

# 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	
<b>Metric sizes</b>							
04	ø4	●					
06	ø6	○	●				
08	ø8		●				
10	ø10		○	●			
12	ø12			○	●		
19	ø19				○	●	
25	ø25					○	
<b>Inch sizes</b>							
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
	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

Type	Symbol	Valve type	Model									
			LVQ20	LVQ30	LVQ40	LVQ50	LVQ60					
								Orifice diameter		Tubing outside dia.		
Millimeter		Inch										
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.	○	○	○	○						

VC

VDW

VQ

VX2

VX

VX3

VXA

VN

LVC

LVA

LVH

LVD

LVQ

LQ

LVN

TI/  
TIL

PA

PAX

PB



## 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 <sup>-6</sup> m <sup>2</sup>	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 (cm <sup>3</sup> /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 17-5-82 for information on changing tubing sizes.

## Specific Product Precautions

**Be sure to read before handling. Refer to page 17-6-3 for Safety Instructions and 17-5-88 to 17-5-89 for High Purity Chemical Valve Precautions.**

### Piping

## Caution

### 1. Connect tubing with special tools.

Refer to pages 17-5-82 through 17-5-84 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.

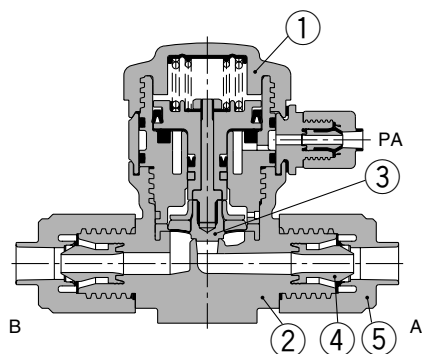
#### Tightening torque for piping

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

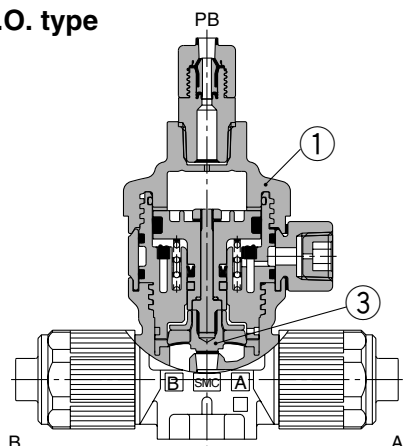
## Construction

### Basic type

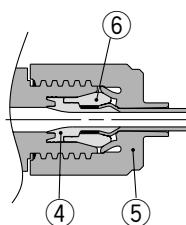
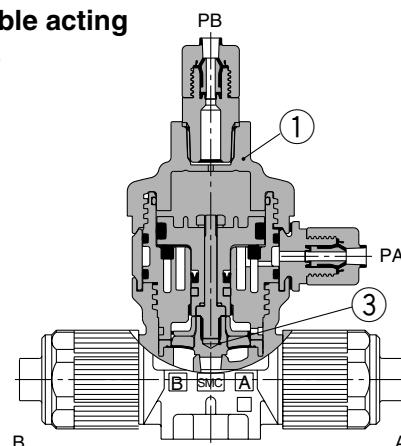
#### N.C. type



