Best suited for chemical liquid piping in semi-conductor manufacturing process

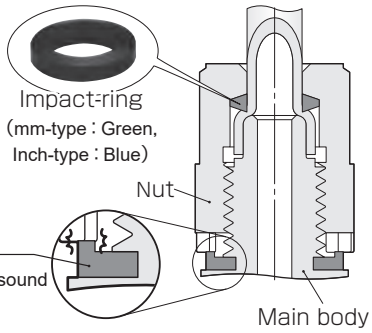
Fluororesin PFA



Characteristics

High tensile pull strength and seal integrity are realized.

▶ An impact-ring holds the tubing firmly.



Easy control of nut tightening.

▶ A click gauge is incorporated for making an easy check that the nut is firmly tightened.

Made of PFA with high chemical and heat resistance.

▶ Most of fluid medium or gaseous atmosphere.

Bore Through Male Connector is also available.



Clean washing + clean packaging

▶ ISO class 6

Little liquid stagnation

▶ Clean and Sanitary

Lower tightening torque

▶ Little body deformation

Model designation of fittings (Example)



③. Connection type and size

■ Compression fitting

Code	Inch size (inch(㎜)) (Impact-ring color : Blue)					
	H1	H2	H3	H4	H6	H8
Tubing O.D.	1/8" (ø3.2)	1/4" (ø6.35)	3/8" (ø9.35)	1/2 " (ø12.7)	3/4 " (ø19)	1" (ø25.4)
Tubing I.D.	.086" (ø2.18)	5/32" (ø3.95)	1/4" (ø6.35)	3/8" (ø9.53)	5/8" (ø15.8)	7/8" (ø22.2)

Code	mm size (㎜) (Impact-ring color : Green)							
	M3	M4	M6	M8	M10	M12	M19	M25
Tubing O.D.	ø3	ø4	ø6	ø8	ø10	ø12	ø19	ø25
Tubing I.D. (㎜)	ø2	ø3	ø4	ø6	ø8	ø10	ø15.8	ø22

■ Taper thread

Code	NPT thread					
	N1	N2	N3	N4	N6	N8
Male/Female thread	NPT1/8	NPT1/4	NPT3/8	NPT1/2	NPT3/4	NPT1

Code	Taper pipe thread (BSPT)					
	R1	R2	R3	R4	R6	R8
Male thread	R1/8	R1/4	R3/8	R1/2	R3/4	R1
Female thread	Rc1/8	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1

②. Tube size

Code	Inch size (inch(㎜)) (Impact-ring color : Blue)					
	H1	H2	H3	H4	H6	H8
Tubing O.D.	1/8" (ø3.2)	1/4" (ø6.35)	3/8" (ø9.35)	1/2 " (ø12.7)	3/4 " (ø19)	1" (ø25.4)
Tubing I.D.	.086" (ø2.18)	5/32" (ø3.95)	1/4" (ø6.35)	3/8" (ø9.53)	5/8" (ø15.8)	7/8" (ø22.2)

Code	mm size (㎜) (Impact-ring color : Green)							
	M3	M4	M6	M8	M10	M12	M19	M25
Tubing O.D.	ø3	ø4	ø6	ø8	ø10	ø12	ø19	ø25
Tubing I.D.	ø2	ø3	ø4	ø6	ø8	ø10	ø15.8	ø22

*M19 (Tube O.D.:ø19mm) and H6 (Tube O.D.:3/4in.) are common.
Order mm size (Code: M19) for Tube O.D. ø3/4in.

①. Fitting type

Code	Type
U	Union Straight
UT	Union Tee
RUT	Unequal Union Tee
MC	Straight
ME	Elbow

Code	Type
RU	Unequal Union Straight
RUE	Unequal Union Elbow
CP	Cap
MCT	Bore Through Male
FE	Female Elbow

Code	Type
UE	Union Elbow
PMU	Bulkhead Union
UEA	Union Elbow Adapter
FC	Female Straight
MBT	Run Tee

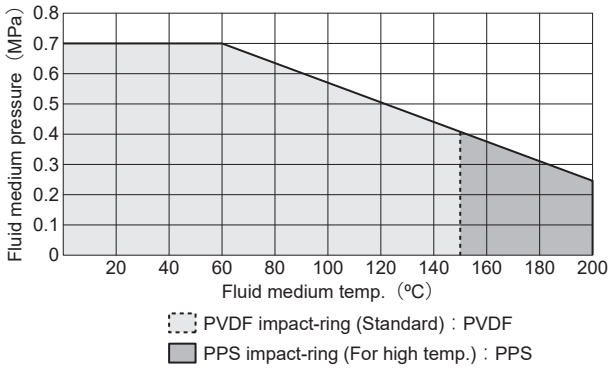
Fluororesin material

Specifications (Fitting)

Fluid medium	Liquid
Max. operating pressure	101psi (0.7MPa) at 32～140°F (at 0～60°C)*1
Operating temp. range	32～392°F (0～200°C) (Depending on Impact-ring material. See the chart below.)*2

*1. When operating temp. exceeds 140°F (60°C), refer to the following chart "Relation of Operating Temp. & Max. Operating Pressure"

*2. Impact-ring made of PVDF of max. operating temp.: 300°F (150°C) is equipped with fitting as standard. PPS impact-ring of max. operating temp.: 390°F (200°C) is required when using the fitting in high temp. exceeding 300°F (150°C). Check the tubing dia. and order applicable impact-ring as well.



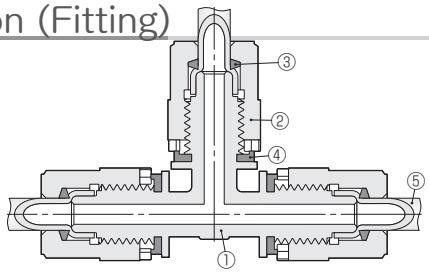
Relation of Operating Temp. & Max. Operating Pressure

Applicable tube

Pisco's Fluororesin PFA (New) tube "SFTN series" is recommended. All sizes for Fluororesin equipment are available (ø3 ～ ø25mm, ø1/8 ～ ø1inch). In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter and tube hardness are within the limits of Table. Tube dimensions.

Construction (Fitting)

F-UT (Union Tee)



No,	Parts	Material
①	Fitting body	PFA
②	Union nut	PFA
③	Impact-ring	PVDF/PPS
④	Click gauge	ETFE
⑤	Tubing	NEW PFA / PFA / PTFE / FEP

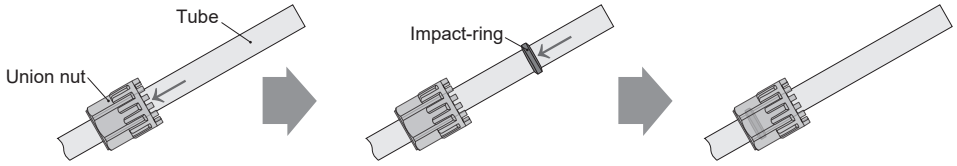
*The female thread portion of models F-FC and F-FE are made of PTFE

