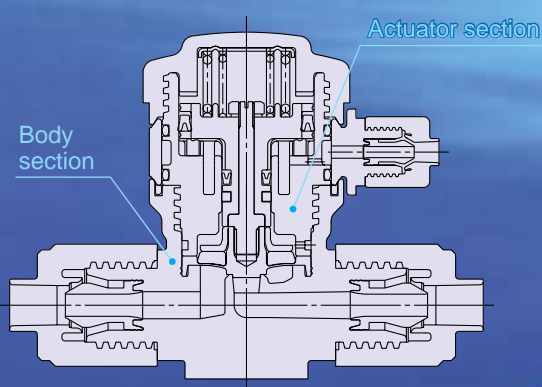


Clean Wet Series

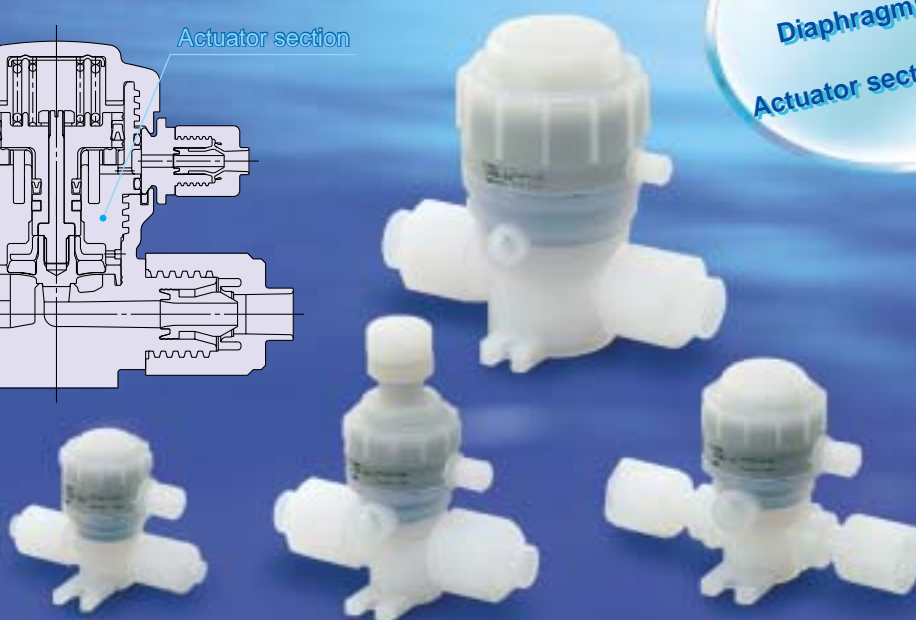
Air Operated Chemical Valve Non-Metallic Exterior

Constructed without screws

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



Body: **New PFA**
Diaphragm: **PTFE**
Actuator section: **PVDF**



Series LVQ

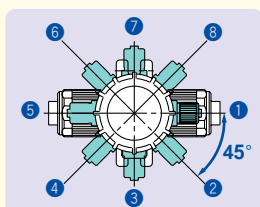
Integral fitting construction

Hyper fitting/
Series LQ2 is used.



Piping from 8 directions are possible.

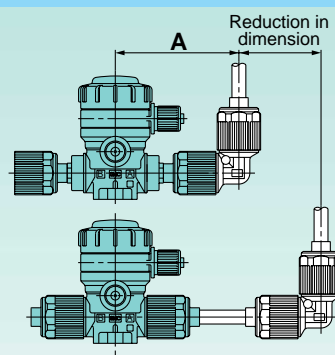
Pilot port



Integral fitting construction

Hyper fitting/Series LQ1 is used.
Can select female thread.

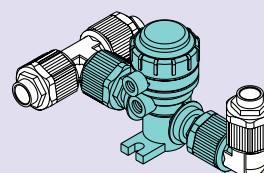
Space Saving Type

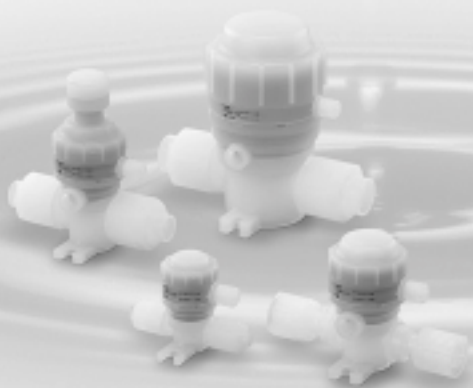


(mm)

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





Diaphragm (PTFE)

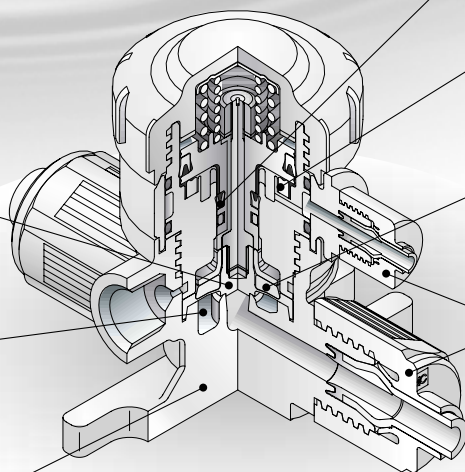
Special diaphragm construction ensures gentle opening and closing that prevents the formation of micro-bubbles.

Minimal residual liquid

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

Body (New PFA)

Compatible with chemicals such as acids, bases and de-ionized water.



Guide ring

Eliminates lateral motion of the poppet which reduces internal leakage.

Piston damper

Absorbs piston momentum to minimize impact-induced particle generation.

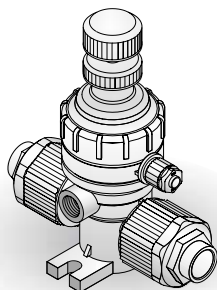
Buffer

Protects diaphragm from deformation and damage due to back pressure.

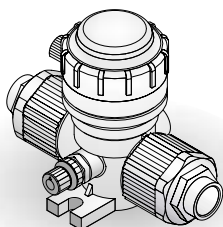
Integral fittings construction

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

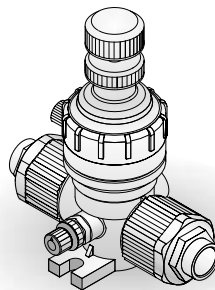
Option



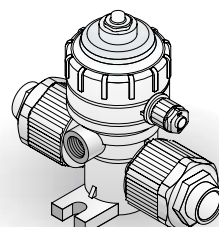
With flow rate adjustment



With by-pass



With flow rate adjustment & by-pass



With indicator

Variations

Orifice diameter	Flow characteristics $A_v \times 10^{-6} \text{ m}^2 (\text{Cv})$	Series	Applicable tubing size													
			Metric size							Inch size						
			4	6	8	10	12	19	25	1/8	3/16	1/4	3/8	1/2	3/4	1
ø4	8.4 (0.35)	LVQ20	●	○						●	●	○				
ø8	31.2 (1.3)	LVQ30			●	○						●	○			
ø10	45.6 (1.9)	LVQ40				●	○						●	○		
ø16	120 (5)	LVQ50					●	○						●	○	
ø22	192 (8)	LVQ60						●	○						●	○

● With reducer ○ Basic size

Integral Fitting Type (Hyper Fittings) 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.

Applicable tubing size

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

○ Basic size ● With reducer

Port B (OUT) different dia. size

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

Option

Nil	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

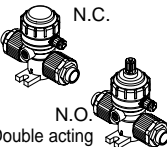
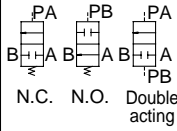
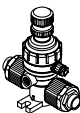
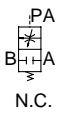

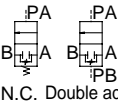

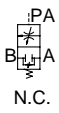


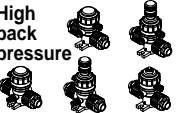



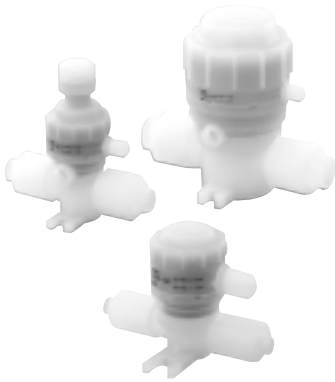
Note) Refer to variations in the table below for valve type and option combinations. Options can not be combined each other.

Pilot port thread type

Nil	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	NP T1/8

Variations

			Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
			Orifice diameter		ø4	ø8	ø10	ø16	ø22
			Tubing outside dia.		6	10	12	19	25
			Millimeter	Inch	1/4	3/8	1/2	3/4	1
Type	Symbol	Valve type							
Basic type 		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.	○	○	○	○	○		



Standard Specifications

Model		LVQ20	LVQ30	LVQ40	LVQ50	LVQ60
Tubing O.D.	Metric size	6	10	12	19	25
	Inch size	1/4	3/8	1/2	3/4	1
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10 ⁻⁶ m²	8.4	31.2	45.6	120	192
	Cv	0.35	1.3	1.9	5	8
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>		-98 kPa to 0.5 MPa			-98 kPa to 0.4 MPa	
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42				
Valve leakage (cm³/min)		0 (with water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.08	0.17	0.22	0.70	0.81

Different Diameter Tubing Applicable with Reducer

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

● With reducer

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



Note) Refer to page 18 for information on changing tubing sizes.

⚠ Specific Product Precautions

Be sure to read before handling. Refer to pages 24 through 26 for safety instructions and high purity chemical valve precautions.

Piping

⚠ Caution

1. Connect tubing with special tools.

Refer to pages 18 through 20 regarding tubing connection and special tools.

