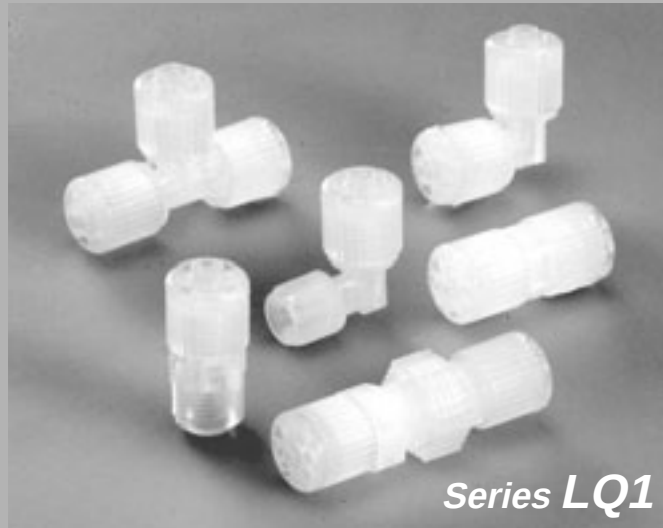


High Purity Fluoropolymer Fittings/Needle Valve/Tubing

Series *LQ1/LVN/TL/TIL*

Clean Wet Series

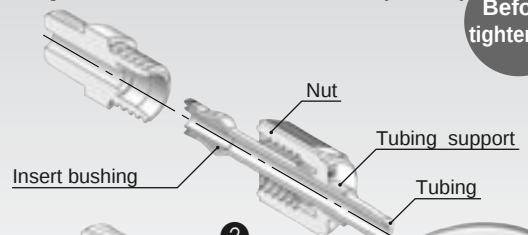


Series *LQ1*

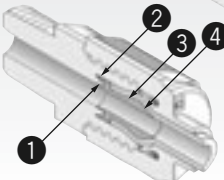
HYPER FITTING® Series *LQ1*

- Quadruple seal construction (PAT.)

Before tightening



After tightening
Quadruple
sealing
parts



New PFA



Series *LVN*

Needle Valve Series *LVN*

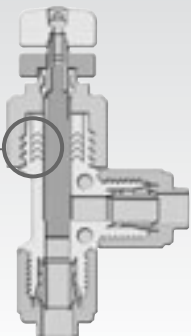
- Fluid adjustment range 0 to 12 μ min
- Integral fitting construction

HYPER FITTING®,
Series LQ2 is used.

- Triple seal construction

Triple seal
construction

New PFA



Series *TL/TIL*

Tubing Series *TL/TIL*

- $\varnothing 1/8"$ x $\varnothing 1/16"$ additionally released.
- Size variations

Metric sizes: $\varnothing 4$ to $\varnothing 19$ (6 sizes)

Inch sizes: $\varnothing 1/8"$ to $\varnothing 1/2"$ (8 sizes)

Super PFA

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

Fluoropolymer Fittings *Series LQ1*

Quadruple sealing construction

The quadruple sealing construction (PAT.) based on SMC's original idea results in highly reliable sealing characteristics with outstanding leakage prevention effect.

Locking

- Locking mechanism utilizes sealing lock by the nut.
- Trapezoidal thread allows application of high torque
- 2 stage pressing by the tubing holder of the nut ensures secure tube holding.

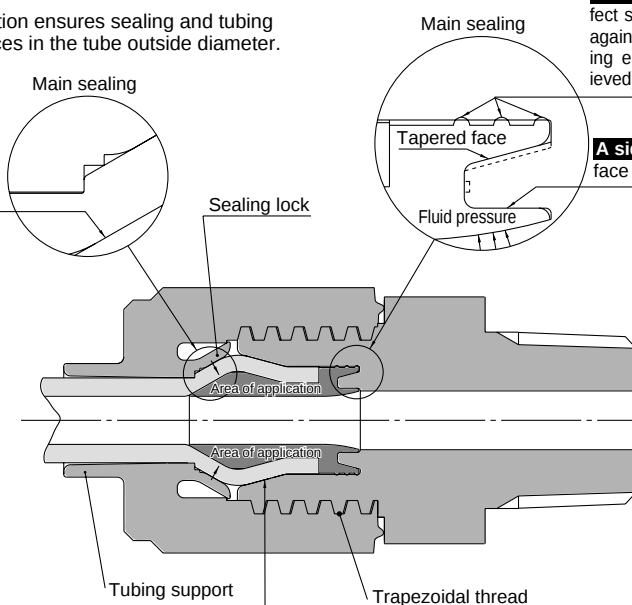
Flow-through characteristics

Excellent flow-through characteristics are achieved by minimizing liquid deposit.

Basic

2 stage pressing construction ensures sealing and tubing locking to absorb differences in the tube outside diameter.

D side sealing : A seal is formed when the tubing is inserted, with its insert bushing, and its compression against the internal nut.



B side sealing : By tapering the face of the body, perfect sealing is achieved by the pressure of the bushing against the body wall (the protrusion of the insert bushing ensures that a secure high pressure seal is achieved).

A side sealing : The fluid pressure pushes the seal face to get effective sealing.

C side sealing : Sealed by the pressure exerted on the tubing by the internal nut.

Strong resistance to tube bending and deformation.

Able to withstand lateral loads with the tubing support.

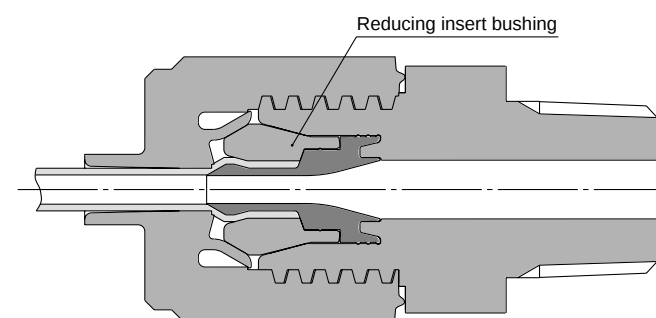
Easy tightening of nuts.

- No positioning guide is required, simply tighten up the tubing to the end of the fitting body.
- The trapezoidal thread prevents oblique nut insertion.

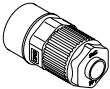
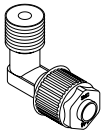
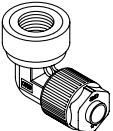
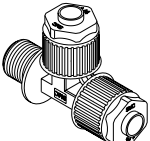
Tubing sizes are interchangeable.

- The reducer method allows tubing size changes without replacing the body.
- Helps standardize fitting items resulting in less stock requirements.

Reducing type

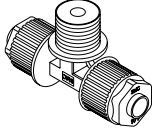
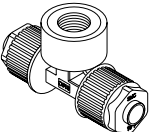
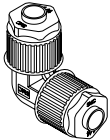
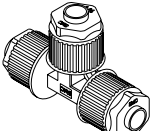
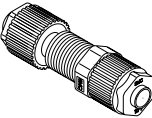
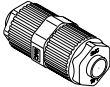


Series LQ1

Series	Appearance	Class	Port size							Tubing O.D.																		
										Metric size								Inch size										
			None	1/8"	1/4"	3/8"	1/2"	3/4"	1"	ø3	ø4	ø6	ø8	ø10	ø12	ø19	ø25	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"				
Connector LQ1H	Male		P.595	1	—	○	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—			
				2	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—		
				3	—	—	○	○	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—		
				4	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—		
				5	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—		
				6	—	—	—	—	—	○	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	
	Female		P.596	1	—	○	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—		
				2	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—		
				3	—	—	○	○	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—		
				4	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—		
				5	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—		
				6	—	—	—	—	—	○	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	
Elbow LQ1L	Male		P.597	1	—	○	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—			
				2	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—		
				3	—	—	○	○	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—		
				4	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—		
				5	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—		
				6	—	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○		
	Female		P.598	1	—	○	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—		
				2	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—		
				3	—	—	○	○	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—		
				4	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—		
				5	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—		
				6	—	—	—	—	—	○	○	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○		
Run tee LQ1R	Male		P.599	1	—	○	—	—	—	—	—	○	○	—	—	—												

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

Series LQ1, LVN, TL/TIL

Series	Appearance	Class	Port size							Tubing O.D.														
										Metric size								Inch size						
			None	1/8"	1/4"	3/8"	1/2"	3/4"	1"	ø3	ø4	ø6	ø8	ø10	ø12	ø19	ø25	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"
Branch tee LQ1B	Male	 P.601	1	—	○	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
			2	—	○	○	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
			3	—	—	○	○	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
			4	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
			5	—	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
			6	—	—	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○
	Female	 P.602	1	—	○	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
			2	—	○	○	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
			3	—	—	○	○	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
			4	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
			5	—	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
			6	—	—	—	—	—	○	○	—	—	—	—	—	●	○	—	—	—	—	—	●	○
Union elbow LQ1E	 P.603	1	○	—	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
		2	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
		3	○	—	—	—	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
		4	○	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
		5	○	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
		6	○	—	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○
Union tee LQ1T	 P.604	1	○	—	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
		2	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
		3	○	—	—	—	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
		4	○	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
		5	○	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
		6	○	—	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○
Panel mount union LQ1P	 P.605	1	○	—	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
		2	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
		3	○	—	—	—	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
		4	○	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
		5	○	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
		6	○	—	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○
Union LQ1U	 P.606	1	○	—	—	—	—	—	—	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
		2	○	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	●	○	—	—	—	—
		3	○	—	—	—	—	—	—	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
		4	○	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
		5	○	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
		6	○	—	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○
Union flange LQ1F	 P.606	4	○	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
		5	○	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
		6	○	—	—	—	—	—	—	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

Note) ○ Basic size ● With reducer

Needle Valve

P.609

Series		Applicable tubing O.D.	
LVN		Metric size	ø4
			ø6
			ø8
			ø10
			ø12
		Inch size	1/8"
			3/16"
			1/4"
			3/8"
			1/2"

High Purity
Fluoropolymer Tubing

P.613

Series		Tubing O.D.	
TL	Material: Super PFA 	Metric size	ø4
			ø6
			ø8
			ø10
			ø12
TIL		Inch size	ø19
			1/8"
			3/16"
			1/4"
			3/8"
		1/2"	

LVC

LVA

LVH

LVD

LVQ

LQ1

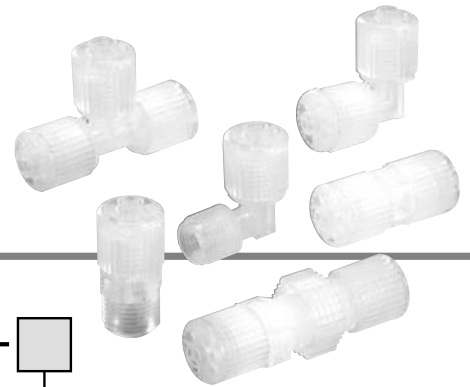
LVN

TL/TIL

LQ3

Fluoropolymer Fittings Hyper Fittings Series LQ1

RoHS



How to Order

Threaded connection

LQ1 H 11 [] - M [] - []

Fitting type

Symbol	Type
H	Connector
L	Elbow
B	Branch tee
R	Run tee

Thread type

Symbol	Type
Nil	R, Rc
N	NPT

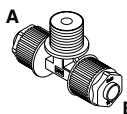
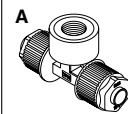
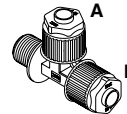
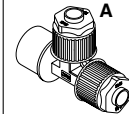
Piping type

Symbol	Type
M	Male
F	Female

Packaging

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

For different diameter (on B side)

Symbol	Application
Nil	Same tubing size
Refer to the applicable tubing table.	Different diameter tubing can be selected within the same body class.
LQ1B	
Branch tee male	Branch tee female
	
LQ1R	
Run tee male	Run tee female
	

The table of combination is the same as that for A side.

Note 1) Only branch tees and run tees can take different diameters.

Note 2) Use of different diameters is not available with size 1.

