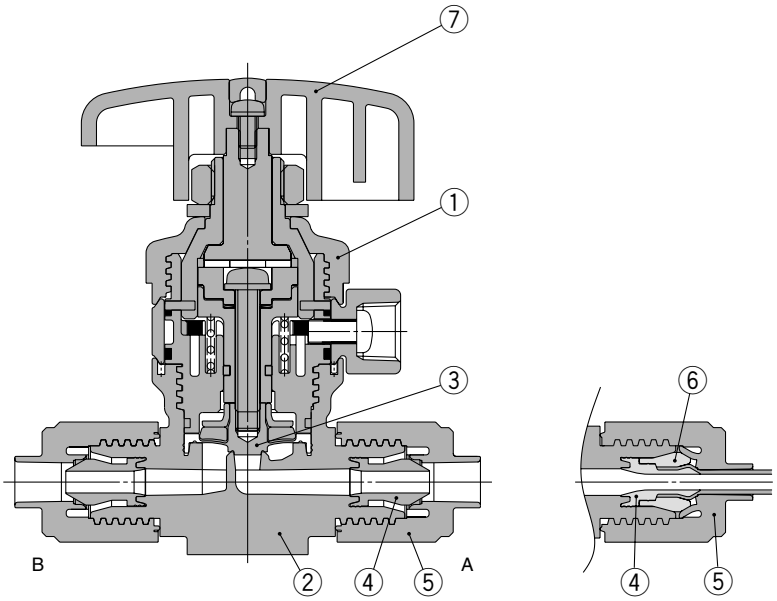
2. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening Torque for Piping

Body class	Torque (N·m)	
	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	—

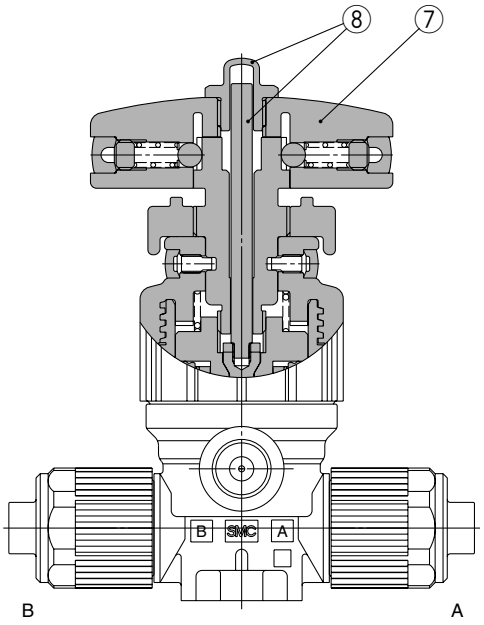
Construction

90° turn type



With reducer

Multi-turn type (With indicator)

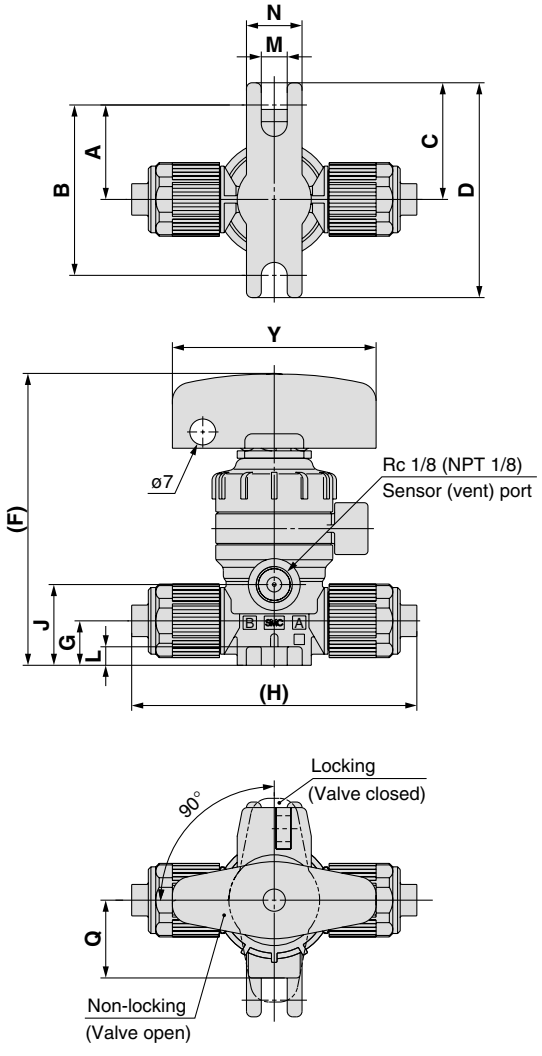


Component Parts

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

Dimensions

90° turn type



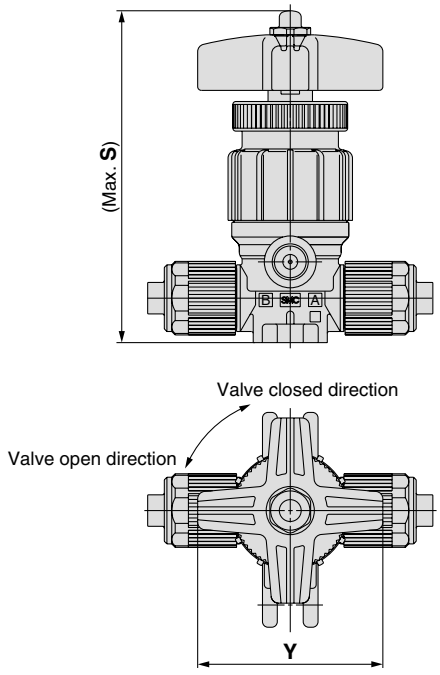
Dimensions (mm)

Model	A	B	C	D	F	G	H	
							V□	S□
LVQH20-V□-1	25.5	46	31.5	58	79	12	70	77
LVQH30-V□-1	28.5	57	34.5	69	103	16.5	83	95
LVQH40-V□-1	28.5	57	34.5	69	108	22	95	109
LVQH50-V□-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□-1	21.8	37	5	7	15	21	55
LVQH30-V□-1	32	50	6	7	20	25	80
LVQH40-V□-1	37.5	55.5	6	7	20	25	80
LVQH50-V□-1	50.2	78.2	10	7	20	38.5	110
LVQH60-V□-1*	60	88	10	7	20	38.5	110

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

Multi-turn type (With indicator)



Dimensions (mm)

Model	S	Y
LVQH20-V□-4	89.6	50
LVQH30-V□-4	107.2	50
LVQH40-V□-4	112.7	50
LVQH50-V□-4	165	71
LVQH60-V□-4*	174.5	71

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

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

How to Order

LVQH 2 0 S – 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

Body type

S	Space saving connection

Fitting type

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

Vent port type

—	Threaded	NPT 1/8
R	Threaded	Rc1 /8

Applicable tubing size

Symbol	Connection tubing O.D.	Body class				
		2	3	4	5	6
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

Note) Refer to page 23 for How to Order applicable fittings. Select the same size as the fitting on the valve.

Handle operation

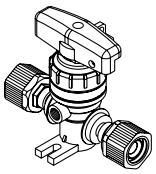
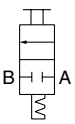
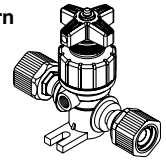
1	90° turn type
4	Multi-turn type (With indicator)

Option

Symbol	Option
—	None
K	Buffer material FFKM
N	For ammonium hydroxide

Note) Options cannot be combined to 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

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	Applaicable 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"	●

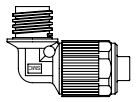
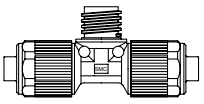
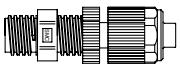
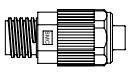
○ Basic size ● With reducer

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

LQ1 E 61 – S
LQ2 E 21 – S

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

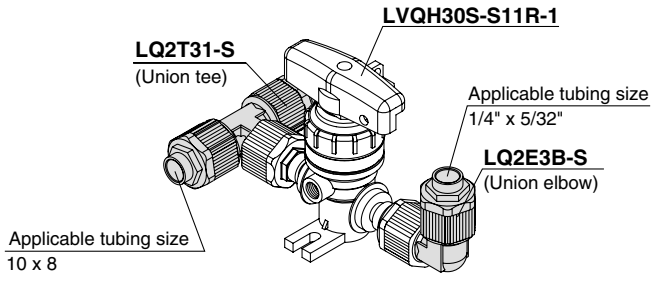
Size	No.	Applicable tubing size (mm)	Reducing
2	1	6 x 4	○
2	2	4 x 3	●
3	1	10 x 8	○
3	2	8 x 6	●
3	3	6 x 4	●
4	1	12 x 10	○
4	2	10 x 8	●
5	1	19 x 16	○
5	2	12 x 10	●

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"	●

○ Basic size ● With reducer

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

Piping Example



Ordering Example

LVQH30S-S11R-1 1
LQ2T31-S (Union tee) 1
LQ2E3B-S (Union elbow) 1

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

Standard Specifications

Model		LVQH20S	LVQH30S	LVQH40S	LVQH50S	LVQH60S
Connection fitting size		2	3	4	5	6
Fitting type		LQ1 or LQ2				LQ1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	**Av x 10^{-6} m^2**	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm^3/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) ( ): High flow type

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

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

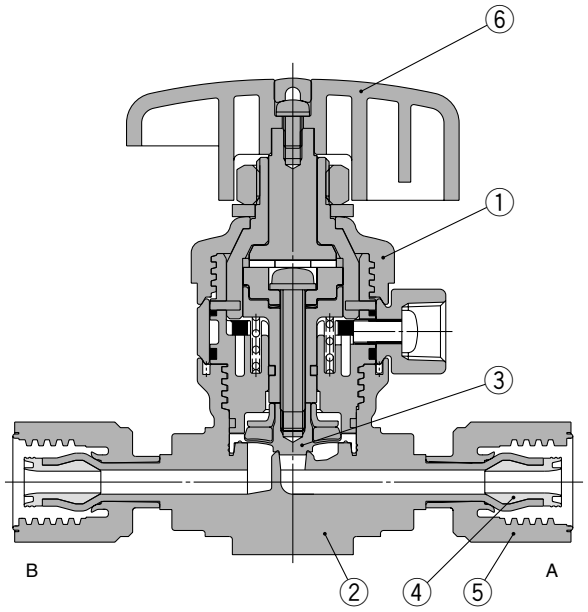
2. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening Torque for Piping

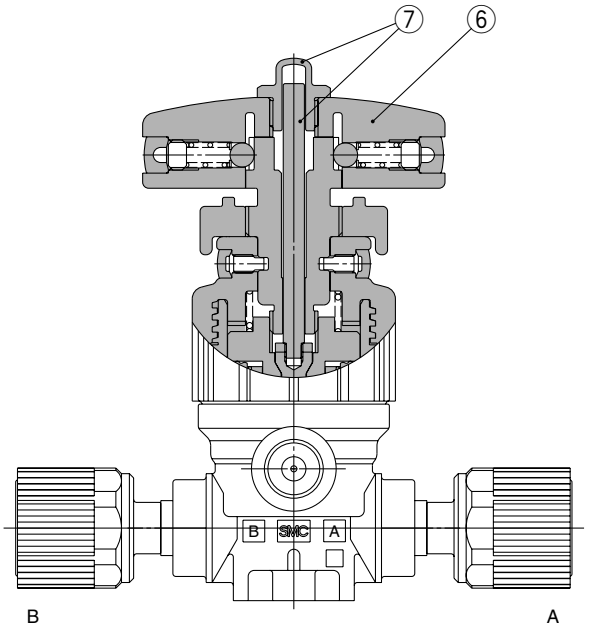
Body class	Torque (N·m)	
	LQ1	**LQ2**
2	0.3 to 0.4	1.5 to 2.0
3	0.8 to 1.0	3.0 to 3.5
4	1.0 to 1.2	7.5 to 9.0
5	2.5 to 3.0	11.0 to 13.0
6	5.5 to 6.0	—

Construction

90° turn type



Multi-turn type (With indicator)

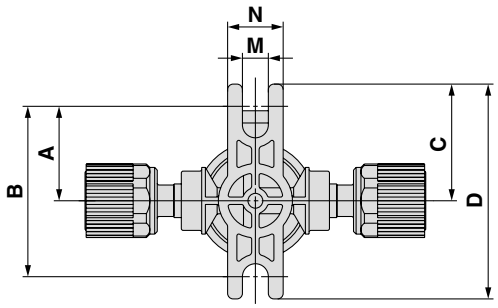


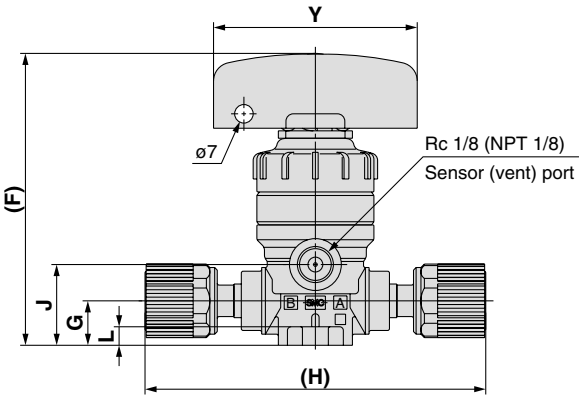
Component Parts

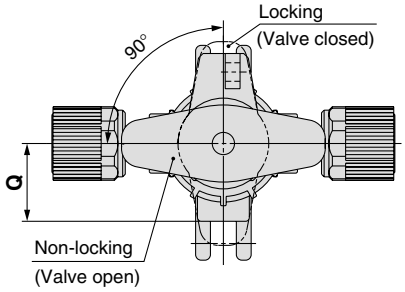
No.	Description	Material
1	**Actuator**	PVDF
2	**Body**	PFA
3	**Diaphragm**	PTFE
4	**Insert bushing**	PFA
5	**Nut**	PFA
6	**Handle**	PVDF
7	**Indicator/Cover**	PP

Dimensions

90° turn type







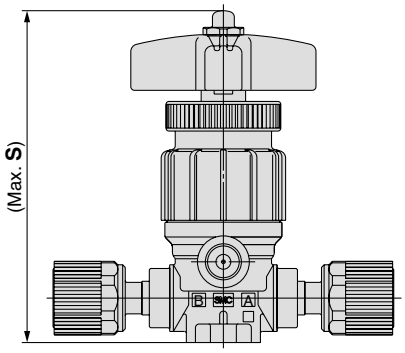
Dimensions (mm)

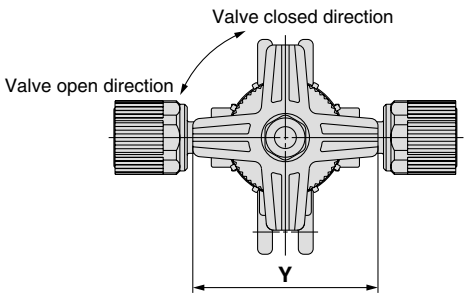
Model	A	B	C	D	F	G	H	
							V□	S□
LVQH20S-$^{V}_{S}$□-1	25.5	46	31.5	58	79	12	89	92
LVQH30S-$^{V}_{S}$□-1	28.5	57	34.5	69	103	16.5	106	112
LVQH40S-$^{V}_{S}$□-1	28.5	57	34.5	69	108	22	120	126
LVQH50S-$^{V}_{S}$□-1	42	84	48	96	165	25	164	168
LVQH60S-V□-1∗	42	84	48	96	175	32	177	—

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

∗ LVQ60 is available only with "V".
∗ Drawings show LVQ□0-S.