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

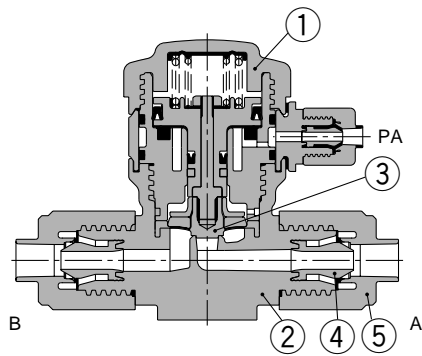
Tightening torque for piping

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

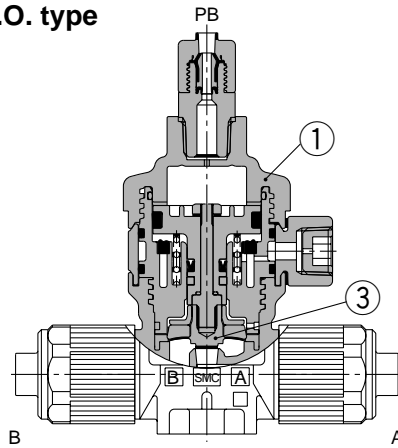
Construction

Basic type

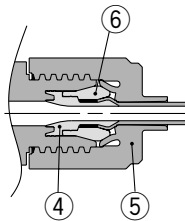
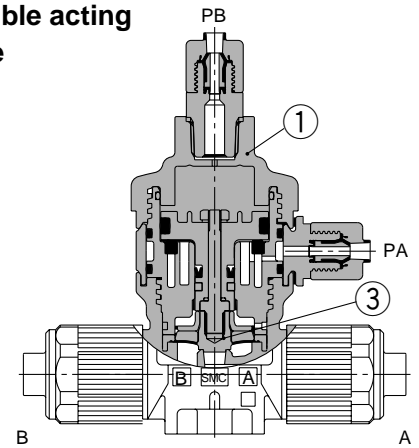
N.C. type



N.O. type

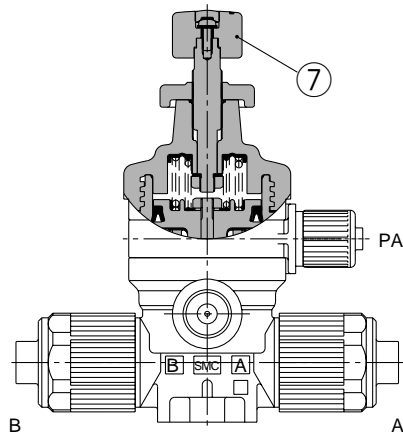


Double acting type

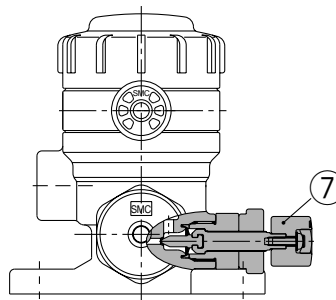


With reducer

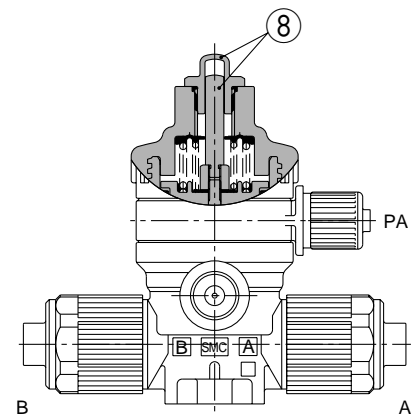
With flow rate adjustment



With by-pass



With indicator



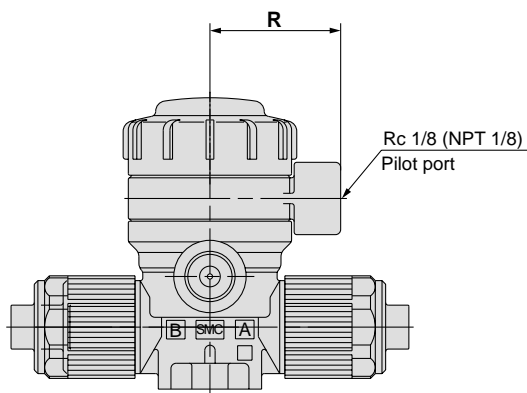
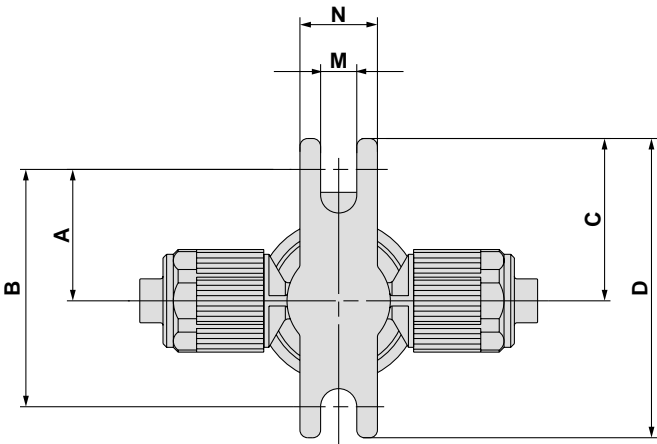
Parts list

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

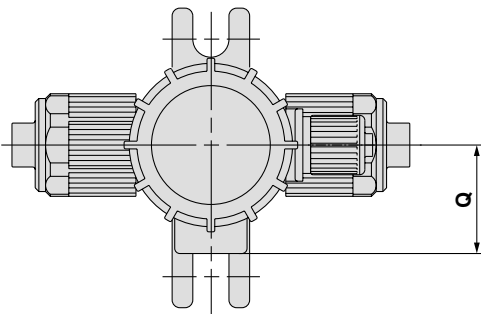
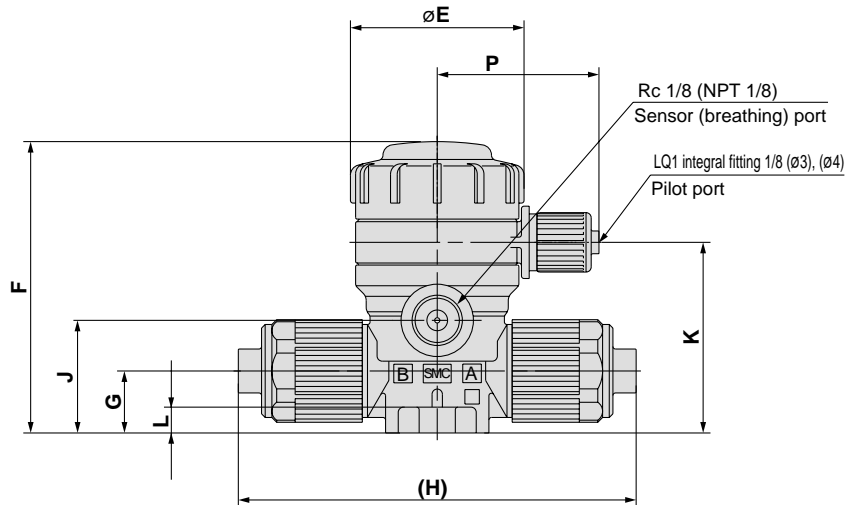
Series LVQ

Dimensions

Basic type, High back pressure spec.
N.C. valve



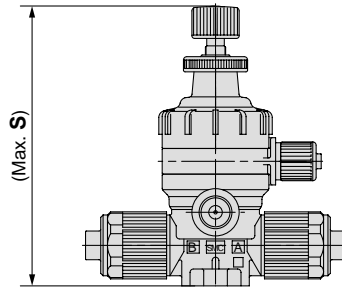
Pilot port Rc 1/8 (NPT 1/8)
Threaded type



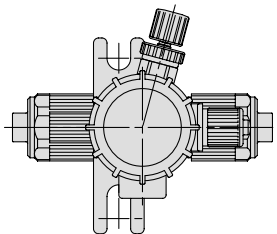
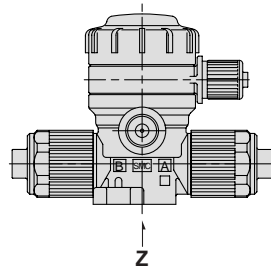
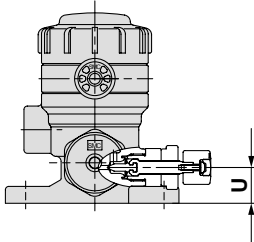
LVQ□0-S□ Dimensions (N.C. valve)																	(mm)
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	
LVQ20-S□	25.5	46	31.5	58	33.6	56.5	12	77	21.8	37	5	7	15	31.3	21	25.3	
LVQ30-S□	23.5	47	29.5	59	45.4	77	16.5	95	32	50	6	7	20	37.2	25	31.2	
LVQ40-S□	23.5	47	29.5	59	45.4	82.5	22	109	37.5	55.5	6	7	20	37.2	25	31.2	
LVQ50-S□	35	70	41	82	75	127	25	141	50.2	78.2	10	7	20	50.8	38.5	45	
LVQ60-S□	35	70	41	82	75	137	32	150	60	88	10	7	20	50.8	38.5	45	

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

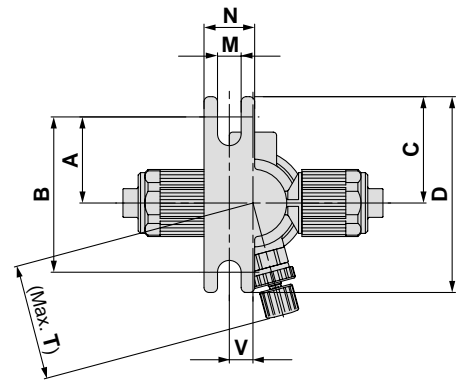
Dimensions (mm)	
Model	S
LVQ20-S□-1	83
LVQ30-S□-1	113.5
LVQ40-S□-1	119
LVQ50-S□-1	171.5
LVQ60-S□-1	182.5



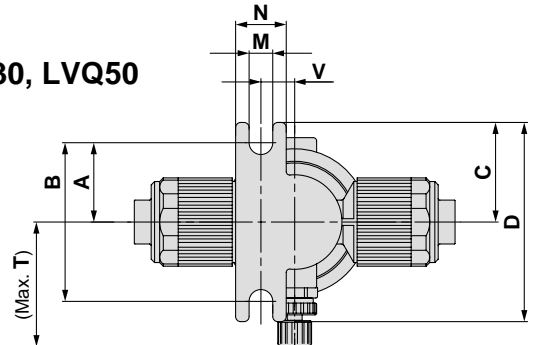
With by-pass, High back pressure spec. with by-pass
N.C. valve



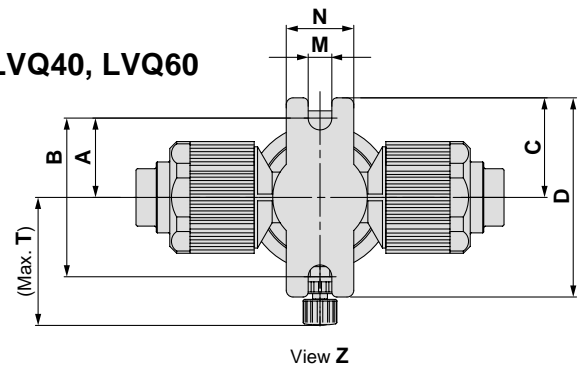
LVQ20



LVQ30, LVQ50



LVQ40, LVQ60

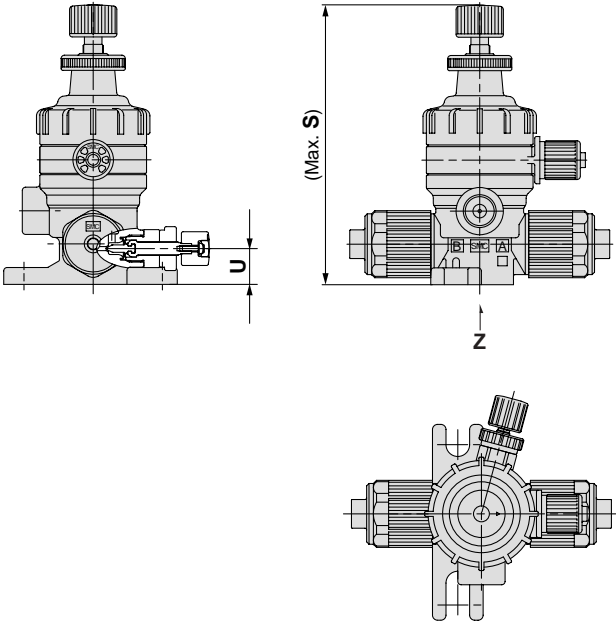


Dimensions (mm)									
Model	A	B	C	D	M	N	T	U	V
LVQ20-S□-2	25.5	46	31.5	58	7	15	35.3	10.6	7
LVQ30-S□-2	23.5	47	29.5	59	7	15	36.9	16.5	10
LVQ40-S□-2	23.5	47	29.5	59	7	20	37.9	22	—
LVQ50-S□-2	35	70	41	82	7	20	64	25	17
LVQ60-S□-2	35	70	41	82	7	20	66	32	—