Table. Tubing dimensions

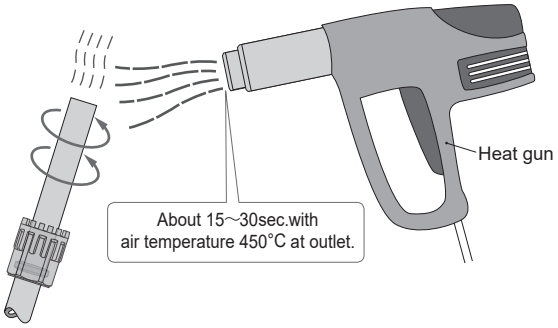
	Tube size	O.D. (ømm)	I.D. (ømm)	Thickness (mm)	Tolerance	
					O.D. (ømm)	Thickness (ømm)
inch size	ø1/8"	3.18	2.18	0.5	±0.1	±0.05
	ø1/4"	6.35	3.95	1.2	±0.1	±0.1
	ø3/8"	9.53	6.33	1.6	±0.12	±0.1
	ø1/2"	12.7	9.53	1.6	±0.12	±0.1
	ø3/4"	19	15.8	1.6	±0.12	±0.1
	ø1"	25.4	22.2	1.6	±0.2	±0.1
mm size	ø3	3	2	0.5	±0.1	±0.05
	ø4	4	3	0.5	±0.1	±0.05
	ø6	6	4	1	±0.1	±0.06
	ø8	8	6	1	±0.12	±0.06
	ø10	10	8	1	±0.12	±0.06
	ø12	12	10	1	±0.12	±0.06
	ø19 (3/4")	19	15.8 (5/8")	1.6	±0.12	±0.1
	ø25	25	22	1.5	±0.2	±0.1

How to install (by hot flaring)

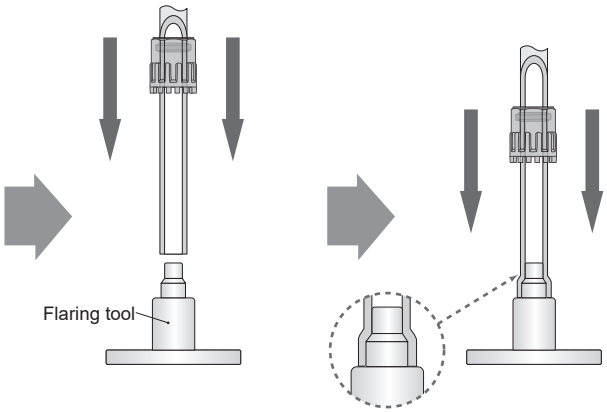
1 : Insert a tube into a union nut and an impact-ring.



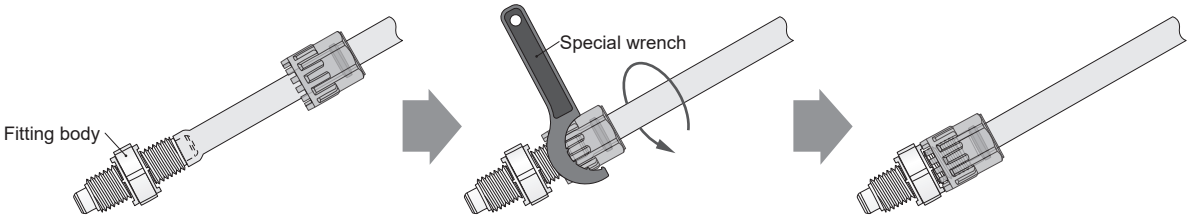
2 : Heat the edge of the tube evenly.



3 : Insert the heated tube edge onto a flaring tool immediately and hold it until the tube cools down.



4 : Insert the flared PFA or PTFE tube edge onto the fitting body. With a special wrench, tighten a union nut until projections on the union nut touch with a click gauge.



*For fluororesin fittings with tube O.D.:ø1/8inch, ø3mm or ø4mm, install them by cold flaring.
Cold flaring: flaring without heating. For details, please contact us.

Safety instruction manual

⚠Warnings

【For all fluororesin equipment】

1.Make sure to follow the instructions in this catalog (or instructions manual) for the installation, retorquing and reinstallation of the products. Improper installation or tightening may cause accidents like a fluid leakage or a piping coming off.
2.Do not retorque the products while pressure is supplied or under high temperature. It may cause damage or deformation of the products, leading to a fluid spouting. Make sure to lower the temperature to normal, and set the pressure to “0” before retorquing.
3.Make sure to use the fitting within the range of the specifications. Otherwise accidents like a fluid leakage or a piping coming-off may be caused.
4.Max. operating pressure of this products varies depending on the operating temperature. Make sure to check the “Relation of Operating Temp. & Max. Operating Pressure” in the specifications before the usage and follow it.
5.Since the fitting is made of resin, avoid any tensile force and bending force in / after installing it. Otherwise, there is a risk of causing damage or deformation of the product, resulting a fluid leakage.
6.Check chemical resistance before using the products, when the fluid medium is chemicals or solvent. Depending on the conditions, it may cause damage to the products, the detaching of tubes, and a fluid leakage.
7.Do not use the products under the condition with vibration or physical impact. These may cause damage to the products, the escape of tubes and a fluid leakage.

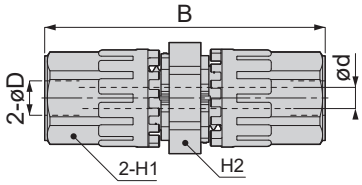
⚠Cautions

1.Do not use Pisco’s fluororesin equipment, combined with any other parts than this series. Otherwise accidents like a fluid leakage or a piping coming off may be caused.
2.Take safety measures such as providing a protection cover on piping and fitting to avoid burn when the liquid in piping exceeds 158°F (70°C).
3.Make sure to use Pisco’s flaring tool to flare tubes. Otherwise accidents like a fluid leakage may be caused.
4.Pay attention not to get burned when flaring tubes. The parts get hot.
5.Make sure the room is well ventilated when flaring tubes. Toxic gas may be generated if excessively heated.
6.Make sure to dispose liquid in a fitting and wash it before discarding the fitting. Unwashed fitting waste with toxic, flammable or corrosive liquid can be dangerous.
7.Toxic gas is generated when burning fluororesin. Dispose the fitting according to the regulations in your area.
8.Contact us when using gas as fluid medium. Basically Pisco’s fluororesin equipment is designated for liquid.
9.Make sure that the impact-ring is in the right position after piping. Piping without impact-ring is dangerous, causing accidents like a fluid leakage or a piping coming off.
10.Make sure to use impact-ring for high temperature when the liquid in piping exceeds 300°F (150°C). The impact-ring equipped with a fitting as standard will cause a fluid leakage or a piping coming off on 300°F (150°C) or higher.
11.When retorquing is necessary, due to a leakage from tube inserting parts, make sure the liquid temperature is normal, and make the pressure “0” before retorquing. Tighten the union nut with a special wrench by 1/4 turns and observe the progress. Be noted that the liquid still may ooze out after retorquing (even after the leakage stops) for a while, since some liquid remains inside the union nut.
12.A leakage from taper pipe thread parts due to “creep phenomenon” which is particular to resin may occur. Check the tightening condition periodically and re-torque the thread in case of leaks.
13.After the initial tightening of the union nut and taper pipe thread, the torque is reduced, normally within 24hours, due to the characteristics of the resin. Therefore, retorquing after 24hours is effective to ensure the long-term stable sealability. When a heat cycle is applied to the fitting, retorquing at low temperature after the first heat cycle is recommended.
14.Taper thread is not coated with Sealock. When coating the thread with seal tape, do not coat 1.5 to 2 screw ridges from the tip of the thread.
15.Tighten taper thread by hand until it stops, then use a wrench to tighten it about 1.5 to 2.5 more turns. Excessive tightening may break the thread part. Inadequate tightening may cause a loosened thread or a fluid leakage.
16.Take safety measures such as providing a protection cover if there is a risk of causing damages or fire on machine / facilities by a fluid leakage.
17.Corrosiveness of a fitting and its ion elution to fluid medium depend on the operating environment. If they might adversely affect the machine and equipment, evaluate and examine the product based on the actual usage condition prior to the product adoption.