Multi-turn type (With indicator)





Dimensions (mm)

Model	S	Y
LVQH20S-$^{V}_{S}$□-4	89.6	50
LVQH30S-$^{V}_{S}$□-4	107.2	50
LVQH40S-$^{V}_{S}$□-4	112.7	50
LVQH50S-$^{V}_{S}$□-4	165	71
LVQH60S-V□-4∗	174.5	71

∗ LVQ60 is available only with "V".
∗ Drawings show LVQ□0-S.

Series LVQ
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 with special tools.

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

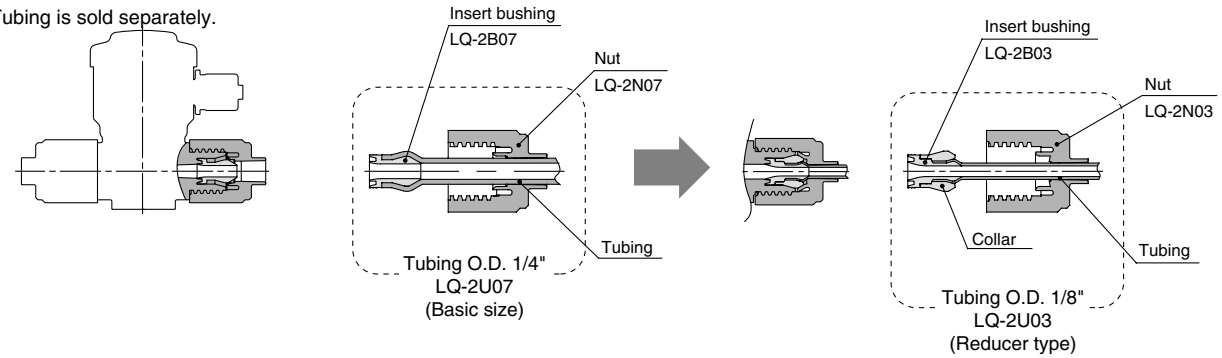
Changing the tubing size

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

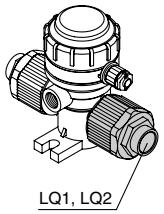
Prepare an insert bushing and nut for 1/8" O.D. tubing (LQ-2U03) and change the tubing size.

(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
—	LQ2
1	LQ1

Body class

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

Parts type

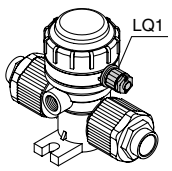
Symbol	Parts type
U	Nut & Insert bushing
B	Insert bushing
N	Nut

Tubing size

Symbol	Tubing O.D.	Body class	Applicable fitting
03	1/8" (ø3)	2	LQ1 LQ2
04	ø4		
05	3/16"		
06	ø6		
07	1/4"		
06	ø6	3	
08	ø8		
10	ø10		
07	1/4"		
11	3/8"		

Symbol	Tubing O.D.	Body class	Applicable fitting
10	ø10	4	LQ1 LQ2
12	ø12		
11	3/8"		
13	1/2"		
12	ø12	5	
13	1/2"		
19	3/4", ø19		
19	3/4", ø19	6	LQ1
25	1", ø25		

For pilot port



LQ1 – 1 U 03

Body class

Symbol	Body class	Applicable fitting
1	1	LQ1

Parts type

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

Tubing size

Symbol	Tubing O.D.	Body class
03	1/8" (ø3)	1
04	ø4	

Note) Cannot change to tubing with different diameter.

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

How to Order

LVQ 2 0 – Z 07 □ – □ – □

Body class

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

Valve type

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

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

LQ3 integral 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						
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

Pilot port type

—	With LQ3 fitting	Connection tubing O.D. 1/8" (ø3)
M	With LQ3 fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

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

Option 2

Symbol	Applicable option 1	2	3	4	5	6	7	8	9	24	Option
—	○	○	○	○	○	○	○	○	○	○	None
J	○	—	—	—	○	○	—	—	—	—	For high temperature
K	○	○	○	○	○	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	○	—	—	—	—	—	High flow type **LVQ6□** only

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

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

Variations

Type	Symbol	Valve type	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
		Model					
		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.	○	○	○	○	○
High back pressure		N.C.	○	○	○	○	○
With indicator & by-pass		N.C.	○	○	○	○	○

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 characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
	High temperature	–98 kPa to 0.3 MPa				
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42				
	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		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) ( ): High flow type

⚠ Specific Product Precautions

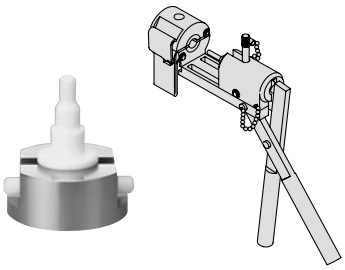
Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

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



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

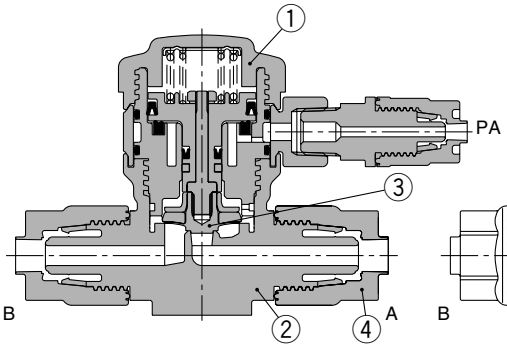
Tightening Torque for Piping

Body class	Torque (N·m)
2	1.6 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

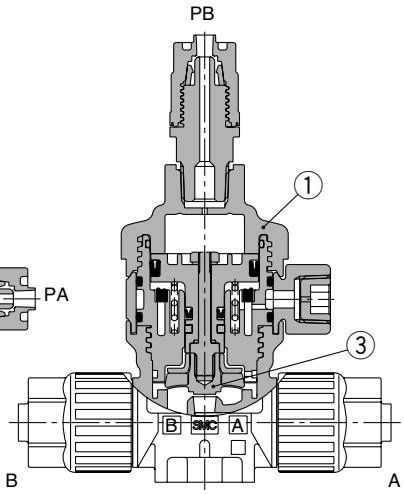
Construction

Basic

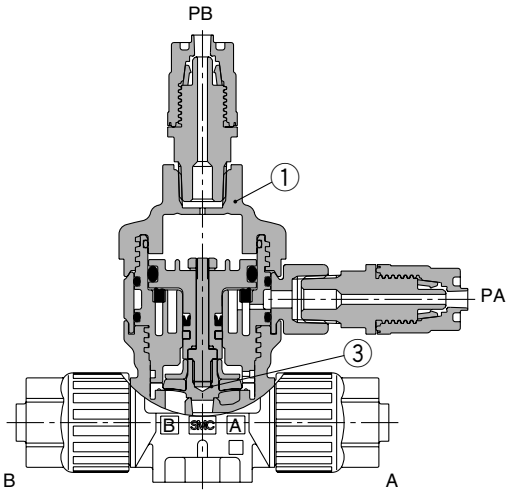
N.C.



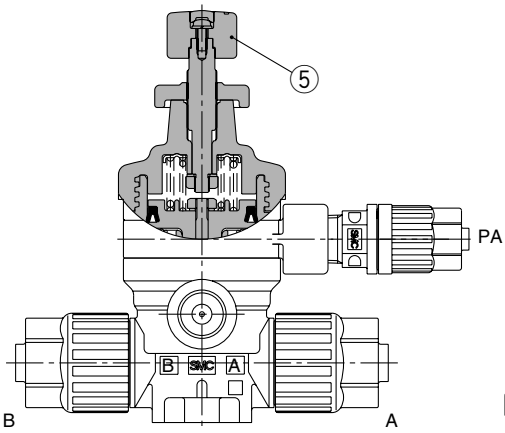
N.O.



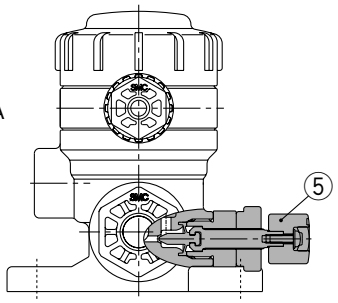
Double acting



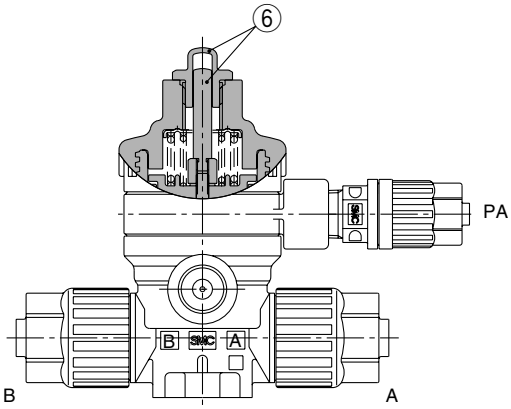
With flow rate adjustment



With by-pass



With indicator

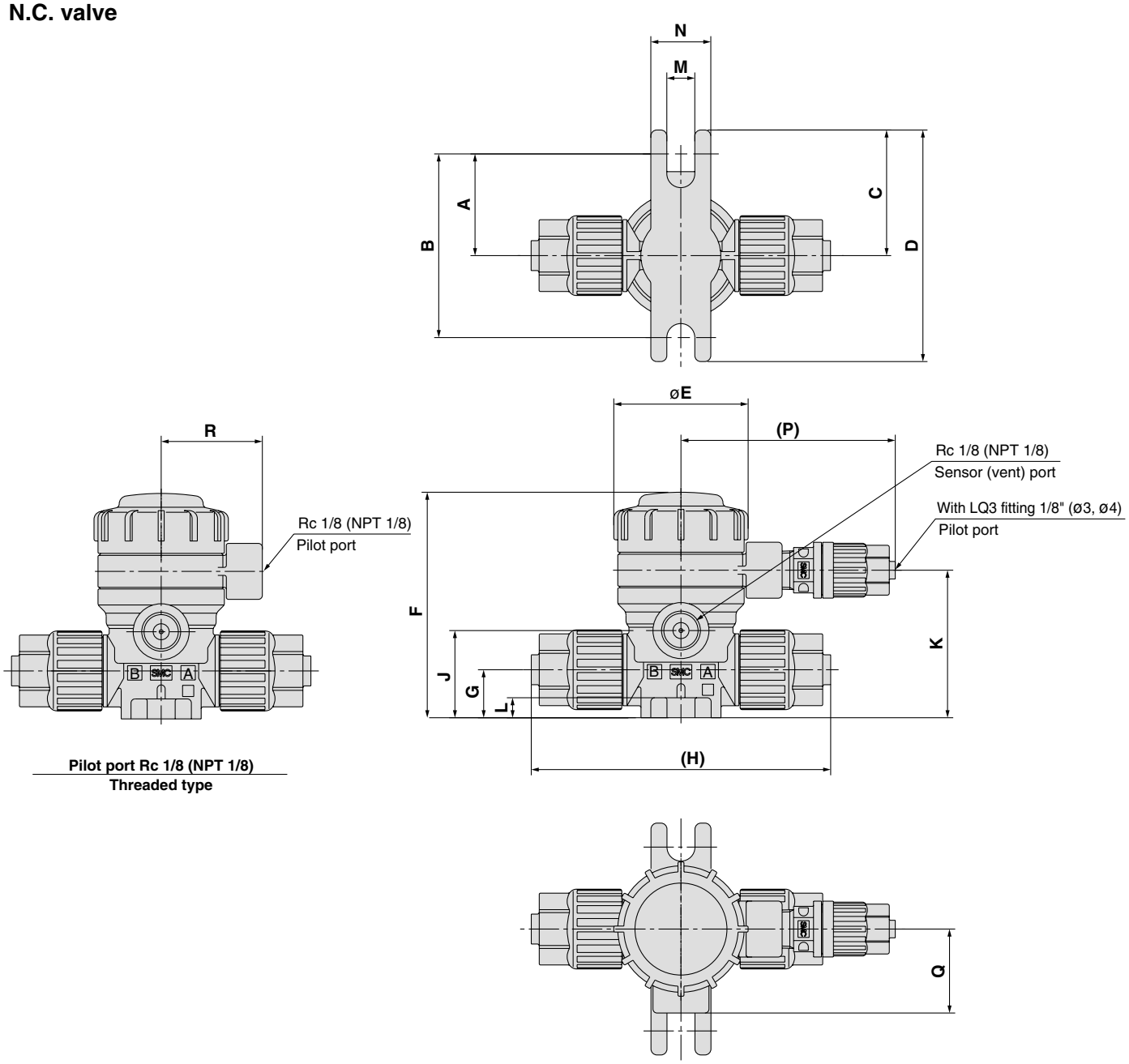


Component Parts

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

Dimensions

Basic, High back pressure
N.C. valve



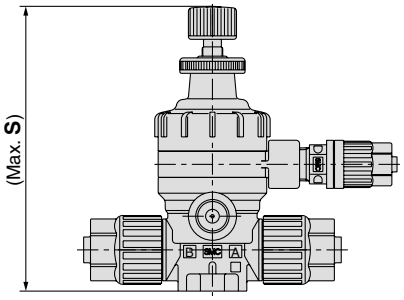
LVQ□0-Z□□ Dimensions (N.C. Valve) (mm)

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

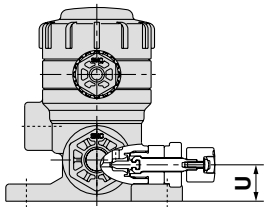
With flow rate adjustment
N.C. valve

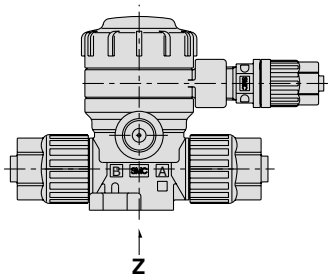
Dimensions (mm)

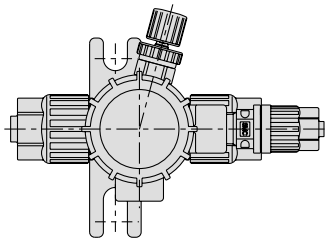
Model	S
LVQ20-Z□□-1	83
LVQ30-Z□□-1	113.5
LVQ40-Z□□-1	119
LVQ50-Z□□-1	171.5
LVQ60-Z□□-1	182.5