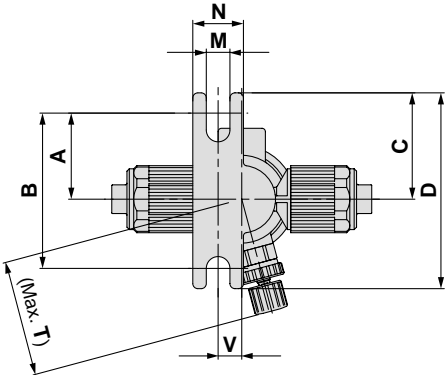
Series LVQ

Dimensions

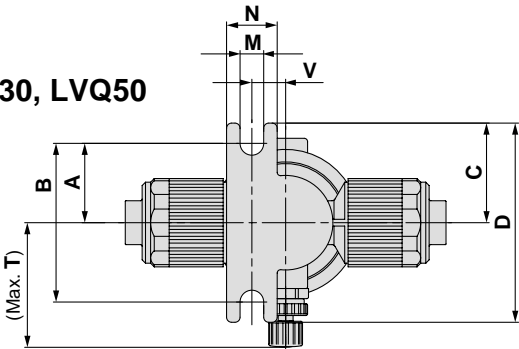
With flow rate adjustment & by-pass
High back pressure spec. with flow rate adjustment & by-pass
N.C. valve



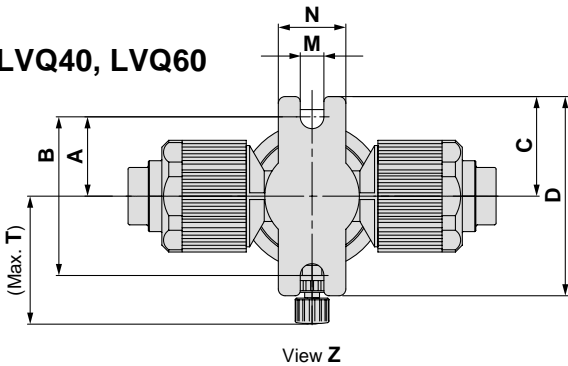
LVQ20



LVQ30, LVQ50



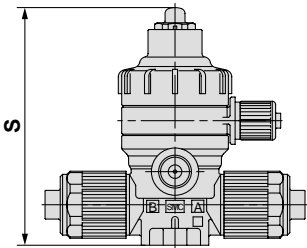
LVQ40, LVQ60



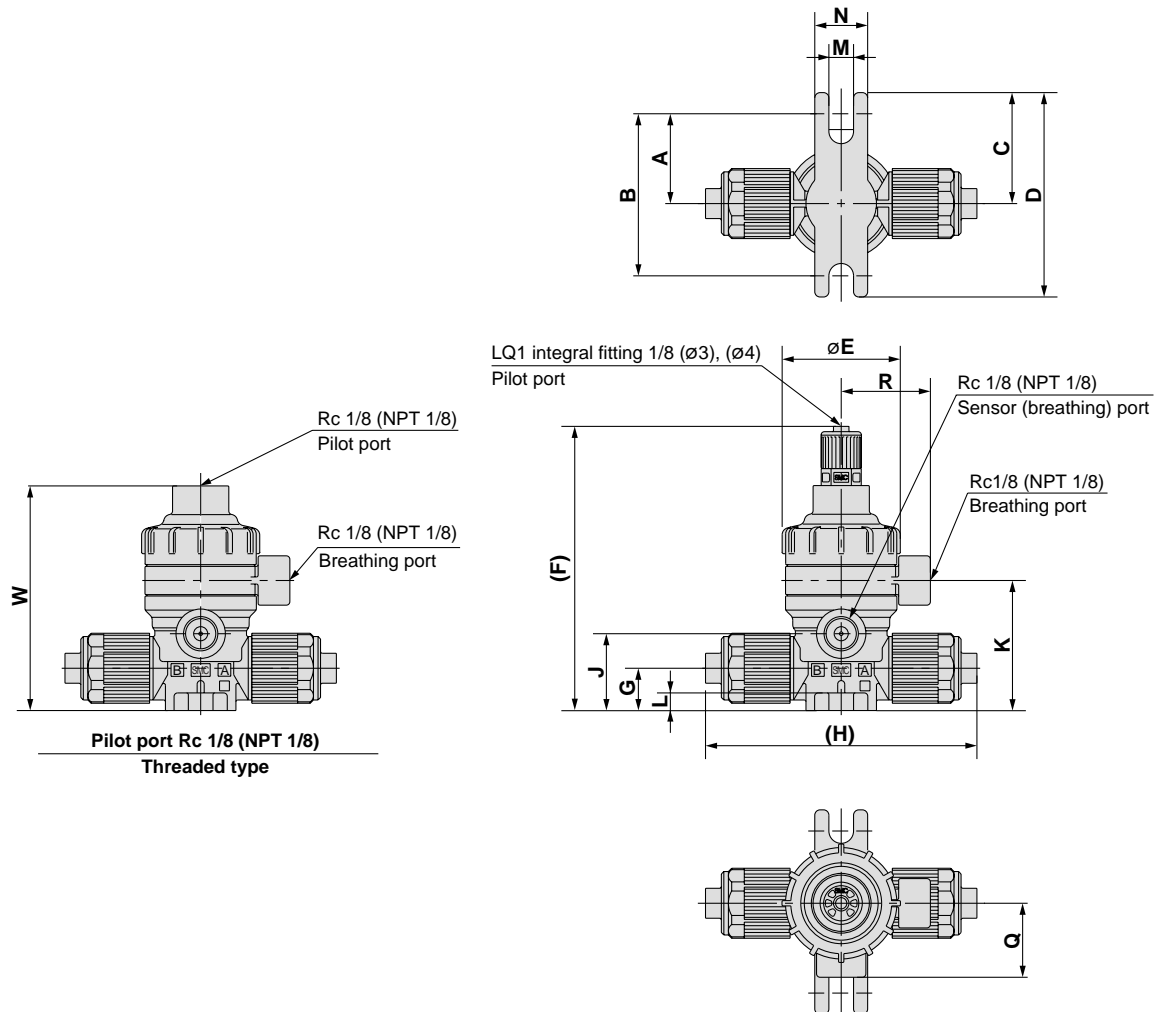
Dimensions										(mm)
Model	A	B	C	D	M	N	S	T	U	V
LVQ20-S□-3	25.5	46	31.5	58	7	15	83	35.3	10.6	7
LVQ30-S□-3	23.5	47	29.5	59	7	15	113.5	36.9	16.5	10
LVQ40-S□-3	23.5	47	29.5	59	7	20	119	37.9	22	—
LVQ50-S□-3	35	70	41	82	7	20	171.5	64	25	17
LVQ60-S□-3	35	70	41	82	7	20	182.5	66	32	—

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

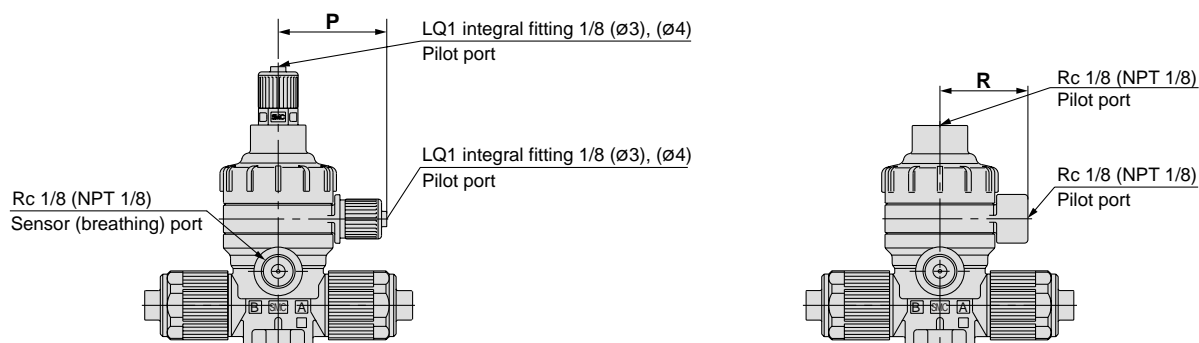
Dimensions		(mm)
Model	S	
LVQ20-S□-4	70.5	
LVQ30-S□-4	88.5	
LVQ40-S□-4	94	
LVQ50-S□-4	134.5	
LVQ60-S□-4	144	



Basic type N.O. valve



Double acting valve



LVQ□₂-S□ Dimensions (N.O. valve, double acting valve)

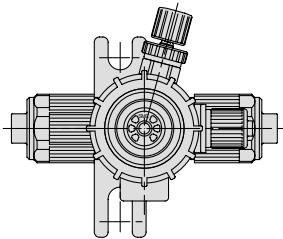
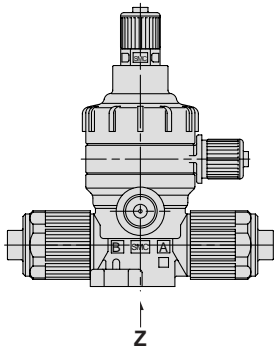
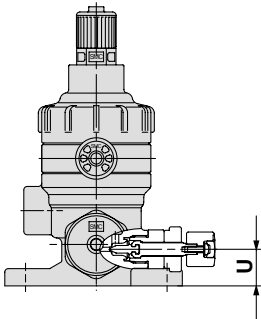
(mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2 ₂ -S□	25.5	46	31.5	58	33.6	81	12	77	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3 ₂ -S□	23.5	47	29.5	59	45.4	99	16.5	95	32	50	6	7	20	37.2	25	31.2	82
LVQ4 ₂ -S□	23.5	47	29.5	59	45.4	104.5	22	109	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5 ₂ -S□	35	70	41	82	75	145	25	141	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6 ₂ -S□	35	70	41	82	75	154.5	32	150	60	88	10	7	20	50.8	38.5	45	137.5