Appearance drawing

F-U Union Straight





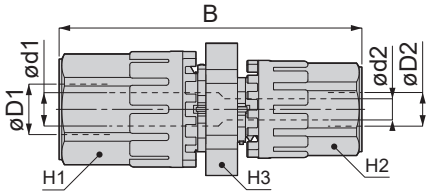
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD	ød	B	Hex. H1	Hex. H2	Weight (g)
	3×2	2	40.7	11	13	10.9
	4×3	3	40.7	11	13	12.0
	6×4	4	52.4	16	20	27.0
F-U-M8	8×6	6.3	60.7	19	23	41.0
F-U-M10	10×8	8	60.7	19	23	42.0
F-U-M12	12×10	10	73.3	24	29	63.6
F-U-M19	19×15.8 (3/4"x5/8")	16	88.3	32	38	132.0
F-U-M25	25×22	22	102.3	41	49	247.0

F-RU Unequal Union Straight





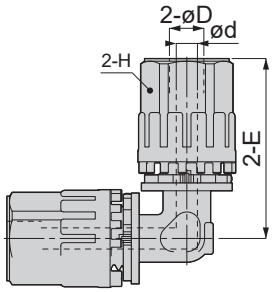
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD1	Tubing O.D. x I.D. øD2	ød1	ød2	B	Hex. H1	Hex. H2	Hex. H3	Weight (g)
	6×4	3×2	4	2	46.5	16	11	20	22.0
		4×3		3					23.0
F-RU-M8-M6	8×6	6×4	6.3	4	56.6	19	16	23	34.0
F-RU-M10-M6	10×8	6×4	8	4	56.6	19	16	23	32.0
F-RU-M10-M8		8×6		6.3	60.7		19		38.0
F-RU-M12-M6	12×10	6×4	10	4	63.5	24	16	29	50.0
F-RU-M12-M8		8×6		6.3	67.7		19		55.0
F-RU-M12-M10		10×8		8					56.0
F-RU-M19-M10	19×15.8	10×8	16	8	75.1	32	19	38	94.0
F-RU-M19-M12		12×10		10	80.8		24		106.7
F-RU-M25-M12	25×22	12×10	22	10	87.8	41	24	49	170.0
F-RU-M25-M19		19×15.8		16	95.3		32		190.0

F-UE Union Elbow



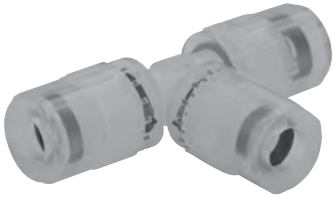


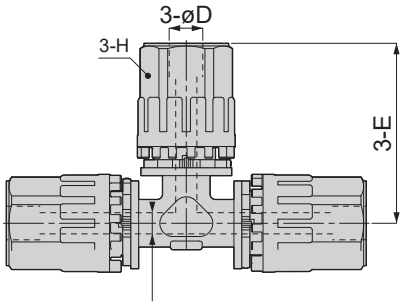
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
	3×2	2	24.8	11	11.0
	4×3	3	24.8	11	11.2
	6×4	4	33.7	16	27.0
F-UE-M8	8×6	6.3	39.9	19	40.2
F-UE-M10	10×8	8	39.9	19	40.0
F-UE-M12	12×10	10	48.5	24	68.0
F-UE-M19	19×15.8 (3/4"x5/8")	16	61	32	150.0
F-UE-M25	25×22	22	73	41	259.0

F-UT Union Tee





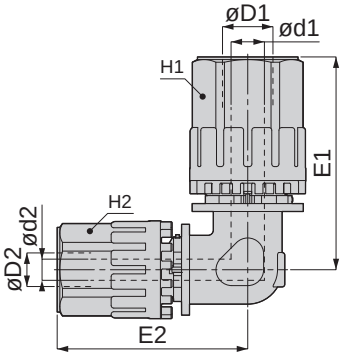
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
	3×2	2	24.8	11	15.0
	4×3	3	24.8	11	16.0
	6×4	4	33.7	16	37.0
F-UT-M8	8×6	6.3	39.9	19	57.0
F-UT-M10	10×8	8	39.9	19	58.0
F-UT-M12	12×10	10	48.5	24	105.0
F-UT-M19	19×15.8 (3/4"x5/8")	16	61	32	214.0
F-UT-M25	25×22	22	73	41	396.0

F-RUE Unequal Union Elbow





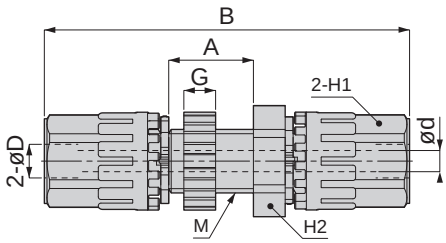
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD1	Tubing O.D. x I.D. øD2	ød1	ød2	E1	E2	Hex. H1	Hex. H2	Weight (g)
	6×4	3×2	4	2	33.7	27.3	16	11	20.0
		4×3		3					20.2
F-RUE-M8-M6	8×6	6×4	6.3	4	39.9	35.7	19	16	35.0
F-RUE-M10-M6	10×8	6×4	8	4	39.9	35.7	19	16	34.0
F-RUE-M10-M8		8×6		6.3		39.9		19	40.0
F-RUE-M12-M6	12×10	6×4	10	4	48.5	38.2	24	16	52.0
F-RUE-M12-M8		8×6		6.3		42.4		19	57.0
F-RUE-M12-M10		10×8		8					58.0
F-RUE-M19-M10	19×15.8	10×8	16	8	61	46.9	32	19	110.0
F-RUE-M19-M12		12×10		10		53		24	120.0
F-RUE-M25-M12	25×22	12×10	22	10	73	58	41	24	180.0
F-RUE-M25-M19		19×15.8		16		66		32	220.0

F-PMU Bulkhead Union





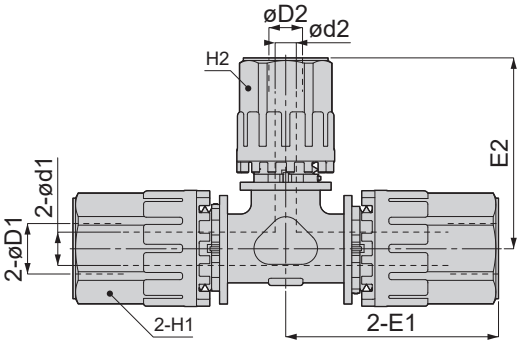
Tubing size : mm

Unit : mm

Model code	Tubing O.D. x I.D. øD	ød	M	B	A	G	Hex. H1	Hex. H2	Weight (g)
	6×4	4	M12×P1.5	68.4	16	6	16	20	32.0
F-PMU-M8	8×6	6.3	M16×P1.5	76.7	16	6	19	23	48.0
F-PMU-M10	10×8	8	M16×P1.5	76.7	16	6	19	23	49.0
F-PMU-M12	12×10	10	M20×P2	90.6	17.3	7.3	24	29	81.0
F-PMU-M19	19×15.8 (3/4"x5/8")	16	M27×P2	105.6	17.3	7.3	32	38	152.0
F-PMU-M25	25×22	22	M36×P2	119.6	17.3	7.3	41	49	228.0