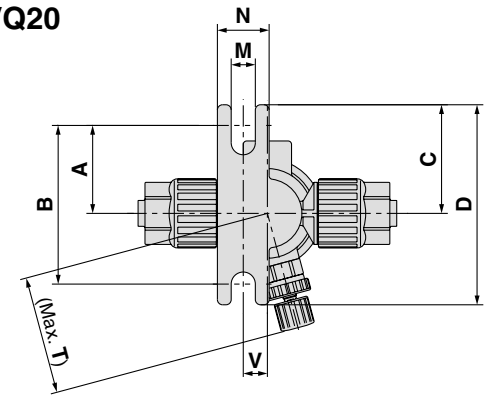
With by-pass
N.C. valve



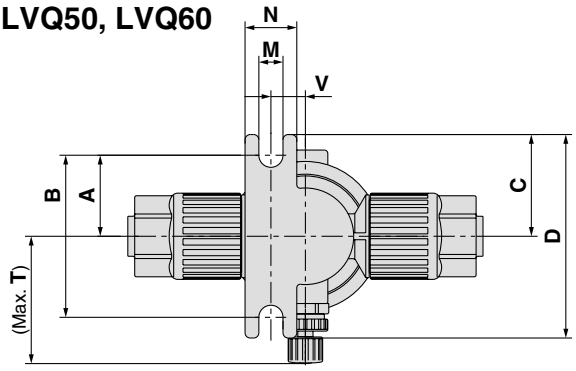




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



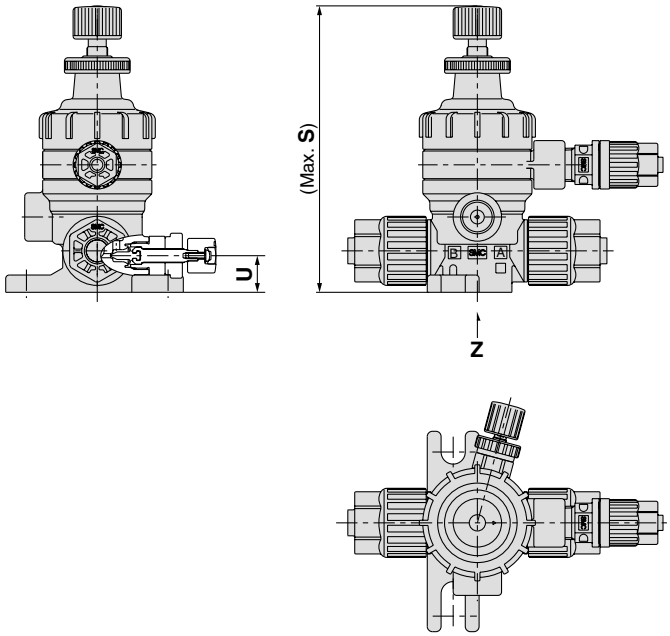
View **Z**

Dimensions (mm)

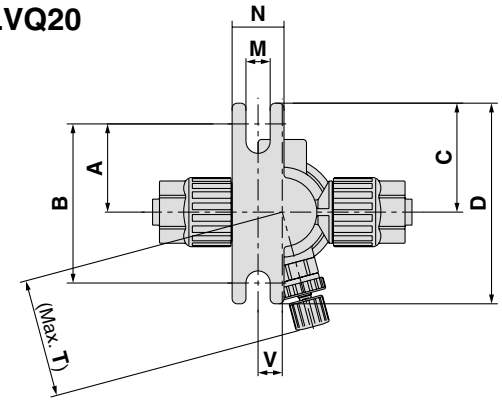
Model	A	B	C	D	M	N	T	U	V
LVQ20-Z□□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30-Z□□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40-Z□□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50-Z□□-2	38	76	44	88	7	20	64	25	17
LVQ60-Z□□-2	38	76	44	88	7	20	66	32	17

Dimensions

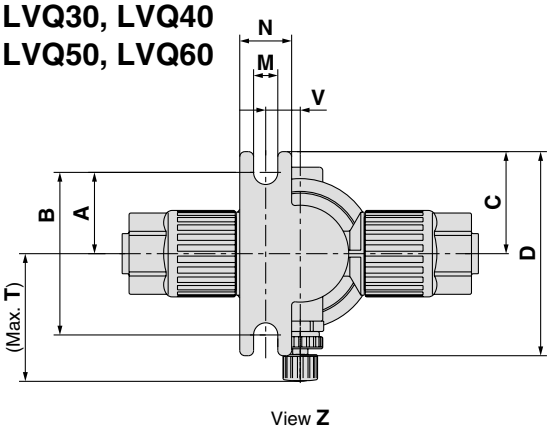
With flow rate adjustment & by-pass
N.C. valve



LVQ20



LVQ30, LVQ40
LVQ50, LVQ60



View **Z**

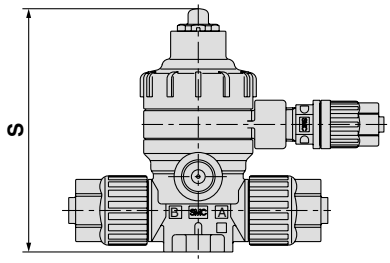
Dimensions (mm)

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

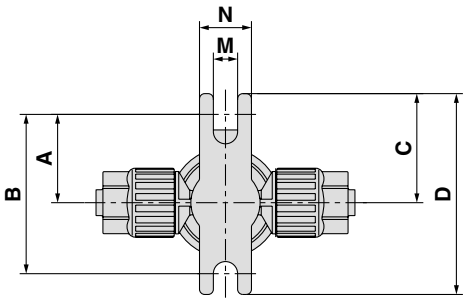
With indicator
N.C. valve

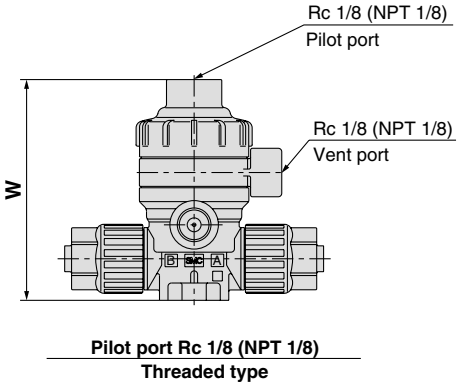
Dimensions (mm)

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

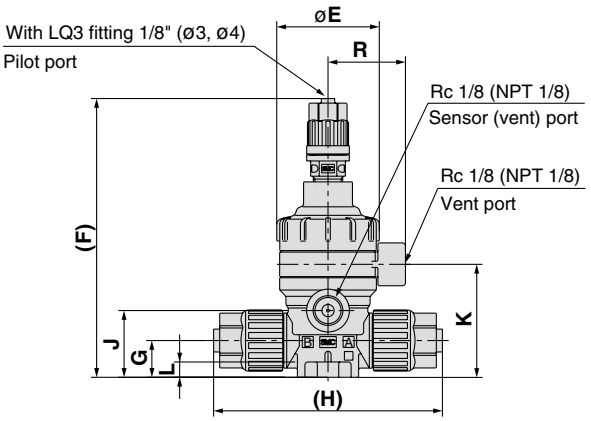


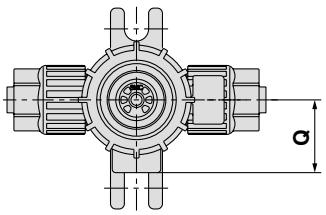
Basic
N.O. valve



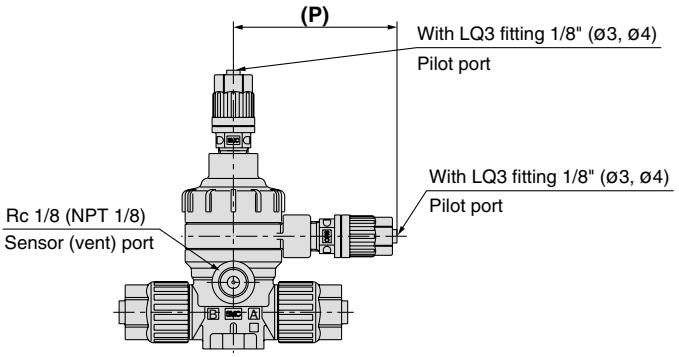


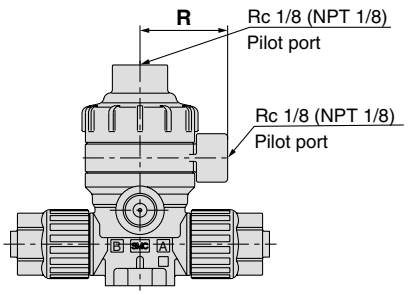
Pilot port Rc 1/8 (NPT 1/8)
Threaded type





Double acting valve



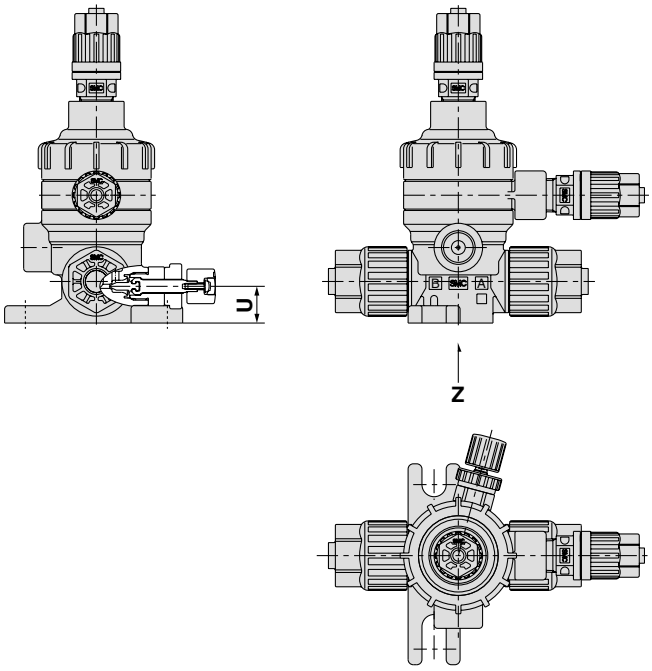


LVQ□$\frac{1}{2}$-Z□□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

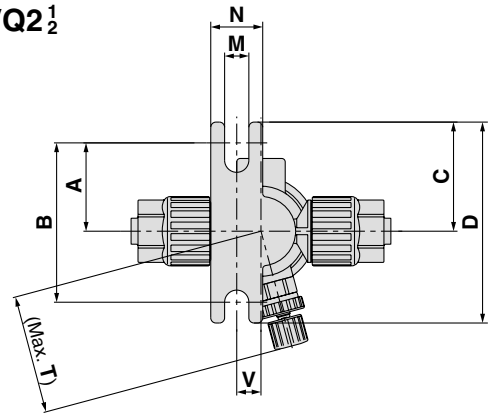
Model	A	B	B	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2$\frac{1}{2}$-Z□□	25.5	46	31.5	58	33.6	89.5	12	75	21.8	37	5	7	15	53.5	21	25.3	64
LVQ3$\frac{1}{2}$-Z□□	28.5	57	34.5	69	45.4	107.5	16.5	103	32	50	6	7	20	59.5	25	31.2	82
LVQ4$\frac{1}{2}$-Z□□	28.5	57	34.5	69	45.4	113	22	114	37.5	55.5	6	7	20	59.5	25	31.2	87.5
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

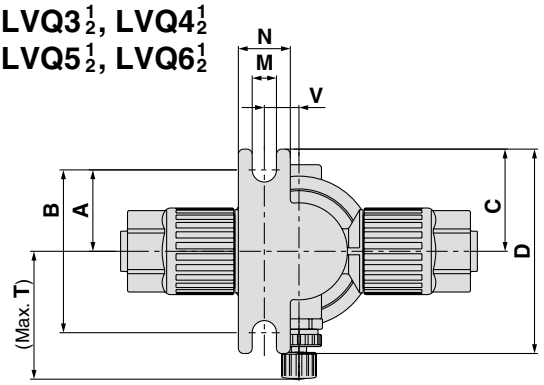
With by-pass
Double acting valve



LVQ2$\frac{1}{2}$



LVQ3$\frac{1}{2}$, LVQ4$\frac{1}{2}$
LVQ5$\frac{1}{2}$, LVQ6$\frac{1}{2}$



View **Z**

Dimensions (N.O Valve, Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ2$\frac{1}{2}$-Z□□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ3$\frac{1}{2}$-Z□□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ4$\frac{1}{2}$-Z□□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ5$\frac{1}{2}$-Z□□-2	38	76	44	88	7	20	64	25	17
LVQ6$\frac{1}{2}$-Z□□-2	38	76	44	88	7	20	66	32	17

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

How to Order

LVQ 2 0 S – Z 07 □ – □ – □

Body class

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

Valve type

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

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

Body type

S	Space saving connection

LQ3 integral fitting

Applicable tubing size

Symbol	Connection tubing O.D.	Body class 2	3	4	5	6
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

Note) Refer to page 37 for How to Order applicable fittings. Select a tube with the same size as the valve side fitting.

Pilot port type

—	With LQ3 fitting	Connection tubing O.D. 1/8" (ø3)
M	With LQ3 fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

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

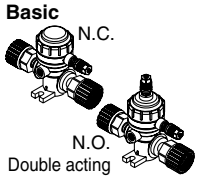
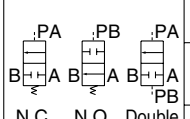
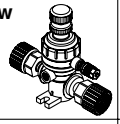
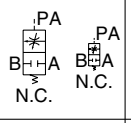
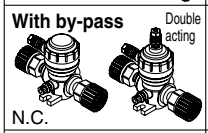
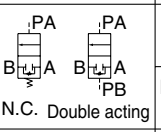
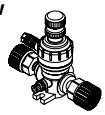
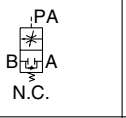
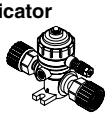
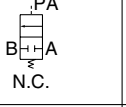
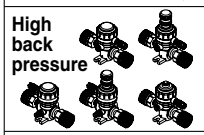
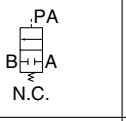
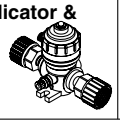
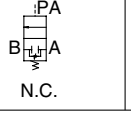
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table can not be combined to each other.

Option 2

Symbol	Applicable option 1	2	3	4	5	6	7	8	9	24	Option
—	○	○	○	○	○	○	○	○	○	○	None
J	○	—	—	—	○	○	—	—	—	—	For high temperature
K	○	○	○	○	○	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	○	—	—	—	—	—	High flow type **LVQ6□** only

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

Variations

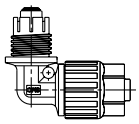
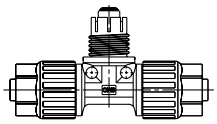
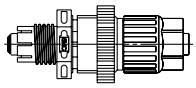
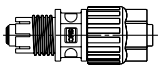
Type	Symbol	Model / Orifice diameter / Connection fitting size / Valve type	LVQ20S ø4 2	LVQ30S ø8 3	LVQ40S ø10 4	LVQ50S ø16 5	LVQ60S ø22 6
Basic 		N.C.	○	○	○	○	○
		N.O.	○	○	○	○	○
		Double acting	○	○	○	○	○
With flow rate adjustment 		N.C.	○	○	○	○	○
With by-pass 		N.C.	○	○	○	○	○
		Double acting	○	○	○	○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

How to Order Space Saving Fittings

LQ3 E 6A – S

One of the nuts is not attached.

Fitting type

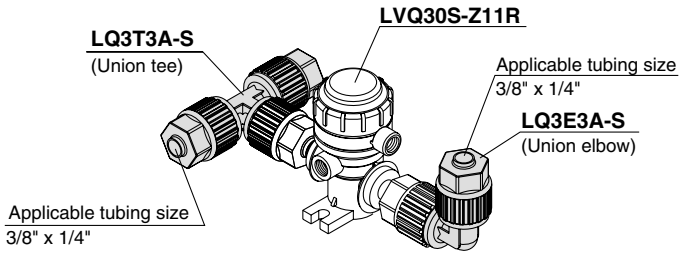
E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

Applicable tubing size

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.