#### N.O. type

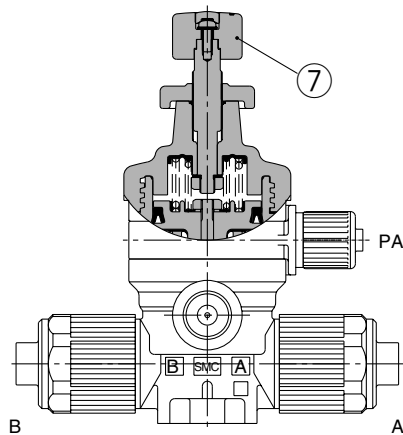


#### Double acting type

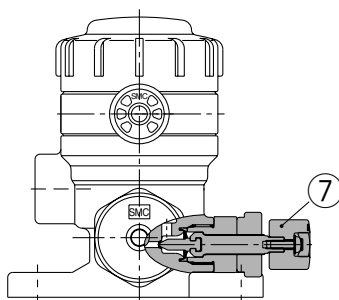


With reducer

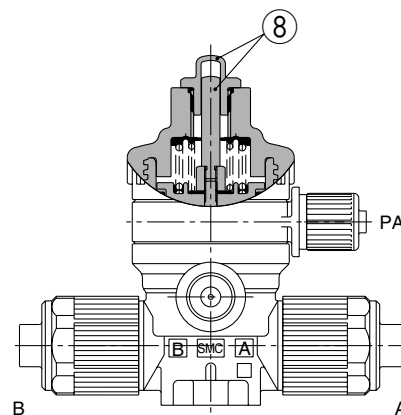
#### With flow rate adjustment



#### With by-pass



#### With indicator



VC

VDW

VQ

VX2

VX

VX3

VXA

VN

LVC

LVA

L VH

LVD

**LVQ**

LQ

LVN

TI/  
TIL

PA

PAX

PB

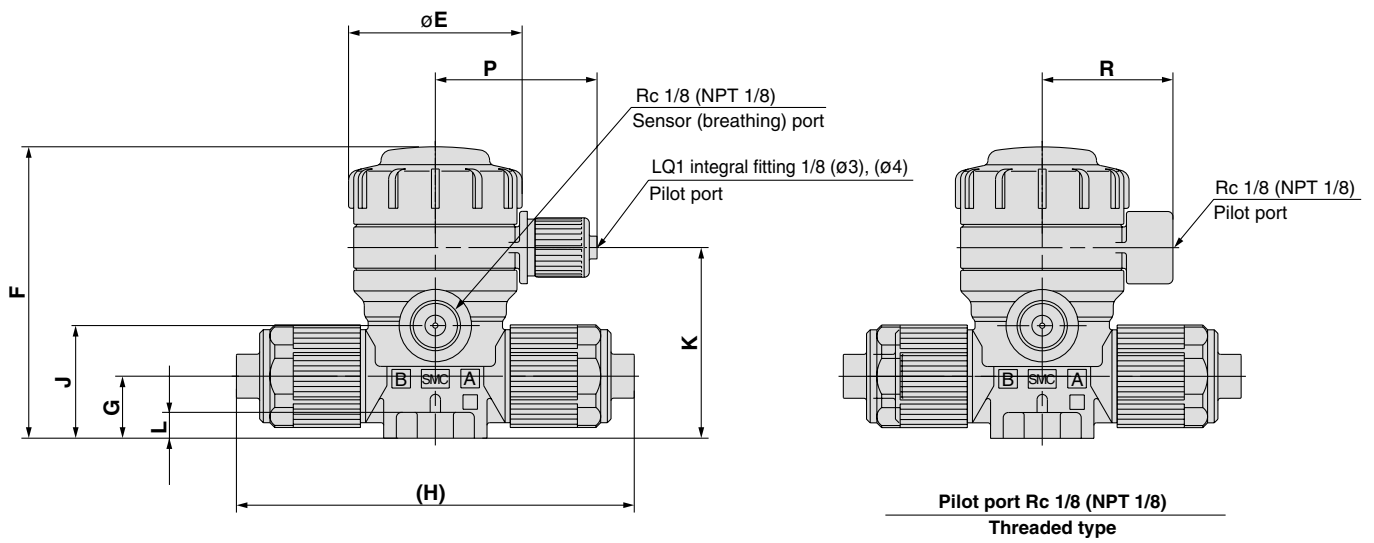
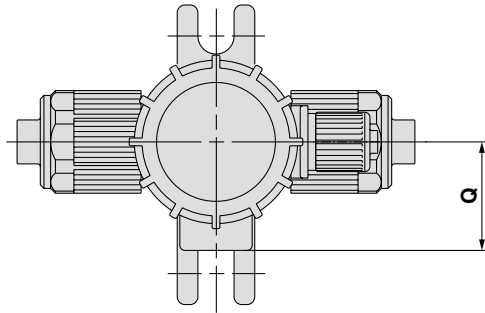
### Parts list

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

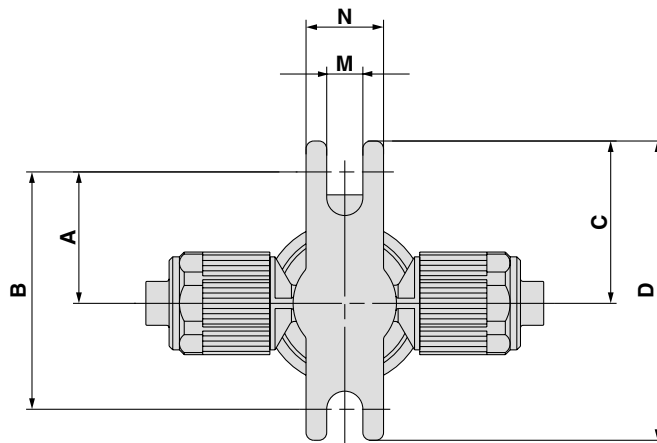
# Series LVQ

## Dimensions

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



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



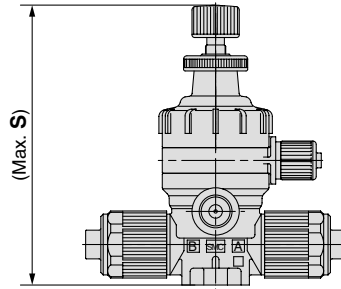
LVQ□0-S□ Dimensions (N.C. valve)

(mm)

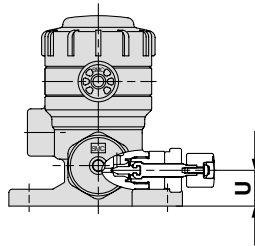
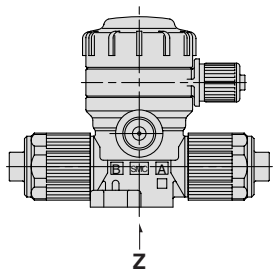
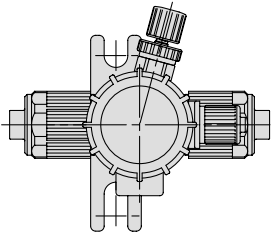
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
LVQ20-S□	25.5	46	31.5	58	33.6	56.5	12	77	21.8	37	5	7	15	31.3	21	25.3
LVQ30-S□	23.5	47	29.5	59	45.4	77	16.5	95	32	50	6	7	20	37.2	25	31.2
LVQ40-S□	23.5	47	29.5	59	45.4	82.5	22	109	37.5	55.5	6	7	20	37.2	25	31.2
LVQ50-S□	35	70	41	82	75	127	25	141	50.2	78.2	10	7	20	50.8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

