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

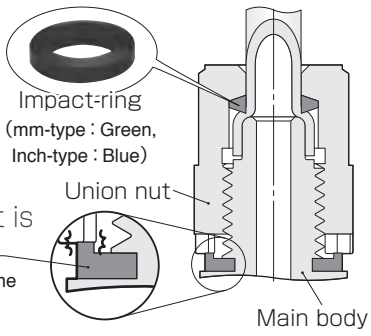
Fluororesin equipment

NEW PRODUCT

Characteristics

High pull-out strength and sealability are realized.

▶ An impact-ring holds the tube firmly.



Easy control of union nut tightening.

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

Tightening completion can be checked visually and by click sound when the gauge convex part and nut concave part touches.

Made of PFA and PTFE with high chemical and heat resistance.

▶ Applicable for most of fluid medium or gaseous atmosphere.

Straight Through type, in which the liquid touches only with the tube, is also available.

▶ The body has a through hole equals to the tube O.D. (See page 70 and 71 for details.)

▶ Tube can be fixed at any length through fitting body.

Clean washing + clean packaging.

▶ISO class 6 cleanliness

Little liquid stagnation

▶ Clean and Sanitary

Lower tightening torque

▶ Little body deformation

Needle valve, best suited for applications that require flow rate adjustment, is also available.

▶2 types are provided.

Model designation of fittings (Example)

F – MC (①) – M12 (②) – R4 (③)

③. Connection type and size

■ Compression fitting

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

	Inch size (inch(㎜)) (Impact-ring color : Blue)					
Code	H1	H2	H3	H4	H6	H8
Tube O.D.	ø1/8(ø3.2)	ø1/4(ø6.35)	ø3/8(ø9.35)	ø1/2(ø12.7)	ø3/4(ø19.05)	ø1(ø25.4)
Tube I.D. (㎜)	ø2.18	ø3.95	ø6.35	ø9.53	ø15.8	ø22.2

■ Taper thread

	Taper pipe thread					
Code	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

	NPT thread					
Code	N1	N2	N3	N4	N6	N8
Thread size	NPT1/8	NPT1/4	NPT3/8	NPT1/2	NPT3/4	NPT1

②. Tube size

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

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

	Inch size (inch(㎜)) (Impact-ring color : Blue)					
Code	H1	H2	H3	H4	H6	H8
Tube O.D.	ø1/8(ø3.2)	ø1/4(ø6.35)	ø3/8(ø9.35)	ø1/2(ø12.7)	ø3/4(ø19.05)	ø1(ø25.4)
Tube I.D. (㎜)	ø2.18	ø3.95	ø6.35	ø9.53	ø15.8	ø22.2

①. Fitting type

Code	Type	Code	Type	Code	Type
U	Union Straight	RU	Unequal Union Straight	UE	Union Elbow
UT	Union Tee	RUE	Unequal Union Elbow	PMU	Bulkhead Union
RUT	Unequal Union Tee	CP	Cap	UEA	Union Elbow Adapter
MC	Straight	MCT	Straight Through	FC	Female Straight
ME	Elbow	FE	Female Elbow	MBT	Run Tee

Fluororesin equipment

Model designation of needle valve (Example)

F – JHAW (①) – H2 (②)

②. Tube size

	mm size (㎜)		Inch size	
記 号	M3	M6	H1	H2
Tube O.D.	ø3	ø6	ø1/8(ø3.2)	ø1/4(ø6.35)
Tube I.D.	ø2	ø4	ø2.18	ø3.95

①. Needle valve type

記 号	Type
JHAW	Union Straight
JHA	Union Elbow

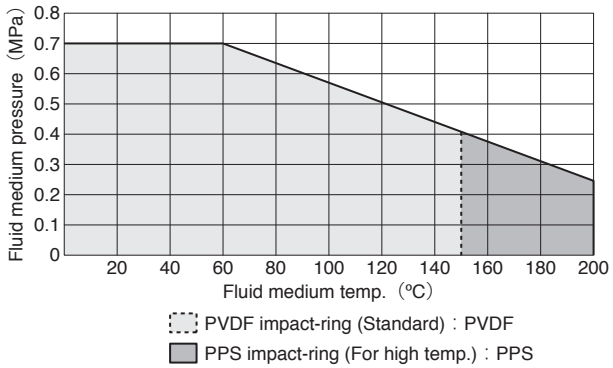
Fluororesin equipment

Specifications (Fitting)

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

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

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



Relation of Operating Temp. & Max. Operating Pressure

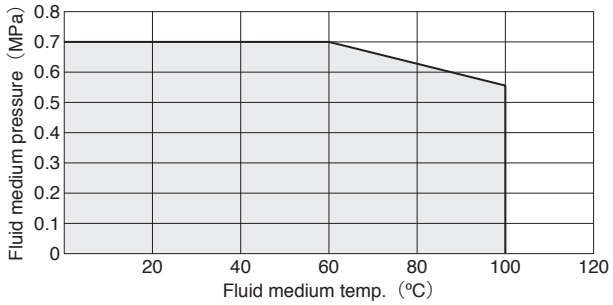
Applicable tube

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.