Piping Example



Ordering Example

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

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

Standard Specifications

Model		LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
Connection fitting size		2	3	4	5	6
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
	High temperature	–98 kPa to 0.3 MPa				
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		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) ( ): High flow type

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

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

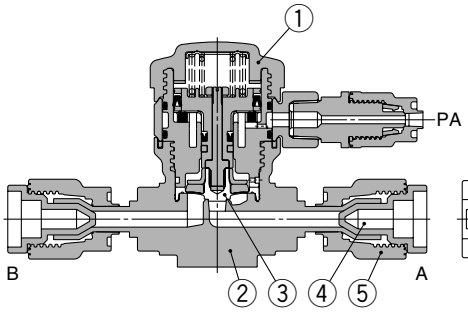
Tightening Torque for Piping

Body class	Torque (N·m)
2	1.6 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

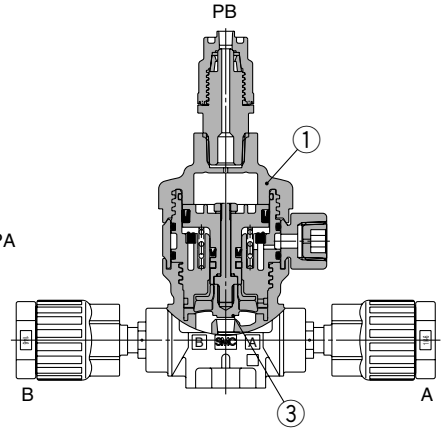
Construction

Basic

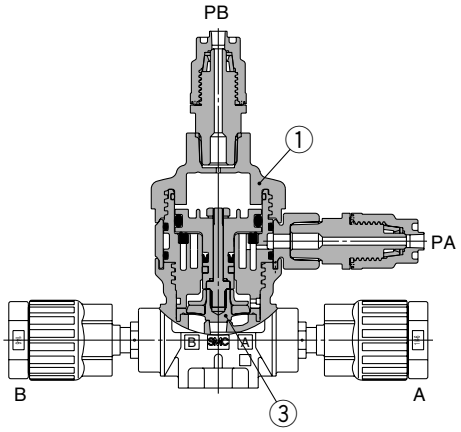
N.C.



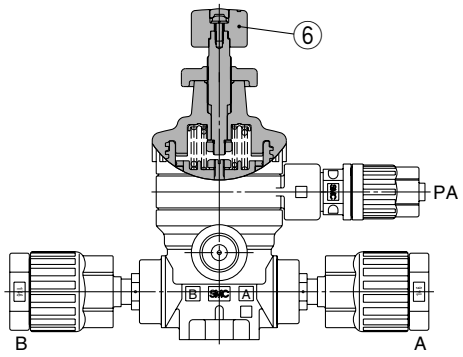
N.O.



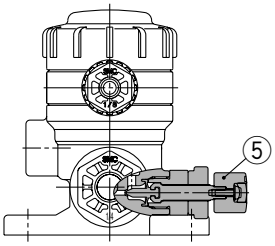
Double acting



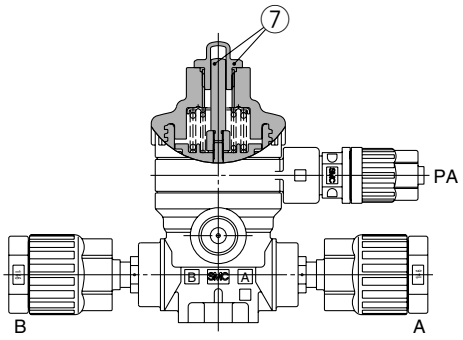
With flow rate adjustment



With by-pass



With indicator

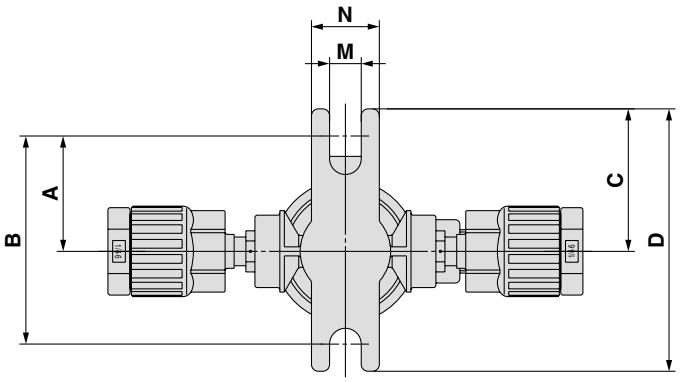


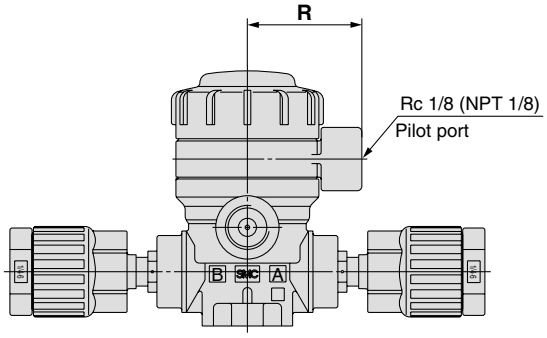
Component Parts

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

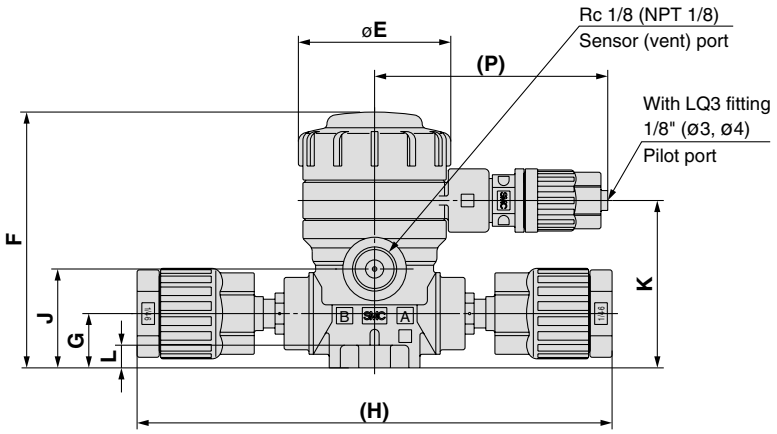
Dimensions

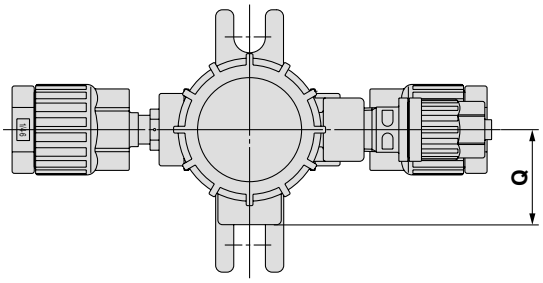
Basic, High back pressure
N.C. valve





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





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

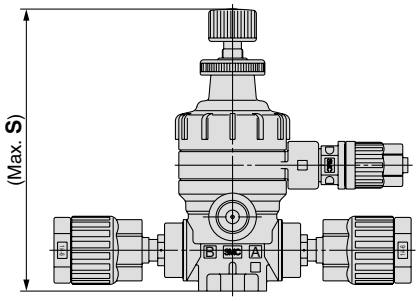
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20S-Z□	25.5	46	31.5	58	33.6	56.5	12	105	21.8	37	5	7	15	53.5	21	25.3
LVQ30S-Z□	28.5	57	34.5	69	45.4	77	16.5	137	32	50	6	7	20	59.5	25	31.2
LVQ40S-Z□	28.5	57	34.5	69	45.4	82.5	22	151	37.5	55.5	6	7	20	59.5	25	31.2
LVQ50S-Z□	42	84	48	96	75	127	25	202	50.2	78.2	10	7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

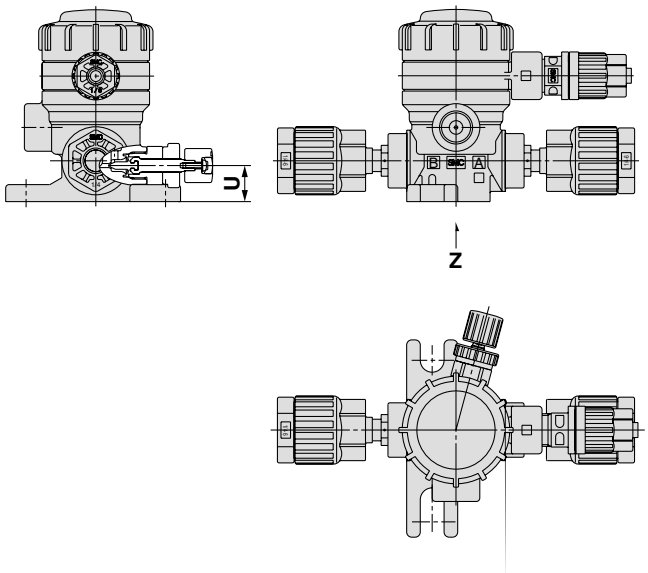
With flow rate adjustment, High back pressure with flow rate adjustment
N.C. valve

Dimensions (mm)

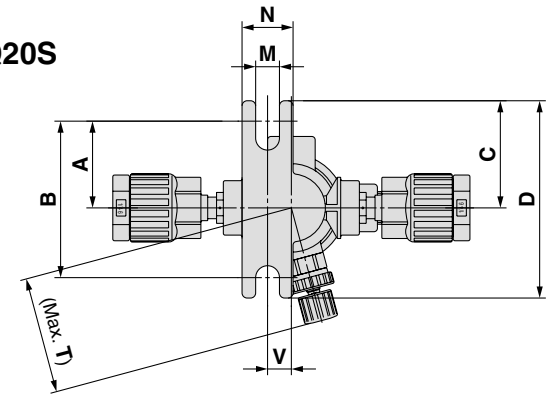
Model	S
LVQ20S-Z□-1	83
LVQ30S-Z□-1	113.5
LVQ40S-Z□-1	119
LVQ50S-Z□-1	171.5
LVQ60S-Z□-1	182.5



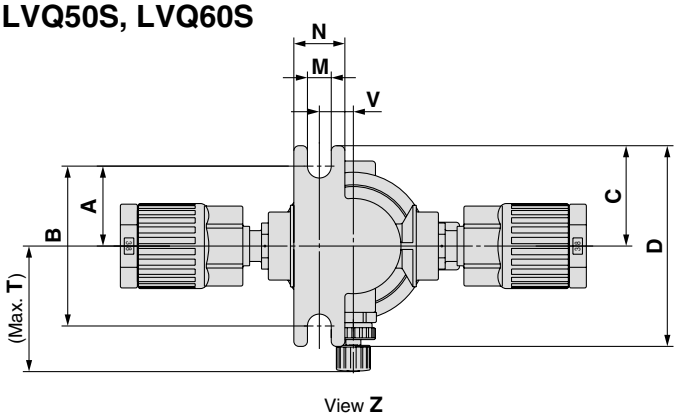
With by-pass, High back pressure with by-pass
N.C. valve



LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S

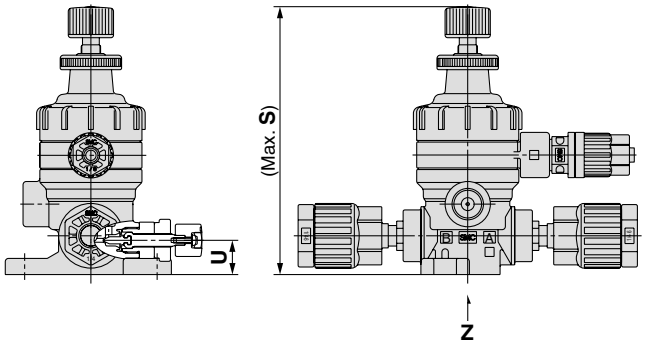


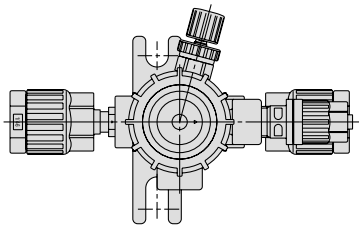
View **Z**

Dimensions (mm)

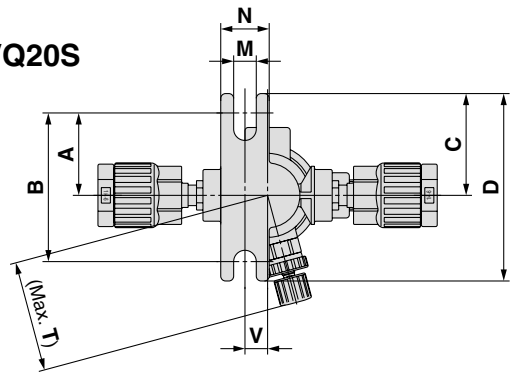
Model	A	B	C	D	M	N	T	U	V
LVQ20S-Z□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30S-Z□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40S-Z□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50S-Z□-2	38	76	44	88	7	20	64	25	17
LVQ60S-Z□-2	38	76	44	88	7	20	66	32	17

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

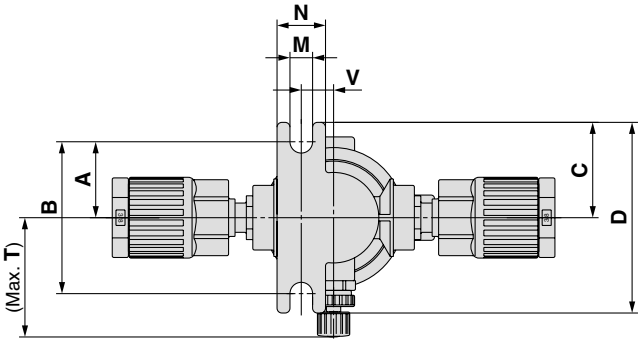




LVQ20S



LVQ30S, LVQ40S
LVQ50S, LVQ60S



View **Z**

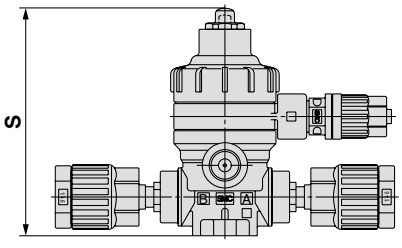
Dimensions (mm)

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)

