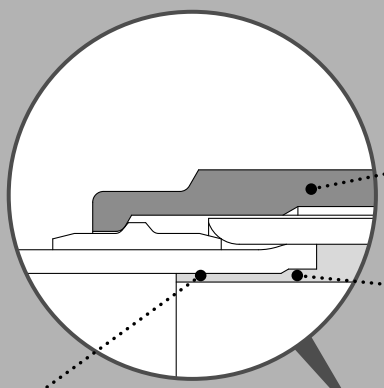
Stainless Steel 316 Insert Fittings

Series KFG

Superior tube mounting

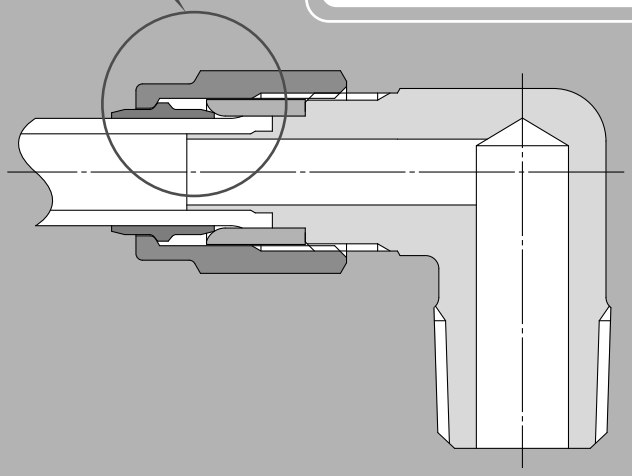
Union nut
- No need to remove nuts
- Tube can be installed as-is
- Light tightening, and adhesion prevention as well

Tube holder
- Prevents tubes from being disconnected during piping
- A strong feeling when inserting tube



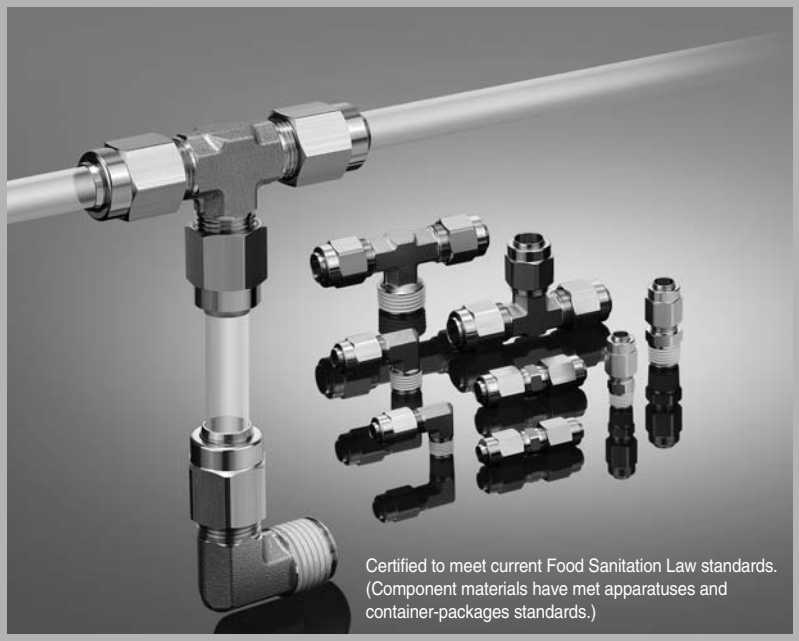
A reliable seal
Holds the tube tightly

Insert
An insert mechanism can provide reliable retaining force on tubes made of a wide variety of materials



Material: Stainless steel 316

- Max. operating temperature 150°C
- Applicable tubing material
  FEP, PFA, Modified PTFE, Nylon, Soft nylon, Polyurethane, Polyolefin, Soft polyolefin
- Can be used with steam.
- Grease-free



Certified to meet current Food Sanitation Law standards. (Component materials have met apparatuses and container-packages standards.)