Specifications (Needle valve)

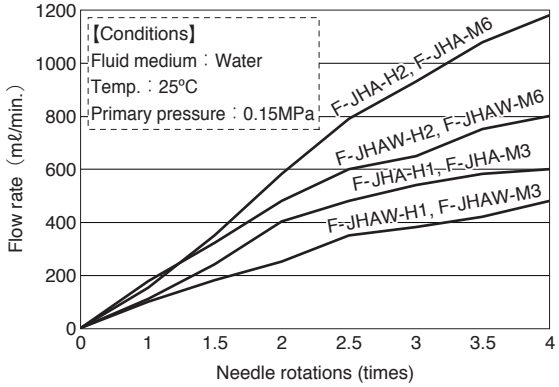
Fluid medium	Liquid
Max. operating pressure	0.7MPa
Operating temp. range	0 ~ 100°C (Must be within the range of the chart below.)*

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



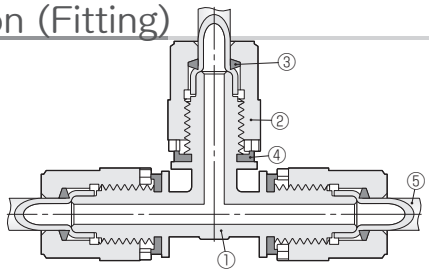
Relation of Operating Temp. & Max. Operating Pressure

Flow characteristics (Needle valve)



Construction (Fitting)

F-UT (Union Tee)



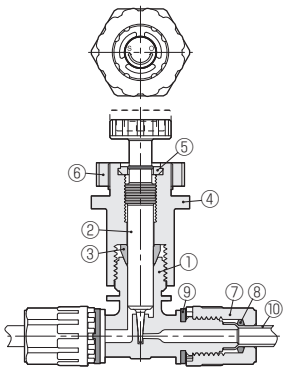
No,	Parts	Material
①	Fitting body	PFA/PTFE
②	Union nut	PFA
③	Impact-ring	PVDF/PPS
④	Click gauge	ETFE
⑤	Tube	PFA/PTFE/FEP

Table. Tube dimensions

	Tube size	O.D. (ømm)	I.D. (ømm)	Thickness (mm)	Tolerance O.D. (ømm)	Tolerance Thickness (ømm)
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	19	15.8	1.6	±0.12	±0.1
	ø25	25	22	1.5	±0.2	±0.1
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"	19.05	15.8	1.6	±0.12	±0.1
	ø1"	25.4	22.2	1.6	±0.2	±0.1

Construction (Needle valve)

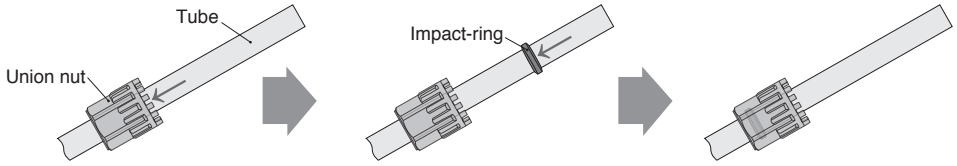
F-JHAW (Union Straight)



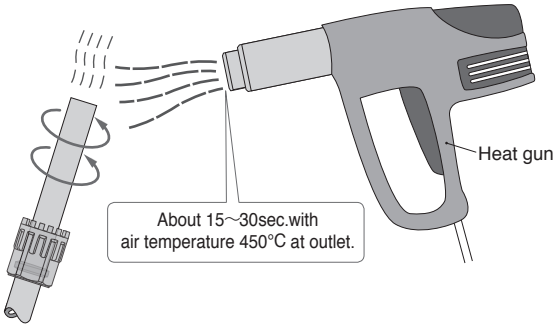
No,	Parts	Material
①	Fitting body	PFA
②	Needle	PFA
③	Ferrule	PTFE
④	Outer nut	PP
⑤	Stopper	PP
⑥	Lock nut	PFA
⑦	Union nut	PFA
⑧	Impact-ring	PVDF
⑨	Click gauge	ETFE
⑩	Tube	PFA/PTFE/FEP

How to install (by hot flaring)

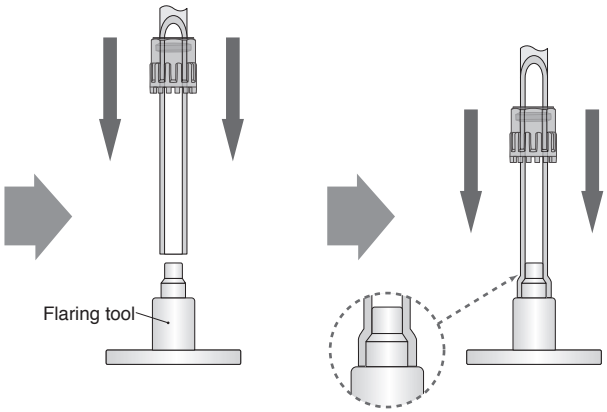
1 : Insert a tube into a union nut and an impact-ring.



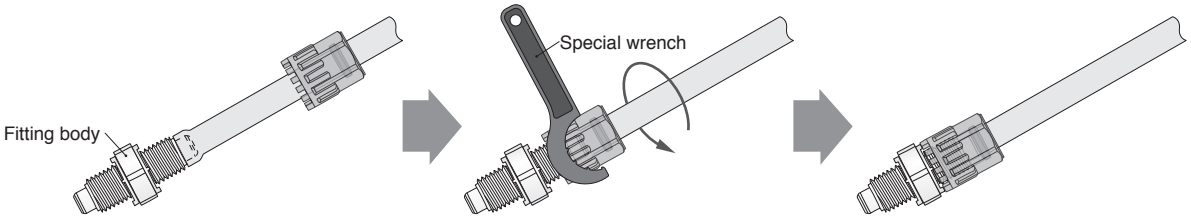
2 : Heat the edge of the tube evenly.



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.

【For fluororesin needle valve】

1.Since this product is made of resin, do not tighten the nut or turn the knob excessively.

2.Loosened outer nut causes a fluid leakage, which is very dangerous. Make sure to retorque it, stopping the operation immediately when looseness occurs.

⚠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 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 150°C. The impact-ring equipped with a fitting as standard will cause a fluid leakage or a piping coming off on 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.