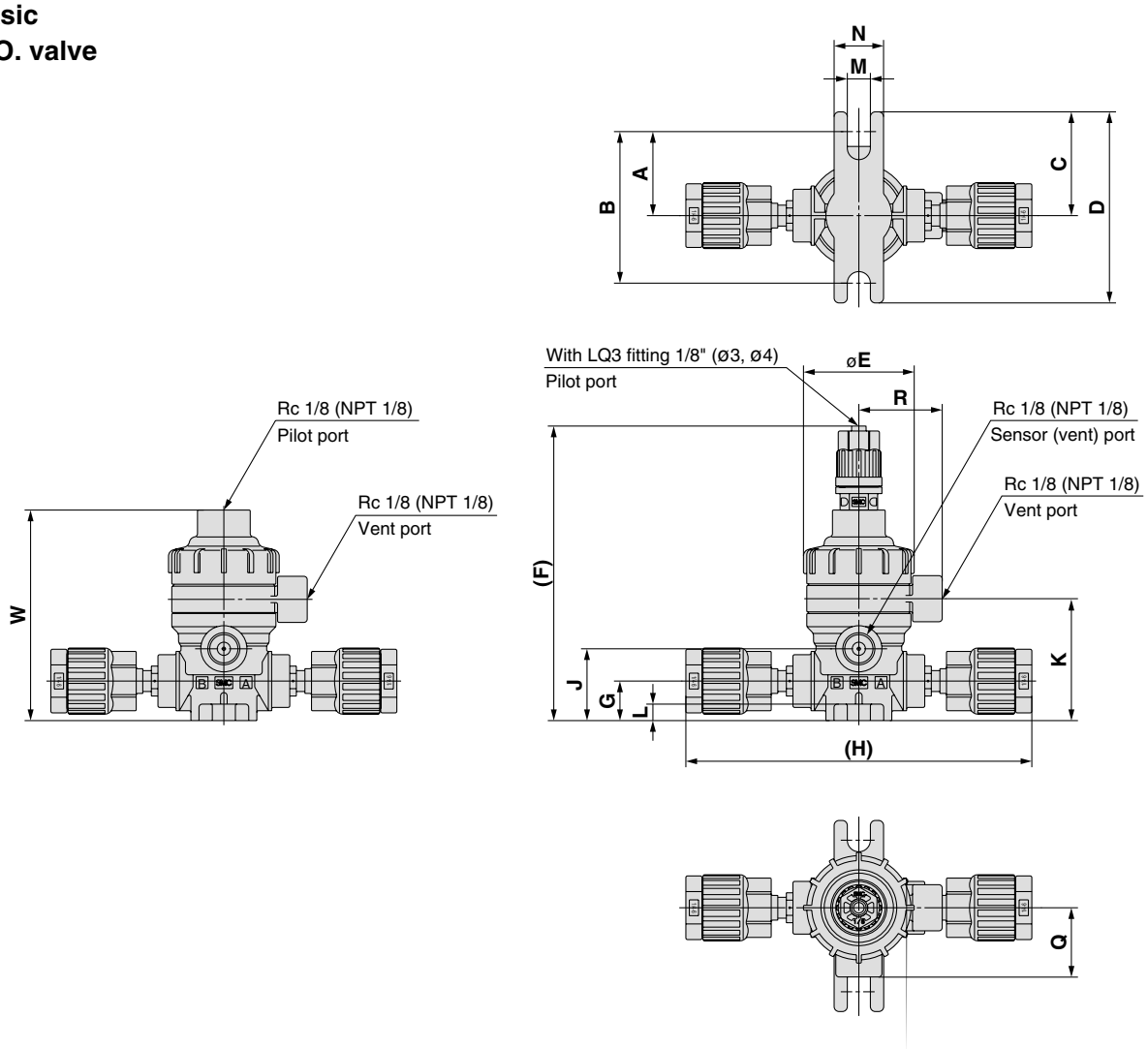
Model	S
LVQ20S-Z□-4	70.5
LVQ30S-Z□-4	88.5
LVQ40S-Z□-4	94
LVQ50S-Z□-4	134.5
LVQ60S-Z□-4	144



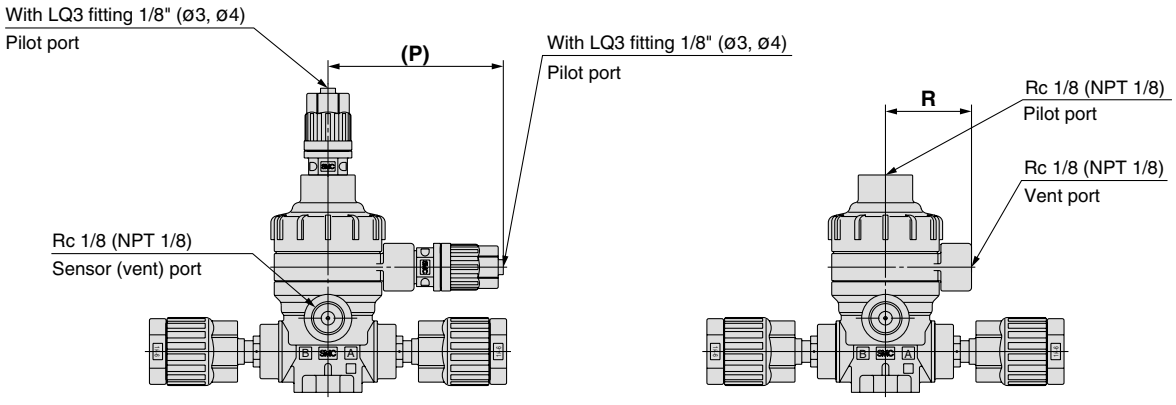
Dimensions

Basic

N.O. valve



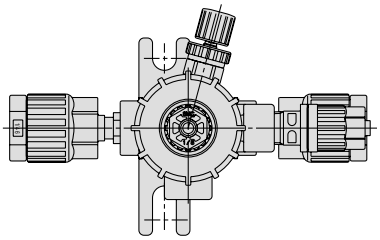
Double acting valve



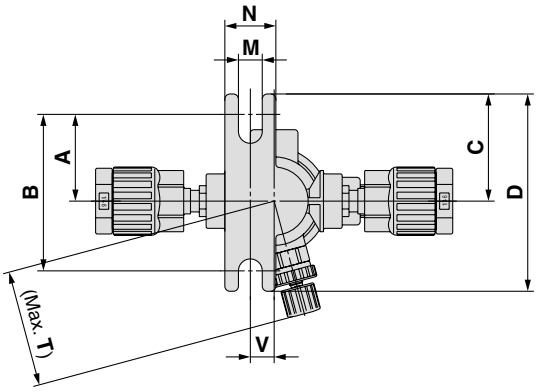
LVQ□$^{1}_{2}$S-Z□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

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

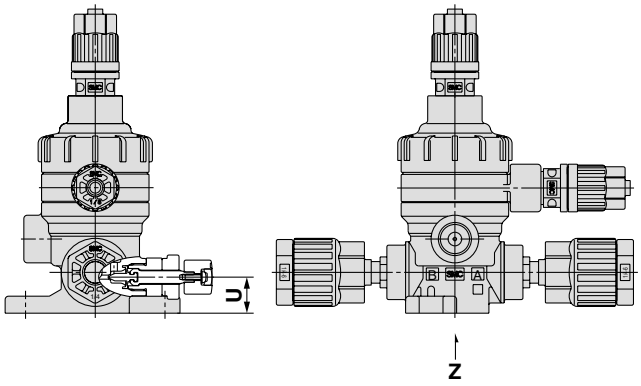
With by-pass
Double acting valve

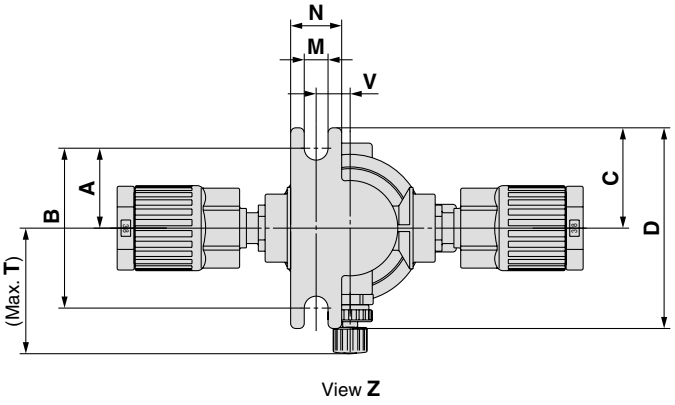


LVQ2$\frac{1}{2}$S



LVQ3$\frac{1}{2}$S, LVQ4$\frac{1}{2}$S
LVQ5$\frac{1}{2}$S, LVQ6$\frac{1}{2}$S





Dimensions (N.O Valve, Double Acting Valve) (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ2$\frac{1}{2}$-S-Z□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ3$\frac{1}{2}$-S-Z□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ4$\frac{1}{2}$-S-Z□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ5$\frac{1}{2}$-S-Z□-2	38	76	44	88	7	20	64	25	17
LVQ6$\frac{1}{2}$-S-Z□-2	38	76	44	88	7	20	66	32	17

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

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

Option

Symbol	Option
—	None
K	Buffer material FFKM
N	For ammonium hydroxide

Note) Options cannot be combined to each other.

LQ3 integral fitting

Handle operation

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

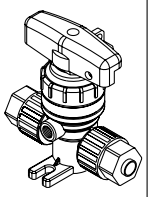
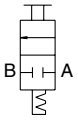
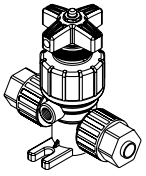
Applicable tubing size

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					○

Vent port type

—	Threaded	NPT 1/8
R	Threaded	Rc1 /8

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			○	○	○	○	○

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 characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm^3/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) ( ): High flow type

⚠ Specific Product Precautions

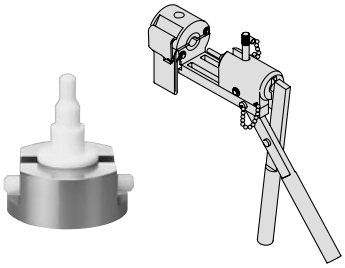
Be sure to read before handling. Refer to back pages 1 through to 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

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



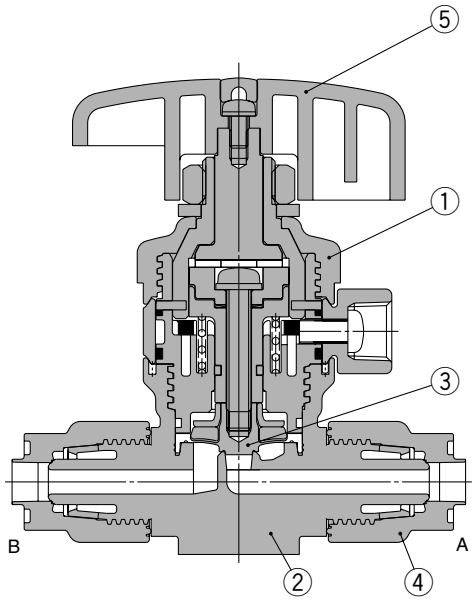
2. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening Torque for Piping

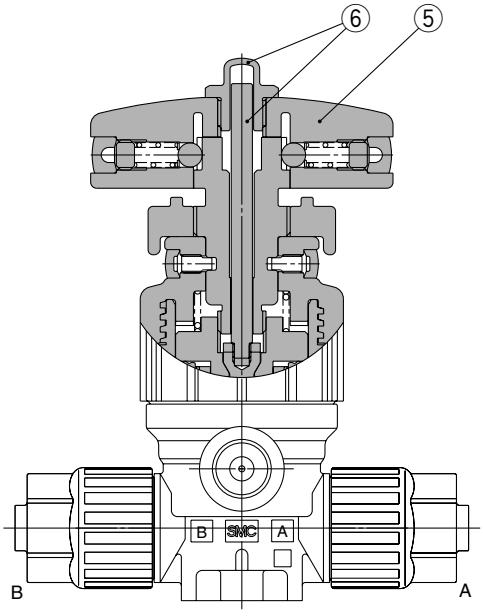
Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

Construction

90° turn type



Multi-turn type (With indicator)

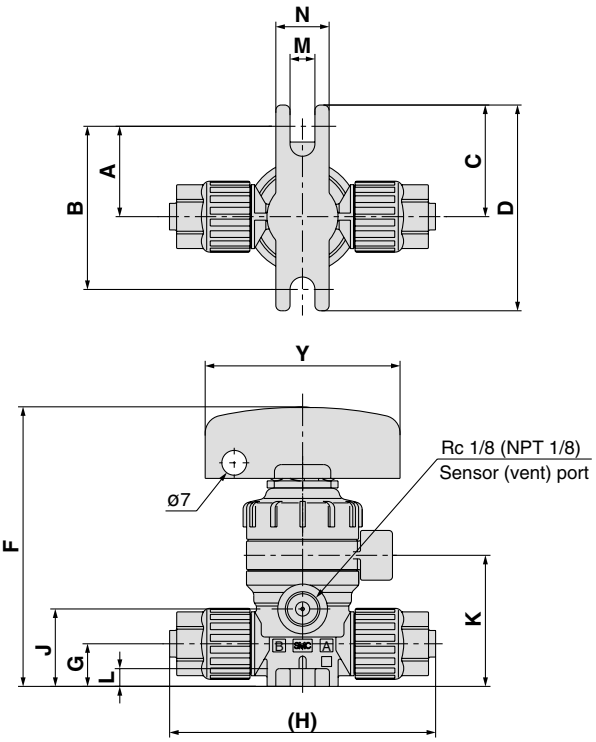


Component Parts

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

Dimensions

90° turn type

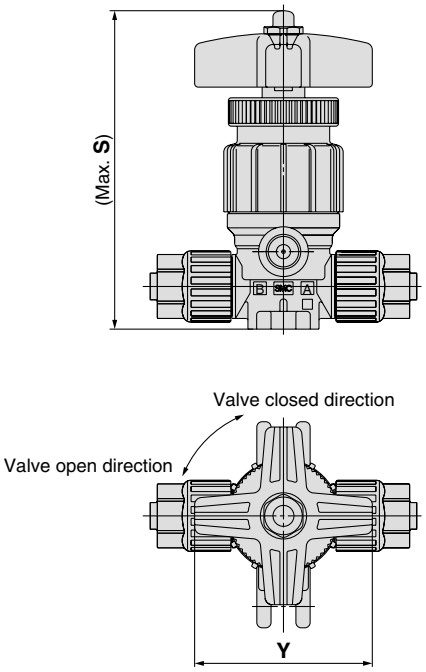


Dimensions (mm)

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	89.6	50
LVQH30-Z□-4	107.2	50
LVQH40-Z□-4	112.7	50
LVQH50-Z□-4	165	71
LVQH60-Z□-4	174.5	71

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

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 integral fitting

Option

Symbol	Option
—	None
K	Buffer material FFKM
N	For ammonium hydroxide

Note) Options cannot be combined to each other.

Handle operation

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

Vent port type

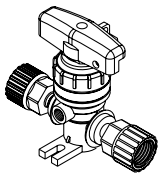
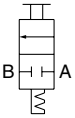
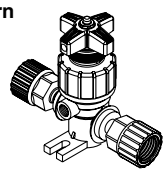
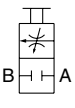
—	Threaded	NPT 1/8
R	Threaded	Rc 1/8

Applicable tubing size

Symbol	Connection tubing O.D.	Body class 2	3	4	5	6
Inch size						
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

Note) Refer to page 50 for How to Order applicable fittings. Select the same size as fitting on the valve.

Variations

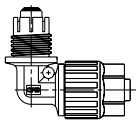
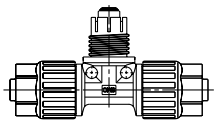
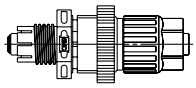
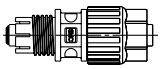
Type / Symbol / Connection fitting size / Orifice diameter / Model			LVQ20S	LVQ30S	LVQ40S	LVQ50S	LVQ60S
			ø4	ø8	ø10	ø16	ø22
			2	3	4	5	6
90° turn type			○	○	○	○	○
Multi-turn type			○	○	○	○	○

How to Order Space Saving Fittings

LQ3 E 6A – S

One of the nuts is not attached.

Fitting type

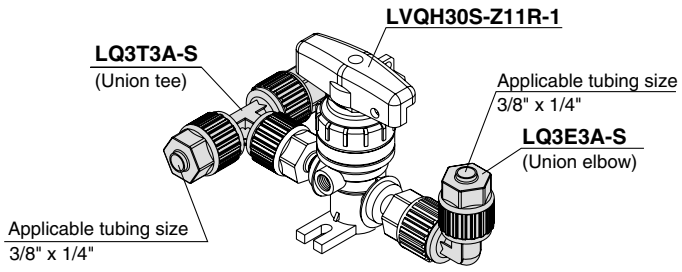
E	T
Union elbow 	Union tee 
P	**U**
Panel mount union 	Union 

Applicable tubing size

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.