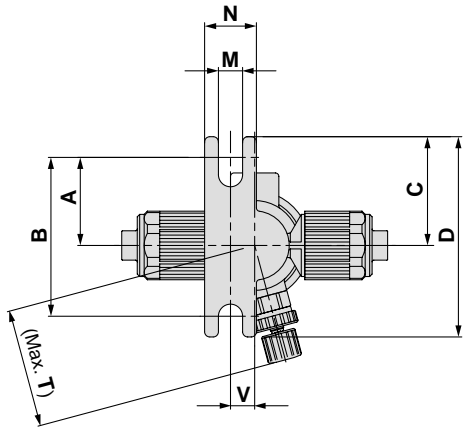
Series **LVQ**

Dimensions

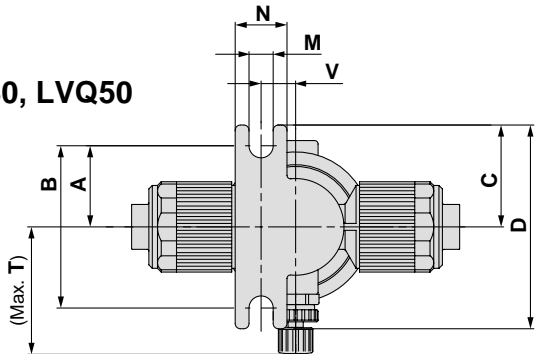
With by-pass
Double acting valve



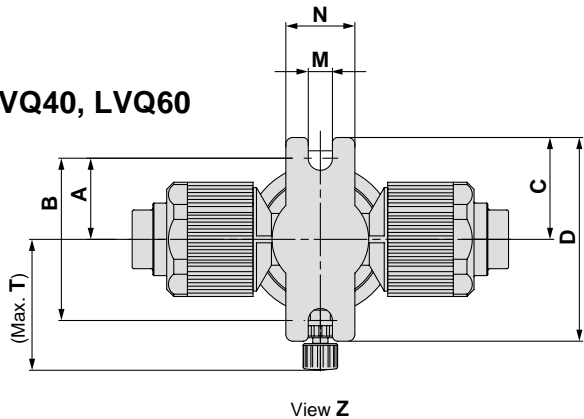
LVQ20



LVQ30, LVQ50



LVQ40, LVQ60



View Z

Dimensions (N.O valve, double acting valve) (mm)									
Model	A	B	C	D	M	N	T	U	V
LVQ2 ¹ ₂ -S□-2	25.5	46	31.5	58	7	15	35.3	10.6	7
LVQ3 ¹ ₂ -S□-2	23.5	47	29.5	59	7	15	36.9	16.5	10
LVQ4 ¹ ₂ -S□-2	23.5	47	29.5	59	7	20	37.9	22	—
LVQ5 ¹ ₂ -S□-2	35	70	41	82	7	20	64	25	17
LVQ6 ¹ ₂ -S□-2	35	70	41	82	7	20	66	32	—

Space Saving/Space Saving Connection Series *LVQ*



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
----------	-------------------------

Option

Nil	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 combinations
Options can not be combined each other.

Pilot port thread type



























































Nil	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	NP T1/8

Applicable fitting size

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

Note) Refer to page 18 for How to order fitting parts.
Select the fittings of the same size as the one at the valve side.

Variations

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

How to Order Fitting for Space Saving

Applicable tubing size

Size	No.	Applicable tubing size (mm)	Reducing
6	1	25 x 22	○
6	2	19 x 16	●

Size	Symbol	Applicable tubing size (inch)	Reducing
6	A	1" x 7/8"	○
6	B	3/4" x 5/8"	●

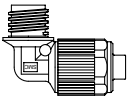
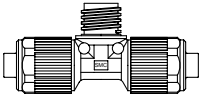

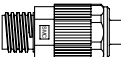
○ Basic size ● With reducer

LQ1 E 61 - S

LQ2 E 21 - S

One nut (including insert bushing) of the nuts is not attached.
Please refer to below piping example.

Type of fitting

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	No.	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) Select the fittings of the same size as the one at the valve side.

Piping example

LQ2T31-S
(Union tee)

LVQ30S-S11R

Applicable tubing size
1/4" x 5/32"

LQ2E3B-S
(Union elbow)

Applicable tubing size
10 x 8

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
Orifice diameter		ø4	ø8	ø10	ø16	ø22
Flow characteristics	Av x 10 ⁻⁶ m ²	8.4	31.2	45.6	120	192
	Cv	0.35	1.3	1.9	5	8
Withstand pressure (MPa)		1				
Operating pressure <A→B flow>		-98 kPa to 0.5 MPa			-98 kPa to 0.4 MPa	
Back pressure (MPa)	Standard	0.3 or less			0.2 or less	
	High back pressure	0.42				
Valve leakage (cm³/min)		0 (with water pressure)				
Pilot air pressure (MPa)		0.3 to 0.5 (High back pressure: 0.45 to 0.55)				
Pilot port size		1/8" (ø3), ø4, Rc 1/8, NPT 1/8				
Fluid temperature (°C)		0 to 100				
Ambient temperature (°C)		0 to 60				
Weight (kg)		0.085	0.175	0.223	0.725	0.835

⚠ Specific Product Precautions

Be sure to read before handling. Refer to pages 24 through 26 for safety instructions and high purity chemical valve 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

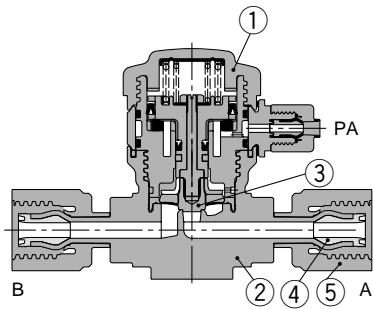
Body class	Torque (Nm)
2	1.5 to 2.0
3	3.0 to 3.5
4	7.5 to 9.0
5	11.0 to 13.0
6	5.5 to 6.0

Series LVQ

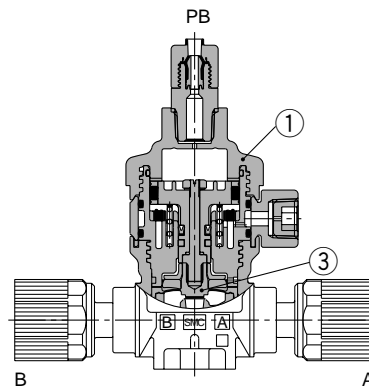
Construction

Basic type

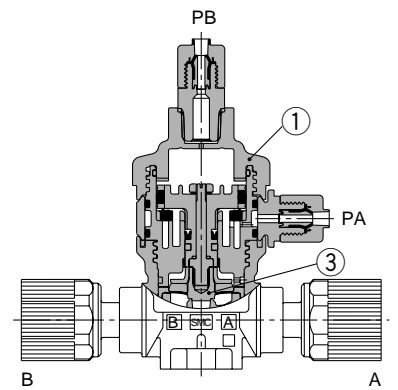
N.C. type



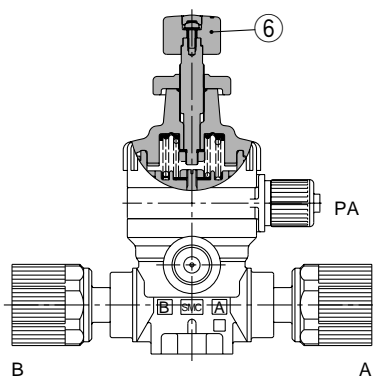
N.O. type



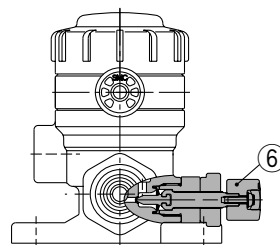
Double acting type



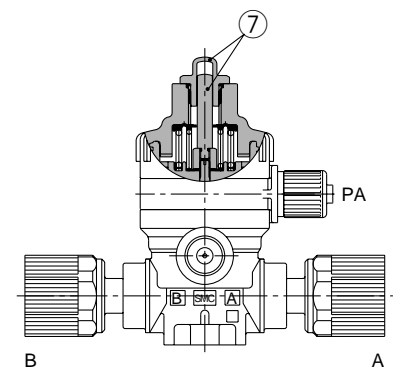
With flow rate adjustment



With by-pass



With indicator

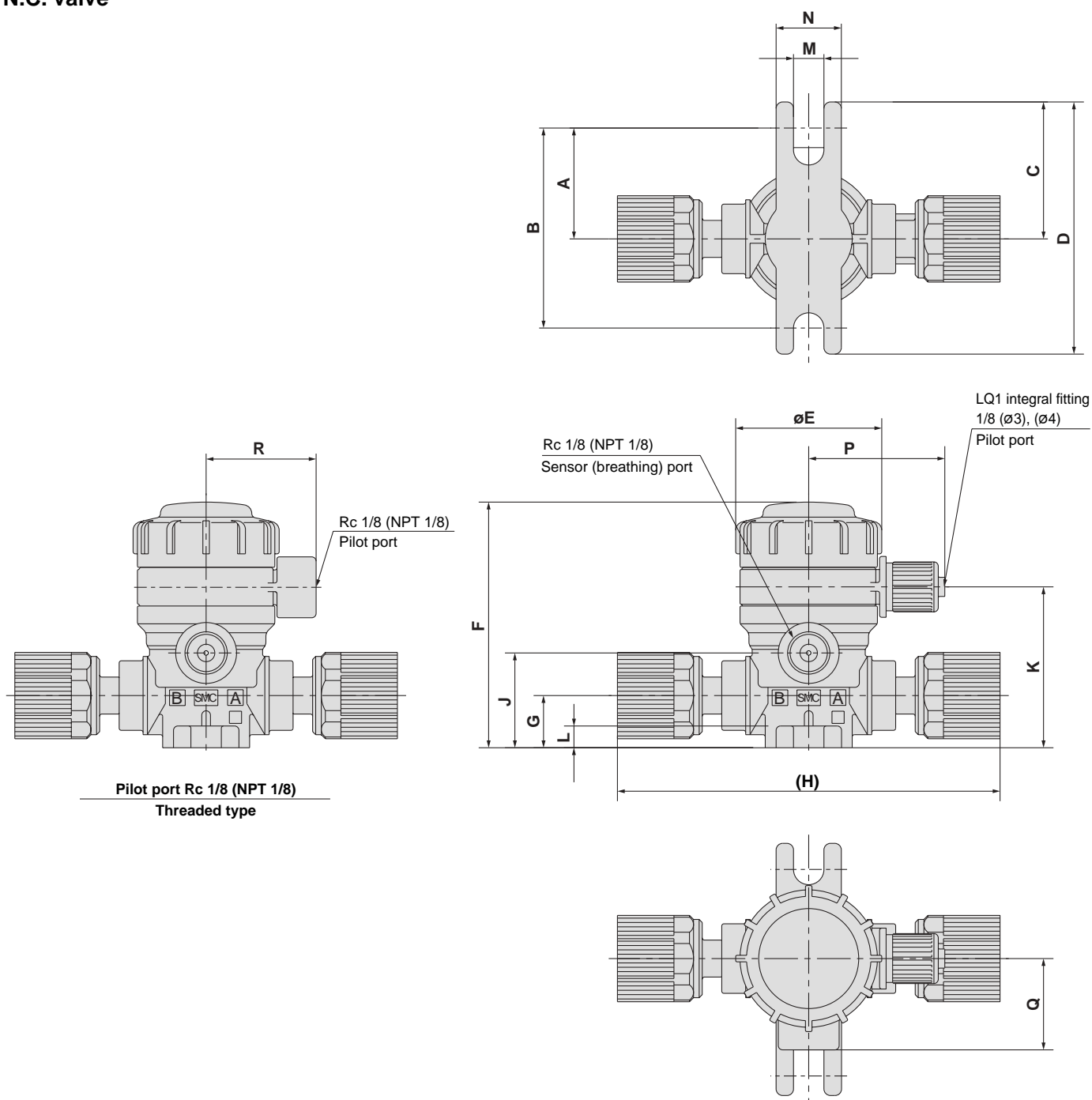


Parts list

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

Dimensions

Basic type, High back pressure spec.
N.C. valve



LVQ□0S-S□ Dimensions (N.C. valve)