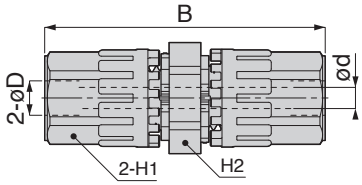
15. Tighten taper thread by hand until it stops, then use a wrench to tighten it about 1.5 to 2.5 more turns. Excessive tightening may break the thread part. Inadequate tightening may cause a loosened thread or a fluid leakage.

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



Tube size : inch

Unit：mm

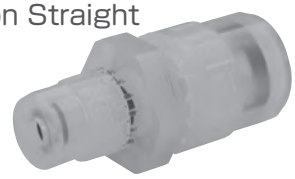
Model code	Tube O.D. x I.D. øD	ød	B	Hex. H1	Hex. H2	Weight (g)
F-U-H1	3.18×2.18	2	40.7	11	13	10.6
F-U-H2	6.35×3.95	4	52.4	16	20	26.7
F-U-H3	9.53×6.35	6.3	60.7	19	23	40.0
F-U-H4	12.7×9.53	10	73.3	24	29	64.0
F-U-H8	25.4×22.2	22	102.3	41	49	247.0

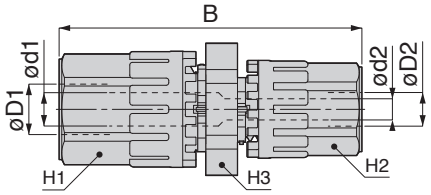
Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD	ød	B	Hex. H1	Hex. H2	Weight (g)
F-U-M3	3×2	2	40.7	11	13	10.9
F-U-M4	4×3	3	40.7	11	13	12.0
F-U-M6	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	16	88.3	32	38	132.0
F-U-M25	25×22	22	102.3	41	49	247.0

F-RU Unequal Union Straight





Tube size : inch

Unit：mm

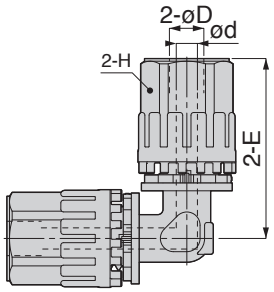
Model code	Tube O.D. x I.D. øD1	Tube O.D. x I.D. øD2	ød1	ød2	B	Hex. H1	Hex. H2	Hex. H3	Weight (g)
F-RU-H2-H1	6.35×3.95	3.18×2.18	4	2	46.5	16	11	20	21.0
F-RU-H3-H2	9.53×6.35	6.35×3.95	6.3	4	56.6	19	16	23	32.6
F-RU-H4-H2	12.7×9.53	6.35×3.95	10	4	63.5	24	16	29	50.0
F-RU-H4-H3		9.53×6.35		6.3	67.7		19		56.7
F-RU-H6-H3	19×15.8	9.53×6.35	16	6.3	75.1	32	19	38	94.0
F-RU-H6-H4		12.7×9.53		10	80.8		24		106.7
F-RU-H8-H4	25.4×22.2	12.7×9.53	22	10	87.8	41	24	49	170.0
F-RU-H8-H6		19.05×15.8		16	95.3		32		197.0

Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD1	Tube O.D. x I.D. øD2	ød1	ød2	B	Hex. H1	Hex. H2	Hex. H3	Weight (g)
F-RU-M6-M3	6×4	3×2	4	2	46.5	16	11	20	22.0
F-RU-M6-M4		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



Tube size : inch

Unit：mm

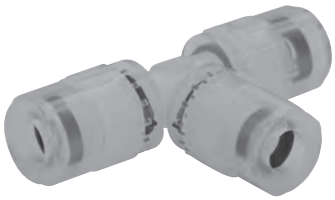
Model code	Tube O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
F-UE-H1	3.18×2.18	2	24.8	11	10.4
F-UE-H2	6.35×3.95	4	33.7	16	26.1
F-UE-H3	9.53×6.35	6.3	39.9	19	40.0
F-UE-H4	12.7×9.53	10	48.5	24	68.0
F-UE-H8	25.4×22.2	22	73	41	278.0

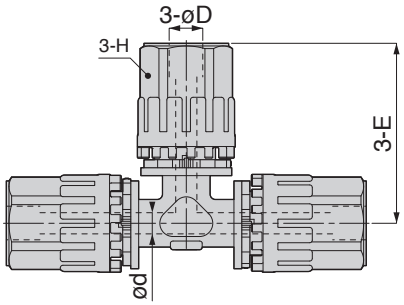
Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
F-UE-M3	3×2	2	24.8	11	11.0
F-UE-M4	4×3	3	24.8	11	11.2
F-UE-M6	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	16	61	32	150.0
F-UE-M25	25×22	22	73	41	259.0

F-UT Union Tee





Tube size : inch

Unit：mm

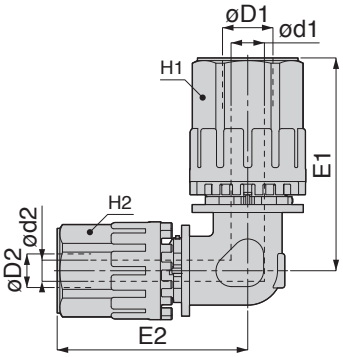
Model code	Tube O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
F-UT-H1	3.18×2.18	2	24.8	11	14.2
F-UT-H2	6.35×3.95	4	33.7	16	39.0
F-UT-H3	9.53×6.35	6.3	39.9	19	56.0
F-UT-H4	12.7×9.53	10	48.5	24	99.0
F-UT-H8	25.4×22.2	22	73	41	394.0

Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD	ød	E	Hex. H	Weight (g)
F-UT-M3	3×2	2	24.8	11	15.0
F-UT-M4	4×3	3	24.8	11	16.0
F-UT-M6	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	16	61	32	214.0
F-UT-M25	25×22	22	73	41	396.0