Piping Example



Ordering Example

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

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

Standard Specifications

Model		LVQH20S	LVQH30S	LVQH40S	LVQH50S	LVQH60S
Connection fitting size		2	3	4	5	6
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm^3/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) ( ): High flow type

⚠ Specific Product Precautions

Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

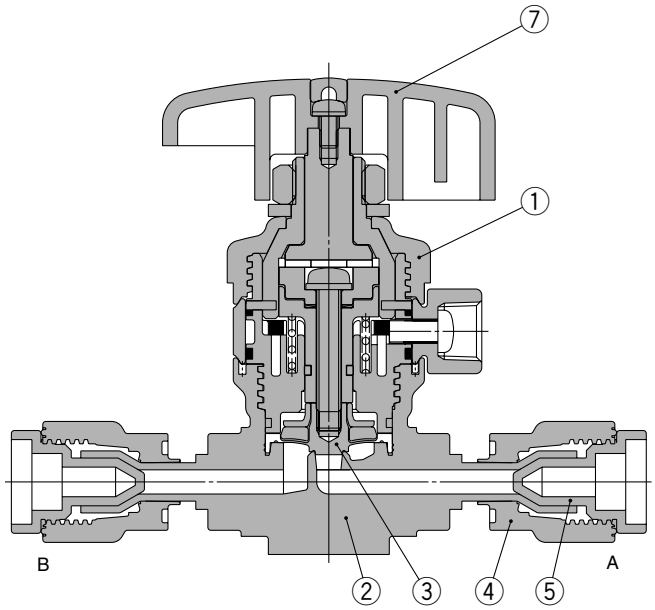
1. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening Torque for Piping

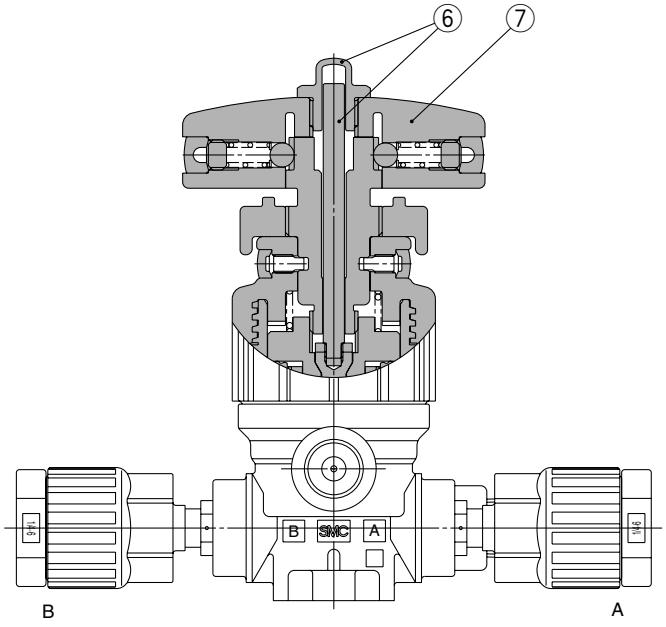
Body class	Torque (N·m)
2	1.6 to 1.8
3	3.2 to 3.5
4	5.0 to 5.3
5	10.0 to 10.5
6	22.5 to 23.0

Construction

90° turn type



Multi-turn type (With indicator)

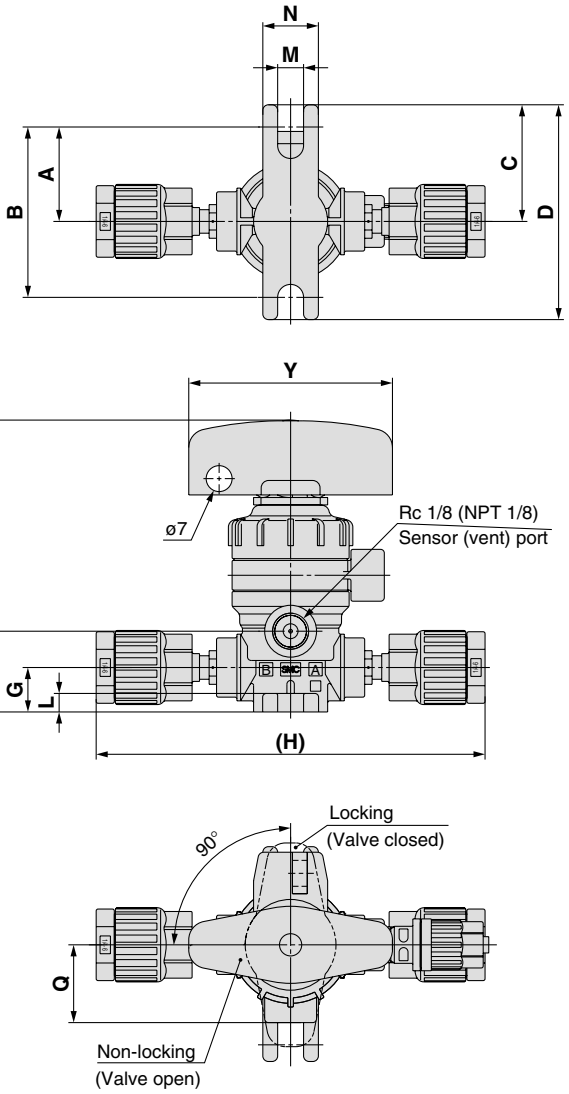


Component Parts

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

Dimensions

90° turn type

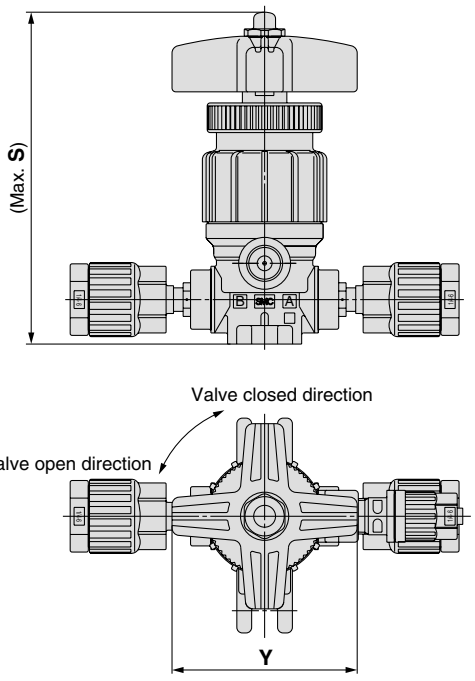


Dimensions (mm)

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	89.6	50
LVQH30S-Z□-4	107.2	50
LVQH40S-Z□-4	112.7	50
LVQH50S-Z□-4	165	71
LVQH60S-Z□-4	174.5	71

Air Operated
Tube Extension Integral Fitting Type
Series LVQ-T

How to Order

LVQ 2 0 – T 07 □ – □ – □

Body class

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

Valve type

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

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

Tube extension fitting

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					○

Pilot port type

—	With LQ1 fitting	Connection tubing O.D. 1/8" (ø3)
M	With LQ1 fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

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

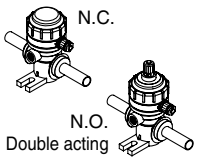
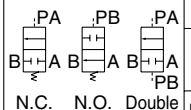
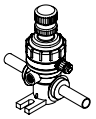
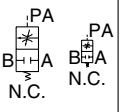
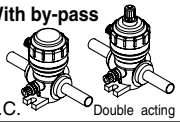
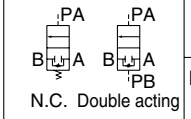
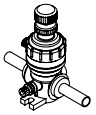
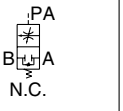
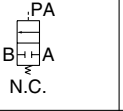
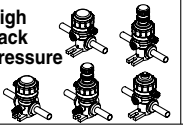
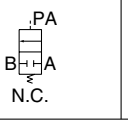
Note) Refer to variations in the table below for valve type and option 1 combinations.
Options in the same table can not be combined to each other.

Option 2

Symbol	Applicable option 1	2	3	4	5	6	7	8	9	Option
—	○	○	○	○	○	○	○	○	○	None
J	○	—	—	—	○	○	—	—	—	For high temperature
K	○	○	○	○	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	○	—	—	—	—	High flow type **LVQ6□** only

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

Variations

Type	Symbol	Valve type	Model	LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
			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
Basic 			N.C.	○	○	○	○	○
			N.O.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjust-ment 			N.C.	○	○	○	○	○
With by-pass 			N.C.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjust-ment & by-pass 			N.C.	○	○	○	○	○
With indicator 			N.C.	○	○	○	○	○
High back pressure 			N.C.	○	○	○	○	○

Standard Specifications

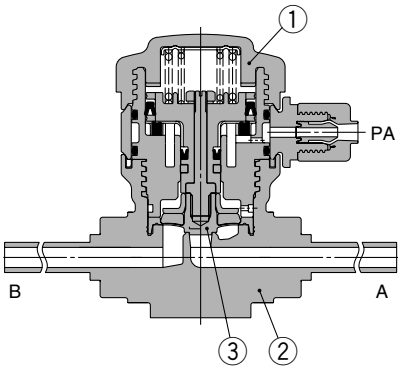
Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Tubing O.D.	Metric	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>	Standard	–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
	High temperature	–98 kPa to 0.3 MPa				
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		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) ( ): High flow type

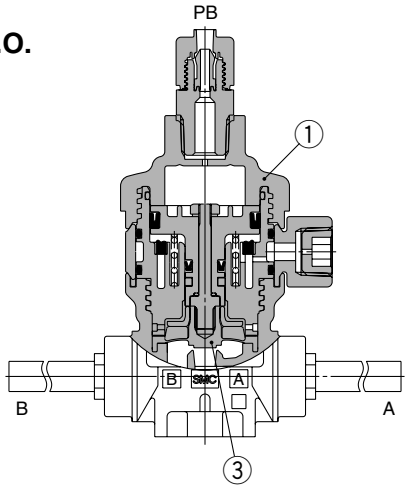
Construction

Basic

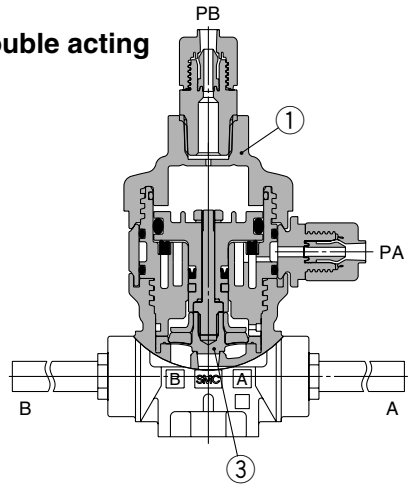
N.C.



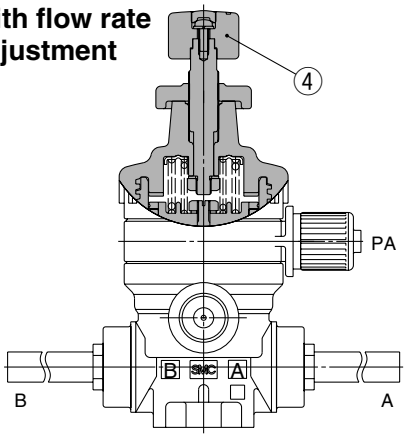
N.O.



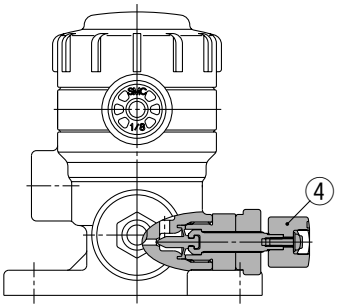
Double acting



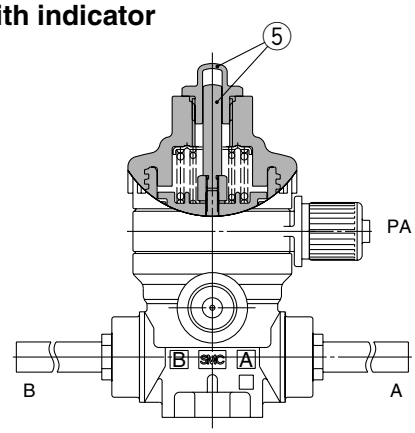
With flow rate adjustment



With by-pass



With indicator

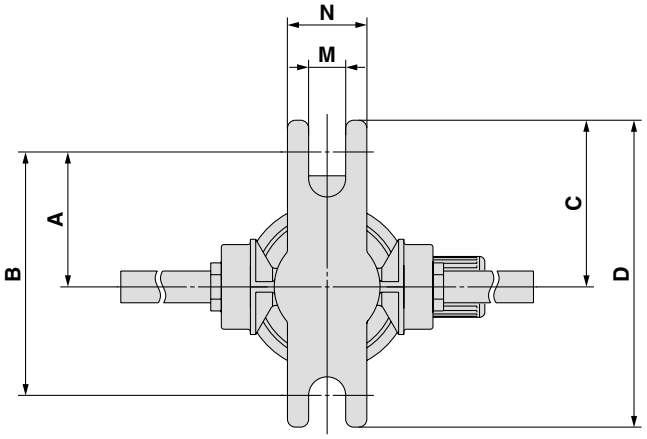


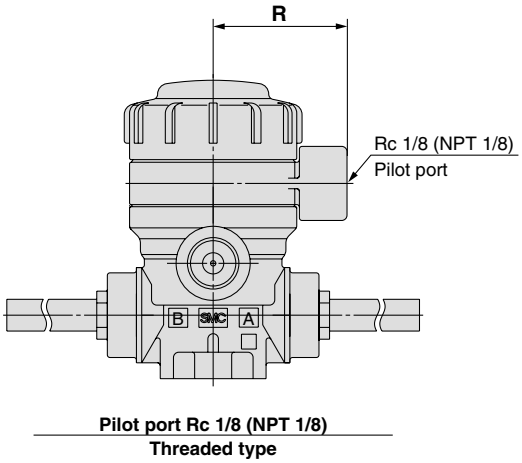
Component Parts

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

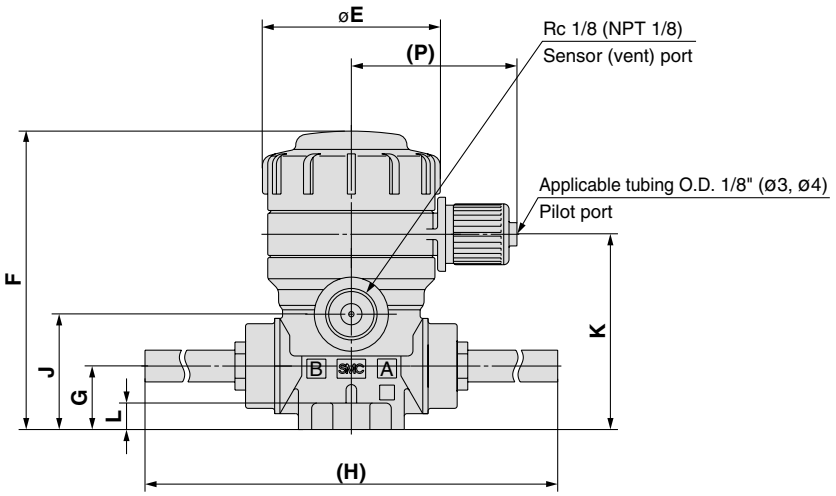
Dimensions

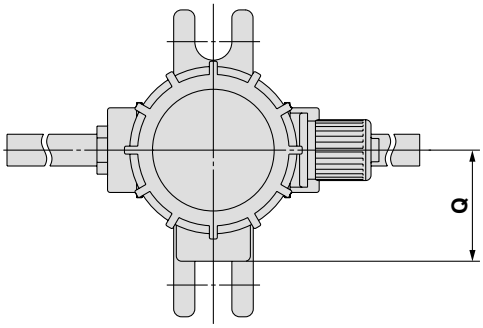
Basic, High back pressure
N.C. valve





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



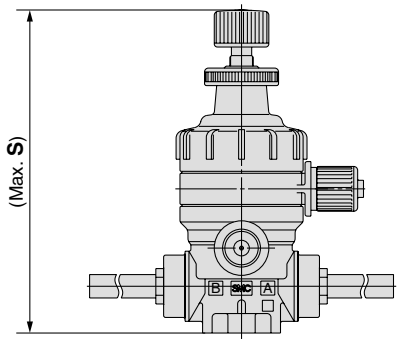


LVQ□0-T□ Dimensions (N.C. Valve) (mm)