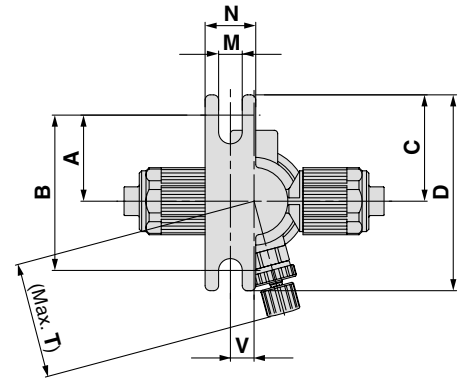
Dimensions (mm)	
Model	S
LVQ20-S□-1	83
LVQ30-S□-1	113.5
LVQ40-S□-1	119
LVQ50-S□-1	171.5
LVQ60-S□-1	182.5



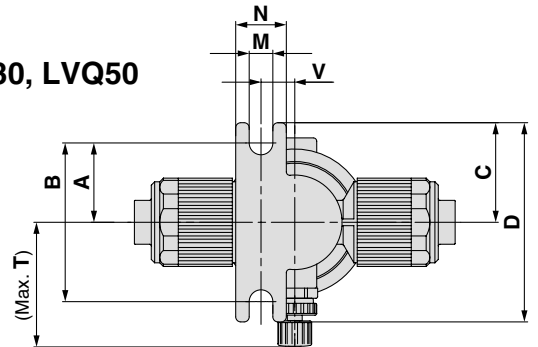
With by-pass, High back pressure spec. with by-pass  
N.C. valve



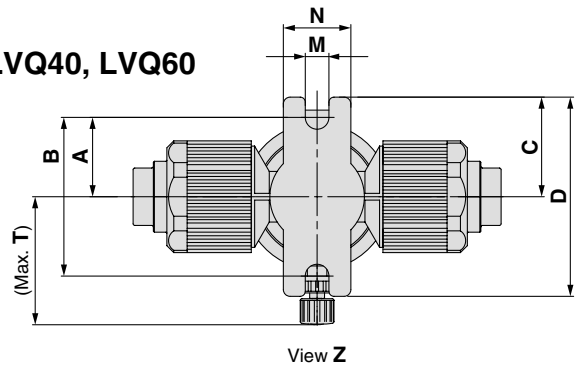
LVQ20



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	—

- VC□
- VDW
- VQ
- VX2
- VX□
- VX3
- VXA
- VN□
- LVC
- LVA
- L VH
- LVD
- LVQ**
- LQ
- LVN
- TI/  
TIL
- PA
- PAX
- PB

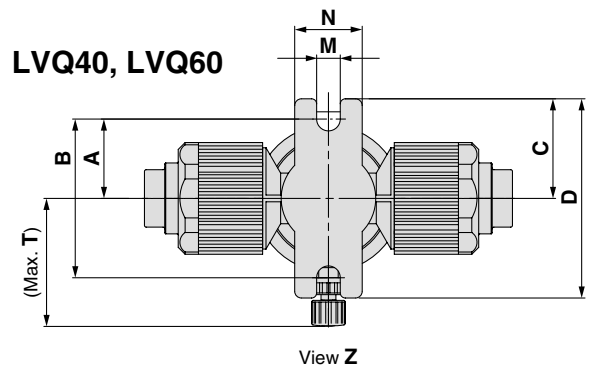
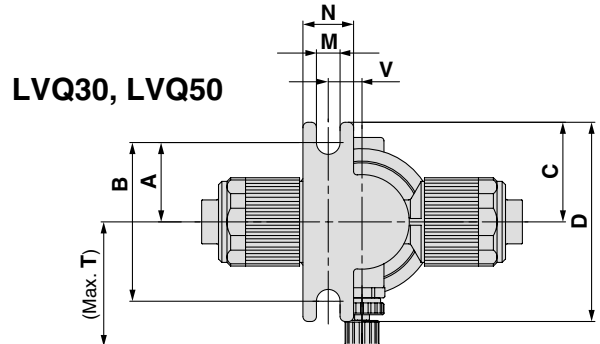
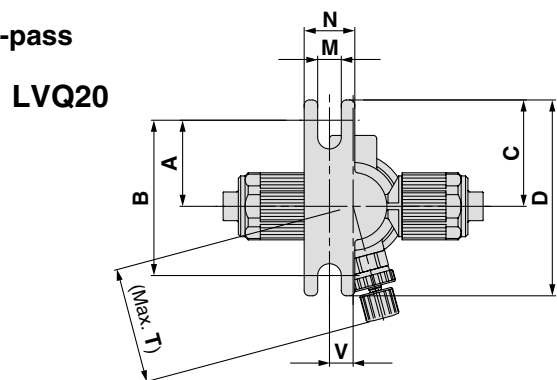
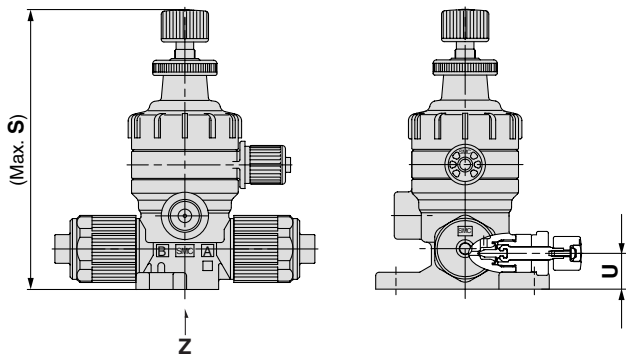
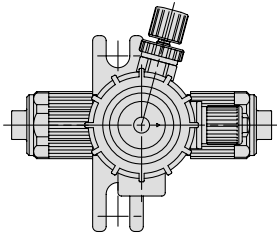
# Series LVQ