Male Connector: KFGH

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGH0425-01S
		R1/4	KFGH0425-02S
ø6	ø4	R1/8	KFGH0604-01S
		R1/4	KFGH0604-02S
ø8	ø6	R1/8	KFGH0806-01S
		R1/4	KFGH0806-02S
		R3/8	KFGH0806-03S
ø10	ø7.5	R1/4	KFGH1075-02S
		R3/8	KFGH1075-03S
		R1/2	KFGH1075-04S
ø12	ø9	R1/4	KFGH1209-02S
		R3/8	KFGH1209-03S
		R1/2	KFGH1209-04S

Male Branch Tee: KFGT

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGT0425-01S
		R1/4	KFGT0425-02S
ø6	ø4	R1/8	KFGT0604-01S
		R1/4	KFGT0604-02S
ø8	ø6	R1/8	KFGT0806-01S
		R1/4	KFGT0806-02S
		R3/8	KFGT0806-03S
ø10	ø7.5	R1/4	KFGT1075-02S
		R3/8	KFGT1075-03S
		R1/2	KFGT1075-04S
ø12	ø9	R1/4	KFGT1209-02S
		R3/8	KFGT1209-03S
		R1/2	KFGT1209-04S

Male Elbow: KFGL

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGL0425-01S
		R1/4	KFGL0425-02S
ø6	ø4	R1/8	KFGL0604-01S
		R1/4	KFGL0604-02S
ø8	ø6	R1/8	KFGL0806-01S
		R1/4	KFGL0806-02S
		R3/8	KFGL0806-03S
ø10	ø7.5	R1/4	KFGL1075-02S
		R3/8	KFGL1075-03S
		R1/2	KFGL1075-04S
ø12	ø9	R1/4	KFGL1209-02S
		R3/8	KFGL1209-03S
		R1/2	KFGL1209-04S

Straight Union: KFGH

Applicable tubing size		Model
O.D.	I.D.	
ø4	ø2.5	KFGH0425-00
ø6	ø4	KFGH0604-00
ø8	ø6	KFGH0806-00
ø10	ø7.5	KFGH1075-00
ø12	ø9	KFGH1209-00

Union Tee: KFGT

Applicable tubing size		Model
O.D.	I.D.	
ø4	ø2.5	KFGT0425-00
ø6	ø4	KFGT0604-00
ø8	ø6	KFGT0806-00
ø10	ø7.5	KFGT1075-00
ø12	ø9	KFGT1209-00

Related Product

Stainless Steel 316 One-touch Fittings

Series KQG

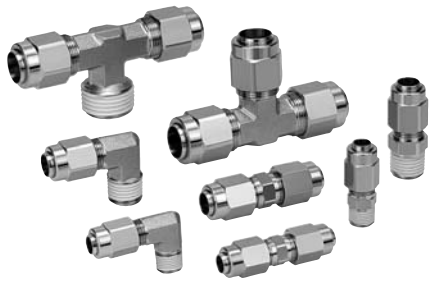
- Material: Metal parts/ Stainless steel 316
  Seal parts/Special FKM
- Operating fluid temperature: –5 to 150°C
- Grease-free

Port size	Applicable tubing O.D.				
	ø4	ø6	ø8	ø10	ø12
M5	●	●			
R1/8	●	●	●		
R1/4		●	●	●	
R3/8			●	●	●
R1/2					●

Stainless Steel 316
Insert Fittings
Series KFG

Certified to meet current Food Sanitation Law standards.

(Component materials have met apparatuses and container-packages standards.)



Specifications

Operating fluid		Air, Water Note 1), Steam Note 2)
Operating pressure range Note 3)		–100 kPa to 1 MPa
Proof pressure		3 MPa
Ambient and Operating fluid temperature		–5 to 150°C (No freezing)
Lubricant		Grease-free specification
Thread	**Mounting section**	JIS B0203 (Taper thread for piping)
	Nut section	JIS B0205 (Metric fine thread)
Seal on the threads		With sealant

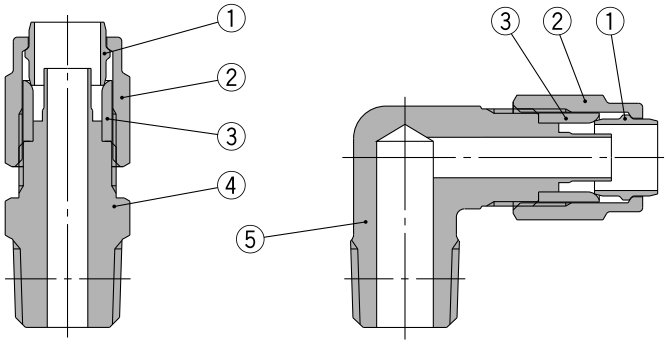
Note 1) The surge pressure must be under the maximum operating pressure.
Note 2) Please consult SMC for applicable tubing.
Note 3) Do not use the fittings with a leak tester or for vacuum retention because they are not guaranteed for zero leakage.