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

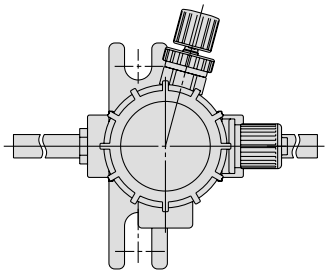
With flow rate adjustment, High back pressure with flow rate adjustment N.C. valve

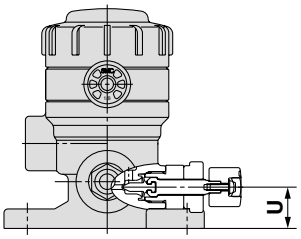


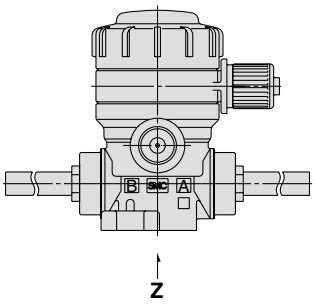
Dimensions (mm)

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

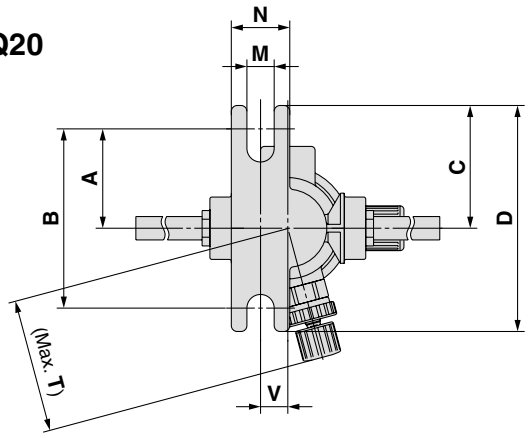
With by-pass, High back pressure with by-pass N.C. valve



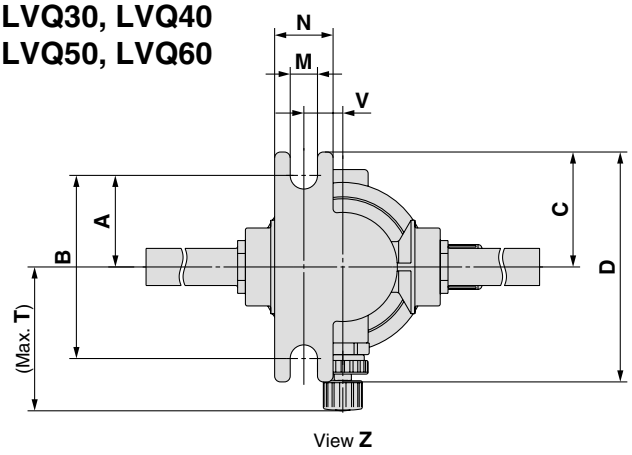




LVQ20



LVQ30, LVQ40
LVQ50, LVQ60

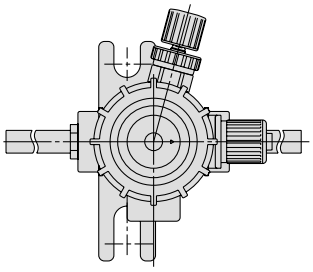


View **Z**

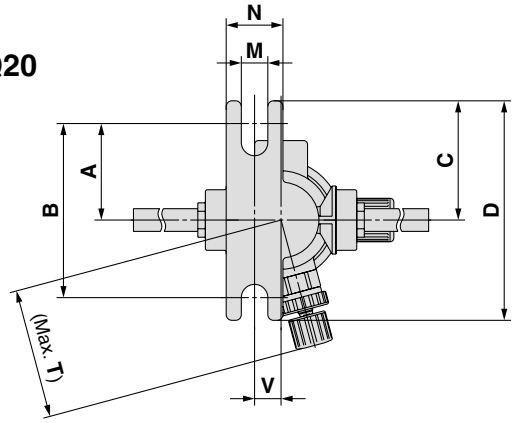
Dimensions (mm)

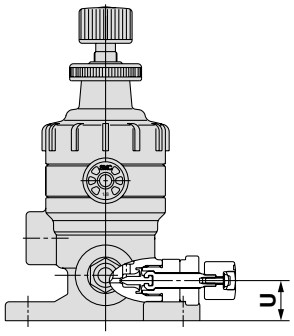
Model	A	B	C	D	M	N	T	U	V
LVQ20-T□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ30-T□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ40-T□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ50-T□-2	38	76	44	88	7	20	64	25	17
LVQ60-T□-2	38	76	44	88	7	20	66	32	17

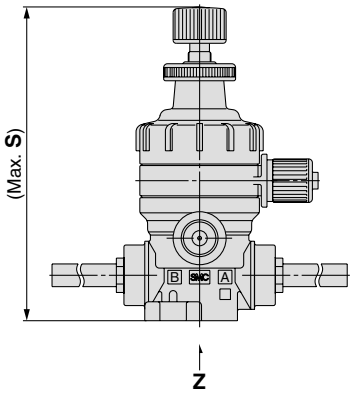
With flow rate adjustment & by-pass,
High back pressure with flow rate adjustment & by-pass
N.C. valve



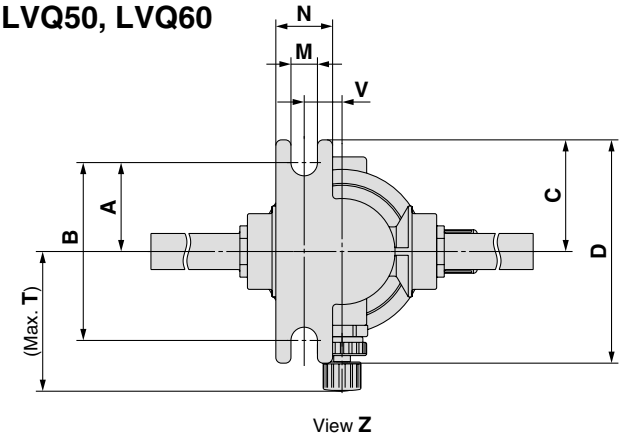
LVQ20







LVQ30, LVQ40
LVQ50, LVQ60

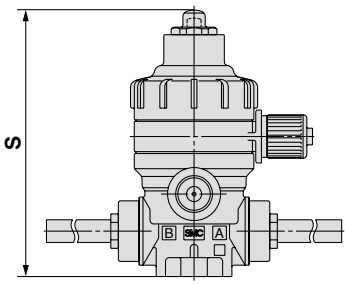


View **Z**

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

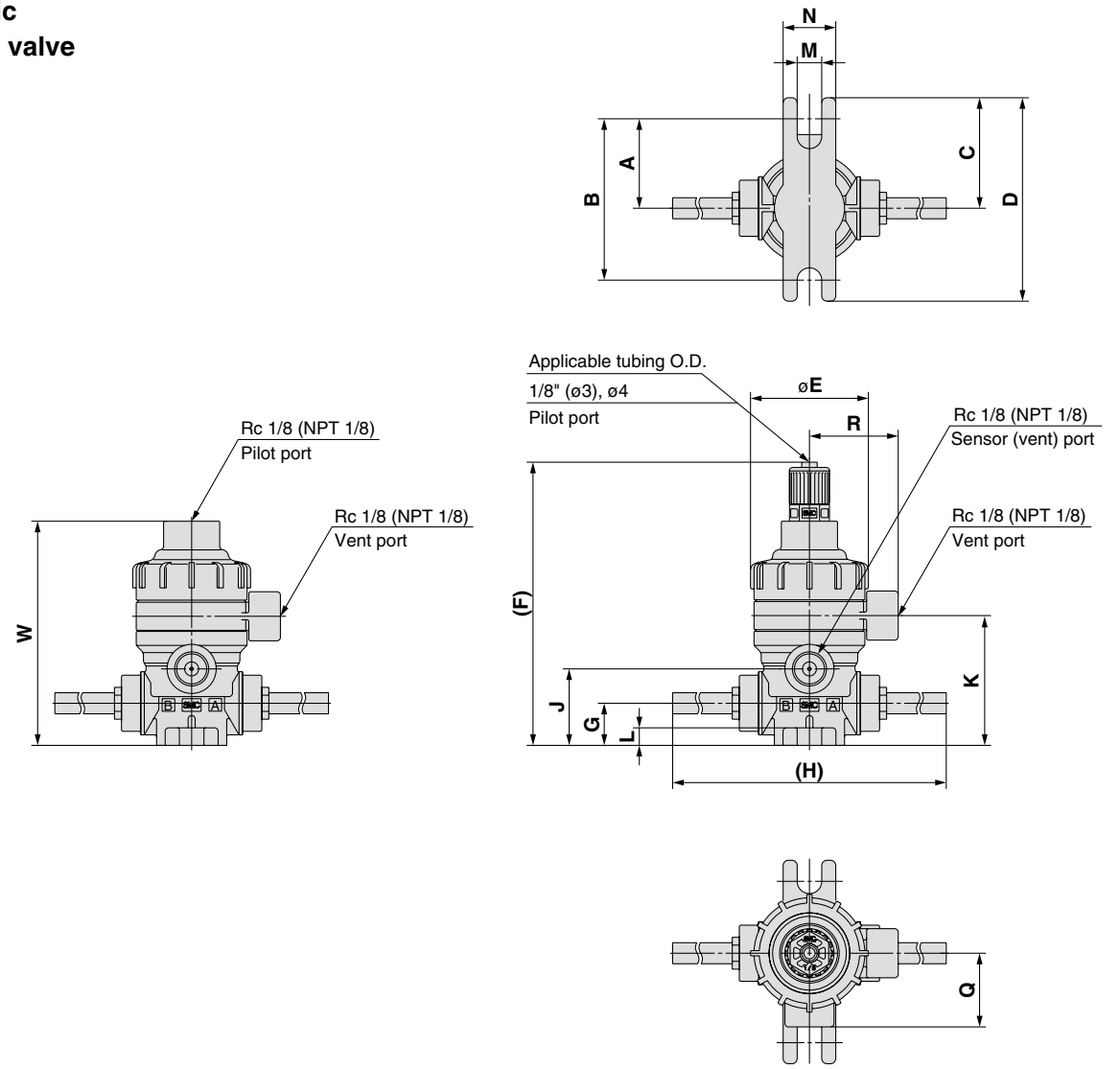


Dimensions (mm)

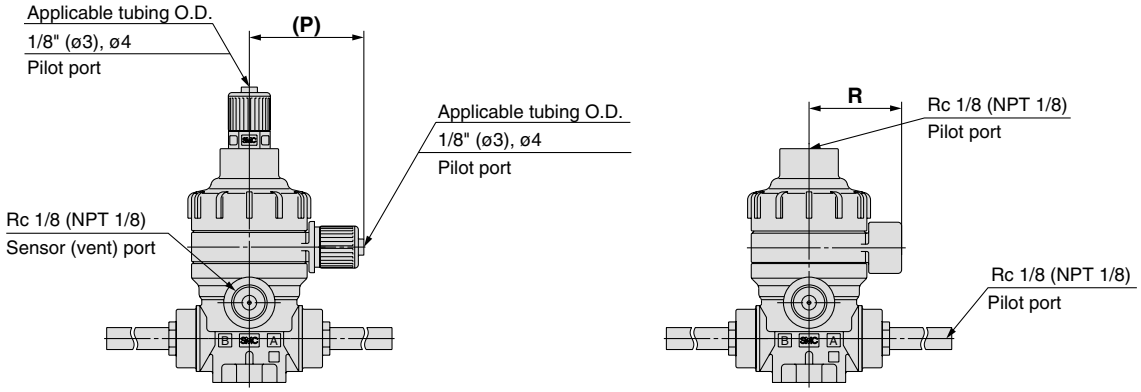
Model	S
LVQ20-T□-4	70.5
LVQ30-T□-4	88.5
LVQ40-T□-4	94
LVQ50-T□-4	134.5
LVQ60-T□-4	144

Dimensions

Basic
N.O. valve



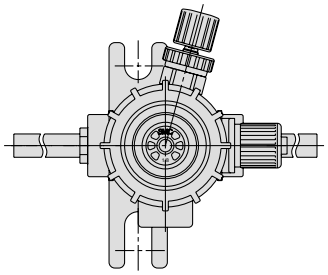
Double acting valve



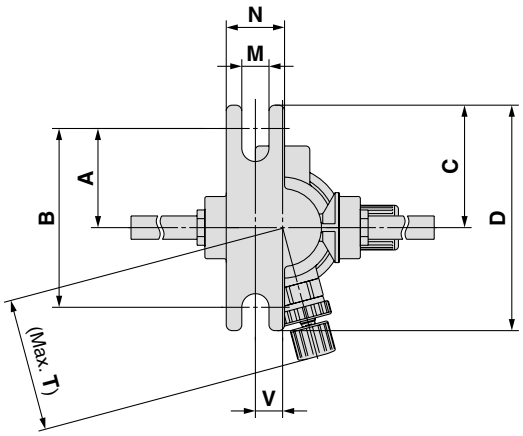
LVQ□$^{1}_{2}$-T□ Dimensions (N.O. Valve, Double Acting Valve) (mm)

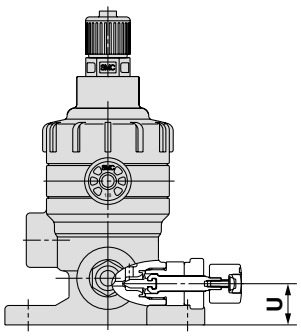
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2$^{1}_{2}$-T□	25.5	46	31.5	58	33.6	81	12	111.5	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3$^{1}_{2}$-T□	28.5	57	34.5	69	45.4	99	16.5	136	32	50	6	7	20	37.2	25	31.2	82
LVQ4$^{1}_{2}$-T□	28.5	57	34.5	69	45.4	104	22	137	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5$^{1}_{2}$-T□	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

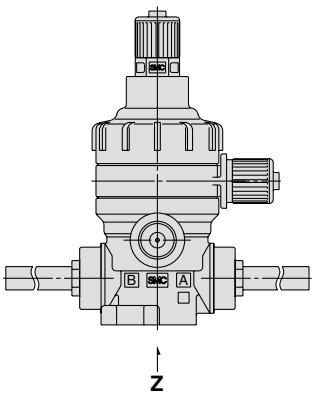
With by-pass
Double acting valve



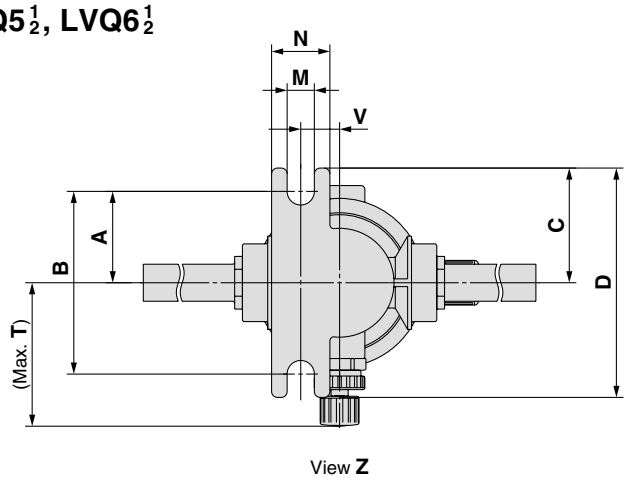
LVQ2$\frac{1}{2}$







LVQ3$\frac{1}{2}$, LVQ4$\frac{1}{2}$
LVQ5$\frac{1}{2}$, LVQ6$\frac{1}{2}$



View **Z**

Dimensions (mm)

Model	A	B	C	D	M	N	T	U	V
LVQ2$\frac{1}{2}$-T□-2	25.5	46	31.5	58	7	15	34.3	10.6	7
LVQ3$\frac{1}{2}$-T□-2	25.5	51	31.5	63	7	15	36.9	16.5	10
LVQ4$\frac{1}{2}$-T□-2	25.5	51	31.5	63	7	15	37.9	22	10
LVQ5$\frac{1}{2}$-T□-2	38	76	44	88	7	20	64	25	17
LVQ6$\frac{1}{2}$-T□-2	38	76	44	88	7	20	64	32	17

Manually Operated
Tube Extension Integral Fitting Type
Series LVQH-T

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

Option

Symbol	Option
—	None
K	Buffer material FFKM
N	For ammonium hydroxide

Note) Options cannot be combined to each other.