F-RUE Unequal Union Elbow



Tube size : inch

Unit : mm

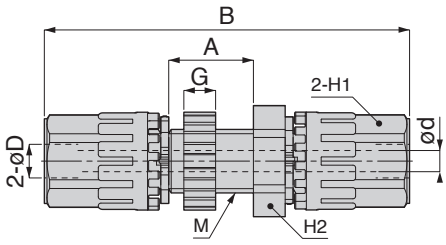
Model code	Tube O.D. x I.D. øD1	Tube O.D. x I.D. øD2	ød1	ød2	E1	E2	Hex. H1	Hex. H2	Weight (g)
F-RUE-H2-H1	6.35×3.95	3.18×2.18	4	2	33.7	27.3	16	11	20.0
F-RUE-H3-H2	9.53×6.35	6.35×3.95	6.3	4	39.9	35.7	19	16	35.0
F-RUE-H4-H2	12.7×9.53	6.35×3.95	10	4	48.5	38.2	24	16	51.0
F-RUE-H4-H3		9.53×6.35		6.3		42.4		19	57.0
F-RUE-H6-H3	19×15.8	9.53×6.35	16	6.3	61	46.9	32	19	109.0
F-RUE-H6-H4		12.7×9.53		10		53		24	120.0
F-RUE-H8-H4	25.4×22.2	12.7×9.53	22	10	73	58	41	24	202.0
F-RUE-H8-H6		19×15.8		16		66		32	231.0

Tube size : mm

Unit : mm

Model code	Tube O.D. x I.D. øD1	Tube O.D. x I.D. øD2	ød1	ød2	E1	E2	Hex. H1	Hex. H2	Weight (g)
F-RUE-M6-M3	6×4	3×2	4	2	33.7	27.3	16	11	20.0
F-RUE-M6-M4		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



Tube size : inch

Unit : mm

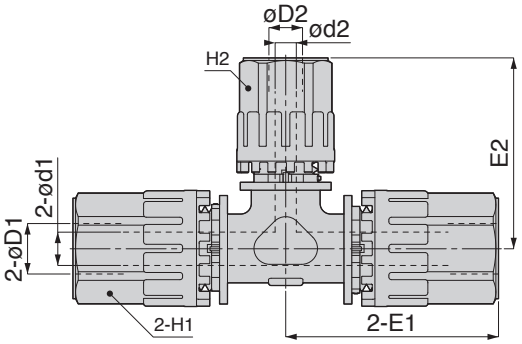
Model code	Tube O.D. x I.D. øD	ød	M	B	A	G	Hex. H1	Hex. H2	Weight (g)
F-PMU-H2	6.35×3.95	4	M12×P1.5	68.4	16	6	16	20	32.0
F-PMU-H3	9.53×6.35	6.3	M16×P1.5	76.7	16	6	19	23	46.0
F-PMU-H4	12.7×9.53	10	M20×P2	90.6	17.3	7.3	24	29	81.0
F-PMU-H8	25.4×22.2	22	M36×P2	119.6	17.3	7.3	41	49	225.0

Tube size : mm

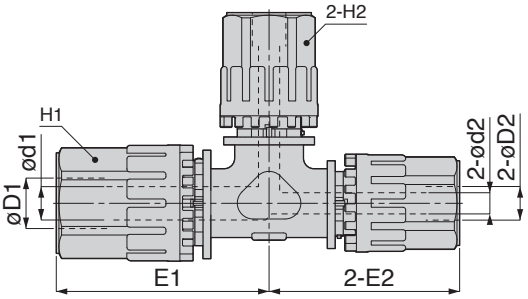
Unit : mm

Model code	Tube O.D. x I.D. øD	ød	M	B	A	G	Hex. H1	Hex. H2	Weight (g)
F-PMU-M6	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	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

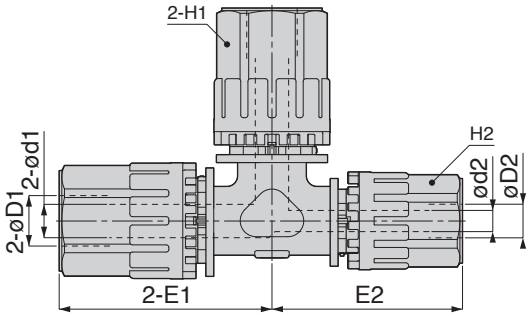
F-RUT Unequal Union Tee



■ Tube size：H3-H2-H2



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



Tube size : inch

Unit：mm

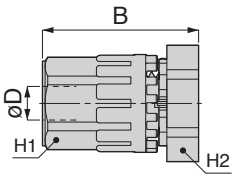
Model code	Tube O.D. x I.D. øD1	Tube O.D. x I.D. øD2	ød1	ød2	E1	E2	Hex. H1	Hex. H2	Weight (g)
F-RUT-H3-H2-H3	9.53×6.35	6.35×3.95	6.3	4	39.9	35.7	19	16	51.0
F-RUT-H3-H2-H2									50.0
F-RUT-H3-H3-H2									53.0
F-RUT-H4-H2-H4	12.7×9.53	6.35×3.95	10	4	48.5	38.2	24	16	83.0
F-RUT-H4-H4-H2									
F-RUT-H4-H3-H4		9.53×6.35		6.3		42.4		19	89.0
F-RUT-H4-H4-H3									88.0
F-RUT-H6-H3-H6	19×15.8	9.53×6.35	16	6.3	61	46.9	32	19	171.0
F-RUT-H6-H4-H6		12.7×9.53		10		53		24	181.0
F-RUT-H6-H6-H4									187.0
F-RUT-H8-H6-H8	25.4×22.2	19×15.8	22	16	73	66	41	32	322.0

Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD1	Tube 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