Size combination

Class	No.	Applicable tubing size (mm)	Tubing O.D.
1	1	4 x 3	1/8"
1	2	3 x 2	
2	1	6 x 4	1/8"
2	2	4 x 3	
2	C	3 x 2	1/4"
2	3	6 x 4	
2	4	4 x 3	1/4"
2	F	3 x 2	
3	1	10 x 8	1/4"
3	2	8 x 6	
3	3	6 x 4	3/8"
3	4	10 x 8	
3	5	8 x 6	3/8"
3	6	6 x 4	
4	1	12 x 10	3/8"
4	2	10 x 8	
4	3	12 x 10	1/2"
4	4	10 x 8	
5	1	19 x 16	1/2"
5	2	12 x 10	
5	3	19 x 16	3/4"
5	4	12 x 10	
6	1	25 x 22	3/4"
6	2	19 x 16	
6	3	25 x 22	1"
6	4	19 x 16	

Class	No.	Applicable tubing size (inch)	Tubing O.D.
1	A	1/8" x 0.086"	1/8"
—	—	—	—
2	A	1/4" x 5/32"	1/8"
2	B	3/16" x 1/8"	
2	C	1/8" x 0.086"	1/4"
2	D	1/4" x 5/32"	
2	E	3/16" x 1/8"	1/4"
2	F	1/8" x 0.086"	
3	A	3/8" x 1/4"	1/4"
3	B	1/4" x 5/32"	
3	C	3/8" x 1/4"	3/8"
3	D	1/4" x 5/32"	
4	A	1/2" x 3/8"	3/8"
4	B	3/8" x 1/4"	
4	C	1/2" x 3/8"	1/2"
4	D	3/8" x 1/4"	
5	A	3/4" x 5/8"	1/2"
5	B	1/2" x 3/8"	
5	C	3/4" x 5/8"	3/4"
5	D	1/2" x 3/8"	
6	A	1" x 7/8"	3/4"
6	B	3/4" x 5/8"	
6	C	1" x 7/8"	1"
6	D	3/4" x 5/8"	



Note) For each body class, the second and later numbers or symbols indicate reducing. However, in case of size 1, the tubing cannot be changed by reducing.

How to Order

Tubing connection

LQ1 **E** **11** **—** **—**

Packaging

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

Fitting type

Symbol	Type
E	Union elbow
T	Union tee
P	Panel mount union
U	Union
F	Union flange

Combination of different diameter (on B side)

Class	No.	Applicable tubing size (mm)
1	1	4 x 3
1	2	3 x 2
2	1	6 x 4
2	2	4 x 3
2	C	3 x 2
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

Class	No.	Applicable tubing size (inch)
1	A	1/8" x 0.086"
—	—	—
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"



Note) For each body class, the second and later numbers or symbols indicate reducing. However, use of different diameters is not available with size 1.

Size combination

Class	No.	Applicable tubing size (mm)
1	1	4 x 3
1	2	3 x 2
2	1	6 x 4
2	2	4 x 3
2	C	3 x 2
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

Class	No.	Applicable tubing size (inch)	Applicable flange
1	A	1/8" x 0.086"	—
—	—	—	—
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"	15 A
4	B	3/8" x 1/4"	15 A
5	A	3/4" x 5/8"	20 A
5	B	1/2" x 3/8"	20 A
6	A	1" x 7/8"	25 A
6	B	3/4" x 5/8"	25 A

Symbol	Application
Nil	Same tubing size
Refer to the applicable tubing table.	Different diameter tubing can be selected within the same body class.
Union elbow LQ1E	Union tee LQ1T
Panel mount union LQ1P	Union LQ1U



Note 1) For each body class, the second and later numbers or symbols indicate reducing. However, in case of size 1, the tubing cannot be changed by reducing.

Note 2) Sizes 1 to 3 are not available for the union flange

Note 3) For Union flange, nut sizes 4 and 5 are as shown below.

LQ1F4□: LQ-4N□□

LQ1F5□: LQ-5N□□

Different diameter tubing order example

Different diameter tubing (with plug-in reducer) can be selected within the same body class.

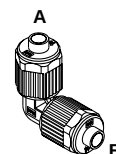
(Example) Union elbow

Body class 3

A side: ø10 x ø8

B side: ø8 x ø6

Order as shown below.



LQ1 **E** **31** **32**

Only select combinations from the same body class.

Different dia. tubing size (B side)

Applicable tubing size (A side)

Union elbow

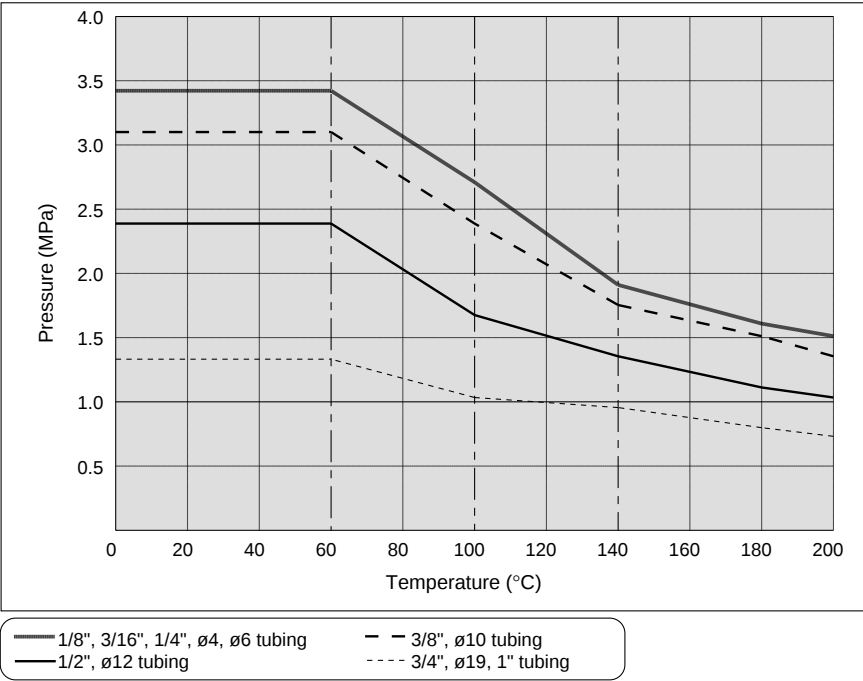
Series LQ1



Specifications

Feature \ Model	LQ1□10	LQ1□20	LQ1□30	LQ1□40	LQ1□50	LQ1□60
Material	NEW PFA					
Maximum operating pressure (at 20°C)	1.0 MPa					
Proof pressure	Refer to the withstand pressure and heat resistance performance curves.					
Operating temperature	0 to 200°C					

Burst Pressure and Heat Resistance Performance



⚠ Specific Product Precautions

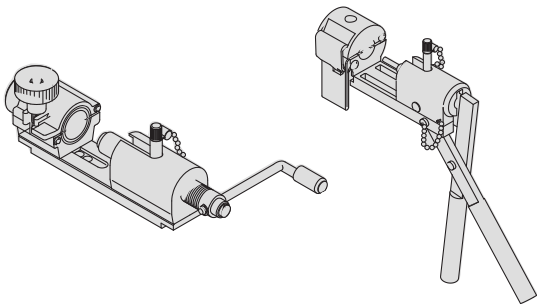
Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions.

Piping

⚠ Caution

1. Connect tubing with special tools

Please refer to the LQ1, 2 series mounting method in “High Purity Fluoropolymer Fittings: HYPER FITTINGS®” (M-E05-1) for tubing connection and special tools. (Downloadable from our web site.)



⚠ Caution

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

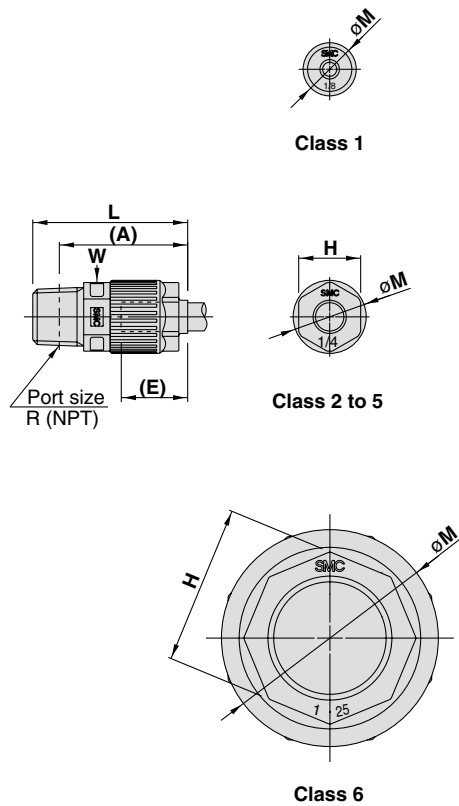
Tightening torque for piping

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

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

Dimensions

Male Connector: LQ1H-M



(A) shows the reference dimension after connection.
 (E) shows the approximate dimension of the inserted tubing from the end of the nut.
 "W" is width across flats dimension.

Metric sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	E	H	L	M	W
LQ1H11-M□	ø4	1/8"	21	10	—	25	11.5	10
LQ1H12-M□	ø3							
LQ1H21-M□	ø6	1/8"	31.5	15	14	35	16.5	14
LQ1H22-M□	ø4							
LQ1H23-M□	ø6	1/4"	29					
LQ1H24-M□	ø4							
LQ1H2F-M□	ø3	1/4"	36.5	20	17	42.5	23	19
LQ1H31-M□	ø10							
LQ1H32-M□	ø8	3/8"	36					
LQ1H33-M□	ø6							
LQ1H34-M□	ø10	3/8"	46	24	21	52	28	23
LQ1H35-M□	ø8							
LQ1H36-M□	ø6	1/2"	44					
LQ1H41-M□	ø12							
LQ1H42-M□	ø10	1/2"	55	29	26	62.5	39	32
LQ1H43-M□	ø12							
LQ1H44-M□	ø10	3/4"	53.5					
LQ1H51-M□	ø19							
LQ1H52-M□	ø12	3/4"	72	39.5	36	81	49	46
LQ1H53-M□	ø19							
LQ1H54-M□	ø12	1"	71					
LQ1H61-M□	ø25							
LQ1H62-M□	ø19	1"						
LQ1H63-M□	ø25							
LQ1H64-M□	ø19							

Inch sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	E	H	L	M	W
LQ1H1A-M□	1/8"	1/8"	21	10	—	25	11.5	10
LQ1H2A-M□	1/4"							
LQ1H2B-M□	3/16"	1/8"	31.5	15	14	35	16.5	14
LQ1H2C-M□	1/8"							
LQ1H2D-M□	1/4"	1/4"	29	20	17	42.5	23	19
LQ1H2E-M□	3/16"							
LQ1H2F-M□	1/8"	1/4"	36.5	24	21	52	28	23
LQ1H3A-M□	3/8"							
LQ1H3B-M□	1/4"	3/8"	36	39.5	36	81	49	46
LQ1H3C-M□	3/8"							
LQ1H3D-M□	1/4"	1/2"	44	29	26	62.5	39	32
LQ1H4A-M□	1/2"							
LQ1H4B-M□	3/8"	3/4"	53.5	71	72	81	49	46
LQ1H4C-M□	1/2"							
LQ1H4D-M□	3/8"	1"						
LQ1H5A-M□	3/4"							
LQ1H5B-M□	1/2"	3/4"	72	39.5	36	81	49	46
LQ1H5C-M□	3/4"							
LQ1H5D-M□	1/2"	1"	71					
LQ1H6A-M□	1"							
LQ1H6B-M□	3/4"	1"						
LQ1H6C-M□	1"							
LQ1H6D-M□	3/4"							

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

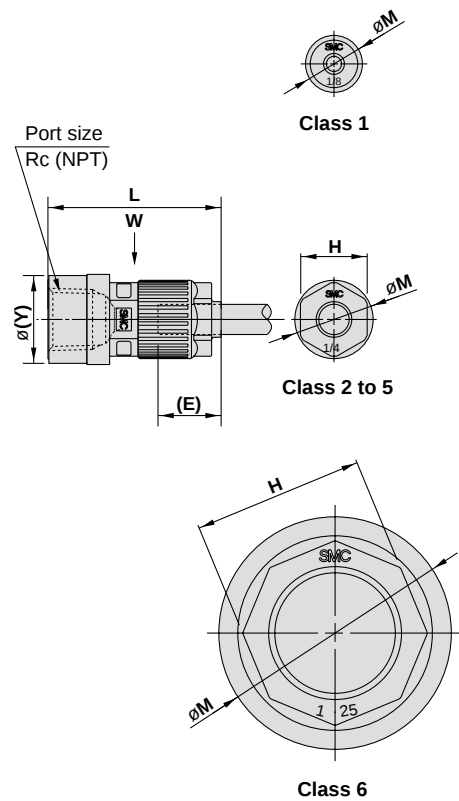
TL/TIL

LQ3

Series LQ1

Dimensions

Female Connector: LQ1H-F



(E) shows the reference of the inserted tubing from the end of the nut.