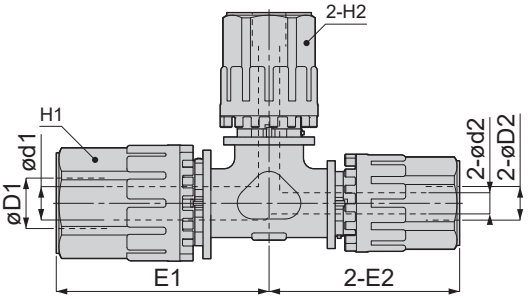
F-RUT Unequal Union Tee





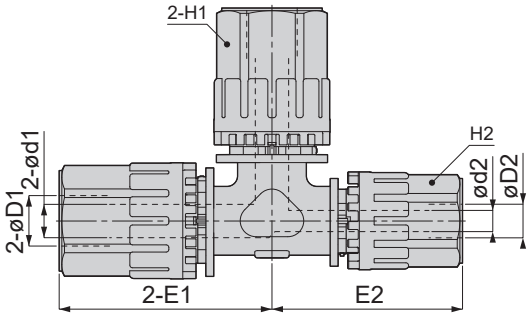
■ Tube size：H3-H2-H2





■ Tube size：H3-H3-H2, H4-H4-H2, H4-H4-H3, H6-H6-H4, M19-M19-M12





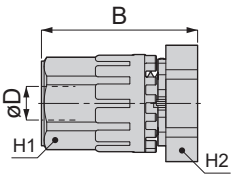
Tubing size : mm

Unit：mm

Model code	Tubing O.D. x I.D. øD1	Tubing O.D. x I.D. øD2	ød1	ød2	E1	E2	Hex. H1	Hex. H2	Weight (g)
F-RUT-M8-M6-M8	8×6	6×4	6.3	4	39.9	35.7	19	16	50.0
F-RUT-M10-M6-M10	10×8	6×4	8	4	39.9	35.7	19	16	50.0
F-RUT-M10-M8-M10		8×6		6.3		39.9		19	57.0
F-RUT-M12-M6-M12	12×10	6×4	10	4	48.5	38.2	24	16	84.0
F-RUT-M12-M8-M12		8×6		6.3		42.4		19	93.0
F-RUT-M12-M10-M12		10×8		8					
F-RUT-M19-M10-M19	19×15.8	10×8	16	8	61	46.9	32	19	170.0
F-RUT-M19-M12-M19		12×10		10		53		24	183.0
F-RUT-M19-M19-M12									189.0
F-RUT-M25-M19-M25	25×22	19×15.8	22	16	73	66	41	32	323.0

F-CP Cap





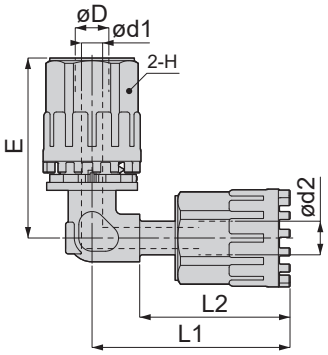
Tubing size : mm

Unit : mm

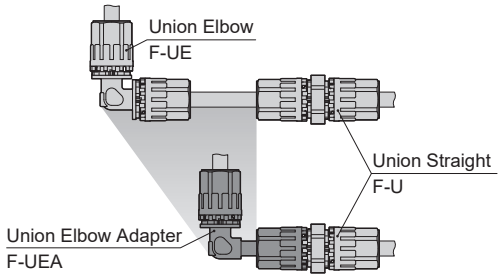
Model code	Tubing O.D. x I.D. øD	B	Hex. H1	Hex. H2	Weight (g)
	6×4	29.2	16	20	35.0
F-CP-M8	8×6	33.4	19	23	38.0
F-CP-M10	10×8	33.4	19	23	40.0
F-CP-M12	12×10	40.3	24	29	43.0
F-CP-M19	19×15.8 (3/4"x5/8")	47.8	32	38	82.0
F-CP-M25	25×22	54.8	41	49	133.0

F-UEA Union Elbow Adapter (Socket type)





■ Compared with Union Elbow (F-UE), Union Elbow Adapter contributes to space-saving in right angled piping. It can be connected to a mating tting directly by removing its union nut.(See below.)



Tubing size : mm

Unit : mm

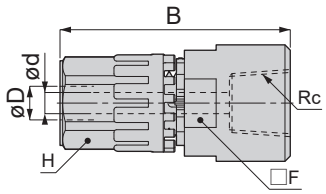
Model code	Tubing O.D. x I.D. øD	ød1	Applicable tting code ød2	E	L1	L2	Hex. H	Weight (g)
	6×4	4	H2 or M6	33.7	37.4	28.4	16	26.0
F-UEA-M8-TH3S	8×6	6.3	H3 or M8	39.9	42.2	31.2	19	38.0
F-UEA-M10-TH3S	10×8	8	H3 or M8	39.9	42.2	31.2	19	38.0
F-UEA-M12-TH4S	12×10	10	H4 or M12	48.5	52.5	39	24	66.0
F-UEA-M19-TH6S	19×15.8 (3/4"x5/8")	16	H6 or M19	61	65	47	32	138.0
F-UEA-M25-TH8S	25×22	22	H8 or M25	73	83.7	60.7	41	233.0

*1. "L1" and "L2" are outline dimensions

*2. Can be connected to tting with both mm and inch size listed in "Applicable tting code" above.

F-FC Female Straight





Tubing size : inch, Female thread size : NPT thread(NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	Rc	B	ød	Hex. H	□F	Weight (g)
F-FC-H2-N1	1/4" (6.35)×5/32" (3.95)	NPT1/8	40.2	4	16	20	24.0
F-FC-H2-N2		NPT1/4	43.2				26.0
F-FC-H2-N3		NPT3/8	43.7			23	28.0
F-FC-H3-N2	3/8" (9.53)×1/4" (6.35)	NPT1/4	47.4	6.3	19	23	32.0
F-FC-H3-N3		NPT3/8	47.9				35.0
F-FC-H3-N4		NPT1/2	51.9			29	48.0
F-FC-H4-N2	1/2" (12.7)×3/8" (9.53)	NPT1/4	54.3	10	24	29	48.0
F-FC-H4-N3		NPT3/8	54.8				50.0
F-FC-H4-N4		NPT1/2	58.8				60.0
F-FC-H6-N4	3.4" (19)×5/8" (15.8)	NPT1/2	66.3	16	32	38	100.0
		NPT3/4	66.8				117.0
	1" (25.4)×7/8" (22.2)	NPT3/4	73.8	22	41	49	175.0
		NPT1	77.8				210.0

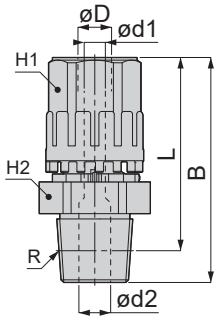
Tubing size : mm, Female thread size : Taper pipe thread(Rc)