Tube size : inch

Unit : mm

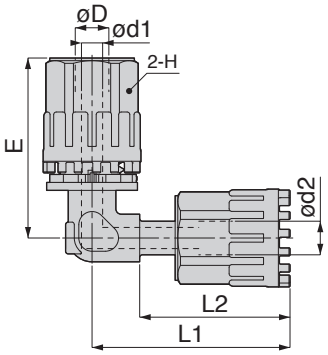
Model code	Tube O.D. x I.D. øD	B	Hex. H1	Hex. H2	Weight (g)
F-CP-H2	6.35×3.95	29.2	16	20	35.0
F-CP-H3	9.53×6.35	33.4	19	23	38.0
F-CP-H4	12.7×9.53	40.3	24	29	43.0
F-CP-H8	25.4×22.2	54.8	41	49	136.0

Tube size : mm

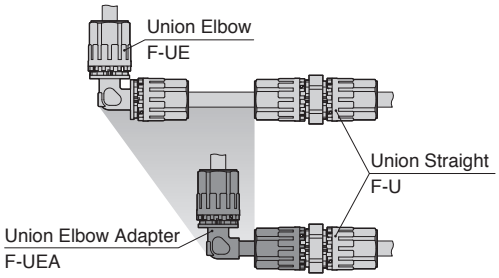
Unit : mm

Model code	Tube O.D. x I.D. øD	B	Hex. H1	Hex. H2	Weight (g)
F-CP-M6	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	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 fitting directly by removing its union nut.(See below.)



Tube size : inch

Unit : mm

Model code	Tube O.D. x I.D. øD	ød1	Applicable fitting code ød2	E	L1	L2	Hex. H	Weight (g)
F-UEA-H2-TH2S	6.35×3.95	4	H2 or M6	33.7	37.4	28.4	16	24.0
F-UEA-H3-TH3S	9.53×6.35	6.3	H3 or M8	39.9	42.2	31.2	19	37.0
F-UEA-H4-TH4S	12.7×9.53	10	H4 or M12	48.5	52.5	39	24	64.0
F-UEA-H8-TH8S	25.4×22.2	22	H8 or M25	73	83.7	60.7	41	231.0

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

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

Tube size : mm

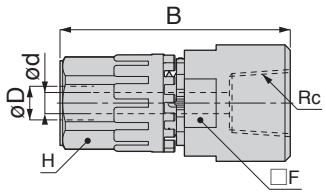
Unit : mm

Model code	Tube O.D. x I.D. øD	ød1	Applicable fitting code ød2	E	L1	L2	Hex. H	Weight (g)
F-UEA-M6-TH2S	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	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 fitting with both mm and inch size listed in "Applicable fitting code" above.

F-FC Female Straight



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

Unit：mm

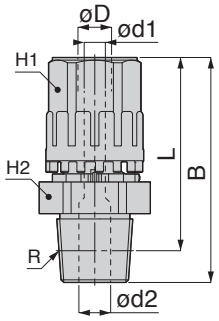
Model code	Tube O.D. x I.D. øD	Rc	B	ød	Hex. H	□F	Weight (g)
F-FC-H2-N1	6.35×3.95	NPT1/8	40.2	4	16	20	24.0
F-FC-H2-N2		NPT1/4	43.2				26.0
F-FC-H2-N3		NPT3/8	43.7			23	28.0
F-FC-H3-N2	9.53×6.35	NPT1/4	47.4	6.3	19	23	32.0
F-FC-H3-N3		NPT3/8	47.9				35.0
F-FC-H3-N4		NPT1/2	51.9			29	48.0
F-FC-H4-N2	12.7×9.53	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	19×15.8	NPT1/2	66.3	16	32	38	100.0
F-FC-H6-N6		NPT3/4	66.8				117.0
F-FC-H8-N6	25.4×22.2	NPT3/4	73.8	22	41	49	175.0
F-FC-H8-N8		NPT1	77.8				210.0

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

Unit：mm

Model code	Tube O.D. x I.D. øD	Rc	B	ød	Hex. H	□F	Weight (g)
F-FC-M6-R1	6×4	Rc1/8	40.2	4	16	20	24.0
F-FC-M6-R2		Rc1/4	43.2				26.0
F-FC-M6-R3		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



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

Unit : mm

Model code	Tube O.D. x I.D. øD	R	B	L	ød1	ød2	Hex. H1	Hex. H2	Weight (g)
F-MC-H2-N1	6.35×3.95	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	9.53×6.35	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	12.7×9.53	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
F-MC-H4-N6		NPT3/4	57.4	48.8		16			47.5
F-MC-H6-N4	19×15.8	NPT1/2	64.6	56.5	16	12	32	38	84.4
F-MC-H6-N6		NPT3/4	64.9	56.3		16			85.8
F-MC-H6-N8		NPT1	69.2	59		22			88.7
F-MC-H8-N6	25.4×22.2	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.

Tube size : inch, Thread size : Taper pipe thread(R)

Unit : mm

Model code	Tube O.D. x I.D. øD	R	B	L	ød1	ød2	Hex. H1	Hex. H2	Weight (g)
F-MC-H1-R1	3.18×2.18	R1/8	32.3	28.3	2	3	11	13	8.4
F-MC-H1-R2		R1/4	36.3	30.3		6			9.6
F-MC-H2-R1	6.35×3.95	R1/8	38.2	34.2	4	3	16	20	18.0
F-MC-H2-R2		R1/4	42.2	36.2		6			18.3
F-MC-H2-R3		R3/8		35.9		10			18.7
F-MC-H3-R2	9.53×6.35	R1/4	46.4	40.4	6.3	6.3	19	23	25.2
F-MC-H3-R3		R3/8		40.1		10			26.0
F-MC-H3-R4		R1/2	50.2	42		12			27.7
F-MC-H4-R2	12.7×9.53	R1/4	53.3	47.3	10	6	24	29	42.0
F-MC-H4-R3		R3/8		47		10			43.0
F-MC-H4-R4		R1/2	57.1	48.9		12			46.0
F-MC-H4-R6		R3/4	57.4	47.9		16			47.0
F-MC-H8-R6	25.4×22.2	R3/4	71.9	62.4	22	16	41	49	130.0
F-MC-H8-R8		R1	76.2	65.8		22			160.0