"W" is width across flats dimension.

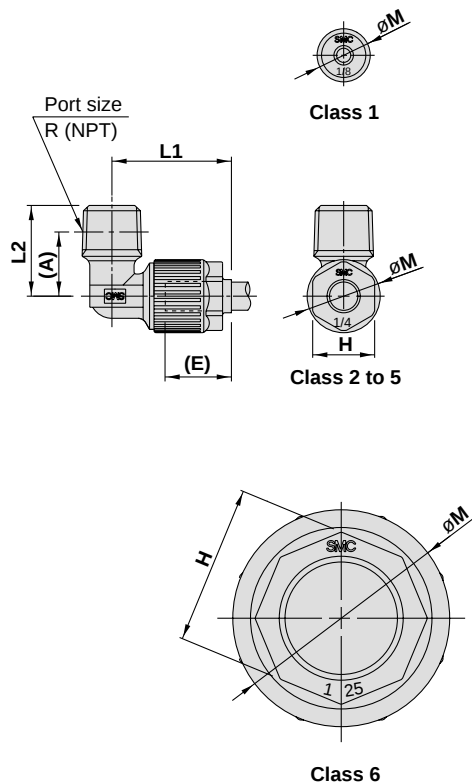
Metric sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	E	H	L	M	W	Y
LQ1H11-F□	Ø4	1/8"	10	—	26.5	Ø11.5	10	Ø18.5
LQ1H12-F□	Ø3							
LQ1H21-F□	Ø6							
LQ1H22-F□	Ø4	1/8"	15	14	35	Ø16.5	14	Ø18.5
LQ1H2C-F□	Ø3							
LQ1H23-F□	Ø6							
LQ1H24-F□	Ø4	1/4"	15	14	36.5	Ø16.5	14	Ø21.5
LQ1H2F-F□	Ø3							
LQ1H31-F□	Ø10							
LQ1H32-F□	Ø8	1/4"	20	17	42.5	Ø23	19	Ø21.5
LQ1H33-F□	Ø6							
LQ1H34-F□	Ø10							
LQ1H35-F□	Ø8	3/8"	20	17	42.5	Ø23	19	Ø25
LQ1H36-F□	Ø6							
LQ1H41-F□	Ø12							
LQ1H42-F□	Ø10	3/8"	24	21	47.5	Ø28	23	Ø25
LQ1H43-F□	Ø12							
LQ1H44-F□	Ø10							
LQ1H51-F□	Ø19	1/2"	24	21	50	Ø28	23	Ø29.5
LQ1H52-F□	Ø12							
LQ1H53-F□	Ø19							
LQ1H54-F□	Ø12	3/4"	29	26	60	Ø39	32	Ø36
LQ1H61-F□	Ø25							
LQ1H62-F□	Ø19							
LQ1H63-F□	Ø25	1"	39.5	36	75	Ø49	46	Ø36
LQ1H64-F□	Ø19							
LQ1H65-F□	Ø25	1"	39.5	36	78.5	Ø49	46	Ø44.5
LQ1H66-F□	Ø19							

Inch sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	E	H	L	M	W	Y
LQ1H1A-F□	1/8"	1/8"	10	—	26.5	Ø11.5	10	Ø18.5
LQ1H2A-F□	1/4"							
LQ1H2B-F□	3/16"							
LQ1H2C-F□	1/8"	1/8"	15	14	35	Ø16.5	14	Ø18.5
LQ1H2D-F□	1/4"							
LQ1H2E-F□	3/16"							
LQ1H2F-F□	1/8"	1/4"	15	14	36.5	Ø16.5	14	Ø21.5
LQ1H3A-F□	3/8"							
LQ1H3B-F□	1/4"							
LQ1H3C-F□	3/8"	3/8"	20	17	42.5	Ø23	19	Ø21.5
LQ1H3D-F□	1/4"							
LQ1H4A-F□	1/2"							
LQ1H4B-F□	3/8"	3/8"	24	21	47.5	Ø28	23	Ø25
LQ1H4C-F□	1/2"							
LQ1H4D-F□	3/8"							
LQ1H5A-F□	3/4"	1/2"	24	21	50	Ø28	23	Ø29.5
LQ1H5B-F□	1/2"							
LQ1H5C-F□	3/4"							
LQ1H5D-F□	1/2"	3/4"	29	26	60	Ø39	32	Ø36
LQ1H6A-F□	1"							
LQ1H6B-F□	3/4"							
LQ1H6C-F□	1"	1"	39.5	36	75	Ø49	46	Ø36
LQ1H6D-F□	3/4"							
LQ1H6E-F□	1"	1"	39.5	36	78.5	Ø49	46	Ø44.5
LQ1H6F-F□	3/4"							

Male Elbow: LQ1L-M



(A) shows the reference dimension after connection.

(E) shows the approximate dimension of the inserted tubing from the end of the nut.

Metric sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	E	H	L1	L2	M
LQ1L11-M□	Ø4	1/8"	11.5	10	—	18	15	Ø11.5
LQ1L12-M□	Ø3							
LQ1L21-M□	Ø6	1/8"						
LQ1L22-M□	Ø4							
LQ1L2C-M□	Ø3	1/8"	14.5	15	14	27	20.5	Ø16.5
LQ1L23-M□	Ø6							
LQ1L24-M□	Ø4	1/4"						
LQ1L2F-M□	Ø3							
LQ1L31-M□	Ø10	1/4"						
LQ1L32-M□	Ø8							
LQ1L33-M□	Ø6	1/4"	20	20	17	35	26.5	Ø23
LQ1L34-M□	Ø10							
LQ1L35-M□	Ø8	3/8"						
LQ1L36-M□	Ø6							
LQ1L41-M□	Ø12	3/8"						
LQ1L42-M□	Ø10							
LQ1L43-M□	Ø12	3/8"	25	24	21	45	33	Ø28
LQ1L44-M□	Ø10	1/2"						
LQ1L51-M□	Ø19	1/2"						
LQ1L52-M□	Ø12							
LQ1L53-M□	Ø19	3/4"	30.5	29	26	54	40	Ø39
LQ1L54-M□	Ø12							
LQ1L61-M□	Ø25	3/4"						
LQ1L62-M□	Ø19							
LQ1L63-M□	Ø25	1"	35	39.5	36	68.5	46	Ø49
LQ1L64-M□	Ø19							

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

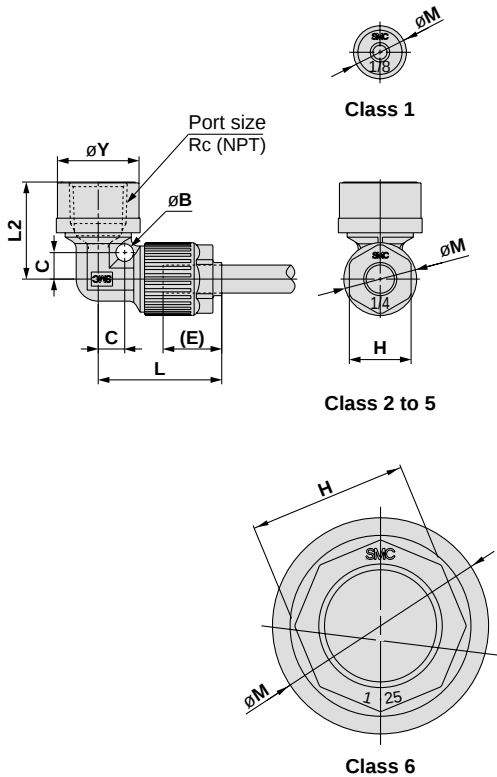
Inch sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	E	H	L1	L2	M
LQ1L1A-M□	1/8"	1/8"	11.5	10	—	18	15	Ø11.5
LQ1L2A-M□	1/4"							
LQ1L2B-M□	3/16"	1/8"						
LQ1L2C-M□	1/8"							
LQ1L2D-M□	1/4"	1/8"	14.5	15	14	27	20.5	Ø16.5
LQ1L2E-M□	3/16"	1/4"						
LQ1L2F-M□	1/8"							
LQ1L3A-M□	3/8"	1/4"						
LQ1L3B-M□	1/4"							
LQ1L3C-M□	3/8"	3/8"	20	20	17	35	26.5	Ø23
LQ1L3D-M□	1/4"							
LQ1L4A-M□	1/2"	3/8"						
LQ1L4B-M□	3/8"							
LQ1L4C-M□	1/2"	1/2"	25	24	21	45	33	Ø28
LQ1L4D-M□	3/8"							
LQ1L5A-M□	3/4"	1/2"						
LQ1L5B-M□	1/2"							
LQ1L5C-M□	3/4"	3/4"	30.5	29	26	54	40	Ø39
LQ1L5D-M□	1/2"							
LQ1L6A-M□	1"	3/4"						
LQ1L6B-M□	3/4"							
LQ1L6C-M□	1"	1"	35	39.5	36	68.5	46	Ø49
LQ1L6D-M□	3/4"							

Series LQ1

Dimensions

Female Elbow: LQ1L-F



(E) shows the reference dimension of the inserted tubing from the end of the nut.

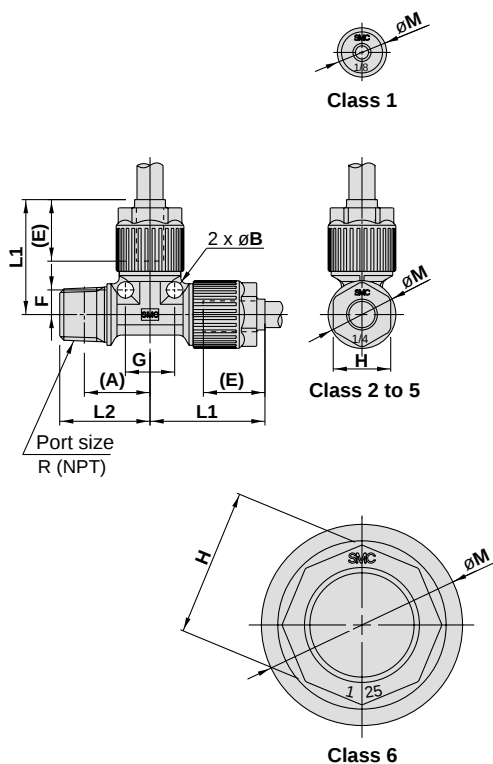
Metric sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	C	E	H	L1	L2	M	Y
LQ1L11-F□	Ø4	1/8"	Ø2	4	10	—	18	17	Ø11.5	Ø18.5
LQ1L12-F□	Ø3									
LQ1L21-F□	Ø6	1/8"	Ø4	6	15	14	27	19.5	Ø16.5	Ø18.5
LQ1L22-F□	Ø4									
LQ1L2C-F□	Ø3	1/4"	Ø4	6	15	14	27	22.5	Ø16.5	Ø21.5
LQ1L23-F□	Ø6									
LQ1L24-F□	Ø4	1/4"	Ø4	6	15	14	27	22.5	Ø16.5	Ø21.5
LQ1L2F-F□	Ø3									
LQ1L31-F□	Ø10	1/4"	Ø5	9	20	17	35	23	Ø23	Ø21.5
LQ1L32-F□	Ø8									
LQ1L33-F□	Ø6	3/8"	Ø5	9	20	17	35	25	Ø23	Ø25
LQ1L34-F□	Ø10									
LQ1L35-F□	Ø8	3/8"	Ø5	9	20	17	35	25	Ø23	Ø25
LQ1L36-F□	Ø6									
LQ1L41-F□	Ø12	3/8"	Ø6	9	24	21	45	29	Ø28	Ø25
LQ1L42-F□	Ø10									
LQ1L43-F□	Ø12	1/2"	Ø6	9	24	21	45	32.5	Ø28	Ø29.5
LQ1L44-F□	Ø10									
LQ1L51-F□	Ø19	1/2"	Ø7	14	29	26	54	37.5	Ø39	Ø29.5
LQ1L52-F□	Ø12									
LQ1L53-F□	Ø19	3/4"	Ø7	14	29	26	54	39.5	Ø39	Ø36
LQ1L54-F□	Ø12									
LQ1L61-F□	Ø25	3/4"	Ø8	18	39.5	36	68.5	44.5	Ø49	Ø36
LQ1L62-F□	Ø19									
LQ1L63-F□	Ø25	1"	Ø8	18	39.5	36	68.5	48	Ø49	Ø44.5
LQ1L64-F□	Ø19									