(mm)

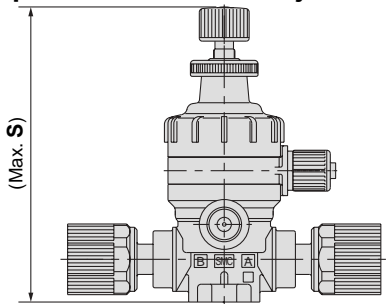
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20S-S07	25.5	46	31.5	58	33.6	56.5	12	92	21.8	37	5	7	15	31.3	21	25.3
LVQ30S-S11	23.5	47	29.5	59	45.4	77	16.5	112	32	50	6	7	20	37.2	25	31.2
LVQ40S-S13	23.5	47	29.5	59	45.4	82.5	22	126	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50S-S19	35	70	41	82	75	127	25	168	50.2	78.2	10	7	20	50.8	38.5	45
LVQ60S-S25	35	70	41	82	75	137	32	177	60	88	10	7	20	50.8	38.5	45

Series LVQ

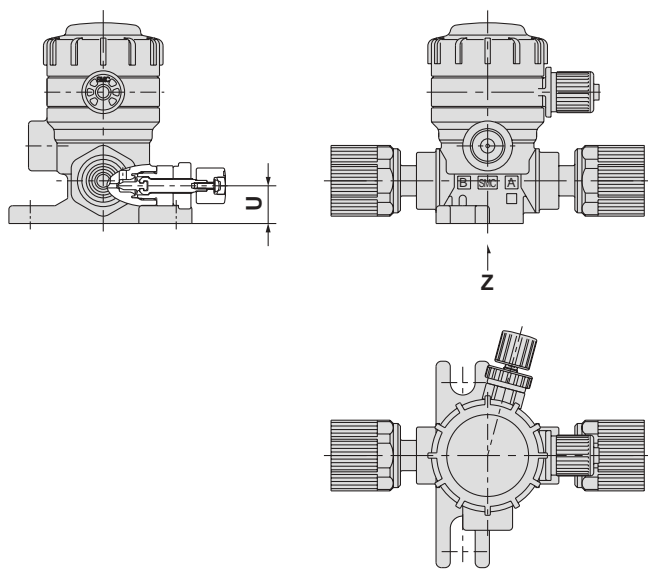
Dimensions

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

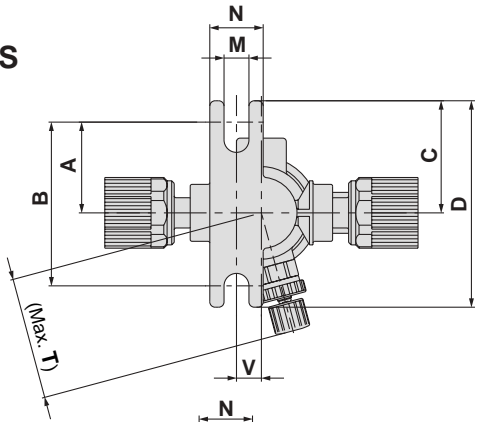
Dimensions (mm)	
Model	S
LVQ20S-S07-1	83
LVQ30S-S11-1	113.5
LVQ40S-S13-1	119
LVQ50S-S19-1	171.5
LVQ60S-S25-1	182.5



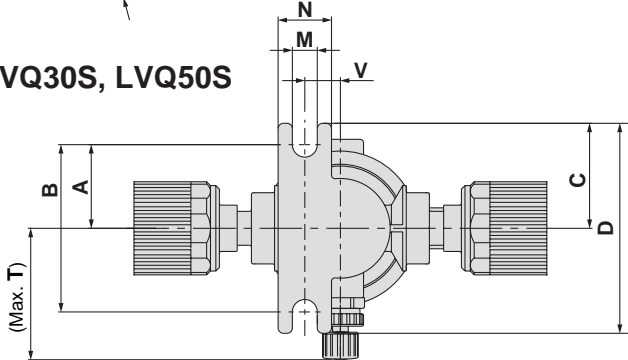
With by-pass, High back pressure spec. with by-pass
N.C. valve



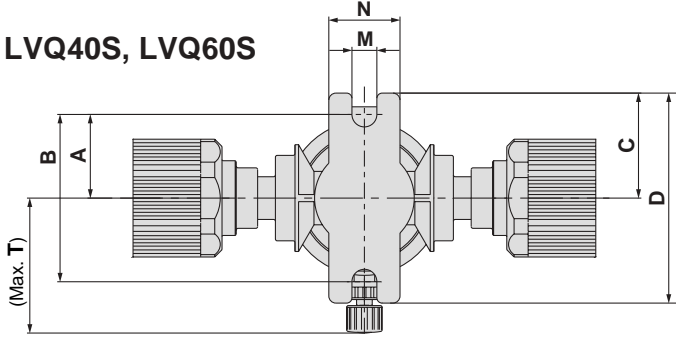
LVQ20S



LVQ30S, LVQ50S



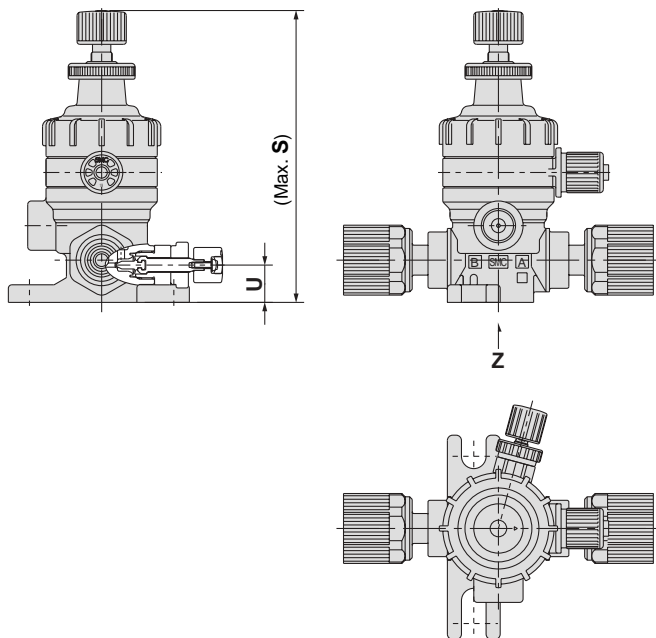
LVQ40S, LVQ60S



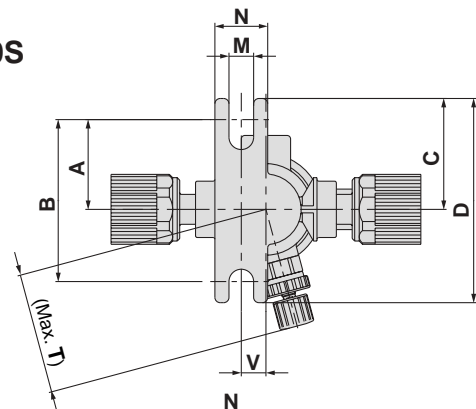
View Z

Dimensions (mm)									
Model	A	B	C	D	M	N	T	U	V
LVQ20S-S07-2	25.5	46	31.5	58	7	15	35.3	10.6	7
LVQ30S-S11-2	23.5	47	29.5	59	7	15	36.9	16.5	10
LVQ40S-S13-2	23.5	47	29.5	59	7	20	37.9	22	—
LVQ50S-S19-2	35	70	41	82	7	20	64	25	17
LVQ60S-S25-2	35	70	41	82	7	20	66	32	—

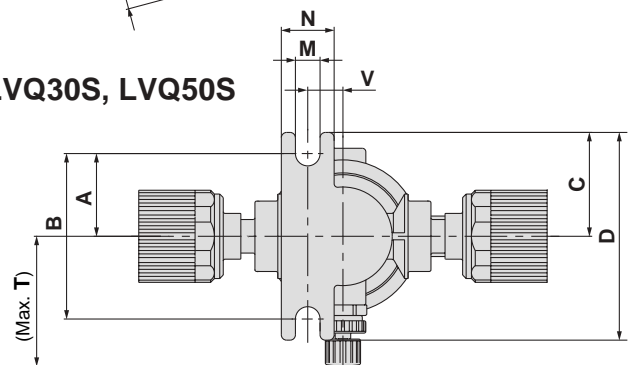
With flow rate adjustment & by-pass
High back pressure spec.
with flow rate adjustment & by-pass
N.C. valve



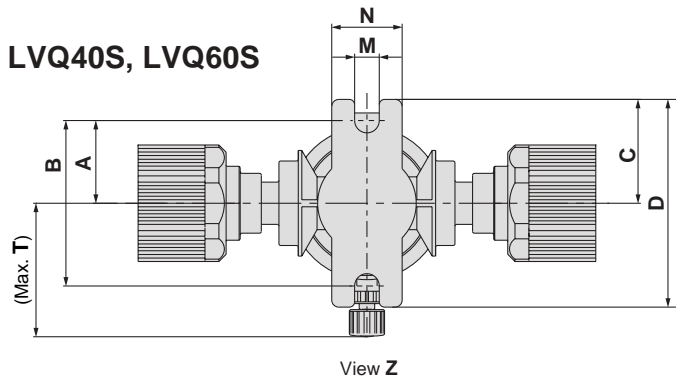
LVQ20S



LVQ30S, LVQ50S



LVQ40S, LVQ60S



View Z

Dimensions

(mm)

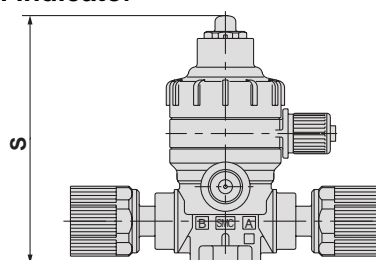
Model	A	B	C	D	M	N	S	T	U	V
LVQ20S-S07-3	25.5	46	31.5	58	7	15	83	35.3	10.6	7
LVQ30S-S11-3	23.5	47	29.5	59	7	15	113.5	36.9	16.5	10
LVQ40S-S13-3	23.5	47	29.5	59	7	20	119	37.9	22	—
LVQ50S-S19-3	35	70	41	82	7	20	171.5	64	25	17
LVQ60S-S25-3	35	70	41	82	7	20	182.5	66	32	—

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

Dimensions

(mm)