Unit : mm

Model code	Tubing O.D. x I.D. øD	Rc	B	ød	Hex. H	□F	Weight (g)
	6×4	Rc1/8	40.2	4	16	20	24.0
		Rc1/4	43.2				26.0
		Rc3/8	43.7			23	28.0
F-FC-M8-R1	8×6	Rc1/8	44.4	6.3	19	23	30.0
F-FC-M8-R2		Rc1/4	47.4				32.0
F-FC-M8-R3		Rc3/8	47.9				34.0
F-FC-M10-R2	10×8	Rc1/4	47.4	8	19	23	32.0
F-FC-M10-R3		Rc3/8	47.9				34.0
F-FC-M10-R4		Rc1/2	51.9			29	46.0
F-FC-M12-R2	12×10	Rc1/4	54.3	10	24	29	48.0
F-FC-M12-R3		Rc3/8	54.8				50.0
F-FC-M12-R4		Rc1/2	58.8				60.0
F-FC-M19-R4	19×15.8	Rc1/2	66.3	16	32	38	100.0
F-FC-M19-R6		Rc3/4	66.8				114.0
F-FC-M25-R6	25×22	Rc3/4	73.8	22	41	49	180.0
F-FC-M25-R8		Rc1	77.8				215.0

F-MC Straight





Tubing size : inch, Thread size : NPT thread(NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	R	B	L	ød1	ød2	Hex. H1	Hex. H2	Weight (g)
F-MC-H2-N1	1/4" (6.35)×5/32" (3.95)	NPT1/8	38.2	34.1	4	3	16	20	21.0
F-MC-H2-N2		NPT1/4	42.2	36.4		6			22.0
F-MC-H2-N3		NPT3/8		36.1		10			24.0
F-MC-H3-N2	3/8" (9.53)×1/4 (6.35)	NPT1/4	46.4	40.6	6.3	6.3	19	23	26.0
F-MC-H3-N3		NPT3/8		40.3		10			27.0
F-MC-H3-N4		NPT1/2	50.2	42.1		12			29.3
F-MC-H4-N2	1/2" (12.7)×3/8" (9.53)	NPT1/4	53.3	47.5	10	6	24	29	43.9
F-MC-H4-N3		NPT3/8		47.2		10			44.3
F-MC-H4-N4		NPT1/2	57.1	49		12			45.3
		NPT3/4	57.4	48.8		16			47.5
F-MC-H6-N4	3/4" (19)×5/8" (15.8)	NPT1/2	64.6	56.5	16	12	32	38	84.4
		NPT3/4	64.9	56.3		16			85.8
F-MC-H6-N8		NPT1	69.2	59		22			88.7
F-MC-H8-N6	1" (25.4)×7/8" (22.2)	NPT3/4	71.9	63.3	22	16	41	49	147.0
F-MC-H8-N8		NPT1	76.2	66		22			156.0

*"L" is a reference value for height dimension after tightening thread.

Tubing size : mm, Thread size : Taper pipe thread(R)

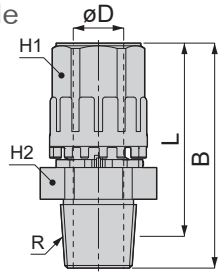
Unit : mm

Model code	Tubing O.D. x I.D. øD	R	B	L	ød1	ød2	Hex. H1	Hex. H2	Weight (g)
	3×2	R1/8	32.3	28.3	2	3	11	13	10.0
		R1/4	36.3	30.3		6			
	4×3	R1/8	32.3	28.3	3	3	11	13	10.0
		R1/4	36.3	30.3		6			
	6×4	R1/8	38.2	34.2	4	3	16	20	16.9
		R1/4	42.2	36.2		6			20.0
		R3/8		35.9		10			21.0
F-MC-M8-R1	8×6	R1/8	42.4	38.4	6.3	3	19	23	22.6
F-MC-M8-R2		R1/4	46.4	40.4		6.3			26.0
F-MC-M8-R3		R3/8		40.1		10			27.0
F-MC-M8-R4		R1/2	50.2	42		12			29.4
F-MC-M10-R2	10×8	R1/4	46.4	40.4	8	6	19	23	24.6
F-MC-M10-R3		R3/8		40.1		10			28.0
F-MC-M10-R4		R1/2	50.2	42		12			30.0
F-MC-M12-R2	12×10	R1/4	53.3	47.3	10	6	24	29	42.0
F-MC-M12-R3		R3/8		47		10			43.0
F-MC-M12-R4		R1/2	57.1	48.9		12			46.0
F-MC-M12-R6		R3/4	57.4	47.9		16			49.0
F-MC-M19-R4	19×15.8	R1/2	64.6	56.4	16	12	32	38	84.0
F-MC-M19-R6		R3/4	64.9	55.4		16			89.0
F-MC-M19-R8		R1	69.2	58.8		22			92.0
F-MC-M25-R6	25×22	R3/4	71.9	62.4	22	16	41	49	160.0
F-MC-M25-R8		R1	76.2	65.8		22			

*"L" is a reference value for height dimension after tightening thread.

F-MCT Bore Through Male







Tubing size : inch, Thread size : NPT thread(NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	R	B	L	Hex. H1	Hex. H2	Weight (g)
F-MCT-H2-N2	1/4" (6.35)×5/32" (3.95)	NPT1/4	42.2	36.4	16	20	21.0
F-MCT-H2-N3		NPT3/8		36.1			24.0
F-MCT-H3-N3	3/8" (9.53)×1/4" (6.35)	NPT3/8	46.4	40.3	19	23	30.0
F-MCT-H3-N4		NPT1/2	50.2	42.1			32.0
F-MCT-H4-N4	1/2" (12.7)×3/8" (9.53)	NPT1/2	57.1	49	24	29	46.0
		NPT3/4	57.4	48.8			54.0
	3/4" (19)× 5/8" (15.8)	NPT3/4	64.9	56.3	32	38	86.0
		NPT1	69.2	59			100.0
	1" (25.4)×7/8" (22.2)	NPT1	76.2	66	41	49	154.0

*"L" is a reference value for height dimension after tightening thread.

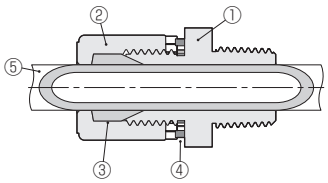
Tubing size : mm, Thread size : Taper pipe thread(R)

Unit : mm

Model code	Tubing O.D. x I.D. øD	R	B	L	Hex. H1	Hex. H2	Weight (g)
	3×2	R1/8	32.3	28.3	11	13	11.0
	4×3	R1/8	32.3	28.3	11	13	11.0
		R1/4	36.3	30.3			13.0
	6×4	R1/8	38.2	34.2	16	20	17.1
		R1/4	42.2	36.2			19.6
		R3/8		35.9			21.5
F-MCT-M8-R2	8×6	R1/4	46.4	40.4	19	23	24.2
F-MCT-M8-R3		R3/8		40.1			26.9
F-MCT-M8-R4		R1/2	50.2	42			32.0
F-MCT-M10-R3	10×8	R3/8	46.4	40.1	19	23	25.0
F-MCT-M10-R4		R1/2	50.2	42			29.0
F-MCT-M12-R4	12×10	R1/2	57.1	48.9	24	29	44.8
F-MCT-M12-R6		R3/4	57.4	47.9			52.1
F-MCT-M19-R6	19×15.8	R3/4	64.9	55.4	32	38	80.8
F-MCT-M19-R8		R1	69.2	59.3			98.0
F-MCT-M25-R8	25×22	R1	76.2	65.8	41	49	156.0

*"L" is a reference value for height dimension after tightening thread.