Applicable Tubing

Series	Tubing O.D.	Tubing O.D. x I.D. (mm)				
		ø4 x ø2.5	ø6 x ø4	ø8 x ø6	ø10 x ø7.5	ø12 x ø9
TH	FEP	●	●	●	●	●
TL	PFA	—	●	●	—	—
TD	Modified PTFE	●	●	●	●	●
T	Nylon	●	●	●	●	●
TS	Soft nylon Note 4)	●	●	●	●	●
TU	Polyurethane	●	●	—	—	—
TPH	Polyolefin	●	●	●	●	●
TPS	Soft polyolefin	●	●	—	—	—

Note 4) Soft nylon tubing is not compatible with water.

Construction



Component Parts

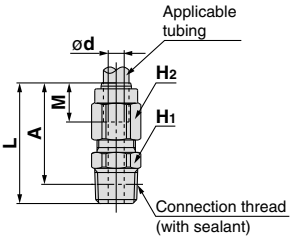
No.	Description	Material	Note
1	**Sleeve**	Stainless steel 316	
2	**Union nut**		Silver plated inner surface
3	**Guide**		Fluorine coating
4	**Male connector body**		
5	**Male elbow body**		

Dimensions

Male Connector: KFGH

Applicable tubing size O.D.	Applicable tubing size I.D.	Connection thread	Model	Width across flats H_1	Width across flats H_2	L	M	ød	A*	Effective area Note) (mm^2)	Mass (g)
ø4	ø2.5	R1/8	**KFGH0425-01S**	10	10	32	11.5	1.5	28	1.6	16
		R1/4	**KFGH0425-02S**	14		36			30		25
ø6	ø4	R1/8	**KFGH0604-01S**	10	12	32.7	11.2	3	28.7	6	19
		R1/4	**KFGH0604-02S**	14		36.7			30.7		29
ø8	ø6	R1/8	**KFGH0806-01S**	12	14	33.7	12.2	5	29.7	17	24
		R1/4	**KFGH0806-02S**	14		37.7			31.7		32
		R3/8	**KFGH0806-03S**			38.7			32.4		44
ø10	ø7.5	R1/4	**KFGH1075-02S**	17	17	39.7	14.2	6.5	33.7	30	44
		R3/8	**KFGH1075-03S**			40.7			34.4		52
		R1/2	**KFGH1075-04S**	22		43.7			35.5		75
ø12	ø9	R1/4	**KFGH1209-02S**	17	19	39.7		8	33.7	45	47
		R3/8	**KFGH1209-03S**			40.7			34.4		55
		R1/2	**KFGH1209-04S**	22		43.7			35.5		78

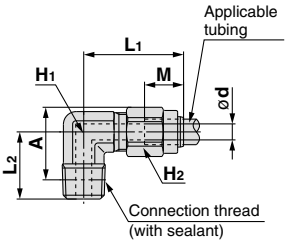
∗ Reference dimensions after installation of R thread
Note) Figures shown when using FEP tubing



Male Elbow: KFGL

Applicable tubing size O.D.	Applicable tubing size I.D.	Connection thread	Model	Width across flats H_1	Width across flats H_2	L_1	L_2	M	ød	A*	Effective area Note) (mm^2)	Mass (g)
ø4	ø2.5	R1/8	**KFGL0425-01S**	10	10	29	17	11.5	1.5	19	1.6	22
		R1/4	**KFGL0425-02S**				19					27
ø6	ø4	R1/8	**KFGL0604-01S**		12	29.7	17	11.2	3	20	6	25
		R1/4	**KFGL0604-02S**				19					30
ø8	ø6	R1/8	**KFGL0806-01S**	12	14	31.2	18	12.2	5	22.1	12	35
		R1/4	**KFGL0806-02S**				21			23.1	16	38
		R3/8	**KFGL0806-03S**			33.2	20			21.8		44
ø10	ø7.5	R1/4	**KFGL1075-02S**	14	17	36.7	21	14.2	6.5	24.8	23	58
		R3/8	**KFGL1075-03S**							24.5	26	64
		R1/2	**KFGL1075-04S**			39.7	25			26.6		77
ø12	ø9	R1/4	**KFGL1209-02S**		19	36.7	21		8	26	27	61
		R3/8	**KFGL1209-03S**							25.6	35	64
		R1/2	**KFGL1209-04S**			39.7	25			27.7		80