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

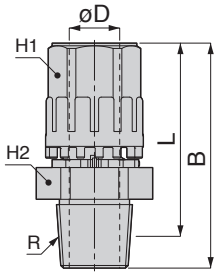
Tube size : mm, Thread size : Taper pipe thread(R)

Unit：mm

Model code	Tube O.D. x I.D. øD	R	B	L	ød1	ød2	Hex. H1	Hex. H2	Weight (g)
F-MC-M3-R1	3×2	R1/8	32.3	28.3	2	3	11	13	10.0
F-MC-M3-R2		R1/4	36.3	30.3		6			
F-MC-M4-R1	4×3	R1/8	32.3	28.3	3	3	11	13	10.0
F-MC-M4-R2		R1/4	36.3	30.3		6			
F-MC-M6-R1	6×4	R1/8	38.2	34.2	4	3	16	20	16.9
F-MC-M6-R2		R1/4	42.2	36.2		6			20.0
F-MC-M6-R3		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 Straight Through



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

Unit : mm

Model code	Tube O.D. x I.D. øD	R	B	L	Hex. H1	Hex. H2	Weight (g)
F-MCT-H2-N2	6.35×3.95	NPT1/4	42.2	36.4	16	20	21.0
F-MCT-H2-N3		NPT3/8		36.1			24.0
F-MCT-H3-N3	9.53×6.35	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	12.7×9.53	NPT1/2	57.1	49	24	29	46.0
F-MCT-H4-N6		NPT3/4	57.4	48.8			54.0
F-MCT-H6-N6	19×15.8	NPT3/4	64.9	56.3	32	38	86.0
F-MCT-H6-N8		NPT1	69.2	59			100.0
F-MCT-H8-N8	25.4×22.2	NPT1	76.2	66	41	49	154.0

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

Tube size : inch, Thread size : Taper pipe thread(R)

Unit : mm

Model code	Tube O.D. x I.D. øD	R	B	L	Hex. H1	Hex. H2	Weight (g)
F-MCT-H3-R4	9.53×6.35	R1/2	50.2	42	19	23	30.8
F-MCT-H4-R4	12.7×9.53	R1/2	57.1	48.9	24	29	50.0

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

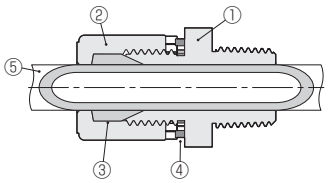
Tube size : mm, Thread size : Taper pipe thread(R)

Unit : mm

Model code	Tube O.D. x I.D. øD	R	B	L	Hex. H1	Hex. H2	Weight (g)
F-MCT-M3-R1	3×2	R1/8	32.3	28.3	11	13	11.0
F-MCT-M4-R1	4×3	R1/8	32.3	28.3	11	13	11.0
F-MCT-M4-R2		R1/4	36.3	30.3			13.0
F-MCT-M6-R1	6×4	R1/8	38.2	34.2	16	20	17.1
F-MCT-M6-R2		R1/4	42.2	36.2			19.6
F-MCT-M6-R3		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.

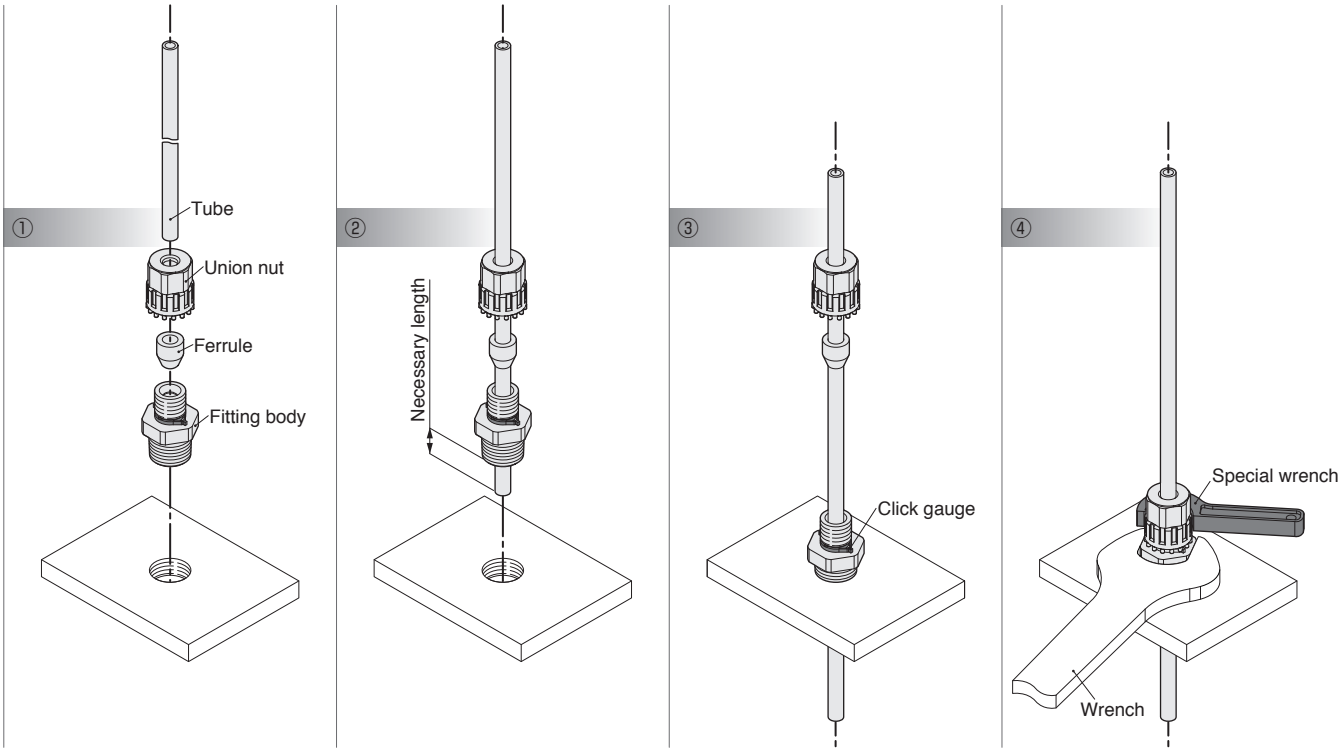
Construction (Straight Through : F-MCT)