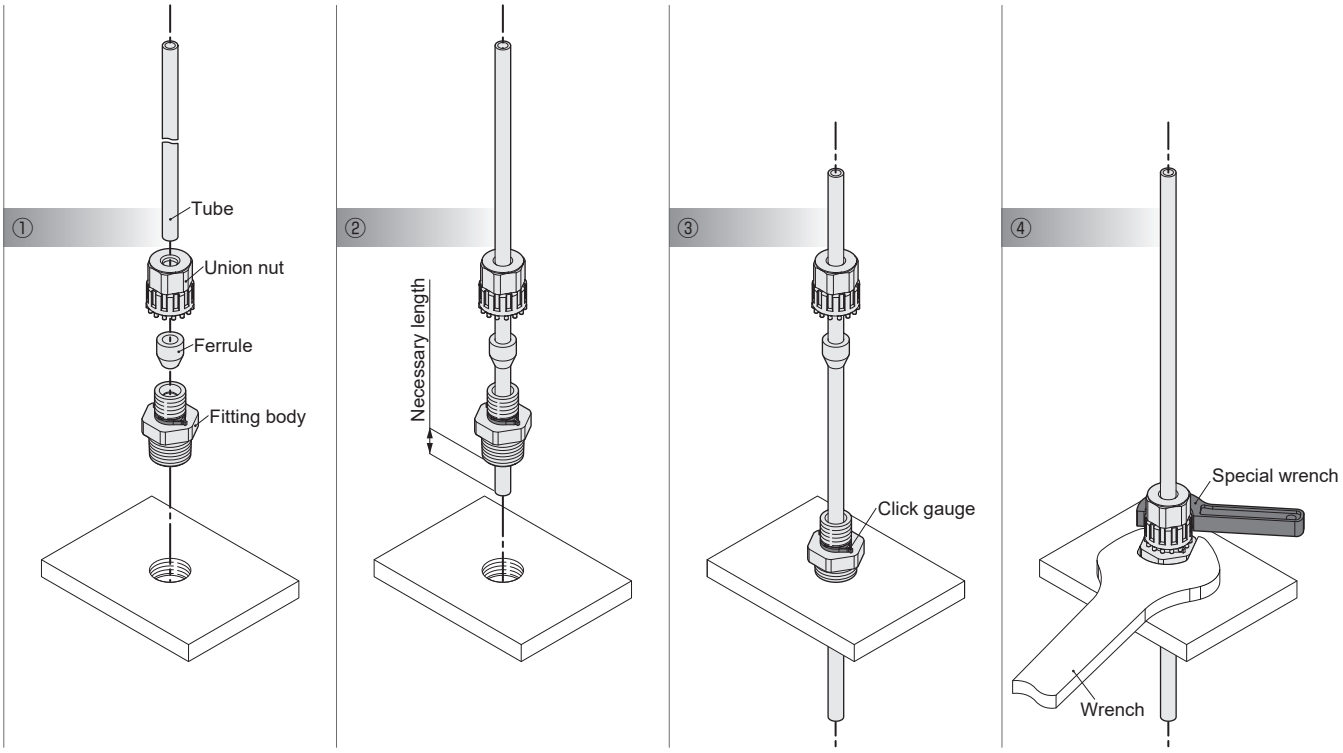
Construction (Straight Through : F-MCT)



No,	Parts	Material
①	Fitting body	PFA
②	Union nut	PFA
③	Ferrule	PTFE
④	Click gauge	ETFE
⑤	Tube	**NEW PFA** / PFA / FEP

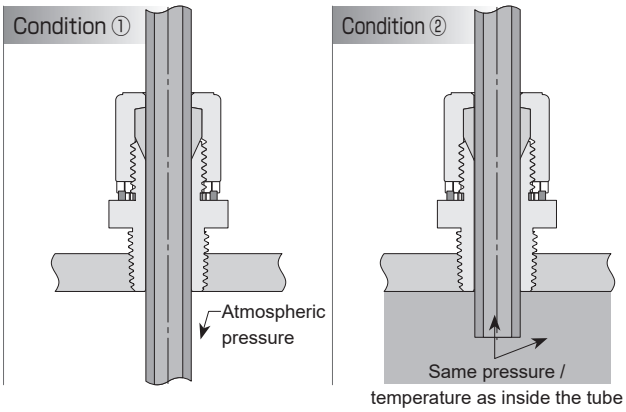
How to install Straight Through (F-MCT)

① : Insert a tubing into a union nut, a ferrule and a fitting body in this order.
*Apply seal tape on the taper pipe thread of the tting body in advance.
*Tapered side of the ferrule must face the tting body.
② : Pull the tubing as needed from the other side of the fitting body.
*Do not tighten the taper pipe thread before putting the tubing through the body hole. Otherwise the tubing may not go through.
③ : Tighten the taper pipe male thread with a mating taper pipe female thread.
④ : Hold the body with a wrench. Tighten the union nut with a special wrench until its projections touches with a click gauge (blue).
*After the nut projections touched the click gauge, tighten the union nut 3-4 more positions.
*Tighten the nut slowly. The nut may not be tightened until the speci ed position, if tightening is too fast. In such a case, retorque the nut again a little later.
*A special wrench is recommended for tightening a union nut.



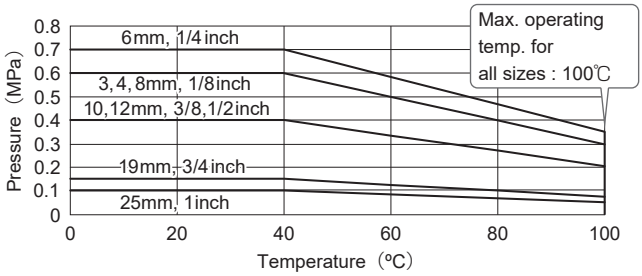
Usage conditions and specifications (Straight Through : F-MCT)

Possible two usage conditions of Straight Through type are shown below. Be careful since each condition has different speci cation.



Condition ①
Outside the tubing : Atmospheric pressure
· Max. operating temperature : 390°F (200°C)
· Max. operating pressure : 101psi (0.7MPa)
(Max. operating pressure must be within that of the tube.)

Condition ②
Outside the tube : Same pressure / temperature as inside the tube
· See the "Relation of Operating Temp. & Max. Operating Pressure" below and use the product within the range.

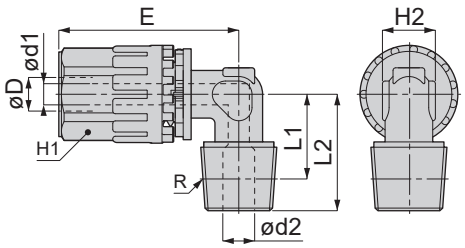


Relation of Operating Temp. & Max. Operating Pressure

⚠ Caution
Never use the product out of range above when the pressure and the temperature outside the tube is same as inside the tube (Condition ②). The tube may fall out.

F-ME Elbow





Tubing size : inch, Thread size : NPT thread(NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-ME-H2-N1	1/4" (6.35)×5/32" (3.95)	NPT1/8	33.7	13.9	18	4	3	16	10	16.7
F-ME-H2-N2		NPT1/4		16.2	22		6			18.3
F-ME-H2-N3		NPT3/8		15.9			10			19.4
F-ME-H3-N2	3/8" (9.53)×1/4" (6.35)	NPT1/4	39.9	18.2	24	6.3	6	19	14	26.2
F-ME-H3-N3		NPT3/8		17.9			10			27.3
F-ME-H3-N4		NPT1/2		19.7	27.8		12			32.0
F-ME-H4-N2	1/2" (12.7)×3/8" (9.53)	NPT1/4	48.5	20.7	26.5	10	6	24	18	42.0
F-ME-H4-N3		NPT3/8		20.4			10			43.0
F-ME-H4-N4		NPT1/2		22.2	30.3		12			46.0
		NPT3/4		22	30.6		16			55.0
F-ME-H6-N4	3/4" (19)×5/8" (15.8)	NPT1/2	61	26.7	34.8	16	12	32	27	96.8
		NPT3/4		28.5	37.1		16			99.7
	1" (25.4)×7/8" (22.2)	NPT3/4	73	33.5	42.1	22	16	41	34	175.8
		NPT1		36.2	46.4		22			178.0

*"L" is a reference value for height dimension after tightening thread.