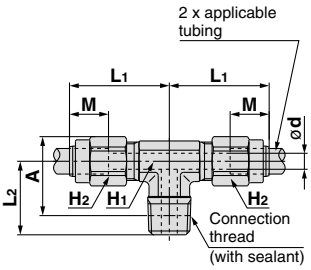
∗ Reference dimensions after installation of R thread
Note) Figures shown when using FEP tubing



Male Branch Tee: KFGT

Applicable tubing size O.D.	Applicable tubing size I.D.	Connection thread	Model	Width across flats H_1	Width across flats H_2	L_1	L_2	M	ød	A*	Effective area Note) (mm^2)	Mass (g)
ø4	ø2.5	R1/8	**KFGT0425-01S**	10	10	29	17	11.5	1.5	19	3	35
		R1/4	**KFGT0425-02S**				19					39
ø6	ø4	R1/8	**KFGT0604-01S**		12	29.7	17	11.2	3	20	10	41
		R1/4	**KFGT0604-02S**				19					46
ø8	ø6	R1/8	**KFGT0806-01S**	12	14	31.2	20	12.2	5	24.1	16	58
		R1/4	**KFGT0806-02S**				23			25.1	25	60
		R3/8	**KFGT0806-03S**			33.2	22			23.8		69
ø10	ø7.5	R1/4	**KFGT1075-02S**	14	17	36.7	23	14.2	6.5	26.8	30	95
		R3/8	**KFGT1075-03S**				22			25.5		101
		R1/2	**KFGT1075-04S**			39.7	27			28.6	41	117
ø12	ø9	R1/4	**KFGT1209-02S**		19	36.7	24		8	29	32	104
		R3/8	**KFGT1209-03S**							28.6	48	106
		R1/2	**KFGT1209-04S**			39.7	27			29.7		124

∗ Reference dimensions after installation of R thread
Note) Figures shown when using FEP tubing

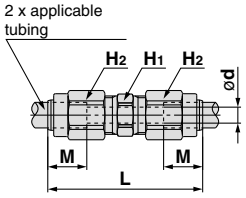


Dimensions

Straight Union: KFGH

Applicable tubing size		Model	Width across flats		L	M	ød	Effective area Note) (mm²)	Mass (g)
O.D.	I.D.		H1	H2					
ø4	ø2.5	KFGH0425-00	8	10	43.9	11.5	1.5	1.6	20
ø6	ø4	KFGH0604-00	10	12	45.4	11.2	3	6	28
ø8	ø6	KFGH0806-00	12	14	48.4	12.2	5	17	39
ø10	ø7.5	KFGH1075-00	17	17	52.4	14.2	6.5	30	63
ø12	ø9	KFGH1209-00		19	52.3		8	45	73

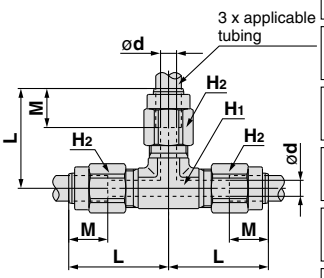
Note) Figures shown when using FEP tubing.



Union Tee: KFGT

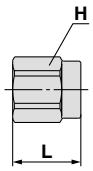
Applicable tubing size		Model	Width across flats		L	M	ød	Effective area Note) (mm²)	Mass (g)
O.D.	I.D.		H1	H2					
ø4	ø2.5	KFGT0425-00	10	10	29	11.5	1.5	1.6	42
ø6	ø4	KFGT0604-00		12	29.7	11.2	3	6	52
ø8	ø6	KFGT0806-00	12	14	31.2	12.2	5	17	70
ø10	ø7.5	KFGT1075-00	14	17	36.7	14.2	6.5	30	117
ø12	ø9	KFGT1209-00		19			8	45	128

Note) Figures shown when using FEP tubing.