Inch sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	C	E	H	L1	L2	M	Y
LQ1L1A-F□	1/8"	1/8"	Ø2	4	10	—	18	17	Ø11.5	Ø18.5
LQ1L2A-F□	1/4"									
LQ1L2B-F□	3/16"	1/8"	Ø4	6	15	14	27	19.5	Ø16.5	Ø18.5
LQ1L2C-F□	1/8"									
LQ1L2D-F□	1/4"	1/4"	Ø4	6	15	14	27	22.5	Ø16.5	Ø21.5
LQ1L2E-F□	3/16"									
LQ1L2F-F□	1/8"	1/4"	Ø4	6	15	14	27	22.5	Ø16.5	Ø21.5
LQ1L3A-F□	3/8"									
LQ1L3B-F□	1/4"	3/8"	Ø5	9	20	17	35	23	Ø23	Ø21.5
LQ1L3C-F□	3/8"									
LQ1L3D-F□	1/4"	3/8"	Ø5	9	20	17	35	25	Ø23	Ø25
LQ1L4A-F□	1/2"									
LQ1L4B-F□	3/8"	3/8"	Ø6	9	24	21	45	29	Ø28	Ø25
LQ1L4C-F□	3/8"									
LQ1L4D-F□	1/2"	1/2"	Ø6	9	24	21	45	32.5	Ø28	Ø29.5
LQ1L4E-F□	3/8"									
LQ1L5A-F□	3/4"	1/2"	Ø7	14	29	26	54	37.5	Ø39	Ø29.5
LQ1L5B-F□	1/2"									
LQ1L5C-F□	3/4"	3/4"	Ø7	14	29	26	54	39.5	Ø39	Ø36
LQ1L5D-F□	1/2"									
LQ1L6A-F□	1"	3/4"	Ø8	18	39.5	36	68.5	44.5	Ø49	Ø36
LQ1L6B-F□	3/4"									
LQ1L6C-F□	1"	1"	Ø8	18	39.5	36	68.5	48	Ø49	Ø44.5
LQ1L6D-F□	3/4"									

Male Run Tee: LQ1R-M



(A) shows the reference dimension after connection.
(E) shows the approximate dimension of the inserted tubing from the end of the nut.

Metric sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	B	E	F	G	H	L1	L2	M
LQ1R11-M□	Ø4	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1R12-M□	Ø3										
LQ1R21-M□	Ø6	1/8"								19.5	
LQ1R22-M□	Ø4		16	Ø4	15	6	12	14	28		16.5
LQ1R2C-M□	Ø3	1/4"								22	
LQ1R23-M□	Ø6										
LQ1R24-M□	Ø4										
LQ1R2F-M□	Ø3										
LQ1R31-M□	Ø10	1/4"	19							25	
LQ1R32-M□	Ø8										
LQ1R33-M□	Ø6			Ø5	20	9	18	17	36.5		23
LQ1R34-M□	Ø10	3/8"	21							27	
LQ1R35-M□	Ø8										
LQ1R36-M□	Ø6										
LQ1R41-M□	Ø12	3/8"	23							29	
LQ1R42-M□	Ø10			Ø6	24	9	18	21	43		28
LQ1R43-M□	Ø12	1/2"	24.5							32	
LQ1R44-M□	Ø10										
LQ1R51-M□	Ø19	1/2"	30.5							38	
LQ1R52-M□	Ø12			Ø7	29	14	28	26	54		39
LQ1R53-M□	Ø19	3/4"	30							39	
LQ1R54-M□	Ø12										
LQ1R61-M□	Ø25	3/4"	36								
LQ1R62-M□	Ø19			Ø8	39.5	18	36	36	69.5	45	49
LQ1R63-M□	Ø25	1"	35								
LQ1R64-M□	Ø19										

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

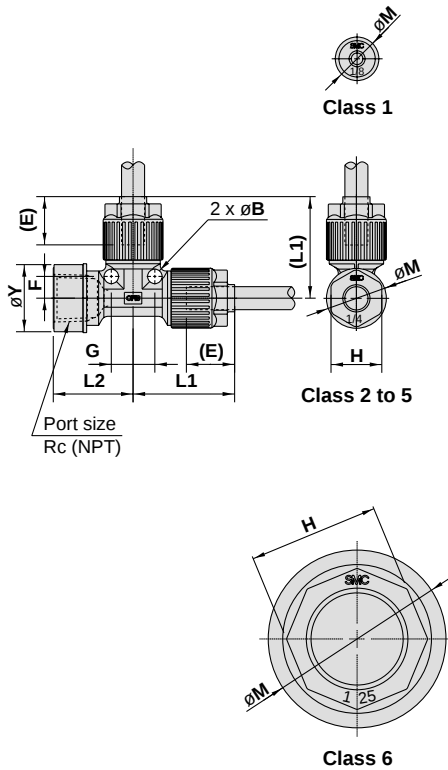
Inch sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	B	E	F	G	H	L1	L2	M
LQ1R1A-M□	1/8"	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1R2A-M□	1/4"										
LQ1R2B-M□	3/16"	1/8"								19.5	
LQ1R2C-M□	1/8"		16	Ø4	15	6	12	14	28		16.5
LQ1R2D-M□	1/4"	1/4"								22	
LQ1R2E-M□	3/16"										
LQ1R2F-M□	1/8"										
LQ1R3A-M□	3/8"	1/4"	19							25	
LQ1R3B-M□	1/4"			Ø5	20	9	18	17	36.5		23
LQ1R3C-M□	3/8"	3/8"	21							27	
LQ1R3D-M□	1/4"										
LQ1R4A-M□	1/2"	3/8"	23							29	
LQ1R4B-M□	3/8"			Ø6	24	9	18	21	43		28
LQ1R4C-M□	1/2"	1/2"	24.5							32	
LQ1R4D-M□	3/8"										
LQ1R5A-M□	3/4"	1/2"	30.5							38	
LQ1R5B-M□	1/2"			Ø7	29	14	28	26	54		39
LQ1R5C-M□	3/4"	3/4"	30							39	
LQ1R5D-M□	1/2"										
LQ1R6A-M□	1"	3/4"	36								
LQ1R6B-M□	3/4"			Ø8	39.5	18	36	36	69.5	45	49
LQ1R6C-M□	1"	1"	35								
LQ1R6D-M□	3/4"										

Series LQ1

Dimensions

Female Run Tee: LQ1R-F



(E) shows the approximate dimension of the inserted tubing from the end of the nut.

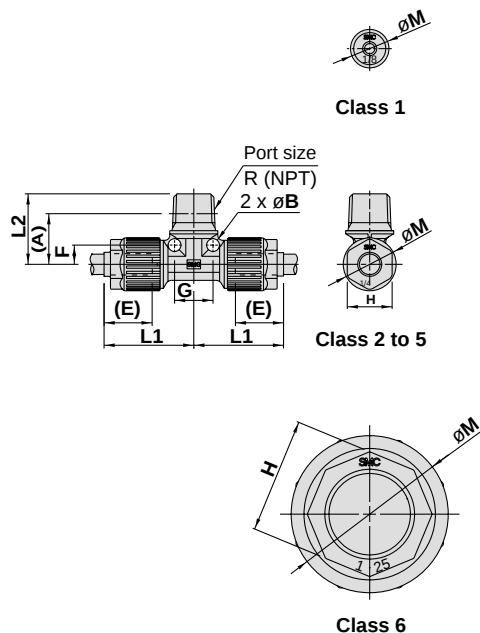
Metric sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	E	F	G	H	L1	L2	M	Y
LQ1R11-F□	Ø4	1/8"	Ø2	10	4	8	—	18.5	16	Ø11.5	Ø18.5
LQ1R12-F□	Ø3										
LQ1R21-F□	Ø6	1/8"							19.5		Ø18.5
LQ1R22-F□	Ø4										
LQ1R2C-F□	Ø3		Ø4	15	6	12	14	28		Ø16.5	
LQ1R23-F□	Ø6										
LQ1R24-F□	Ø4	1/4"							22		Ø21.5
LQ1R2F-F□	Ø3										
LQ1R31-F□	Ø10	1/4"									
LQ1R32-F□	Ø8								24		Ø21.5
LQ1R33-F□	Ø6		Ø5	20	9	18	17	36.5		Ø23	
LQ1R34-F□	Ø10	3/8"							25.5		Ø25
LQ1R35-F□	Ø8										
LQ1R36-F□	Ø6										
LQ1R41-F□	Ø12	3/8"							25		Ø25
LQ1R42-F□	Ø10		Ø6	24	9	18	21	43		Ø28	
LQ1R43-F□	Ø12	1/2"							31.5		Ø29.5
LQ1R44-F□	Ø10										
LQ1R51-F□	Ø19	1/2"							35.5		Ø29.5
LQ1R52-F□	Ø12		Ø7	29	14	28	26	54		Ø39	
LQ1R53-F□	Ø19	3/4"							37		Ø36
LQ1R54-F□	Ø12										
LQ1R61-F□	Ø25	3/4"							42.5		Ø36
LQ1R62-F□	Ø19		Ø8	39.5	18	36	36	69.5		Ø49	
LQ1R63-F□	Ø25	1"							46		Ø44.5
LQ1R64-F□	Ø19										

Inch sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	E	F	G	H	L1	L2	M	Y
LQ1R1A-F□	1/8"	1/8"	Ø2	10	4	8	—	18.5	16	Ø11.5	Ø18.5
LQ1R2A-F□	1/4"										
LQ1R2B-F□	3/16"	1/8"							19.5		Ø18.5
LQ1R2C-F□	1/8"		Ø4	15	6	12	14	28		Ø16.5	
LQ1R2D-F□	1/4"										
LQ1R2E-F□	3/16"	1/4"							22		Ø21.5
LQ1R2F-F□	1/8"										
LQ1R3A-F□	3/8"	1/4"									
LQ1R3B-F□	1/4"		Ø5	20	9	18	17	36.5		Ø23	Ø21.5
LQ1R3C-F□	3/8"	3/8"							25.5		Ø25
LQ1R3D-F□	1/4"										
LQ1R4A-F□	1/2"	3/8"							25		Ø25
LQ1R4B-F□	3/8"		Ø6	24	9	18	21	43		Ø28	
LQ1R4C-F□	1/2"	1/2"							31.5		Ø29.5
LQ1R4D-F□	3/8"										
LQ1R5A-F□	3/4"	1/2"							35.5		Ø29.5
LQ1R5B-F□	1/2"		Ø7	29	14	28	26	54		Ø39	
LQ1R5C-F□	3/4"	3/4"							37		Ø36
LQ1R5D-F□	1/2"										
LQ1R6A-F□	1"	3/4"							42.5		Ø36
LQ1R6B-F□	3/4"		Ø8	39.5	18	36	36	69.5		Ø49	
LQ1R6C-F□	1"	1"							46		Ø44.5
LQ1R6D-F□	3/4"										

Male Branch Tee: LQ1B-M



(A) shows the reference dimension after connection.
(E) shows the approximate dimension of the inserted tubing from the end of the nut.