Tubing size : mm, Taper pipe thread(R)

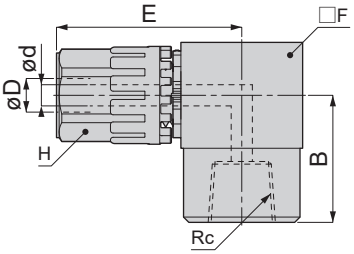
Unit : mm

Model code	Tubing O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
	3×2	R1/8	24.8	13.5	17.5	2	3	11	7.6	10.0
		R1/4		15.5	21.5		6			12.0
	4×3	R1/8	24.8	13.5	17.5	3	3	11	7.6	10.0
		R1/4		15.5	21.5		6			12.0
	6×4	R1/8	33.7	14	18	4	3	16	10	20.0
		R1/4		16	22		6			
		R3/8		15.7			10			19.3
F-ME-M8-R1	8×6	R1/8	39.9	16	20	6.3	3	19	14	26.0
F-ME-M8-R2		R1/4		18	24		6			25.9
F-ME-M8-R3		R3/8		17.7			10			30.0
F-ME-M8-R4		R1/2		19.6	27.8		12			31.9
F-ME-M10-R2	10×8	R1/4	39.9	18	24	8	6	19	14	27.0
F-ME-M10-R3		R3/8		17.7			10			
F-ME-M10-R4		R1/2		19.6	27.8		12			28.8
F-ME-M12-R2	12×10	R1/4	48.5	20.5	26.5	10	6	24	18	42.0
F-ME-M12-R3		R3/8		20.2			10			43.0
F-ME-M12-R4		R1/2		22.1	30.3		12			48.0
F-ME-M12-R6		R3/4		21.1	30.6		16			52.0
F-ME-M19-R4	19×15.8 (3/4"x5/8")	R1/2	61	26.6	34.8	16	12	32	27	100.0
F-ME-M19-R6		R3/4		27.6	37.1		16			101.0
F-ME-M25-R6	25×22	R3/4	73	32.6	42.1	22	16	41	34	180.0
F-ME-M25-R8		R1		36	46.4		22			182.0

*"L" is a reference value for height dimension after tightening thread.

F-FE Female Elbow





Tubing size : inch, Female thread size : NPT thread (NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	Rc	E	B	ød	Hex. H	□F	Weight (g)
F-FE-H2-N1	1/4" (6.35)×5/32" (3.95)	NPT1/8	33.2	21	4	16	20	40.0
F-FE-H2-N2		NPT1/4	34.7	24			23	50.0
F-FE-H2-N3		NPT3/8	36.2	24.5			26	60.0
F-FE-H3-N2	3/8" (9.53)×1/4" (6.35)	NPT1/4	38.9	25.5	6.3	19	23	55.0
F-FE-H3-N3		NPT3/8	40.4	26			26	65.0
F-FE-H3-N4		NPT1/2	43.6	30			32.5	95.0
F-FE-H4-N2	1/2" (12.7)×3/8" (9.53)	NPT1/4	47.5	28.5	10	24	29	90.0
F-FE-H4-N3		NPT3/8		29				
F-FE-H4-N4		NPT1/2	49.3	33			32.5	117.0
F-FE-H6-N4	3/4" (19)×5/8" (15.8)	NPT1/2	59.5	37.5	16	32	38	190.0
		NPT3/4	61.5	38			42	230.0
	1" (25.4)×7/8" (22.2)	NPT3/4	72	43.5	22	41	49	360.0
		NPT1	74.5	47.5			54	455.0

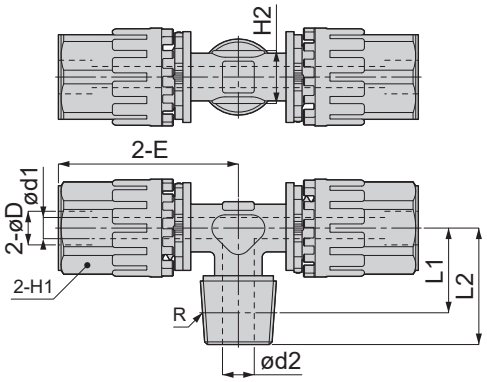
Tubing size : mm, Female thread size : Taper pipe thread (Rc)

Unit : mm

Model code	Tubing O.D. x I.D. øD	Rc	E	B	ød	Hex. H	□F	Weight (g)
	6×4	Rc1/8	33.2	21	4	16	20	40.0
		Rc1/4	34.7	24			23	50.0
		Rc3/8	36.2	24.5			26	55.0
F-FE-M8-R1	8×6	Rc1/8	37.4	21	6.3	19	20	45.0
F-FE-M8-R2		Rc1/4	38.9	25.5			23	55.0
F-FE-M8-R3		Rc3/8	40.4	26			26	65.0
F-FE-M10-R2	10×8	Rc1/4	38.9	25.5	8	19	23	55.0
F-FE-M10-R3		Rc3/8	40.4	26			26	65.0
F-FE-M10-R4		Rc1/2	43.6	30			32.5	95.0
F-FE-M12-R2	12×10	Rc1/4	47.5	28.5	10	24	29	95.0
F-FE-M12-R3		Rc3/8		29				
F-FE-M12-R4		Rc1/2	49.3	33			32.5	120.0
F-FE-M19-R4	19×15.8	Rc1/2	59.5	37.5	16	32	38	190.0
F-FE-M19-R6		Rc3/4	61.5	38			42	230.0
F-FE-M25-R6	25×22	Rc3/4	72	43.5	22	41	49	365.0
F-FE-M25-R8		Rc1	74.5	47.5			54	455.0

F-MBT Branch Tee





Tubing size : inch, Male thread size : NPT thread (NPT)

Unit : mm

Model code	Tubing O.D. x I.D. øD Inch (mm)	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-MBT-H2-N1	1/4" (6.35)×5/32" (3.95)	NPT1/8	33.7	13.9	18	4	3	16	10	30.0
F-MBT-H2-N2		NPT1/4		16.2	22		6			35.0
F-MBT-H2-N3		NPT3/8		15.9			10			
F-MBT-H3-N2	3/8" (9.53)×1/4" (6.35)	NPT1/4	39.9	18.2	24	6.3	6	19	14	45.0
F-MBT-H3-N3		NPT3/8		17.9			10			50.0
F-MBT-H3-N4		NPT1/2		19.7	27.8		12			
F-MBT-H4-N2	1/2" (12.7)×3/8" (9.53)	NPT1/4	48.5	20.7	26.5	10	6	24	18	74.0
F-MBT-H4-N3		NPT3/8		20.4			10			
F-MBT-H4-N4		NPT1/2		22.2	30.3		12			78.0
F-MBT-H6-N4	3/4" (19)×5/8" (15.8)	NPT1/2	61	26.7	34.8	16	12	32	27	170.0
		NPT3/4		28.5	37.1		16			
	1" (25.4)×7/8" (22.2)	NPT3/4	73	33.5	42.1	22	16	41	34	298.0
		NPT1		36.2	46.4		22			304.0

*"L" is a reference value for height dimension after tightening thread.