Union Nut: KFGN

Applicable tubing O.D.	Model	Width across flats H	L	Mass (g)
ø4	KFGN-04	10	15	5
ø6	KFGN-06	12		6
ø8	KFGN-08	14	16	8
ø10	KFGN-10	17	18	11.5
ø12	KFGN-12	19		13.5



Sleeve: KFGS

Applicable tubing O.D.	Model	øD	L	Mass (g)
ø4	KFGS-04	6.5	8	0.7
ø6	KFGS-06	8.5		0.9
ø8	KFGS-08	10.5		1.2
ø10	KFGS-10	13	9	2.1
ø12	KFGS-12	15		2.2

Series KFG
Applicable Fluid Compatibility List 1

Compatibility Checklist for Used Materials and Fluids

Chemical	Main body	Chemical	Main body
	Stainless steel 316		Stainless steel 316
Acrylonitrile	◎	**Citric acid**	◎
Acetamide	○	**Cumene**	×
Acetaldehyde	◎	**Glycerin**	◎
Acetone	◎	**Cresol**	◎
Aniline	○	**Chromic acid [10%]**	◎
Amylene	◎	**Chlorosulfonic acid**	○
Sulphurous acid gas (Humid gas)	◎	**Chlorofluorocarbon (CFC) 11**	—
Sodium bisulfite [50%]	◎	**Chlorofluorocarbon (CFC) 113**	—
Allyl alcohol	◎	**Chlorofluorocarbon (CFC) 12**	○
Benzoic acid	◎	**Chlorofluorocarbon (CFC) 13B1**	—
Ammonia (Compressed gas)	◎	**Chlorofluorocarbon (CFC) 14**	—
Isopropyl alcohol	○	**Chlorofluorocarbon (CFC) 22**	○
Isophorone	×	**Chlorobenzene**	×
Ethyl alcohol	◎	**Chloroform (Trichloromethane)**	○
Ethyl ether	○	**Acetic acid**	○
Ethylene	◎	**Amyl acetate**	◎
Ethylene glycol	×	**Isopropyl acetate [20%]**	◎
Ethylene diamine	◎	**Ethyl acetate**	×
Ethylene dichloride	◎	**Butyl acetate**	×
Epichlorohydrine	◎	**Methyl acetate**	◎
Methyl tertiary butyl ether	—	**Calcium hypochlorite**	◎
Allyl chloride	×	**Sodium hypochlorite [5%]**	◎
Ammonium chloride	◎	**Potassium cyanide [50%]**	◎
Calcium chloride	◎	**Copper cyanide**	◎
Iron chloride (II) [5%]	×	**Diisobutyl ketone**	◎
Sodium chloride	○	**Diisobutylene**	—
Magnesium chloride	◎	**Diethanolamine**	◎
Hydrochloric acid [5%]	×	**Diethylamine**	×
Chlorine gas (Humid gas)	×	**Diethylene glycol**	◎
Carbitol	×	**Carbon tetrachloride**	◎
Formic acid [50%]	○	**Cyclohexanol**	×
o-Xylene	△	**Cyclohexanone**	×
p-Xylene	△	**Cyclohexane**	×

Note 1) [ ] denotes the concentration. Aqueous solutions without condensation notes are in a saturated state.
Note 2) The above data is based on a room temperature of 20°C. Note that you may obtain different figures, depending on temperature conditions.
Note 3) The above data shows compatibility guidelines based upon component parts. Therefore, it is no guarantee of product performance. In addition, using fluids other than those specified in the catalog are not covered by the product's warranty.

How to Read the Table
◎: Completely unaffected or largely unaffected.
○: May be slightly affected, but, dependent upon condition, can sufficiently withstand.
△: Advisable to use as little as possible.
×: Not applicable, as substantially affected.
—: No data is available.

Applicable Fluid Compatibility List 2

Compatibility Checklist for Used Materials and Fluids

Chemical	Main body
	Stainless steel 316
Dichloroethylene	—
Dichlorobenzene	—
Dichloromethane (Methylene chloride)	△
Ethylene bromide	×
Potassium bromide [30%]	◎
Potassium dichromate [25%]	◎
Oxalic acid	◎
Bromine gas	×
Tartaric acid	◎
Nitric acid [65%]	◎
Ammonium nitrate	◎
Ammonium hydroxide	—
Calcium hydroxide	◎
Sodium hydroxide [50%]	◎
Barium hydroxide	◎
Solvent naphtha	◎
Carbonic acid (Humid gas and aqueous solution)	◎
Tetrachloroethylene	×
Tetrahydrofuran	—
Dodecylbenzene	◎
Trichloroethane	△
Trichloroethylene	◎
Trichloroacetic acid	—
Toluene	◎
Naphtha	○
Naphthenic acid	◎
Lactic acid	◎
Carbon disulfide	○
Picric acid	◎
Pyridine	×
Phenol	×