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

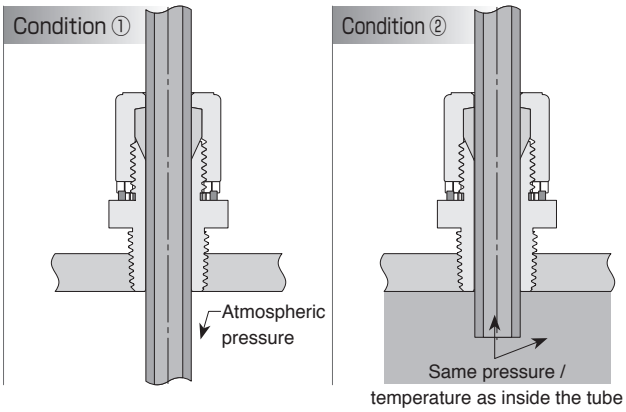
How to install Straight Through (F-MCT)

① : Insert a tube into a union nut, a ferrule and a fitting body in this order.
*Apply seal tape on the taper pipe thread of the fitting body in advance.
*Tapered side of the ferrule must face the fitting body.
② : Pull the tube as needed from the other side of the fitting body.
*Do not tighten the taper pipe thread before putting the tube through the body hole. Otherwise tube 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 specified 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.



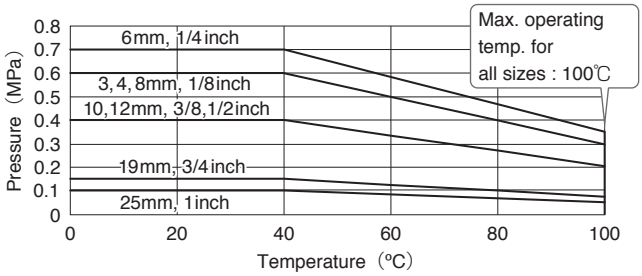
Usage conditions and specifications (Straight Through : F-MCT)

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



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

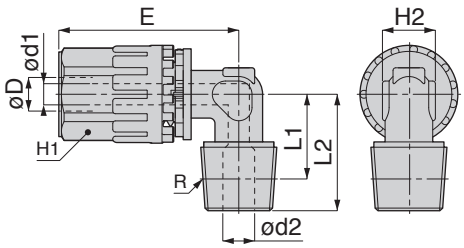
Condition ②
Outside the tube : Same pressure / temperature as inside the tube
· See the "Relation of Operating Temp. & Max. Operating Pressure" below and use the product within the range.



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



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

Unit : mm

Model code	Tube O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-ME-H2-N1	6.35×3.95	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	9.53×6.35	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	12.7×9.53	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
F-ME-H4-N6		NPT3/4		22	30.6		16			55.0
F-ME-H6-N4	19×15.8	NPT1/2	61	26.7	34.8	16	12	32	27	96.8
F-ME-H6-N6		NPT3/4		28.5	37.1		16			99.7
F-ME-H8-N6	25.4×22.2	NPT3/4	73	33.5	42.1	22	16	41	34	175.8
F-ME-H8-N8		NPT1		36.2	46.4		22			178.0

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

Tube size : inch, Taper pipe thread(R)

Unit : mm

Model code	Tube O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-ME-H1-R1	3.18×2.18	R1/8	24.8	13.5	17.5	2	3	11	7.6	8.4
F-ME-H1-R2		R1/4		15.5	21.5		6			10.1
F-ME-H2-R1	6.35×3.95	R1/8	33.7	14	18	4	3	16	10	17.0
F-ME-H2-R2		R1/4		16	22		6			18.0
F-ME-H2-R3		R3/8		15.7			10			19.9
F-ME-H3-R2	9.53×6.35	R1/4	39.9	18	24	6.3	6	19	14	27.0
F-ME-H3-R3		R3/8		17.7			10			
F-ME-H3-R4		R1/2		19.6	27.8		12			32.0
F-ME-H4-R2	12.7×9.53	R1/4	48.5	20.5	26.5	10	6	24	18	40.0
F-ME-H4-R3		R3/8		20.2			10			45.0
F-ME-H4-R4		R1/2		22.1	30.3		12			48.0
F-ME-H4-R6		R3/4		21.1	30.6		16			54.0
F-ME-H8-R6	25.4×22.2	R3/4	73	32.6	42.1	22	16	41	34	182.0
F-ME-H8-R8		R1		36	46.4		22			187.0

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

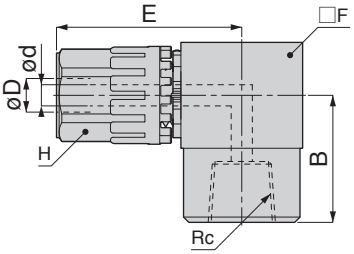
Tube size : mm, Taper pipe thread(R)