Tubing size : mm, Male thread size : Taper pipe

Unit : mm

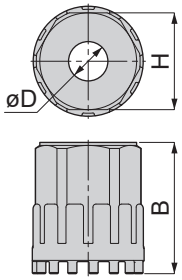
Model code	Tubing O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
	6×4	R1/8	33.7	14	18	4	3	16	10	25.0
		R1/4		16	22		6			32.0
		R3/8		15.7			10			33.0
F-MBT-M8-R1	8×6	R1/8	39.9	16	20	6.3	3	19	14	43.0
F-MBT-M8-R2		R1/4		18	24		6			45.0
F-MBT-M8-R3		R3/8		17.7			10			46.0
F-MBT-M10-R2	10×8	R1/4	39.9	18	24	8	6	19	14	42.0
F-MBT-M10-R3		R3/8		17.7			10			43.0
F-MBT-M10-R4		R1/2		19.6	27.8		12			44.0
F-MBT-M12-R2	12×10	R1/4	48.5	20.5	26.5	10	6	24	18	76.0
F-MBT-M12-R3		R3/8		20.2			10			
F-MBT-M12-R4		R1/2		22.1	30.3		12			80.0
F-MBT-M19-R4	19×15.8	R1/2	61	26.6	34.8	16	12	32	27	166.0
F-MBT-M19-R6		R3/4		27.6	37.1		16			168.0
F-MBT-M25-R6	25×22	R3/4	73	32.6	42.1	22	16	41	34	288.0
F-MBT-M25-R8		R1		36	46.4		22			290.0

*"L" is a reference value for height dimension after tightening thread.

Appearance drawing of parts

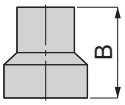
F-UN Union nut

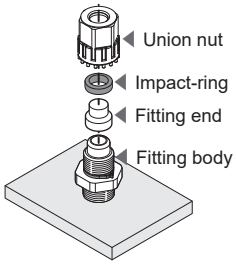




F-E Fitting end







For mm size tubing　　Unit：mm

Model code	Tubing O.D. x I.D. øD	B	Hex. H	Weight (g)
	3×2	16.3	11	28
	4×3	16.3	11	28
	6×4	21.7	16	75
F-UN-M8×10	8×6	25.9	19	102
F-UN-M10×10	10×8	25.9	19	96
F-UN-M12×10	12×10	31	24	183
F-UN-M19×10	19×15.8	38.5	32	377
F-UN-M25×5	25×22	45.5	41	318

For mm size tubing　　Unit：mm

Model code	Tubing O.D. x I.D. øD	B	Weight (g)
	3×2	7	3.1
	4×3	7	3.5
	6×4	9.4	5.3
F-E-M8×10	8×6	13.7	12.3
F-E-M10×10	10×8	12	13.7
F-E-M12×10	12×10	15.8	20.5
F-E-M19×10	19×15.8	17.6	58
F-E-M25×10	25×22	22.5	72

*. "x10" or "x5" at the end of the model code indicate the number of parts in a bag. The weights above are that of 10pcs or 5pcs.

F-RI Impact-ring



Standard type (material : PVDF), for mm size tubing　　Unit：mm

Model code	Tubing O.D. x I.D. øD	Weight (g)
	3×2	5
	4×3	5
	6×4	5
F-RI-M8V×10	8×6	5
F-RI-M10V×10	10×8	7.7
F-RI-M12V×10	12×10	10
F-RI-M19V×10	19×15.8 (3/4"x5/8")	14
F-RI-M25V×10	25×22	53

High temperature type (material : PPS), for mm size tubing　　Unit：mm

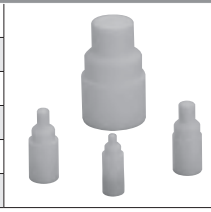
Model code	Tubing O.D. x I.D. øD	Weight (g)
	6×4	7
F-RI-M8S×10	8×6	10
F-RI-M10S×10	10×8	10
F-RI-M12S×10	12×10	10
F-RI-M19S×10	19×15.8 (3/4"x5/8")	10
F-RI-M25S×10	25×22	40

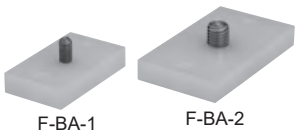
*. "x10" or "x5" at the end of the model code indicate the number of parts in a bag. The weights above are that of 10pcs or 5pcs.

Flaring tools

Make sure to use designated flaring tools listed below. Heat flaring is the basic for fluororesin tting, but cold flaring is possible as well. (Only cold flaring is available for Tube O.D.: ø1/8in., ø3mm, ø4mm.) Follow the instructions on page 60 for installation of a tting.

■ Applicable tubing size for hot flaring tool and model code

Applicable tubing size (O.D. x I.D.)		Model code		
Inch size	mm size (㎜)	Flaring tool model code		Tool base model code
1/4"(ø6.35×ø3.95)	ø6×ø4	F-JA-H2/M6		F-BA-1
3/8"(ø9.53×ø6.35)	ø8×ø6	F-JA-H3/M8		
—	ø10×ø8	F-JA-M10		
1/2"(ø12.7×ø9.53)	ø12×ø10	F-JA-H4/M12		F-BA-2
3/4"(ø19.05×ø15.8)	ø19×ø15.8	F-JA-H6/M19		
1"(ø25.4×ø22.2)	ø25×ø22	F-JA-H8/M25		



■ Applicable tubing size for cold flaring tool and model code

Applicable tubing size (O.D. x I.D.)		Model code		
Inch size	mm size (㎜)	Flaring tool model code		Attachment model code
1/8"(ø3.18×ø2.18)	ø3×ø2	F-JC-H1/M3		F-JC-AP 
—	ø4×ø3	F-JC-M4		
1/4"(ø6.35×ø3.95)	ø6×ø4	F-JC-H2/M6		
3/8"(ø9.53×ø6.35)	—	F-JC-H3		
—	ø8×ø6	F-JC-M8		
—	ø10×ø8	F-JC-M10		
1/2"(ø12.7×ø9.53)	ø12×ø10	F-JC-H4/M12		
3/4"(ø19.05×ø15.8)	ø19×ø15.8	F-JC-H6/M19		
1"(ø25.4×ø22.2)	ø25×ø22	F-JC-H8/M25		

*1. A simple pressing tool is necessary separately for cold flaring to clamp the tube.
*2. An attachment (Model code: F-JC-AP) is necessary for some sizes of cold flaring tools to be attached to a pressing tool. Contact the nearest sales of ce for details.

Special wrench for union nut tightening

■ Applicable tubing size for special wrench and model code

Applicable tubing size (O.D. x I.D.)		Special wrench model code	
Inch size	mm size (㎜)		
1/4"(ø6.35×ø3.95)	ø6×ø4	F-SP-H2/M6	
3/8"(ø9.53×ø6.35)	ø8×ø6, ø10×ø8	F-SP-H3/M8/M10	
1/2"(ø12.7×ø9.53)	ø12×ø10	F-SP-H4/M12	
3/4"(ø19.05×ø15.8)	ø19×ø15.8	F-SP-H6/M19	
1"(ø25.4×ø22.2)	ø25×ø22	F-SP-H8/M25	