Chemical	Main body
	Stainless steel 316
Butyl phthalate	×
Butyl alcohol	△
Hydrofluoric acid [50%]	◎
Furfurol	×
n-Propyl alcohol	◎
Propylene glycol	◎
Bromochloroethane	—
n-Hexane	○
n-Hexyl alcohol	◎
n-Heptane	◎
Benzene	×
n-Pentane	×
Boric acid	◎
Gallic acid	◎
Formic aldehyde	◎
Methyl methacrylate	×
Methyl alcohol	◎
Methyl isobutyl ketone	×
Methyl ethyl ketone	×
Ethyleneglycol monomethyl ether	×
Monoethanolamine	◎
Morpholine	◎
Butyric acid	◎
Hydrogen sulfide (Humid gas and aqueous solution)	◎
Sulphuric acid [10%]	◎
Ammonium sulfate	◎
Sodium bisulfate [10%]	◎
Iron sulfate (II)	○
Sodium sulfate	◎
Phosphoric acid [85%]	◎

Note 1) [ ] denotes the concentration. Aqueous solutions without condensation notes are in a saturated state.

Note 2) The above data is based on a room temperature of 20°C. Note that you may obtain different figures, depending on temperature conditions.

Note 3) The above data shows compatibility guidelines based upon component parts. Therefore, it is no guarantee of product performance. In addition, using fluids other than those specified in the catalog are not covered by the product's warranty.

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Series KFG
Specific Product Precautions

Be sure to read this before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

Selection

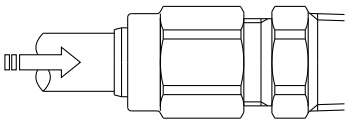
⚠ Caution

1. **Consult with SMC regarding fluids other than air, water and steam.**

Installation and Removal of Tubing

⚠ Caution

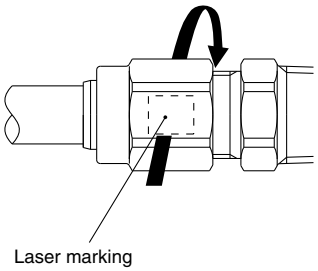
1. **Installation of tubing**
   1) Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tubing, use tubing cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection and leakage.
   2) Without loosening the union nut, grab the tube and gently push it thoroughly into the fitting.
   3) After insertion, confirm that the tube will not disconnect.



   4) When the union is loose, tighten it additionally, temporarily by hand.
   5) After fixing the body with the tightening tool, tighten the union nut by 1.5 turns, using an appropriate wrench. Shown below is the equivalent tightening torque.

Fitting size	Equivalent tightening torque N•m
KFG□0425	7 to 9
KFG□0604	11 to 13
KFG□0806	13 to 15
KFG□1075	16 to 18
KFG□1209	16 to 18

When tightening the nut, the laser marking can be used for reference.



Operating Environment

⚠ Warning

1. **Do not use in environments or locations where there is a danger of damage to fittings and tubing.**
   For fitting and tubing materials, refer to specifications and construction drawings, etc.

Maintenance

⚠ Caution

1. **Pre-maintenance inspection**
   When the product is removed, turn off the power, cut off the supply pressure, and confirm that fluid in the piping has been discharged.
2. **During regular maintenance, check for the following and replace any components as necessary.**
   a) Scratches, gouges, abrasion, corrosion
   b) Leakage
   c) Flattening or distortion of tubing
   d) Hardening, deterioration or softness of tubing
3. **Do not repair the fittings or patch the tubing for reuse.**
4. **Using this product for extended periods of time can result in leaks due to the material change. In such cases, tighten the union nut additionally.**
   A guide for the additional tightening is 1/6 to 1/4 turns. The limit for additional tightening is 1/2 turns.
   When there is a leak even after additional tightening, replace the sleeve and union nuts with new ones.
   Also, the outside diameter of tubes that have been used at high temperatures or for long periods of time will expand, and in some cases pipe fittings cannot be reattached. Tubes that cannot be attached should be discarded and replaced with new ones.
5. **Sleeve is not recyclable.**
   Replace it every time piping is performed.
   Body and union nut are recyclable. Refer to the table below for recyclable life.

Recyclable Life for Body and Union Nut

Tubing		Recyclable life
Series	Material	
TH TL TD	FEP PFA Modified PTFE	5 times
T TS TU TPH TPS	Nylon Soft nylon Polyurethane Polyolefin Soft polyolefin	Twice