Metric sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	B	E	F	G	H	L1	L2	M
LQ1B11-M□	Ø4	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1B12-M□	Ø3	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1B21-M□	Ø6	1/8"	16	Ø4	15	6	12	14	28	19.5	16.5
LQ1B22-M□	Ø4	1/8"	16	Ø4	15	6	12	14	28	19.5	16.5
LQ1B2C-M□	Ø3	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B23-M□	Ø6	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B24-M□	Ø4	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B2F-M□	Ø3	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B31-M□	Ø10	1/4"	19	Ø5	20	9	18	17	36.5	25	23
LQ1B32-M□	Ø8	1/4"	19	Ø5	20	9	18	17	36.5	25	23
LQ1B33-M□	Ø6	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B34-M□	Ø10	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B35-M□	Ø8	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B36-M□	Ø6	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B41-M□	Ø12	3/8"	23	Ø6	24	9	18	21	43	29	28
LQ1B42-M□	Ø10	3/8"	23	Ø6	24	9	18	21	43	29	28
LQ1B43-M□	Ø12	1/2"	24.5	Ø6	24	9	18	21	43	32	28
LQ1B44-M□	Ø10	1/2"	24.5	Ø6	24	9	18	21	43	32	28
LQ1B51-M□	Ø19	1/2"	30.5	Ø7	29	14	28	26	54	38	39
LQ1B52-M□	Ø12	1/2"	30.5	Ø7	29	14	28	26	54	38	39
LQ1B53-M□	Ø19	3/4"	30	Ø7	29	14	28	26	54	39	39
LQ1B54-M□	Ø12	3/4"	30	Ø7	29	14	28	26	54	39	39
LQ1B61-M□	Ø25	3/4"	36	Ø8	39.5	18	36	36	69.5	45	49
LQ1B62-M□	Ø19	3/4"	36	Ø8	39.5	18	36	36	69.5	45	49
LQ1B63-M□	Ø25	1"	35	Ø8	39.5	18	36	36	69.5	45	49
LQ1B64-M□	Ø19	1"	35	Ø8	39.5	18	36	36	69.5	45	49

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

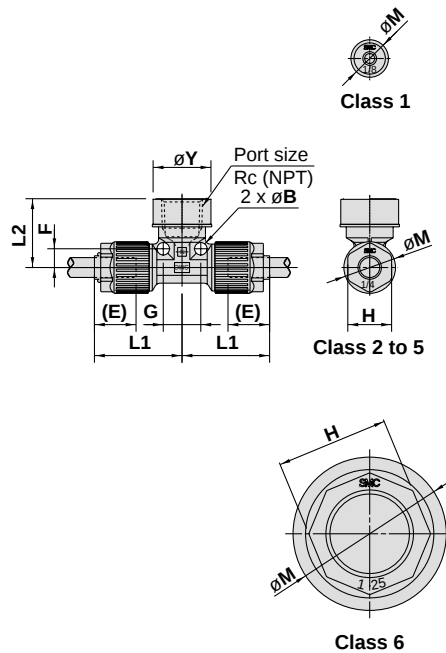
Inch sizes

Model	Applicable tubing O.D.	Connection threads R/NPT	A	B	E	F	G	H	L1	L2	M
LQ1B1A-M□	1/8"	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1B2A-M□	1/4"	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1B2B-M□	3/16"	1/8"	12	Ø2	10	4	8	—	18.5	15.5	11.5
LQ1B2C-M□	1/8"	1/8"	16	Ø4	15	6	12	14	28	19.5	16.5
LQ1B2D-M□	1/4"	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B2E-M□	3/16"	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B2F-M□	1/8"	1/4"	16	Ø4	15	6	12	14	28	22	16.5
LQ1B3A-M□	3/8"	1/4"	19	Ø5	20	9	18	17	36.5	25	23
LQ1B3B-M□	1/4"	1/4"	19	Ø5	20	9	18	17	36.5	25	23
LQ1B3C-M□	3/8"	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B3D-M□	1/4"	3/8"	21	Ø5	20	9	18	17	36.5	27	23
LQ1B4A-M□	1/2"	3/8"	23	Ø6	24	9	18	21	43	29	28
LQ1B4B-M□	3/8"	3/8"	23	Ø6	24	9	18	21	43	29	28
LQ1B4C-M□	1/2"	1/2"	24.5	Ø6	24	9	18	21	43	32	28
LQ1B4D-M□	3/8"	1/2"	24.5	Ø6	24	9	18	21	43	32	28
LQ1B5A-M□	3/4"	1/2"	30.5	Ø7	29	14	28	26	54	38	39
LQ1B5B-M□	1/2"	1/2"	30.5	Ø7	29	14	28	26	54	38	39
LQ1B5C-M□	3/4"	3/4"	30	Ø7	29	14	28	26	54	39	39
LQ1B5D-M□	1/2"	3/4"	30	Ø7	29	14	28	26	54	39	39
LQ1B6A-M□	1"	3/4"	36	Ø8	39.5	18	36	36	69.5	45	49
LQ1B6B-M□	3/4"	3/4"	36	Ø8	39.5	18	36	36	69.5	45	49
LQ1B6C-M□	1"	1"	35	Ø8	39.5	18	36	36	69.5	45	49
LQ1B6D-M□	3/4"	1"	35	Ø8	39.5	18	36	36	69.5	45	49

Series LQ1

Dimensions

Female Branch Tee: LQ1B-F



(E) shows the approximate dimension of the inserted tubing from the end of the nut.

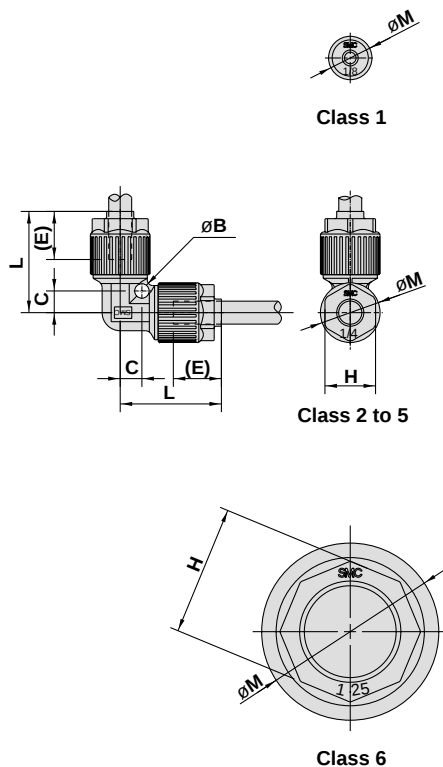
Metric sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	E	F	G	H	L1	L2	M	Y
LQ1B11-F□	Ø4	1/8"	Ø2	10	4	8	—	18.5	16	Ø11.5	Ø18.5
LQ1B12-F□	Ø3										
LQ1B21-F□	Ø6	1/8"	Ø4	15	6	12	14	28	19.5	Ø16.5	Ø18.5
LQ1B22-F□	Ø4										
LQ1B2C-F□	Ø3	1/4"	Ø4	15	6	12	14	28	22	Ø16.5	Ø21.5
LQ1B23-F□	Ø6										
LQ1B24-F□	Ø4	1/4"	Ø4	15	6	12	14	28	22	Ø16.5	Ø21.5
LQ1B2F-F□	Ø3										
LQ1B31-F□	Ø10	1/4"	Ø5	20	9	18	17	36.5	23.7	Ø23	Ø21.5
LQ1B32-F□	Ø8										
LQ1B33-F□	Ø6	3/8"	Ø5	20	9	18	17	36.5	25.5	Ø23	Ø25
LQ1B34-F□	Ø10										
LQ1B35-F□	Ø8	3/8"	Ø5	20	9	18	17	36.5	25.5	Ø23	Ø25
LQ1B36-F□	Ø6										
LQ1B41-F□	Ø12	3/8"	Ø6	24	9	18	21	43	25	Ø28	Ø25
LQ1B42-F□	Ø10										
LQ1B43-F□	Ø12	1/2"	Ø6	24	9	18	21	43	31.5	Ø28	Ø29.5
LQ1B44-F□	Ø10										
LQ1B51-F□	Ø19	1/2"	Ø7	29	14	28	26	54	35.5	Ø39	Ø29.5
LQ1B52-F□	Ø12										
LQ1B53-F□	Ø19	3/4"	Ø7	29	14	28	26	54	37	Ø39	Ø36
LQ1B54-F□	Ø12										
LQ1B61-F□	Ø25	3/4"	Ø8	39.5	18	36	36	69.5	42.5	Ø49	Ø36
LQ1B62-F□	Ø19										
LQ1B63-F□	Ø25	1"	Ø8	39.5	18	36	36	69.5	46	Ø49	Ø44.5
LQ1B64-F□	Ø19										

Inch sizes

Model	Applicable tubing O.D.	Connection threads Rc/NPT	B	E	F	G	H	L1	L2	M	Y
LQ1B1A-F□	1/8"	1/8"	Ø2	10	4	8	—	18.5	16	Ø11.5	Ø18.5
LQ1B2A-F□	1/4"										
LQ1B2B-F□	3/16"	1/8"	Ø4	15	6	12	14	28	19.5	Ø16.5	Ø18.5
LQ1B2C-F□	1/8"										
LQ1B2D-F□	1/4"	1/4"	Ø4	15	6	12	14	28	22	Ø16.5	Ø21.5
LQ1B2E-F□	3/16"										
LQ1B2F-F□	1/8"	1/4"	Ø4	15	6	12	14	28	22	Ø16.5	Ø21.5
LQ1B3A-F□	3/8"										
LQ1B3B-F□	1/4"	1/4"	Ø5	20	9	18	17	36.5	23.7	Ø23	Ø21.5
LQ1B3C-F□	3/8"										
LQ1B3D-F□	1/4"	3/8"	Ø5	20	9	18	17	36.5	25.5	Ø23	Ø25
LQ1B4A-F□	1/2"										
LQ1B4B-F□	3/8"	3/8"	Ø6	24	9	18	21	43	25	Ø28	Ø25
LQ1B4C-F□	1/2"										
LQ1B4D-F□	3/8"	1/2"	Ø6	24	9	18	21	43	31.5	Ø28	Ø29.5
LQ1B5A-F□	3/4"										
LQ1B5B-F□	1/2"	1/2"	Ø7	29	14	28	26	54	35.5	Ø39	Ø29.5
LQ1B5C-F□	3/4"										
LQ1B5D-F□	1/2"	3/4"	Ø7	29	14	28	26	54	37	Ø39	Ø36
LQ1B6A-F□	1"										
LQ1B6B-F□	3/4"	3/4"	Ø8	39.5	18	36	36	69.5	42.5	Ø49	Ø36
LQ1B6C-F□	1"										
LQ1B6D-F□	3/4"	1"	Ø8	39.5	18	36	36	69.5	46	Ø49	Ø44.5

Union Elbow: LQ1E



(E) shows the approximate dimension of the inserted tubing from the end of the nut.

Metric sizes

Model	Applicable tubing O.D.	B	C	E	H	L	M
LQ1E11□□	Ø4	Ø2	4	10	—	18.5	Ø11.5
LQ1E12□□	Ø3						
LQ1E21□□	Ø6						
LQ1E22□□	Ø4	Ø4	6	15	14	28	Ø16.5
LQ1E2C□□	Ø3						
LQ1E31□□	Ø10						
LQ1E32□□	Ø8	Ø5	9	20	17	36.5	Ø23
LQ1E33□□	Ø6						
LQ1E41□□	Ø12						
LQ1E42□□	Ø10	Ø6	9	24	21	43	Ø28
LQ1E51□□	Ø19						
LQ1E52□□	Ø12						
LQ1E61□□	Ø25	Ø8	18	39.5	36	69.5	Ø49
LQ1E62□□	Ø19						

Inch sizes

Model	Applicable tubing O.D.	B	C	E	H	L	M
LQ1E1A□□	1/8"	Ø2	4	10	—	18.5	Ø11.5
LQ1E2A□□	1/4"						
LQ1E2B□□	3/16"						
LQ1E2C□□	1/8"	Ø4	6	15	14	28	Ø16.5
LQ1E3A□□	3/8"						
LQ1E3B□□	1/4"						
LQ1E4A□□	1/2"	Ø6	9	24	21	43	Ø28
LQ1E4B□□	3/8"						
LQ1E5A□□	3/4"						
LQ1E5B□□	1/2"	Ø7	14	29	26	54	Ø39
LQ1E6A□□	1"						
LQ1E6B□□	3/4"						

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

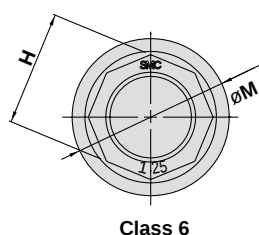
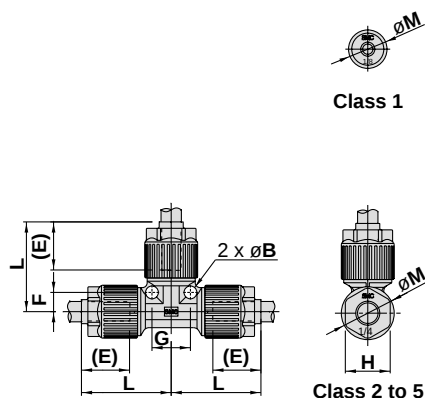
TL/TIL

LQ3

Series LQ1

Dimensions

Union Tee: LQ1T



(E) shows the approximate dimension of the inserted tubing from the end of the nut.