## Dimensions

With flow rate adjustment & by-pass

High back pressure spec. with flow rate adjustment & by-pass

N.C. valve



### Dimensions (mm)

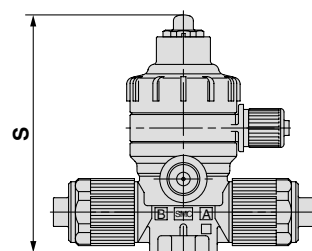
Model	A	B	C	D	M	N	S	T	U	V
LVQ20-S□-3	25.5	46	31.5	58	7	15	83	35.3	10.6	7
LVQ30-S□-3	23.5	47	29.5	59	7	15	113.5	36.9	16.5	10
LVQ40-S□-3	23.5	47	29.5	59	7	20	119	37.9	22	—
LVQ50-S□-3	35	70	41	82	7	20	171.5	64	25	17
LVQ60-S□-3	35	70	41	82	7	20	182.5	66	32	—

With indicator, High back pressure spec. with indicator

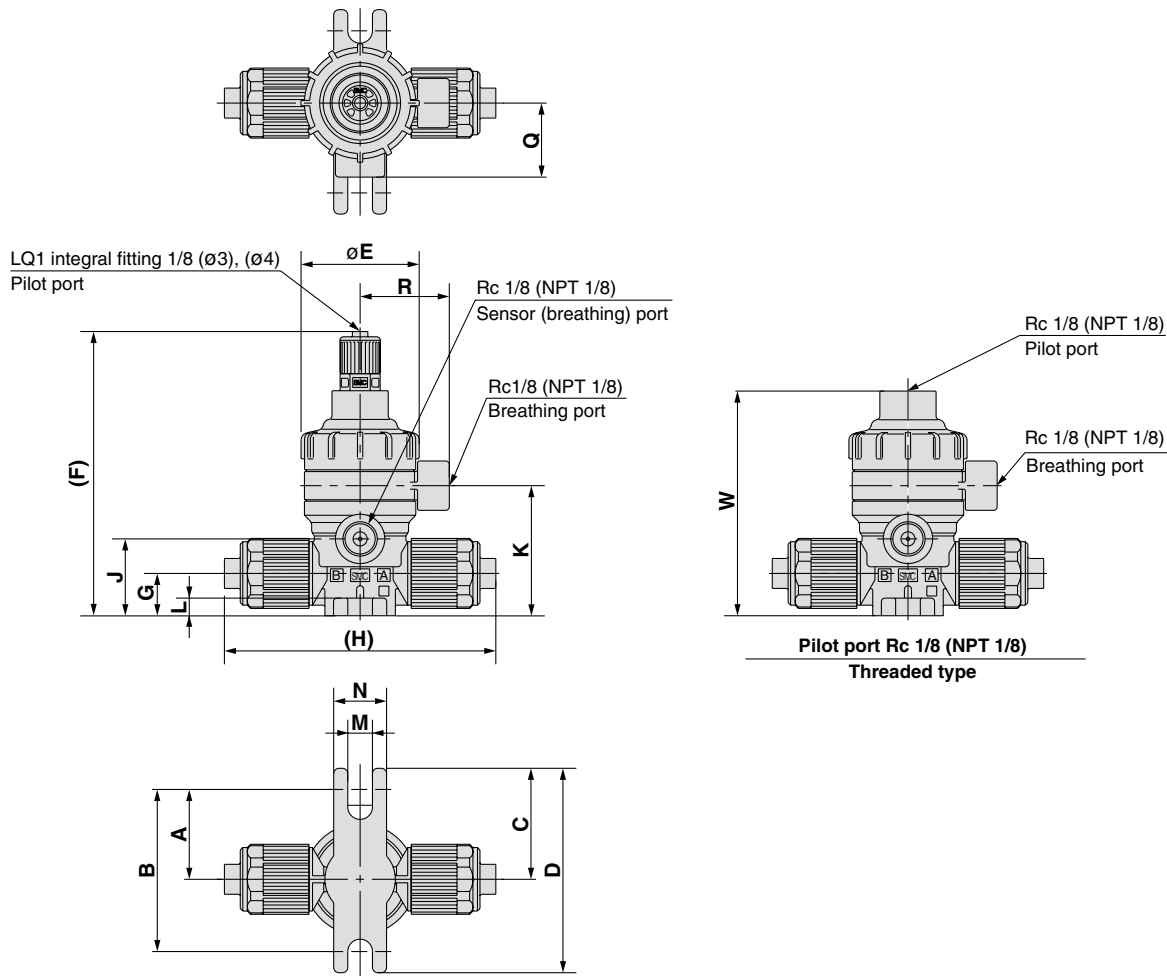
N.C. valve

### Dimensions (mm)

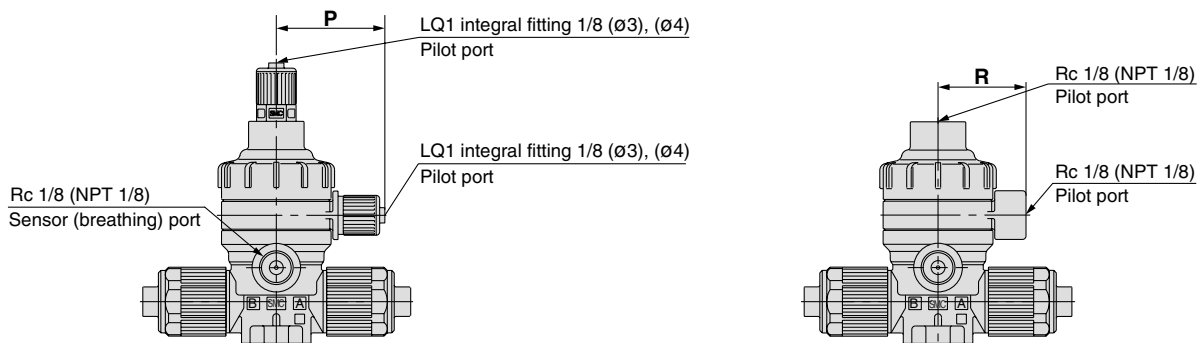
Model	S
LVQ20-S□-4	70.5
LVQ30-S□-4	88.5
LVQ40-S□-4	94
LVQ50-S□-4	134.5
LVQ60-S□-4	144