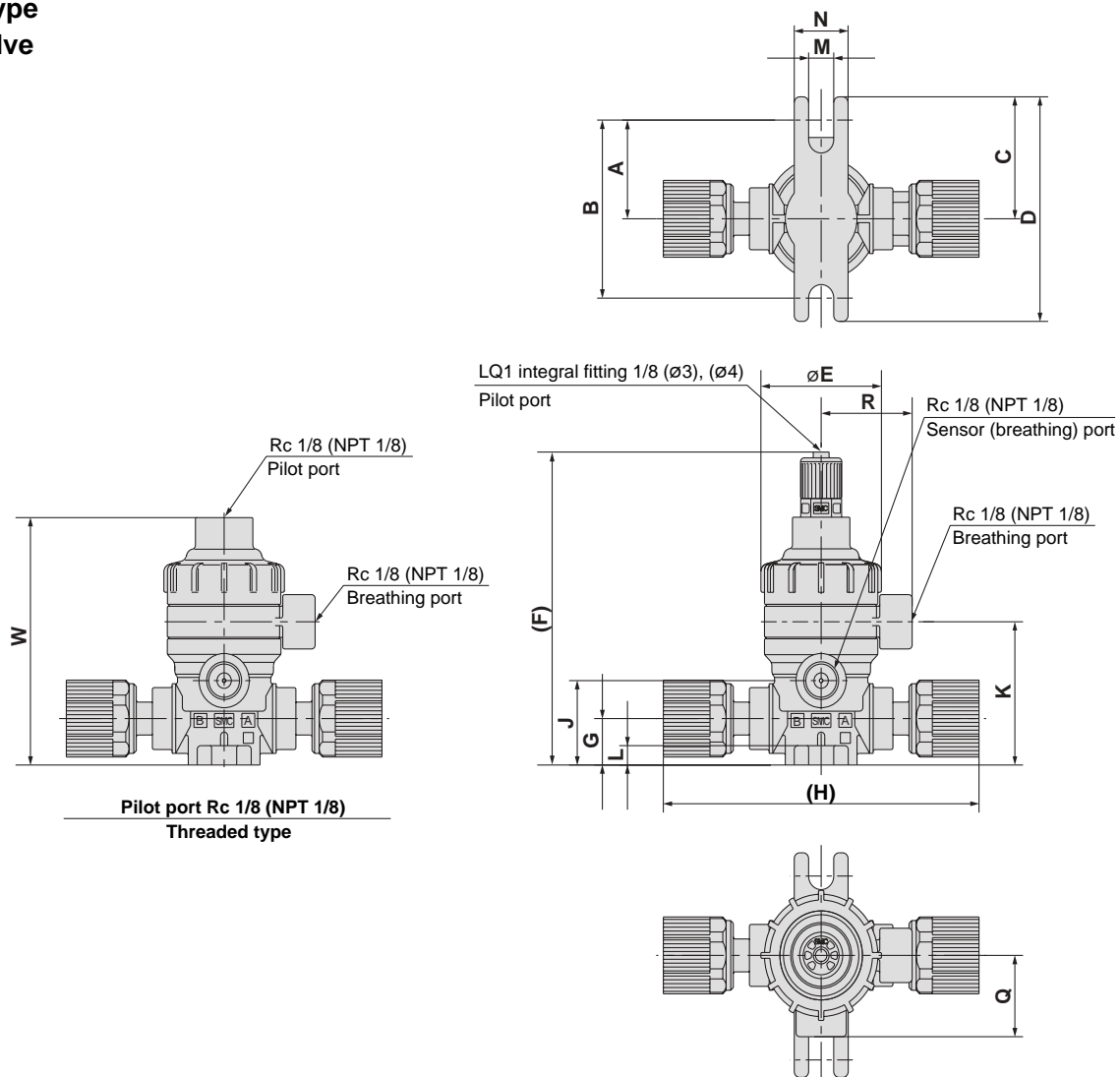
Model	S
LVQ20S-S07-4	70.5
LVQ30S-S11-4	88.5
LVQ40S-S13-4	94
LVQ50S-S19-4	134.5
LVQ60S-S25-4	144



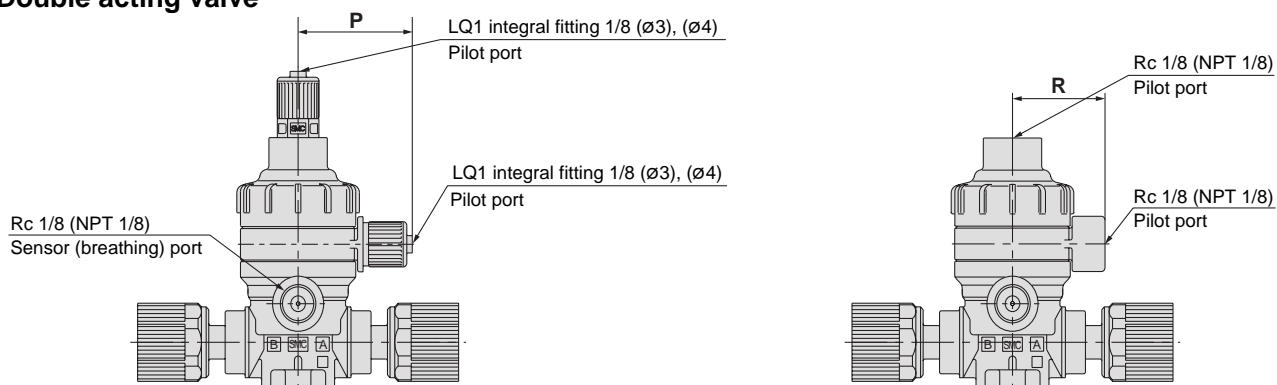
Series LVQ

Dimensions

Basic type
N.O. valve



Double acting valve

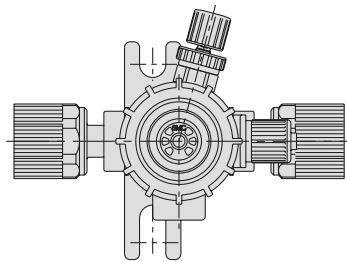
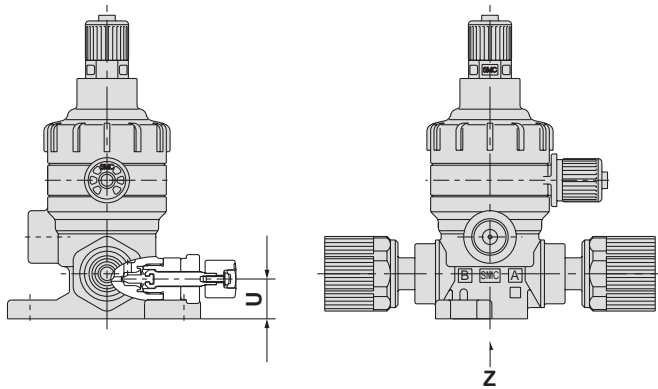


LVQ \square $\frac{1}{2}$ S-S \square Dimensions (N.O. valve, double acting valve)

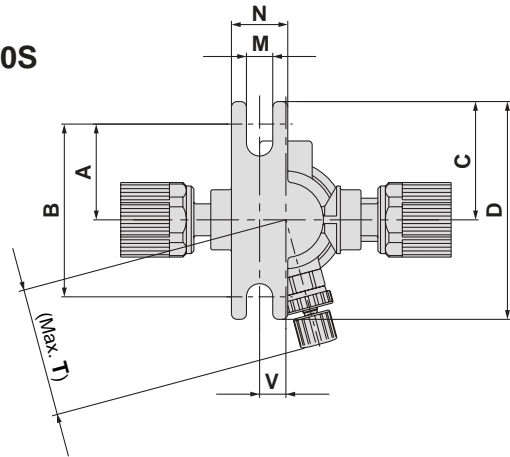
(mm)

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	W
LVQ2 $\frac{1}{2}$ S-S07	25.5	46	31.5	58	33.6	81	12	92	21.8	37	5	7	15	31.3	21	25.3	64
LVQ3 $\frac{1}{2}$ S-S11	23.5	47	29.5	59	45.4	99	16.5	112	32	50	6	7	20	37.2	25	31.2	82
LVQ4 $\frac{1}{2}$ S-S13	23.5	47	29.5	59	45.4	104.5	22	126	37.5	55.5	6	7	20	37.2	25	31.2	87.5
LVQ5 $\frac{1}{2}$ S-S19	35	70	41	82	75	145	25	168	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6 $\frac{1}{2}$ S-S25	35	70	41	82	75	154.5	32	177	60	88	10	7	20	50.8	38.5	45	137.5

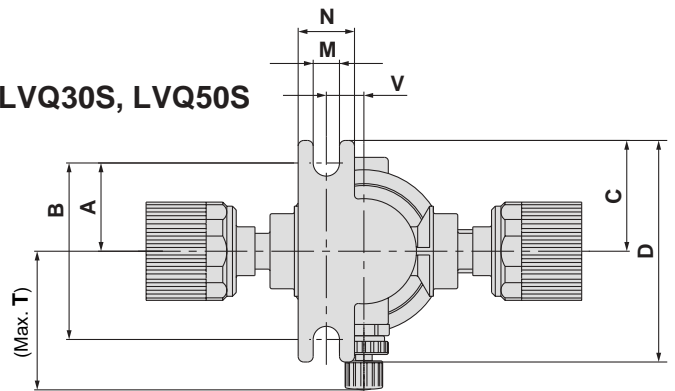
With by-pass
Double acting valve



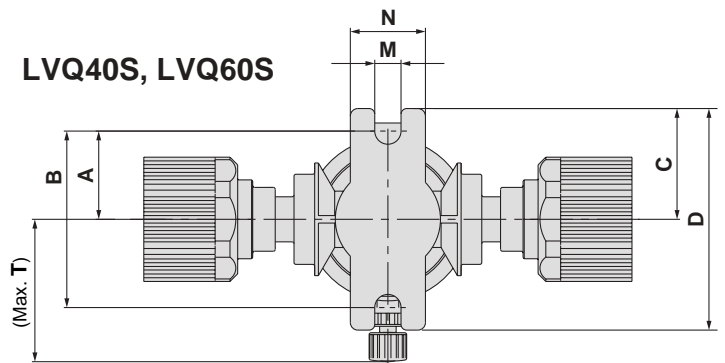
LVQ20S



LVQ30S, LVQ50S



LVQ40S, LVQ60S



View Z

Dimensions (N.O. valve, double acting valve)

(mm)

Model	A	B	C	D	M	N	T	U	V
LVQ2½S-S07-2	25.5	46	31.5	58	7	15	35.3	10.6	7
LVQ3½S-S11-2	23.5	47	29.5	59	7	15	36.9	16.5	10
LVQ4½S-S13-2	23.5	47	29.5	59	7	20	37.9	22	—
LVQ5½S-S19-2	35	70	41	82	7	20	64	25	17
LVQ6½S-S25-2	35	70	41	82	7	20	66	32	—

Series LVQ Fittings and Special Tools

Fittings

Changing tubing sizes

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

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

Part composition

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

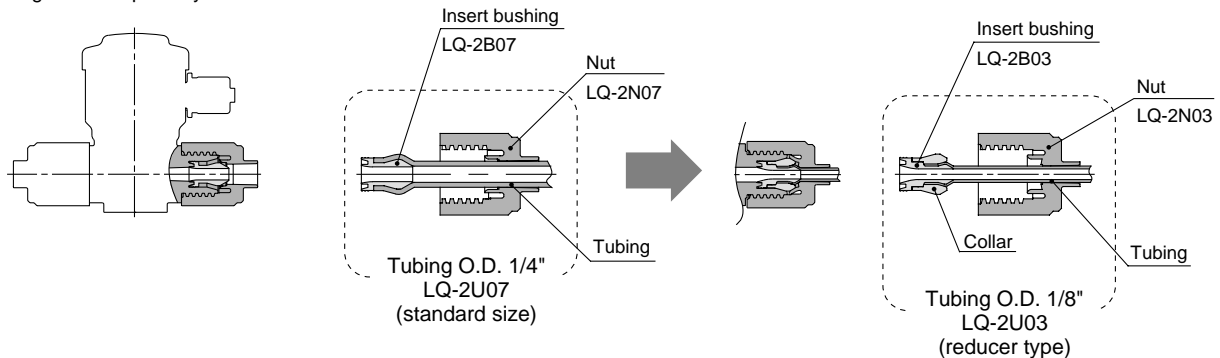
Changing the tubing size

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

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

(Refer to the section on how to order fitting parts.)