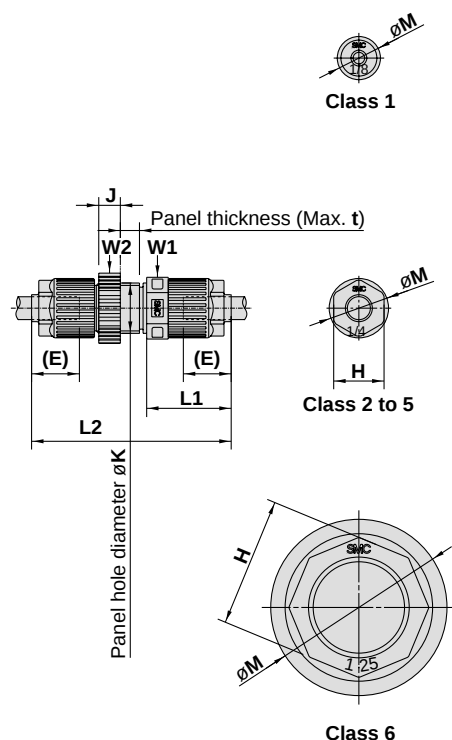
Metric sizes

Model	Applicable tubing O.D.	B	E	F	G	H	L	M
LQ1T11□□	Ø4	Ø2	10	4	8	—	18.5	11.5
LQ1T12□□	Ø3							
LQ1T21□□	Ø6							
LQ1T22□□	Ø4	Ø4	15	6	12	14	28	16.5
LQ1T2C□□	Ø3							
LQ1T31□□	Ø10							
LQ1T32□□	Ø8	Ø5	20	9	18	17	36.5	23
LQ1T33□□	Ø6							
LQ1T41□□	Ø12							
LQ1T42□□	Ø10	Ø6	24	9	18	21	43	28
LQ1T51□□	Ø19							
LQ1T52□□	Ø12							
LQ1T61□□	Ø25	Ø8	39.5	18	36	36	69.5	49
LQ1T62□□	Ø19							

Inch sizes

Model	Applicable tubing O.D.	B	E	F	G	H	L	M
LQ1T1A□□	1/8"	Ø2	10	4	8	—	18.5	11.5
LQ1T2A□□	1/4"							
LQ1T2B□□	3/16"							
LQ1T2C□□	1/8"	Ø4	15	6	12	14	28	16.5
LQ1T3A□□	3/8"							
LQ1T3B□□	1/4"							
LQ1T4A□□	1/2"	Ø6	24	9	18	21	43	28
LQ1T4B□□	3/8"							
LQ1T5A□□	3/4"							
LQ1T5B□□	1/2"	Ø7	29	14	28	26	54	39
LQ1T6A□□	1"							
LQ1T6B□□	3/4"							

Panel Mount Union: LQ1P



(E) shows the approximate dimension of the inserted tubing from the end of the nut.
"W" is width across flats dimension.

Metric sizes

Model	Applicable tubing O.D.	E	H	J	K	L1	L2	M	t	W1	W2
LQ1P11□□	Ø4	10	—	6	10.5	17	44	Ø11.5	8	11	13
LQ1P12□□	Ø3										
LQ1P21□□	Ø6										
LQ1P22□□	Ø4	15	14	6	14.5	23.5	55.5	Ø16.5	8	15	17
LQ1P2C□□	Ø3										
LQ1P31□□	Ø10	20	17	7	20.5	30	69	Ø23	8	21	24
LQ1P32□□	Ø8										
LQ1P33□□	Ø6										
LQ1P41□□	Ø12	24	21	7	24.5	35	78.5	Ø28	8	26	28
LQ1P42□□	Ø10										
LQ1P51□□	Ø19	29	26	9	36.5	43.5	100	Ø39	9	39	43
LQ1P52□□	Ø12										
LQ1P61□□	Ø25										
LQ1P62□□	Ø19	39.5	36	10	48.5	58.5	133	Ø49	10	51	55

Inch sizes

Model	Applicable tubing O.D.	E	H	J	K	L1	L2	M	t	W1	W2
LQ1P1A□□	1/8"	10	—	6	10.5	17	44	Ø11.5	8	11	13
LQ1P2A□□	1/4"										
LQ1P2B□□	3/16"										
LQ1P2C□□	1/8"	15	14	6	14.5	23.5	55.5	Ø16.5	8	15	17
LQ1P3A□□	3/8"										
LQ1P3B□□	1/4"	20	17	7	20.5	30	69	Ø23	8	21	24
LQ1P4A□□	1/2"										
LQ1P4B□□	3/8"										
LQ1P5A□□	3/4"	24	21	7	24.5	35	78.5	Ø28	8	26	28
LQ1P5B□□	1/2"										
LQ1P6A□□	1"	29	26	9	36.5	43.5	100	Ø39	9	39	43
LQ1P6B□□	3/4"										
LQ1P6A□□	1"	39.5	36	10	48.5	58.5	133	Ø49	10	51	55
LQ1P6B□□	3/4"										

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

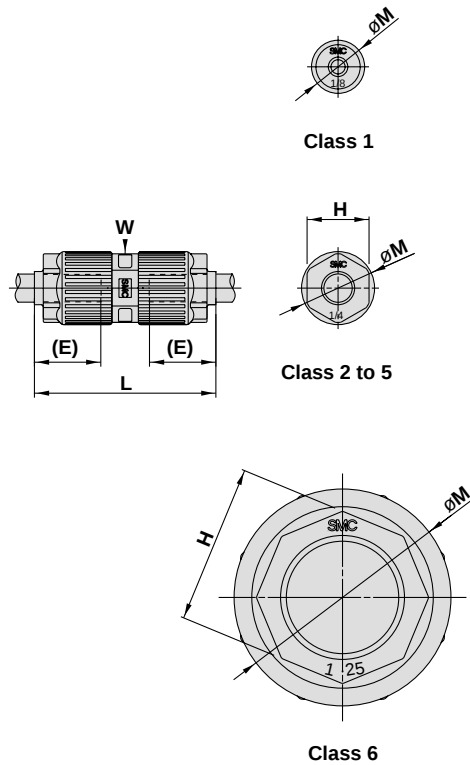
TL/TIL

LQ3

Series LQ1

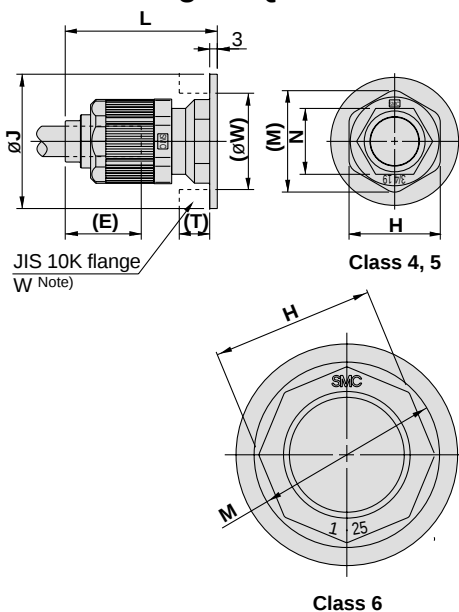
Dimensions

Union: LQ1U



(E) shows the approximate dimension of the inserted tubing from the end of the nut.
"W" is width across flats dimension.

Union Flange: LQ1F



(E) shows the approximate dimension of the inserted tubing from the end of the nut.
(W) is the bore size of the JIS flange required for mounting. This flange is sold separately.
When ordering nuts as spare parts, size 4 and 5 are as shown below.

LQ1F4□: LQ-4N□□
LQ1F5□: LQ-5N□□

606

Metric sizes

Model	Applicable tubing O.D.	E	H	L	M	W
LQ1U11□□	ø4	10	—	29	11.5	10
LQ1U12□□	ø3					
LQ1U21□□	ø6	15	14	41	16.5	14
LQ1U22□□	ø4					
LQ1U2C□□	ø3	20	17	54	23	17
LQ1U31□□	ø10					
LQ1U32□□	ø8					
LQ1U33□□	ø6					
LQ1U41□□	ø12	24	21	63	28	21
LQ1U42□□	ø10					
LQ1U51□□	ø19	29	26	77	39	26
LQ1U52□□	ø12					
LQ1U61□□	ø25	39.5	36	102	49	36
LQ1U62□□	ø19					

Inch sizes

Model	Applicable tubing O.D.	E	H	L	M	W
LQ1U1A□□	1/8"	10	—	29	11.5	10
LQ1U2A□□	1/4"	15	14	41	16.5	14
LQ1U2B□□	3/16"					
LQ1U2C□□	1/8"	20	17	54	23	17
LQ1U3A□□	3/8"					
LQ1U3B□□	1/4"	24	21	63	28	21
LQ1U4A□□	1/2"					
LQ1U4B□□	3/8"	29	26	77	39	26
LQ1U5A□□	3/4"					
LQ1U5B□□	1/2"					
LQ1U6A□□	1"					
LQ1U6B□□	3/4"	39.5	36	102	49	36

Metric sizes

Model	Applicable tubing O.D.	E	H	J	L	N	M	W	(T)
LQ1F41	ø12	28	30	ø53	60	21	33.1	ø34	12
LQ1F42	ø10				58				
LQ1F51	ø19	32	36	ø58	65.2	26	40	ø41	14
LQ1F52	ø12				63.2				
LQ1F61	ø25	39.5	36	ø69	81.5	—	49	ø51	14
LQ1F62	ø19								

Inch sizes

Model	Applicable tubing O.D.	E	H	J	L	N	M	W	(T)
LQ1F4A	1/2"	28	30	ø53	60	21	33.1	ø34	12
LQ1F4B	3/8"				58				
LQ1F5A	3/4"	32	36	ø58	65.2	26	40	ø41	14
LQ1F5B	1/2"				63.2				
LQ1F6A	1"	39.5	36	ø69	81.5	—	49	ø51	14
LQ1F6B	3/4"								

Options

Panel mounting nut

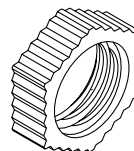
LQN P 2 —

Applicable fitting

Symbol	Class
11	1
12	2
13	3
14	4
15	5
16	6

•Packaging

Nil	Clean packaging	Class M3.5
1	Standard packaging	Class M5.5



Used to secure a panel with a panel mount union.

Nut insert bushing

LQ 1 — **2** **U** **03** —

* The U type is recommended when changing tubing sizes.

Applicable fitting

Symbol	Application
1	For LQ1

Class

Symbol	Class
1	1
2	2
3	3
4	4
5	5
6	6

Type of parts

Symbol	Parts
U	Nut + Insert bushing
B	Insert bushing
N	Nut

•Packaging

Nil	Clean packaging	Class M3.5
1	Standard packaging	Class M5.5

•Applicable tubing size

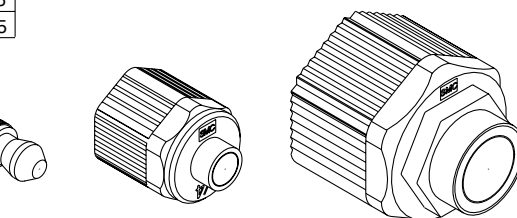
Symbol	Connection tubing size	Class					
		1	2	3	4	5	6

Metric sizes

03	ø3 x ø2	○	○				
04	ø4 x ø3	○	○				
06	ø6 x ø4		○	○			
08	ø8 x ø6			○			
10	ø10 x ø8			○	○		
12	ø12 x ø10				○	○	
19	ø19 x ø16					○	○
25	ø25 x ø22.5						○



Note) In case of class 1, the tubing cannot be changed by reducing.



Symbol	Connection tubing size	Class					
		1	2	3	4	5	6

Inch sizes

03	1/8" x 0.086"	○	○				
05	3/16" x 1/8"		○				
07	1/4" x 5/32"		○	○			
11	3/8" x 1/4"			○	○		
13	1/2" x 3/8"				○	○	
19	3/4" x 5/8"					○	○
25	1" x 7/8"						○

Blanking plug

LQ — **2** **P** **07** —

•Packaging

Nil	Clean packaging	Class M3.5
1	Standard packaging	Class M5.5

•Applicable tubing size

Symbol	Connection tubing size	Class					
		1	2	3	4	5	6

Metric sizes

03	ø3 x ø2	○	●				
04	ø4 x ø3	○	●				
06	ø6 x ø4		○	●			
08	ø8 x ø6			●			
10	ø10 x ø8			○	●		
12	ø12 x ø10				○	●	
19	ø19 x ø16					○	●
25	ø25 x ø22.5						○

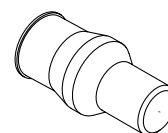
○ Basic size ● With reducer

Symbol	Connection tubing size	Class					
		1	2	3	4	5	6

Inch sizes

03	1/8" x 0.086"	○	●				
05	3/16" x 1/8"		●				
07	1/4" x 5/32"		○	●			
11	3/8" x 1/4"			○	●		
13	1/2" x 3/8"				○	●	
19	3/4" x 5/8"					○	●
25	1" x 7/8"						○

○ Basic size ● With reducer



Used to block fittings which are not being used.