## Basic type N.O. valve



## Double acting valve



LVQ□<sup>1</sup>/<sub>2</sub>-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 <sup>1</sup> / <sub>2</sub> -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 <sup>1</sup> / <sub>2</sub> -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 <sup>1</sup> / <sub>2</sub> -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 <sup>1</sup> / <sub>2</sub> -S□	35	70	41	82	75	145	25	141	50.2	78.2	10	7	20	50.8	38.5	45	128
LVQ6 <sup>1</sup> / <sub>2</sub> -S□	35	70	41	82	75	154.5	32	150	60	88	10	7	20	50.8	38.5	45	137.5

VC□

VDW

VQ

VX2

VX□

VX3

VXA

VN□

LVC

LVA

LVH

LVD

LVQ

LQ

LVN

TI/  
TIL

PA

PAX

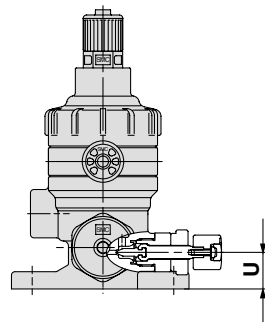
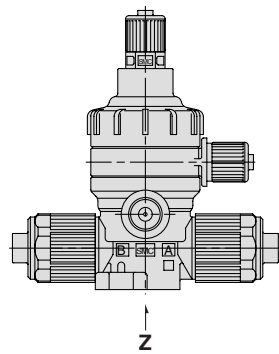
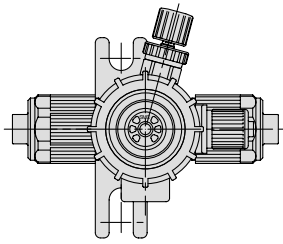
PB