Tube extension fitting

Handle operation

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

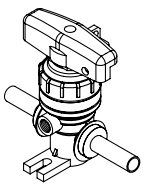
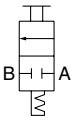
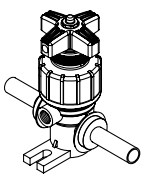
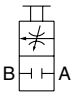
Applicable tubing size

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

—	Threaded	NPT 1/8
R	Threaded	Rc 1/8

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			○	○	○	○	○

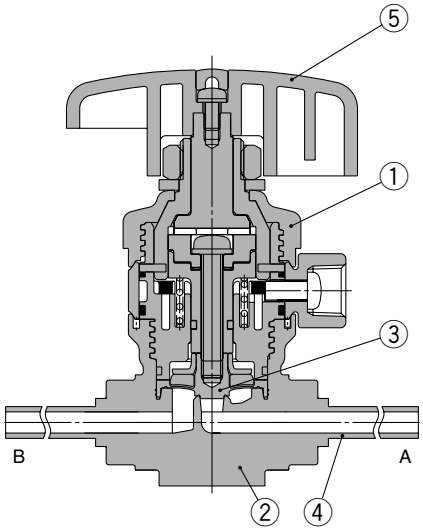
Standard Specifications

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 characteristics	Av x 10^{-6} m^2	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Fluid pressure <A→B>		–98 kPa to 0.5 MPa			–98 kPa to 0.4 MPa	
Back pressure (MPa)		0.3 or less			0.2 or less	
Valve leakage (cm^3/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

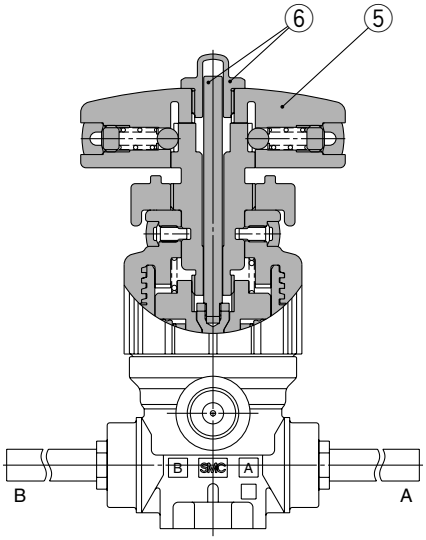
Note) ( ): High flow type

Construction

90° turn type



Multi-turn type (With indicator)

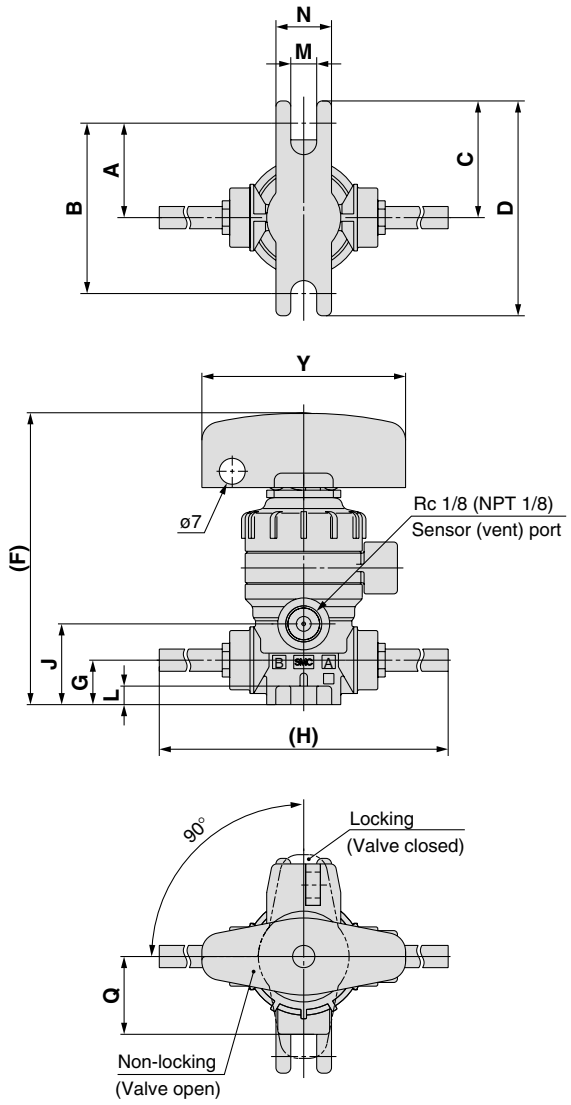


Component Parts

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

Dimensions

90° turn type

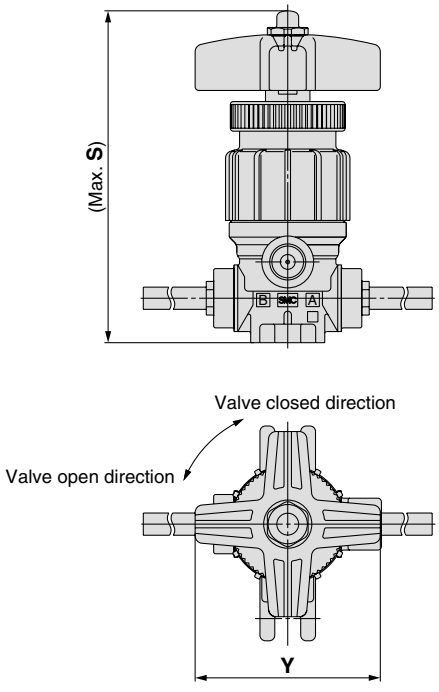


Dimensions (mm)

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	89.6	50
LVQH30-T□-4	107.2	50
LVQH40-T□-4	112.7	50
LVQH50-T□-4	165	71
LVQH60-T□-4	174.5	71

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

Series LVQ□□H

How to Order

LVQ 2 0 H – S 07 □ □ – □ – □

Body class

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

Valve type

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

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

Fitting type

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

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	●				
05	3/16	●				
07	1/4	○	●			
11	3/8		○	●		
13	1/2			○	●	
19	3/4				○	●
25	1					○

○ Basic size ● With reducer

Port B (OUT) different dia. size

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

Pilot port type

—	LQ1 integral fitting	Connection tubing O.D. 1/8" (ø3)
M	LQ1 integral fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

—	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

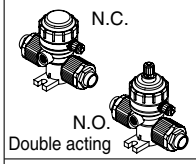
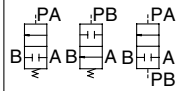
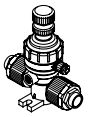
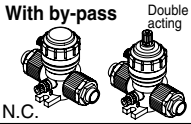
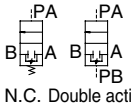
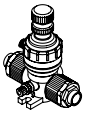
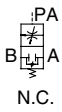
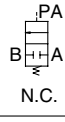
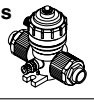
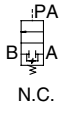
Note) Refer to variations in the table below for valve type and option 1 combinations. Options in the same table cannot be combined to each other.

Option 2

Symbol	Applicable option 1	2	3	4	24	Option
—	○	○	○	○	○	None
J	○	—	—	—	—	For high temperature
K	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	—	High flow type **LVQ6**□ only

Note) Options in the same table cannot be combined to 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	N.C.		○	○	○	○	○
		N.O.		○	○	○	○	○
		Double acting		○	○	○	○	○
With flow rate adjustment 	 N.C.	N.C.		○	○	○	○	○
With by-pass 	 N.C. Double acting	N.C.		○	○	○	○	○
		Double acting		○	○	○	○	○
With flow rate adjustment & by-pass 	 N.C.	N.C.		○	○	○	○	○
With indicator 	 N.C.	N.C.		○	○	○	○	○
With indicator & by-pass 	 N.C.	N.C.		○	○	○	○	○

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

Series LVQ□□H-Z

How to Order

LVQ 2 0 H – Z 07 □ – □ – □

Body class

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

Valve type

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

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

LQ3 integral fitting

Option 2

Symbol	Applicable option					Option
	1	2	3	4	24	
—	○	○	○	○	○	None
J	○	—	—	—	—	For high temperature
K	○	○	○	○	○	Buffer material FFKM
N	○	○	○	○	○	For ammonium hydroxide
P	—	—	—	○	—	High flow type **LVQ6**□ only

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

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						
07	1/4	○				
11	3/8		○			
13	1/2			○		
19	3/4				○	
25	1					○

Pilot port type

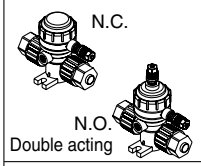
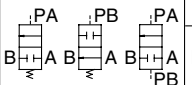
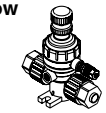
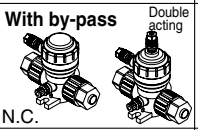
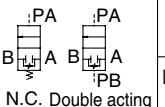
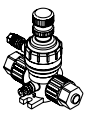
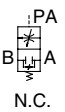
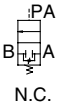
—	With LQ3 fitting	Connection tubing O.D. 1/8" (ø3)
M	With LQ3 fitting	Connection tubing O.D. ø4
R	Threaded	Rc 1/8
N	Threaded	NPT 1/8

Option 1

—	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 on the right for valve type and option 1 combinations. Options in the same table can not be combined to 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 adjust-ment 			N.C.	○	○	○	○	○
With by-pass 			N.C.	○	○	○	○	○
			Double acting	○	○	○	○	○
With flow rate adjust-ment & by-pass 			N.C.	○	○	○	○	○
With indicator 			N.C.	○	○	○	○	○
With indicator & by-pass 			N.C.	○	○	○	○	○

⚠ Specific Product Precautions

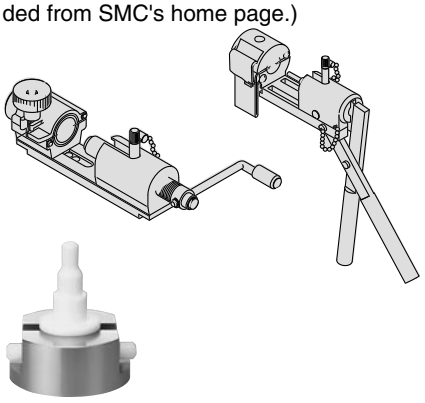
Be sure to read before handling. Refer to back pages 1 through 4 for Safety Instructions and Specific Product Precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

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



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

Tightening Torque for Piping

Body class	Torque (N·m)		
	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.	**Metric**	6	10	12	19	25
	Inch	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	**Av x 10^{-6} m²**	8.4	31.2	45.6	120	192 (228) Note)
	Cv	0.35	1.3	1.9	5	8 (9.5) Note)
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>		–98 kPa to 0.5 MPa				
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		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) ( ): High flow type

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 27 for information on changing tubing sizes.

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)
Pure water	○
Sodium hydroxide Concentration 50% or less	○
Nitrogen gas	○
Ultra 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.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) Note 1) and other safety regulations.

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218: Manipulating industrial robots -Safety.
etc.

⚠ Caution: Operator error could result in injury or equipment damage.

⚠ Warning: Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possibility of serious injury or loss of life.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Safety Instructions

⚠Caution

The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited Warranty and Disclaimer

1. **The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.Note 2)**
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. **For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.**
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. **Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.**

Note 2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Series LVQ
Specific Product Precautions 1

Be sure to read this before handling.

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 catalogue.

2. Fluids

Operate after confirming the compatibility of the product component materials with fluids, using the check list on features page 67. 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 catalogue.

5. Ambient environment

Operate within the ambient operating temperature range. After confirming the compatibility of the product's component materials with the ambient environment, operate so that fluid does not adhere to the product 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.

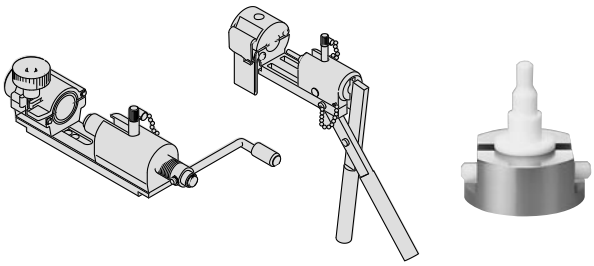
Tightening Torque for Pilot Port

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

3. Metal fittings

In 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 Series LQ1/2 Work Procedure Instructions” (M-E05-1) or “High Purity Fluoropolymer Fittings Hyper Fitting/Flare Type Series LQ3 Fitting Procedure” (M-E06-4). (The pamphlets can be downloaded from SMC's home page.)



Operating Air Supply

⚠ Warning

1. Use clean air.

Do not use compressed air which including chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc., as this may cause damage or malfunction.

Series LVQ
Specific Product Precautions 2

Be sure to read this before handling.

Operating Environment

⚠ Warning

1. **Do not use locations having an explosive atmosphere.**
2. **Do not use locations where vibration or impact occurs.**
3. **Do not use in locations where radiated heat will be received from nearby heat sources.**

Maintenance

⚠ Warning

1. **Maintenance should be performed in accordance with the procedures in the 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, perform periodic inspections to confirm that there are no leaks from valves or fittings, etc.**

⚠ Caution

1. **Removal of drainage**

   Flush drainage from filters regularly.

Precautions

⚠ Warning

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

⚠ 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 pressurised).**
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, 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 near to 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.
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.**

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