Applicable fitting

Symbol	Class
LQ1	
11	1
12	2
13	3
14	4
15	5
16	6

Series LQ1 Insertion Tool

Fittings

Changing tubing sizes

The tubing size can be changed within the same body class (body size) by replacing the nut and insert bushing. However, in case of class 1, the tubing cannot be changed by reducing.

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"
1	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—
2	●	●	○	—	—	—	—	—	●	●	○	—	—	—	—
3	—	—	●	●	○	—	—	—	—	—	●	○	—	—	—
4	—	—	—	—	●	○	—	—	—	—	—	●	○	—	—
5	—	—	—	—	—	●	○	—	—	—	—	—	●	○	—
6	—	—	—	—	—	—	●	○	—	—	—	—	—	●	○

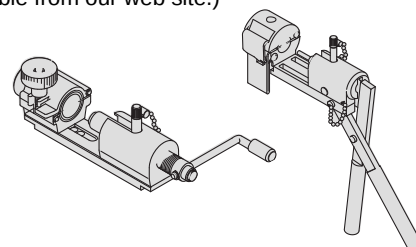
Parts composition

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

⚠ Caution

1. Connect tubing with special tools

Please refer to the LQ1, 2 series mounting method in "High Purity Fluoropolymer Fittings: HYPER FITTINGS®" (M-E05-1) for tubing connection and special tools. (Downloadable from our web site.)



Changing the tubing size

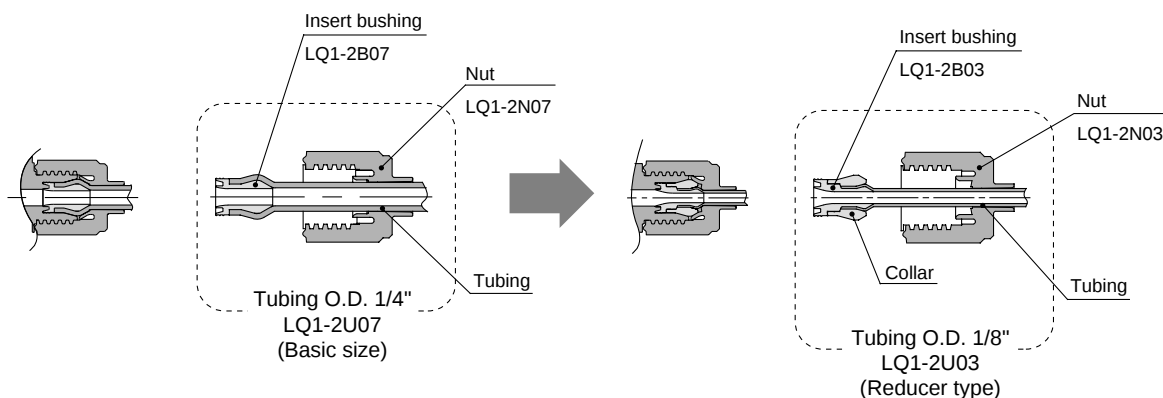
Example) Changing the tubing from an O.D. 1/4" to O.D. 1/8" in LQ1 body class 2.

Prepare an insert bushing and nut for 1/8" O.D. tubing (LQ1-2U03) and change the tubing size.

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



Note) Tubing is sold separately.



High Purity Fluoropolymer Needle Valve Series *LVN*

RoHS

How to Order

LVN **2** 0 – S **07**

Body class

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

LQ2 fittings

A port (IN)

Applicable tubing size

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

○ Basic size ● With reducer

Note) Applicable fittings: LQ2

Port B (OUT) different dia. size

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

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3

Different diameter tubing order example

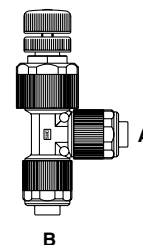
Different diameter tubing (with plug-in reducer) can be selected within the same body class.

(Example) Body class 3

A side: ø10 x ø8

B side: ø8 x ø6

Order as shown below.



LVN**30** – S **10** **08**

• Different dia. tubing size (B side)

• Applicable tubing size (A side)



Standard Specifications

Model		LVN20	LVN30	LVN40
Tubing O.D.	Metric size	4, 6	6, 8, 10	10, 12
	Inch size	1/8, 1/16, 1/4	1/4, 3/8	3/8, 1/2
Orifice diameter		ø4.4	ø8	ø10
Flow characteristics	$Av \times 10^{-6} m^2$	12	33.6	52.8
	Cv	0.5	1.4	2.2
Withstand pressure (MPa)		1		
Operating pressure (MPa)		0 to 0.5		
Fluid temperature (°C)		5 to 90		
Ambient temperature (°C)		0 to 60		
Mass (kg)		0.055	0.115	0.185

Different Diameter Tubing Applicable with Reducer

Different diameter tubing can be selected (within a body class) by using a nut and insert bushing (reducer). Applicable fitting: LQ2

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

Note) Refer to page 608 for information on changing tubing sizes. ○ Basic size ● With reducer

⚠ Specific Product Precautions

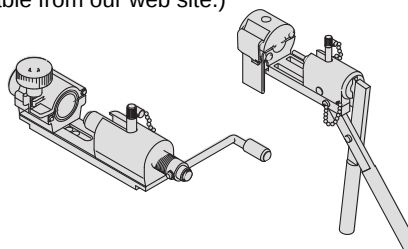
Be sure to read before handlings. Refer to front matters 42 and 43 for Safety Instructions.

Piping

⚠ Caution

1. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



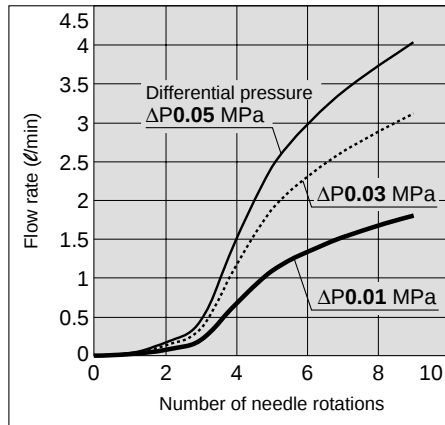
2. Tighten the nut to the end surface of the body. As a guide, refer to the proper tightening torques shown below.

Tightening torque for piping

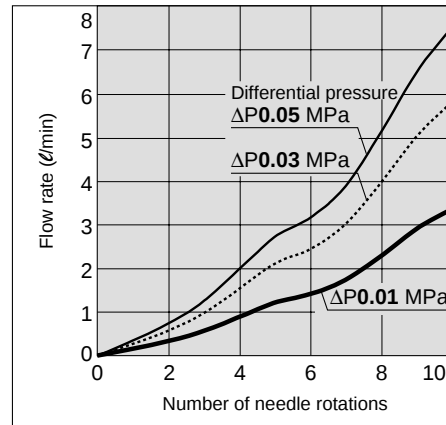
Body class	Torque (N·m)
2	1.5 to 2.0
3	3.0 to 3.5
4	7.5 to 9

Flow Characteristics (Fluid: Water)

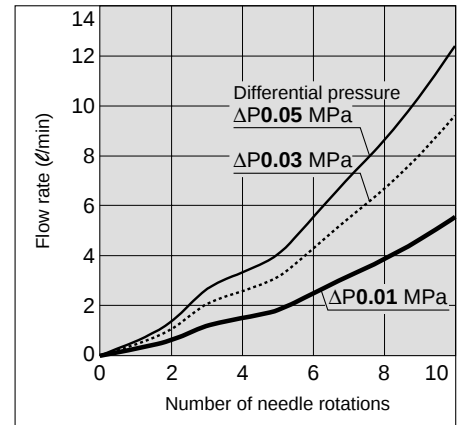
LVN20



LVN30



LVN40



LVC

LVA

LVH

LVD

LVQ

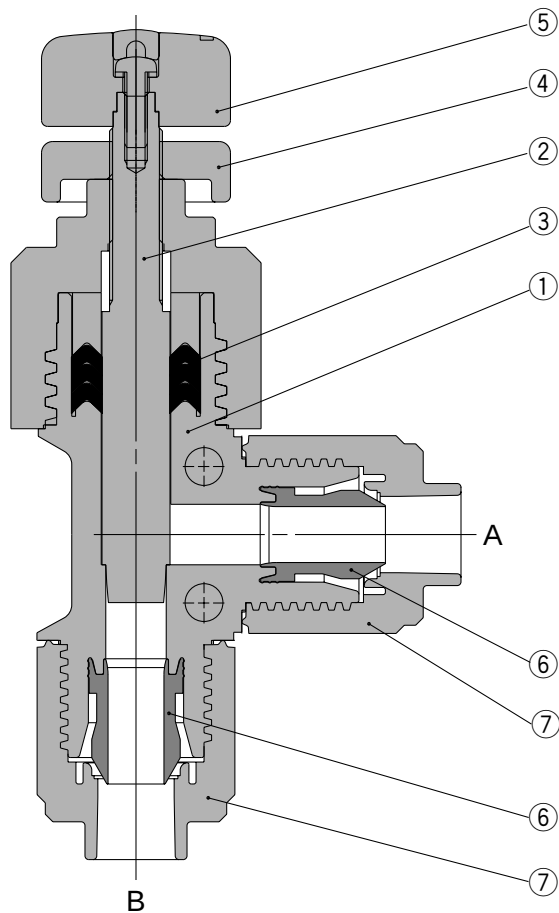
LQ1

LVN

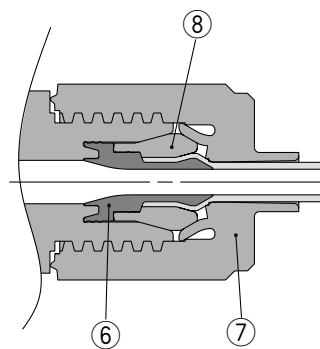
TL/TIL

LQ3

Construction



With reducer

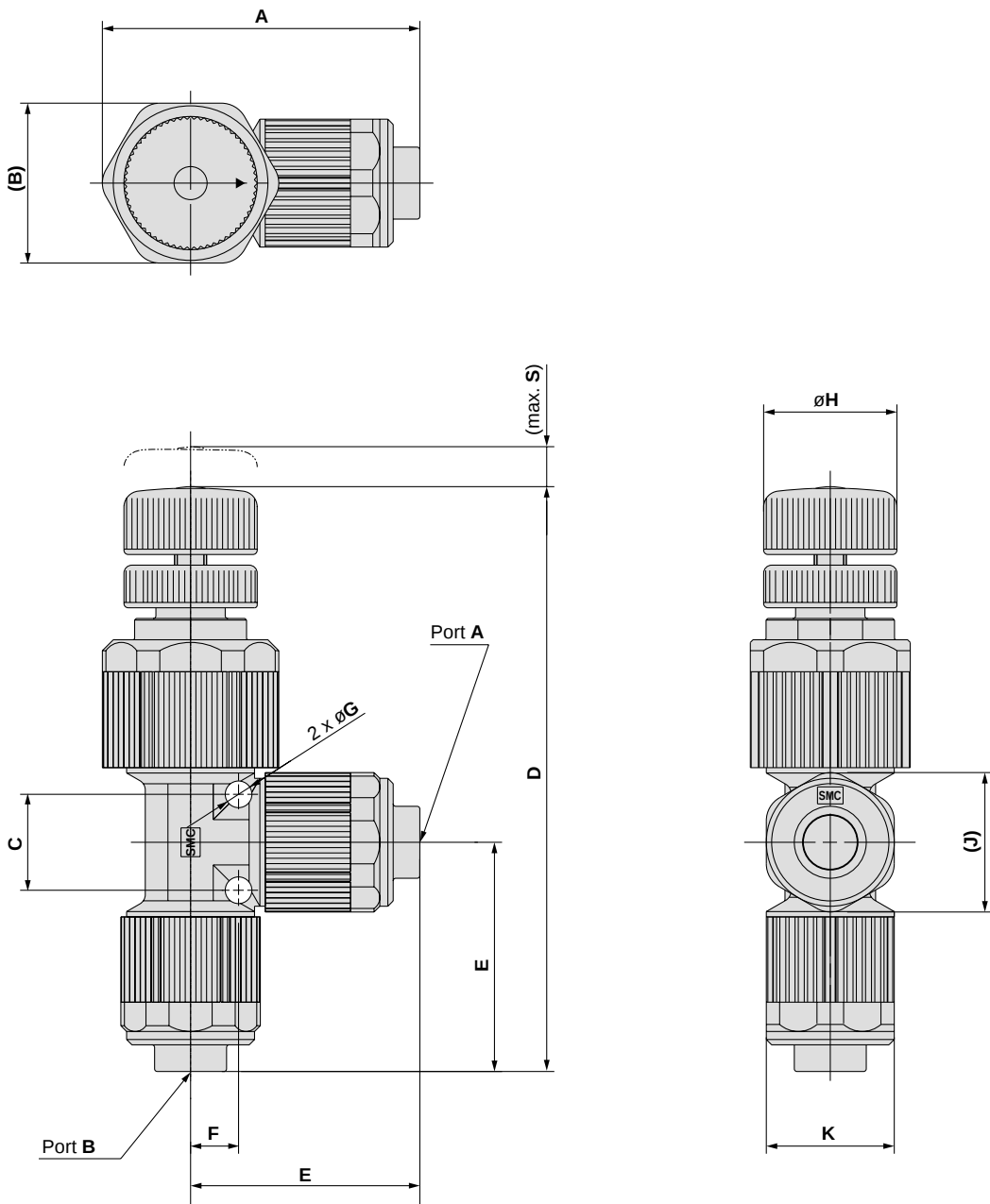


Part lists

No.	Description	Material
1	Body	PFA
2	Needle	PCTFE
3	V seal	PTFE
4	Lock nut	PVDF
5	Adjustment handle	PVDF
6	Insert bushing	PFA
7	Nut	PFA
8	Collar	PFA