# Series LVQ

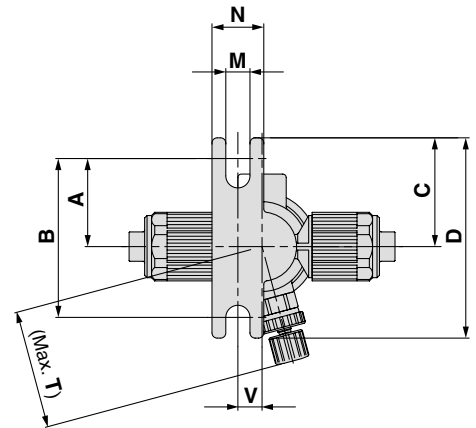
## Dimensions

With by-pass

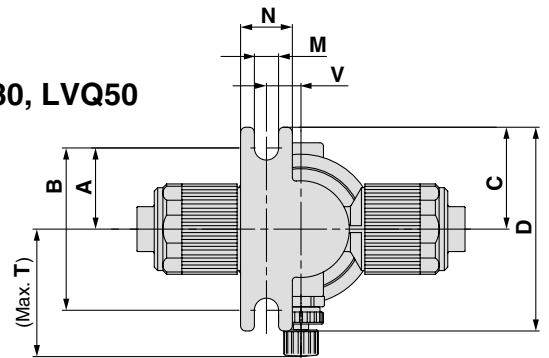
Double acting valve



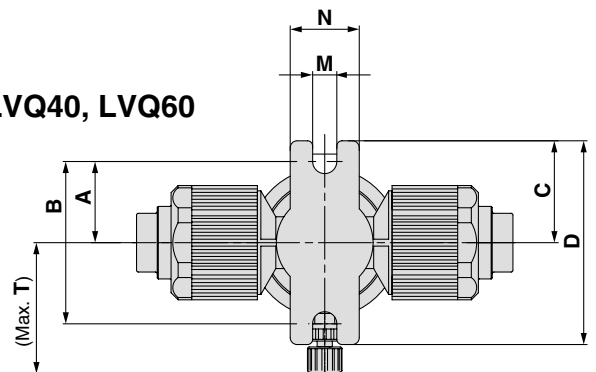
LVQ20



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 <sup>1</sup> -S□-2	25.5	46	31.5	58	7	15	35.3	10.6	7
LVQ3 <sup>1</sup> -S□-2	23.5	47	29.5	59	7	15	36.9	16.5	10
LVQ4 <sup>1</sup> -S□-2	23.5	47	29.5	59	7	20	37.9	22	—
LVQ5 <sup>1</sup> -S□-2	35	70	41	82	7	20	64	25	17
LVQ6 <sup>1</sup> -S□-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

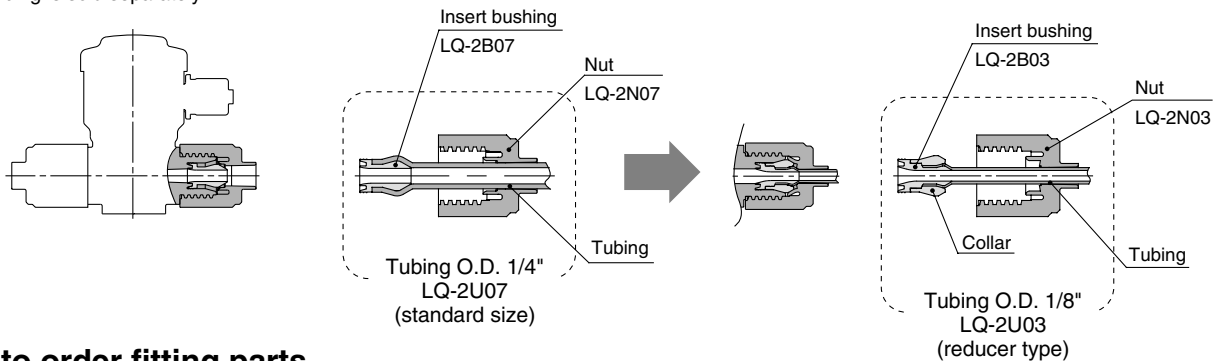
	Component parts		
	Nut	Insert	Collar (insert assembly)
○ Basic size	Yes	Yes	No
● Reducer type	Yes	Yes	Yes

### 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
Nii	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		
08	ø8	3	LQ2
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	LQ2
13	1/2"		
19	3/4", ø19	6	LQ1
19	3/4", ø19		
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	J type	K type
J, K	1, 2		
L, M	1, 2, 3, 4, 5, 6		

- VC
- VDW
- VQ
- VX2
- VX
- VX3
- VXA
- VN
- LVC
- LVA
- L VH
- LVD
- LVQ**
- LQ
- LVN
- T/ TIL
- PA
- PAX
- PB

**Table 1 Tubing size symbols**

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

### Replacement parts

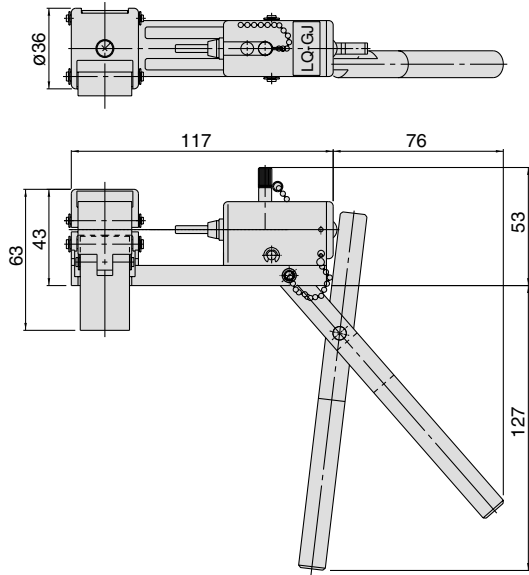
Description	Part No.								
Insert pin holder assembly (with the parts case)	<p><b>LQ-GP J</b> [ ] - [ ]</p> <p>Type</p> <p>Insert pin material (J/K type only)</p> <table border="1"> <tr> <td>Nil</td> <td>Resin</td> </tr> <tr> <td>S</td> <td>Stainless steel</td> </tr> </table> <p>Insert pin/Holder type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

Note 1) 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.