Note) Tubing is sold separately.



How to order fitting parts

LQ — **2** **U** **03** * Type U is recommended when changing tubing sizes.

Type of fitting

Symbol	Applicable fitting
Nil	LQ2
1	LQ1

Body class

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

Type of part

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

Tubing size

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

Symbol	Tubing O.D.	Body class	Applicable fitting	
10	ø10	4	LQ2	
12	ø12			
11	3/8"			
13	1/2"			
12	ø12	5		
13	1/2"			
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

Type of part

Symbol	Type of part
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 of different diameter.

Special Tools

How to order fitting jigs

LQ-G J - - -

Insert pin material

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

Insert pin/Holder type

Nil	Metric size
N	Inch size

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

Option (L/M type only)

Symbol	Option
Nil	None
B	With bracket

Type

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

Option

	Description	Part No.
Bracket assembly		LQ-GBL

Table 1 Tubing size symbols

Type	Body Class	Tubing O.D.															
		Metric sizes								Inch sizes							
J	1	03	04	—	—	—	—	—	—	03	—	—	—	—	—	—	—
	2	—	04	06	—	—	—	—	—	03	05	07	—	—	—	—	—
L	1	03	04	—	—	—	—	—	—	03	—	—	—	—	—	—	—
	2	—	04	06	—	—	—	—	—	03	05	07	—	—	—	—	—
	3	—	—	06	08	10	—	—	—	—	07	11	—	—	—	—	—
	4	—	—	—	—	10	12	—	—	—	—	11	13	—	—	—	—
	5	—	—	—	—	—	12	19	—	—	—	—	13	19	—	—	—
	6	—	—	—	—	—	—	19	25	—	—	—	—	19	25	—	—

Replacement parts

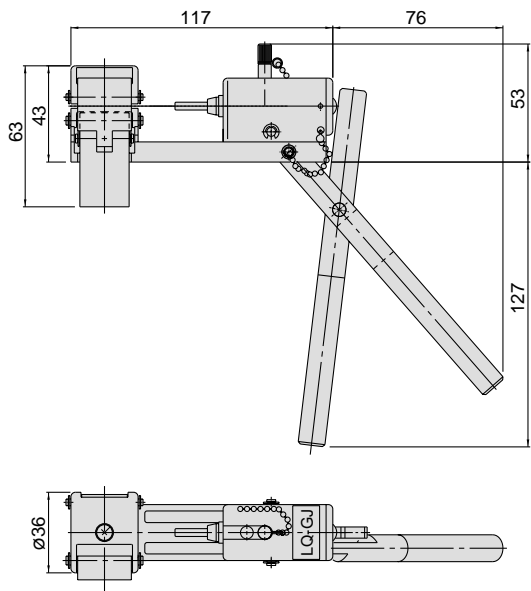
Description	Part No.								
Insert pin holder assembly (with the parts case)	LQ-GP J - - Type Insert pin material (J/K type only) <table border="1"> <tr> <td>Nil</td> <td>Resin</td> </tr> <tr> <td>S</td> <td>Stainless steel</td> </tr> </table> <table border="1"> <tr> <td>Nil</td> <td>Metric sizes</td>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

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

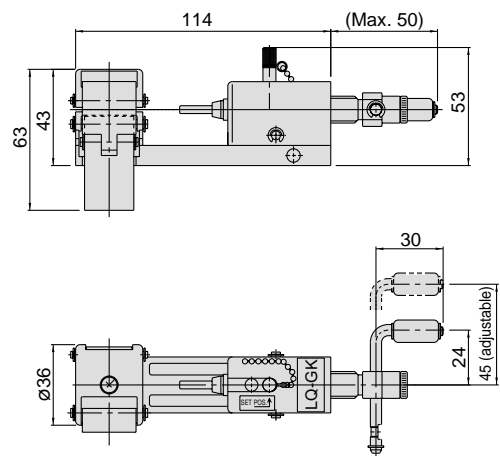
Special Tools

Dimensions

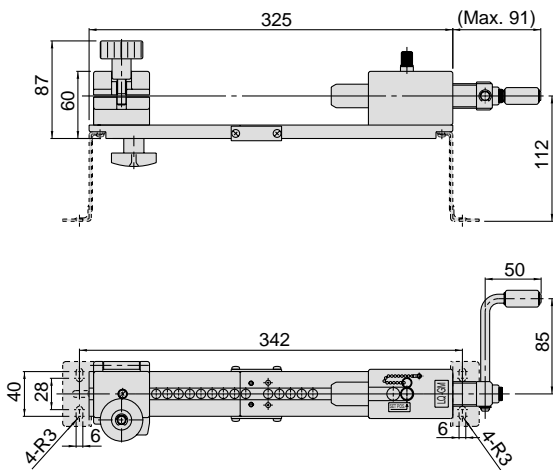
LQ-GJ



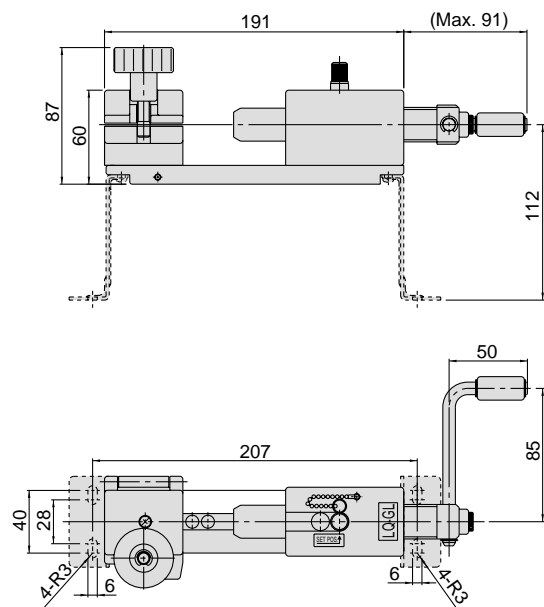
LQ-GK



LQ-GM



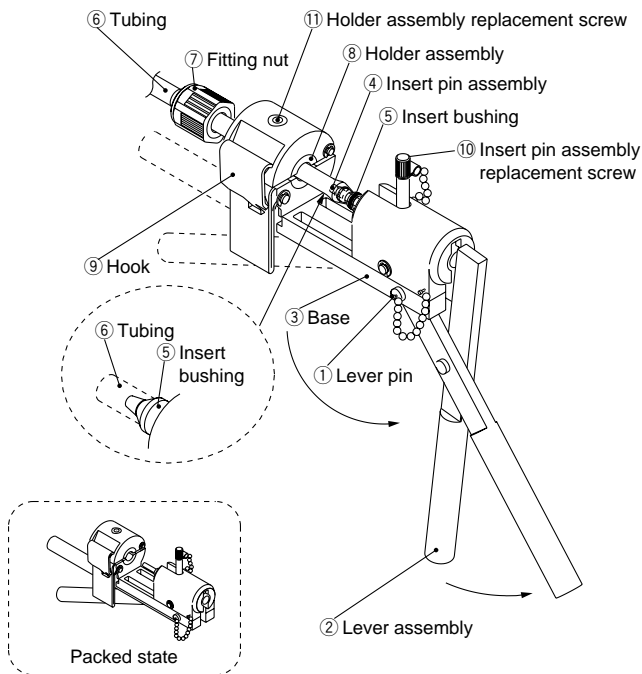
LQ-GL



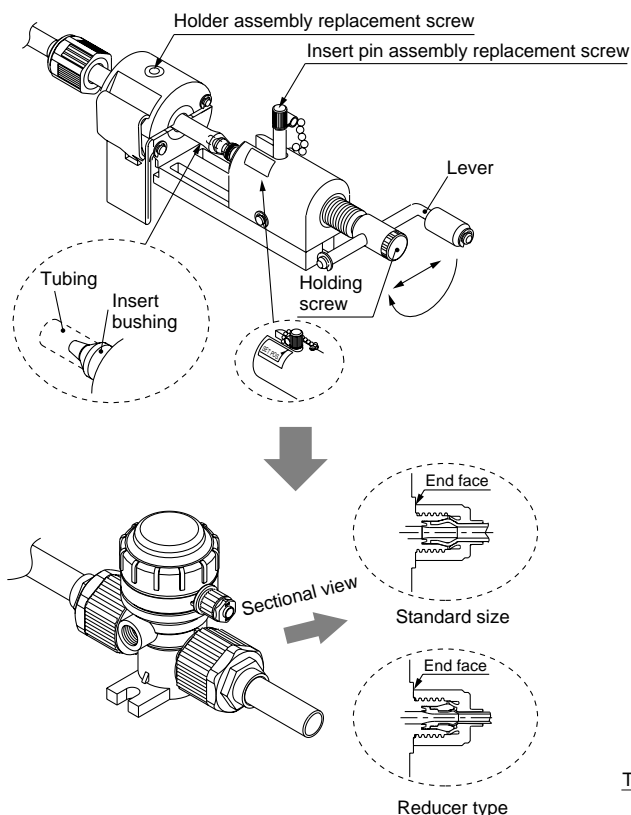
Fitting Assembly Procedure

Assemble fittings following the procedure shown below.

J type



K type



J type fitting assembly procedure

- 1 Pull out the lever pin ①. Rotate the lever assembly ② to align the holes on the lever assembly ② and the base ③. Insert the lever pin ① into the holes to fix the lever assembly ②.
- 2 Place the insert bushing ⑤ on the insert pin assembly ④.
- 3 Cut the end of the tubing ⑥ at a right angle and pass it through the fitting nut ⑦. After placing the tubing ⑥ in the holder assembly ⑧, push it onto the insert bushing ⑤ until it stops and clamp it with the hook ⑨.
- ⚠ Caution**
 - When the tubing ⑥ is curved, straighten it out before using it.
 - The tubing ⑥ may slip if there is oil or dust, etc., on the holder assembly ⑧. Remove the contamination using alcohol or another suitable cleaner.
- 4 Press the insert bushing ⑤ into the tubing ⑥ by turning the lever assembly ②.
- 5 To replace the insert pin assembly ④ and holder assembly ⑧, use the insert pin assembly replacement screw ⑩ and the holder assembly replacement screws ⑪, respectively.