Series *LVN*

Dimensions



Model	A	B	C	D	E	F	G	H	J	K	S
LVN20	48	24	12	88	34.5	6	4	14	20	18	2.4
LVN30	60	30	18	110	43	9	5	25	26	24	7.5
LVN40	72	36	22	124	52	11	6	25	33	30	8

High Purity Fluoropolymer Tubing

RoHS

Series TL/TIL

Material: Super PFA

Series and Specifications

		Metric sizes (Series TL)						Inch sizes (Series TIL)							
Tubing model		TL0403	TL0604	TL0806	TL1008	TL1210	TL1916	TIL01	TILB01	TIL05	TIL07	TIL11	TIL13	TIL19	TIL25
Nominal diameter		—	—	—	—	—	—	1/8"	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"
Tubing size		ø4 x ø3	ø6 x ø4	ø8 x ø6	ø10 x ø8	ø12 x ø10	ø19 x ø16	1/8" x 0.086"	1/8" x 1/16"	3/16" x 1/8"	1/4" x 5/32"	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"	1" x 7/8"
O.D. (mm)	Basic diameter	4	6	8	10	12	19	3.18	3.18	4.75	6.35	9.53	12.7	19.05	25.4
	Tolerance	±0.1				+0.2 −0.1		±0.1						+0.2 −0.1	
Thickness (mm)	Basic diameter	0.5	1				1.5	0.5	0.8	0.8	1.2	1.6			
	Tolerance	±0.05	±0.1				±0.15	±0.05	±0.08	±0.08	±0.12	±0.15			
Bundle	10 m	—	—	—	●	●	●	—	—	—	—	●	●	—	—
	20 m	●	●	●	●	●	●	●	—	●	●	●	●	●	●
	50 m	●	●	●	●	●	●	●	—	●	●	●	●	●	●
	100 m	●	●	●	●	●	●	●	—	●	●	●	●	●	—
	50 Ft. (16 m)	—	—	—	—	—	—	●	●	●	●	●	●	●	●
	100 Ft. (33 m)	—	—	—	—	—	—	●	●	●	●	●	●	●	●
Straight pipe	2 m	●	●	●	●	●	●	●	—	●	●	●	●	●	●
Color		Translucent (color of material)													
Applicable fluid		Please refer to the applicable fluid in page 614.													
Max. operating pressure (at 20°C) ^{Note 1)}		1 MPa			0.9 MPa	0.7 MPa	0.6 MPa	1 MPa						0.7 MPa	0.5 MPa
Burst pressure (at 20°C)		4.9 MPa	6.9 MPa	4.7 MPa	3.6 MPa	2.9 MPa	2.6 MPa	6.4 MPa	9.9 MPa	6.7 MPa	7.9 MPa	6.7 MPa	4.6 MPa	2.8 MPa	2.0 MPa
Min. bending radius (mm) ^{Note 2)}		20		40	65	110	160	12	6	20		30	60	160	290
Max. operating temperature (Fixed use)		260°C													
Material		Super PFA													



Note 1) • The maximum operating pressure is the value at 20°C. For other temperatures, calculate from the burst pressure drop coefficient.

Furthermore, an abnormal temperature increase due to adiabatic compression can cause tubing to burst. To operate at a temperature other than 20°C, the operating pressure must be no more than the value calculated using the equation below: When the value (calculated using the formula below) exceeds 1 MPa, the Max. operating pressure is 1 MPa.

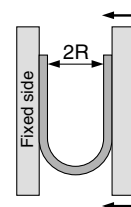
(Max. operating pressure) = 1/4 x (burst pressure drop coefficient) x (burst pressure at 20°C)

• When using a fluid in liquid form, the surge pressure must be no more than the maximum operating pressure.

A surge pressure higher than the maximum operating pressure can cause breakage of the fitting or bursting of the tubing.

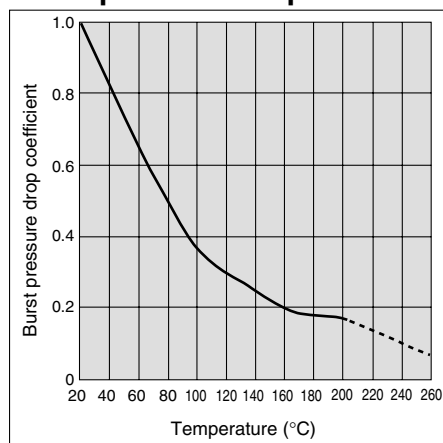
Note 2) The minimum bending radius is measured using the method shown in the figure at the right.

Note 3) It is connectable with LQ Series (3/4" size). As for other commercial items, there are some cases it is not able to connect due to tolerance of dimensions.



At a temperature of 20°C bend the tubing into a U shape. Then with one side fixed, gradually close the other side and measure 2R at the point where the tubing folds or flattens, etc.

Burst pressure drop curve



Note 4)

Eluting fluorine ion amount (μg/g)

Type	Fluorine ion
Eluting amount	0.1 or less

A 15 g piece of fluororesin tubing is cut off, washed in deionized water and immersed in 15 mL of 25% methyl alcohol extract at room temperature for 24 hours. Then the extract is diluted with deionized water to be subjected to a quantitative analysis of fluorine ions.

How to Order

Metric sizes

TL0604 - 20

Inch sizes

TIL01 - 20

Tubing Model

Length Applicable to both metric and inch size

Symbol	Type	Length
10	Roll	10 m
20		20 m
50		50 m
100		100 m
2S	Straight	2 m

Length Applicable to inch size only

Symbol	Type	Length
16	Roll	50 Ft. (16 m)
33		100 Ft. (33 m)

Please refer to the "Series and Specifications" above, as the tubing length differs depending on each size.

Note 4)

Eluting metal ion amount (ng/cm²)

Type	Al	Fe	Ni	Na	Ca
Eluting amount	4.5	0.3	0.2	7.1	1.3

The interior of the fluororesin tubing is washed with super deionized water. Approximately 20g of super high purity hydrofluoric acid (48%) is measured and injected into the tubing. The interior wall of the tubing is immersed at normal temperature for one week with both ends of the tubing plugged. Then the extract was diluted with super deionized water to be subjected to a quantitative analysis on Al, Fe, Ni, Na and Ca by the stripping method.

Note 4) Figures shown in tables are representative values, not guaranteed values.





Applicable Fluids

Material and fluid compatibility check list for high purity fluoropolymer fittings

Chemical		Compatibility
Acetic acid	100%	○
Acetone	100%	○ Note 1)
Ammonium fluoride	40%	○
Ammonium hydroxide	30%	○
Butyl acetate	100%	○
Methylene chloride	100%	○
Hydrochloric acid	38%	○
Hydrofluoric acid	50%	○
Hydrogen peroxide	60%	○
Methanol	100%	○
Methyl ethyl Ketone	—	○
Nitric acid	70%	○
Phosphoric acid	86%	○
Caustic potash	85%	○
Sulfuric acid	100%	○
Toluene	—	○ Note 1)
Xylene	—	○
Sodium hydroxide	100%	○
1,1,1-Trichloroethane	100%	○
Phosphorus pentachloride	—	○
Isobutyl alcohol	—	○ Note 1)
Isopropyl alcohol	—	○ Note 1)
Ozone	—	○
Ethyl acetate	—	○ Note 1)
Deionized water	—	○
Nitrogen	—	○
Ultrapure water	—	○
TMAH	—	○



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.

Table symbol ○: can be used.

- Compatibility is indicated for fluid temperatures of 200°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 LQ1, LVN, TL/TIL

High Purity Fluoropolymer Fittings/ Needle Valve/Tubing

Precautions 1

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions.

Design and 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. Fluid

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. Countermeasures for static electricity

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

Mounting

⚠ Warning

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

2. Instruction manual

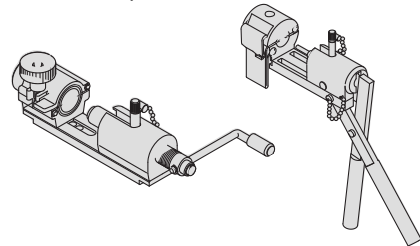
Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

Piping

⚠ Caution

1. Connect tubing with special tools.

Refer to the pamphlet "High-Purity Fluoropolymer Fittings HYPER FITTING®/Series LQ1, 2 Work Procedure Instructions" (M-E05-1) for connecting tubing and special tools. (Downloadable from our web site.)



2. Tighten the nut until it touches the end surface of the body, and then tighten it an additional 1/8 turn. As a guide, refer to the proper tightening torques shown below.

Nut tightening torque for piping

Body class	Torque (N·m)	
	LQ1	LVN
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	—
6	5.5 to 6.0	—



Note) Body class 1 must be tightened manually.

3. Use sealant tape for the piping of taper thread parts such as LQ1H and LQ1L.

Tape the ridges tightly with the sealant tape, starting one ridge width left from thread end side. 3 to 4 sealant tapes are required.

Taper thread mounting torque

Bore size	Torque (N·m)
1/8	0.6 to 0.9
1/4	0.8 to 1.2
3/8	1.0 to 1.6
1/2	1.5 to 2.0
3/4	2.0 to 2.7
1	2.5 to 3.6

LVC

LVA

LVH

LVD

LVQ

LQ1

LVN

TL/TIL

LQ3



Series LQ1, LVN, TL/TIL

High Purity Fluoropolymer Fittings/ Needle Valve/Tubing

Precautions 2

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions.

Operating Environment

⚠ Warning

1. Do not use in locations having an explosive atmosphere.
2. Do not operate in locations where vibration or impact occurs.
3. In locations near heat sources, block off radiated heat.

Maintenance

⚠ Warning

1. Perform maintenance in accordance with the procedures in the instruction manual.

Improper handling can cause damage.

2. When removing or reinstalling fittings, remove any remaining chemicals and carefully replace them with deionized water or air, etc., before beginning work activities.

3. Tightening of taper threads for piping

Because the taper threads are made of resin, minute leakage may gradually occur due to stress relaxation. Perform periodic inspections, and if leakage is detected correct the problem by additional tightening. If additional tightening becomes ineffective, replace the fitting with a new product.

4. Check the following during regular maintenance, and replace components as necessary.

- a) Scratches, gouges, abrasion, corrosion
- b) Twisting, flattening or distortion of tubing
- c) Hardening, deterioration or softening of tubing

5. Do not repair or patch the replaced tubing or fittings for reuse.

Operating Precautions

⚠ Warning

1. Operate within the range of the maximum operating pressure.

⚠ Caution

1. After a long period of non-use, perform inspections before beginning operation.
2. Use sufficient care in the handling of series LQ clean packaging types when their packaging is opened.
3. For LVN Series, be careful not to apply any excessive force to the stroke end, which fully opens and closes, to avoid accidental damage or changes in flow characteristics.

Installation of Tubing

⚠ Caution

1. Cut the end of the tubing at a right angle and pass it through the fitting nut. After placing the tubing in the holder, push it onto the insert bushing until it stops and clamp it with the knob.

As a guide when tightening the tubing with the knob, maintain a uniform gap (approx. 2 mm) on both sides of the holder.

- When the tubing is curved, straighten it out before using it.
- The tubing may slip if there is oil or dust, etc., on the holder. Remove the contamination using alcohol or another suitable cleaner.

Use of Tubing

⚠ Caution

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

Applicable tubing sizes

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