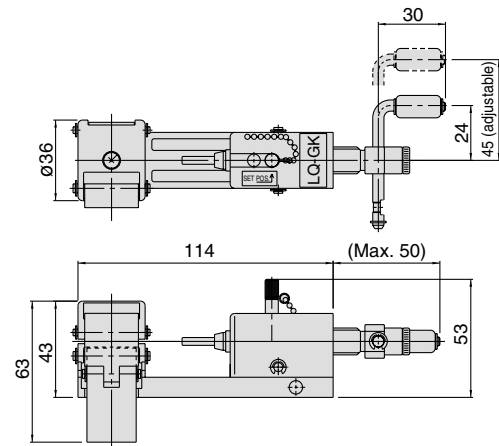
## Special Tools

### Dimensions

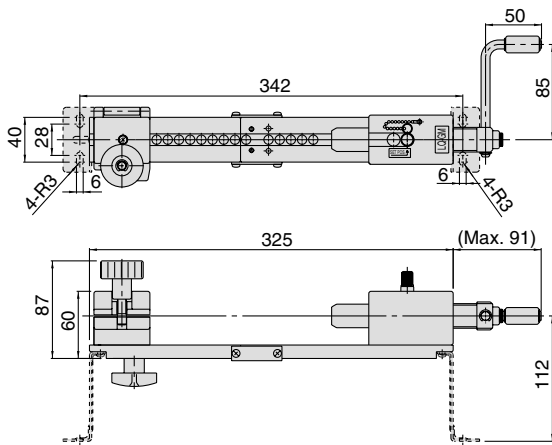
LQ-GJ



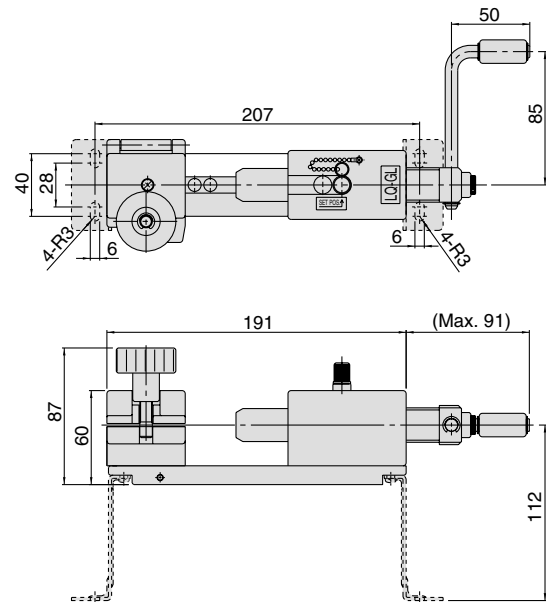
LQ-GK



LQ-GM



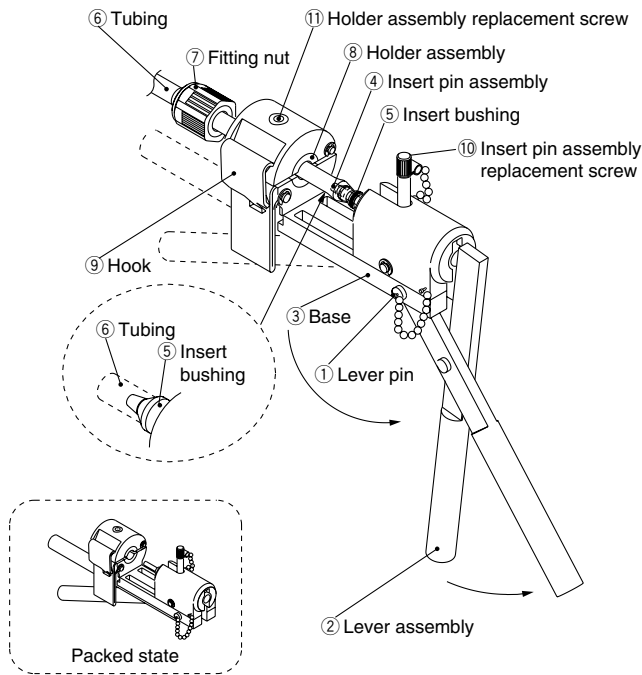
LQ-GL



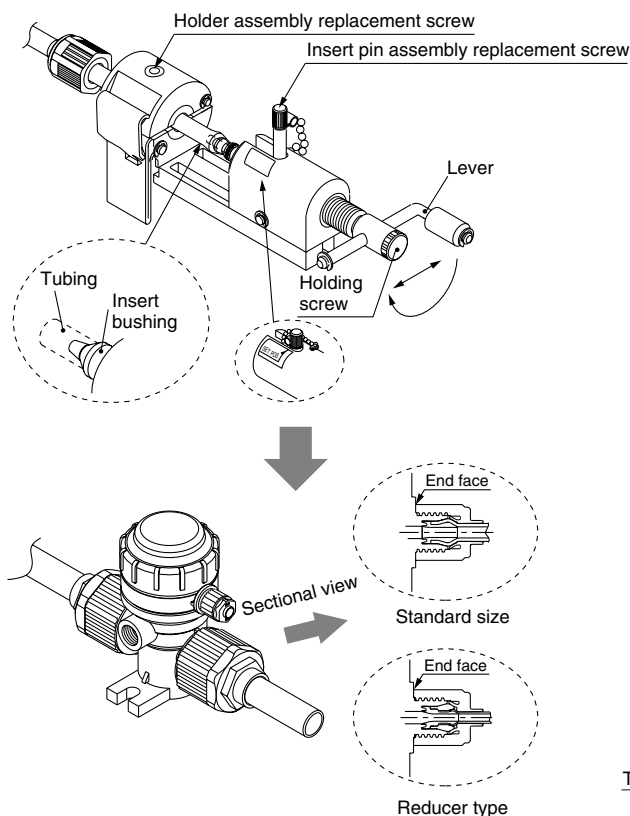
## Fitting Assembly Procedure

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

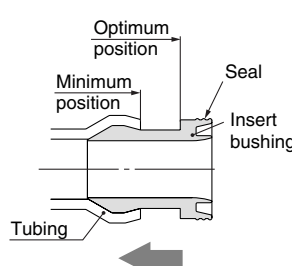
- For procedure to set and press fit the insert pin assembly, refer to L, M type fitting assembly procedures.
- For procedure to set the tubing, refer to J type procedure.