K type fitting assembly procedure

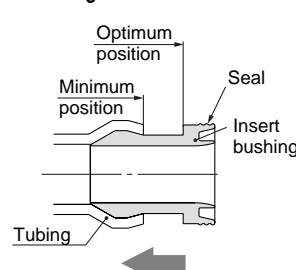
- For procedure to set and press fit the insert pin assembly, refer to L, M type fitting assembly procedures.
- For procedure to set the tubing, refer to J type procedure.

- 1 } Refer to J type assembly procedure.
- 5 }
- 6 Tighten the fitting nut ⑦ until it reaches the prescribed position on the body (end face). As a guide, refer to the proper tightening torques shown below.

Nut tightening torque for piping

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

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



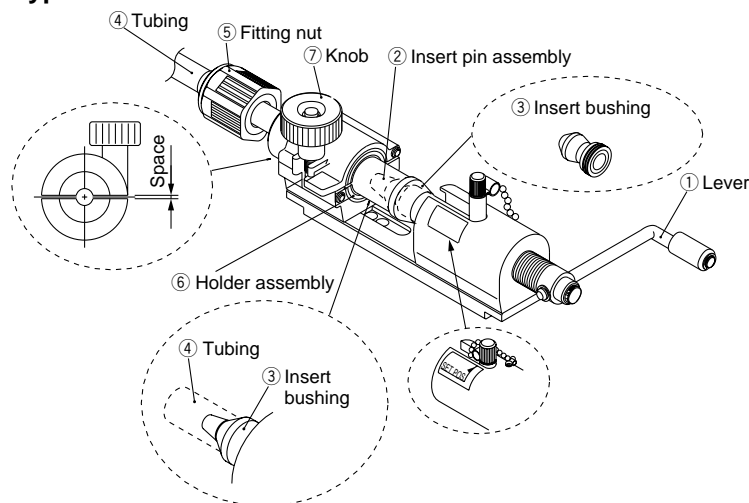
⚠ Precautions on installation

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

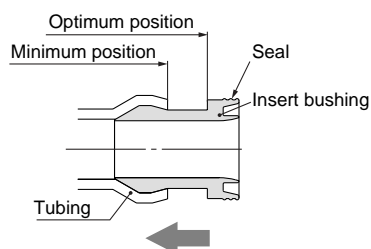
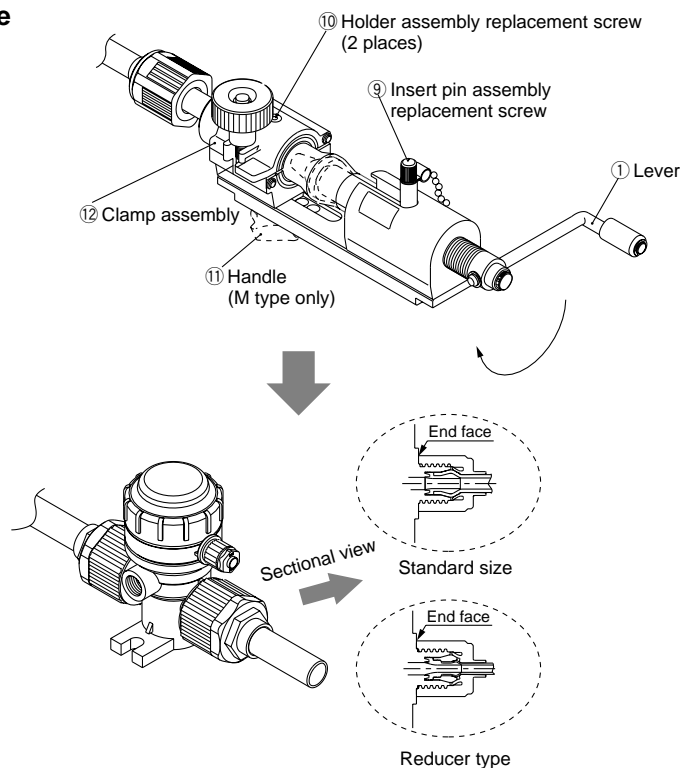
Fitting Assembly Procedure

Assemble fittings following the procedure shown below.

L type



M type



L/M type fitting assembly procedure

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

Nut tightening torque for piping

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

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

Precautions on installation

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



Applicable Fluids

Material and fluid compatibility check list for air 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)
DI water	○
Sodium hydroxide Concentration 50% or less	○
Nitrogen gas	○
Super pure water	○
Toluene	○ Note 1, 2)
Hydrofluoric acid	○ Note 2)
Sulfuric acid (except fuming sulfuric acid)	○ Note 2)
Phosphoric acid Concentration 80% or less	○

Table symbols ○ : Can be used
○ : Can be used in certain conditions
× : Cannot be used



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

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

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


- Compatibility is indicated for fluid temperatures of 100°C or less.
- The material and fluid compatibility check list provides reference values as a guide only, therefore we do not guarantee the application to our product.
- The data above is based on the information presented by the material manufacturers.
- SMC is not responsible for its accuracy and any damage happened because of this data.





Series LVQ

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 ^{Note 1)}, JIS B 8370 ^{Note 2)} and other safety practices.

 **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 possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power --General rules relating to systems

Note 2) JIS B 8370 : Pneumatic system axiom.

Warning

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

Since the products specified here are used in various operating conditions, their compatibility for the specific system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified. Referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate machinery and equipment.

Assembly, handling or repair of machinery and equipment should be performed by trained and experienced operators.

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

4. To promote safe operation, be sure to observe company standards and legal regulations, etc.

Refer to ISO4414, JIS B 8370 (pneumatic system axiom), labor health and safety laws and other safety regulations.



Series LVQ

High Purity Chemical Valve Non-Metallic Exterior Precautions 1

Be sure to read 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's component materials with fluids, using the check list on features page 23. Contact SMC regarding fluids other than those in the check list.

Operate within the indicated fluid temperature range.

3. Maintenance space

Ensure the necessary space for maintenance and inspections.

4. Fluid pressure range

Keep the supplied fluid pressure within the operating pressure range shown in the 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's exterior surfaces.

6. Liquid seals

When circulating fluid

Provide a relief valve in the system so that fluid does not get into the liquid seal circuit.

7. Countermeasures for static electricity

Since static electricity may be generated depending on the fluid being used, implement suitable countermeasures.

Mounting

Warning

1. If air leakage increases or equipment does not operate properly, stop operation.

After mounting, perform suitable function and leak tests to confirm that the mounting is correct.

2. Instruction manual

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

Piping

Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.

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

Operating port tightening torque

Operating port	Torque (Nm)
Rc, NPT 1/8	0.8 to 1.0

3. Use of metal fittings

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

4. See page 21 regarding tubing connections.

Operating Air Supply

Warning

1. Use clean air.

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



Series LVQ

High Purity Chemical Valve Non-Metallic Exterior Precautions 2

Be sure to read before handling.

Operating Environment

⚠ Warning

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

Maintenance

⚠ Warning

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

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

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

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

3. Perform work after removing residual chemicals and carefully replacing them with DI water or air, etc.
4. Do not disassemble the product. Products which have been disassembled cannot be guaranteed.

If disassembly is necessary, contact SMC.

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

⚠ Caution

1. Removal of drainage

Flush drainage from filters regularly.

Precautions on Usage

⚠ Warning

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

⚠ Caution

1. Please note that when the product is shipped from the factory, gases such as N₂ and air may leak from the valve at a rate of 1cm³/min (when pressurized).
2. When operated at a very low flow rate, the series LVQ with flow rate adjustment may vibrate, etc. depending on the operating conditions. Therefore, operate it after careful examination of the flow rate, pressure and piping conditions.
3. In the series LVQ, water hammering may occur depending on the fluid pressure conditions. In most cases, improvement is possible by adjusting the pilot pressure with a speed controller, etc., but the flow rate, pressure and piping conditions should be reviewed.
4. To adjust the flow rate for the series LVQ with flow rate adjustment, open gradually starting from the fully closed condition. Opening is accomplished by turning the adjustment knob counter clockwise. Additionally, do not apply any unreasonable force to the adjustment handle when nearing a fully opened or closed state. This may result in deformation of the orifice sheet surface or damage to the threaded part of the adjustment handle. It is in the fully closed condition when the product is shipped from the factory.
5. After a long period of nonuse, perform a test run before beginning regular operation.
6. Since the LVQ is packaged in a clean room use sufficient care in handling when opened.

SMC CORPORATION (Europe)

Austria	☎ +43 226262280	www.smc.at	sales@smc.at
Belgium	☎ +32 33551464	www.smc-pneumatics.be	post@smcpneumatics.be
Bulgaria	☎ +359 2 9744492	www.smc.bg	sales@smc.at
Czech Republic	☎ +42 0541424611	www.smc.cz	office@smc.cz
Denmark	☎ +45 70252900	www.smc-pneumatik.dk	smc@smc-pneumatik.dk
Estonia	☎ +372 6593540	www.smc-pneumatics.ee	smc@smcpneumatics.ee
Finland	☎ +358 9859580	www.smc.fi	smcfi@smcfi
France	☎ +33 164761000	www.smc-france.fr	contact@smc-france.fr
Germany	☎ +49 61034020	www.smc-pneumatik.de	info@smc-pneumatik.de
Greece	☎ +30 2103426076	www.smceu.com	parianos@hol.gr
Hungary	☎ +36 13711343	www.smc-automation.hu	office@smc-automation.hu
Ireland	☎ +353 14039000	www.smc-pneumatics.ie	sales@smcpneumatics.ie
Italy	☎ +39 0292711	www.smcitalia.it	mailbox@smcitalia.it
Latvia	☎ +37 7779474	www.smc.lv	info@smclv.lv

Netherlands	☎ +31 205318888	www.smc-pneumatics.nl	info@smcpneumatics.nl
Norway	☎ +47 67129020	www.smc-norge.no	post@smc-norge.no
Poland	☎ +48 225485085	www.smc.pl	office@smc.pl
Portugal	☎ +351 226108922	www.smces.es	postpt@smc.smces.es
Romania	☎ +40 213205111	www.smcromania.ro	smcromania@smcromania.ro
Russia	☎ +812 1185445	www.smc-pneumatik.ru	smcfa@peterlink.ru
Slovakia	☎ +421 244456725	www.smc.sk	office@smc.sk
Slovenia	☎ +386(7)3885249	www.smc-ind-avtom.si	office@smc-ind-avtom.si
Spain	☎ +34 945184100	www.smces.es	post@smc.smces.es
Sweden	☎ +46 86030700	www.smc.nu	post@smcpneumatics.se
Switzerland	☎ +41 523963131	www.smc.ch	info@smc.ch
Turkey	☎ +90 2122211516	www.entek.com.tr	smc-entek@entek.com.tr
UK	☎ +44 8001382930	www.smc-pneumatics.co.uk	sales@smcpneumatics.co.uk

European Marketing Centre ☎ +34 945184100
SMC CORPORATION ☎ +81 0335022740

www.smceu.com
www.smcworld.com