- 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.)

VC□

VDW

VQ

VX2

VX□

VX3

VXA

VN□

LVC

LVA

LVH

LVD

LVQ

LQ

LVN

TI/  
TIL

PA

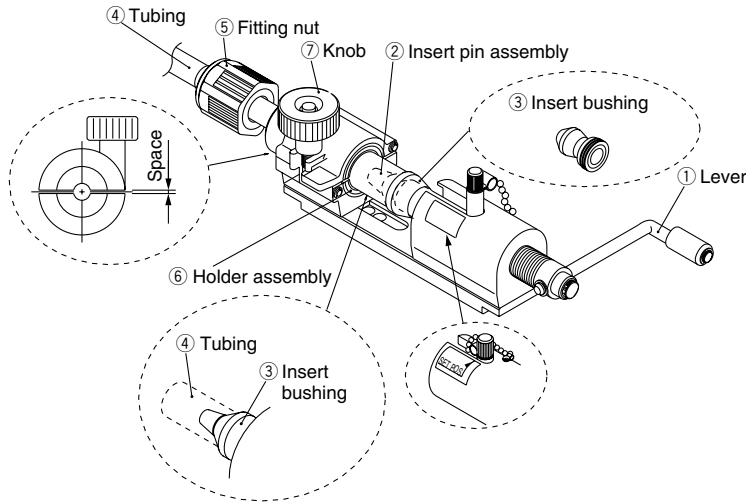
PAX

PB

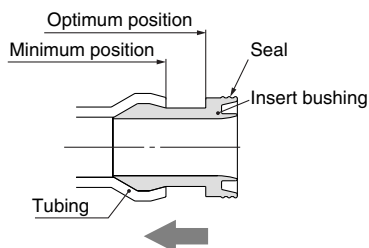
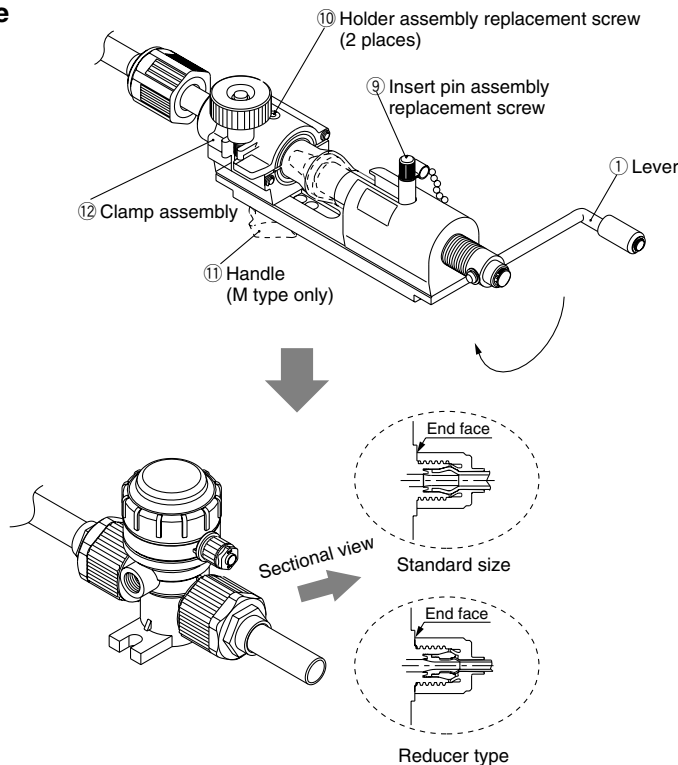
## Fitting Assembly Procedure

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

Table symbols  : Can be used  
 : Can be used 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.

VC   
VDW  
VQ  
VX2  
VX   
VX3  
VXA  
VN   
LVC  
LVA  
LVH  
LVD  
LVQ  
LQ  
LVN  
TI/  
TIL  
PA  
PAX  
PB



## 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 catalog.

##### 2. Fluids

Operate after confirming the compatibility of the product's component materials with fluids, using the check list on features page 17-5-87. Contact SMC regarding fluids other than those in the check list.

Operate within the indicated fluid temperature range.

##### 3. Maintenance space

Ensure the necessary space for maintenance and inspections.

##### 4. Fluid pressure range

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

##### 5. Ambient environment

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 17-5-85 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 N<sub>2</sub> and air may leak from the valve at a rate of 1cm<sup>3</sup>/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.

VC□

VDW

VQ

VX2

VX□

VX3

VXA

VN□

LVC

LVA

L VH

LVD

LVQ

LQ

LVN

TI/  
TIL

PA

PAX

PB