Unit : mm

Model code	Tube O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-ME-M3-R1	3×2	R1/8	24.8	13.5	17.5	2	3	11	7.6	10.0
F-ME-M3-R2		R1/4		15.5	21.5		6			12.0
F-ME-M4-R1	4×3	R1/8	24.8	13.5	17.5	3	3	11	7.6	10.0
F-ME-M4-R2		R1/4		15.5	21.5		6			12.0
F-ME-M6-R1	6×4	R1/8	33.7	14	18	4	3	16	10	20.0
F-ME-M6-R2		R1/4		16	22		6			
F-ME-M6-R3		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	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



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

Unit : mm

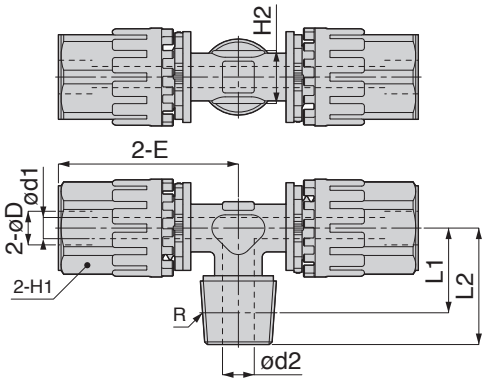
Model code	Tube O.D. x I.D. øD	Rc	E	B	ød	Hex. H	□F	Weight (g)
F-FE-H2-N1	6.35×3.95	NPT1/8	33.2	21	4	16	20	40.0
F-FE-H2-N2		NPT1/4	34.7	24			23	50.0
F-FE-H2-N3		NPT3/8	36.2	24.5			26	60.0
F-FE-H3-N2	9.53×6.35	NPT1/4	38.9	25.5	6.3	19	23	55.0
F-FE-H3-N3		NPT3/8	40.4	26			26	65.0
F-FE-H3-N4		NPT1/2	43.6	30			32.5	95.0
F-FE-H4-N2	12.7×9.53	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	19×15.8	NPT1/2	59.5	37.5	16	32	38	190.0
F-FE-H6-N6		NPT3/4	61.5	38			42	230.0
F-FE-H8-N6	25.4×22.2	NPT3/4	72	43.5	22	41	49	360.0
F-FE-H8-N8		NPT1	74.5	47.5			54	455.0

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

Unit : mm

Model code	Tube O.D. x I.D. øD	Rc	E	B	ød	Hex. H	□F	Weight (g)
F-FE-M6-R1	6×4	Rc1/8	33.2	21	4	16	20	40.0
F-FE-M6-R2		Rc1/4	34.7	24			23	50.0
F-FE-M6-R3		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 Run Tee



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

Unit：mm

Model code	Tube O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-MBT-H2-N1	6.35×3.95	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	9.53×6.35	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	12.7×9.53	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	19×15.8	NPT1/2	61	26.7	34.8	16	12	32	27	170.0
F-MBT-H6-N6		NPT3/4		28.5	37.1		16			
F-MBT-H8-N6	25.4×22.2	NPT3/4	73	33.5	42.1	22	16	41	34	298.0
F-MBT-H8-N8		NPT1		36.2	46.4		22			304.0

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

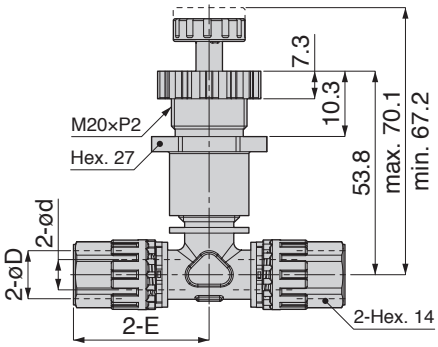
Tube size : mm, Male thread size : Taper pipe thread(R)

Unit：mm

Model code	Tube O.D. x I.D. øD	R	E	L1	L2	ød1	ød2	Hex. H1	WAF H2	Weight (g)
F-MBT-M6-R1	6×4	R1/8	33.7	14	18	4	3	16	10	25.0
F-MBT-M6-R2		R1/4		16	22		6			32.0
F-MBT-M6-R3		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.

F-JHAW Needle valve Union Straight



Tube size : inch

Unit：mm

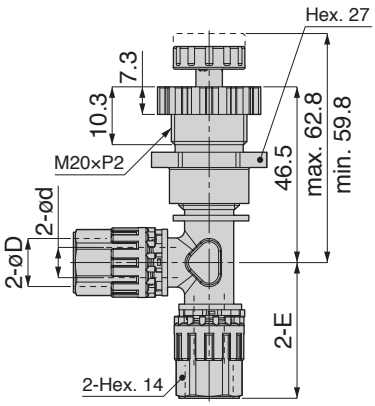
Model code	Tube O.D. x I.D. øD	E	ød	Weight (g)
F-JHAW-H1	3.18×2.18	29.3	2	47
F-JHAW-H2	6.35×3.95	35.7	4	57

Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD	E	ød	Weight (g)
F-JHAW-M3	3×2	29.3	2	48
F-JHAW-M6	6×4	35.7	4	58

F-JHA Needle valve Union Elbow



Tube size : inch

Unit：mm

Model code	Tube O.D. x I.D. øD	E	ød	Weight (g)
F-JHA-H1	3.18×2.18	29.3	2	43
F-JHA-H2	6.35×3.95	35.7	4	55

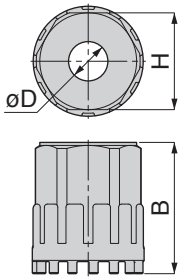
Tube size : mm

Unit：mm

Model code	Tube O.D. x I.D. øD	E	ød	Weight (g)
F-JHA-M3	3×2	29.3	2	43
F-JHA-M6	6×4	35.7	4	55

Appearance drawing of parts

F-UN Union nut



For inch size tube

Unit：mm

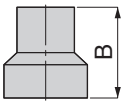
Model code	Tube O.D. x I.D. øD	B	Hex. H	Weight (g)
F-UN-H1×10	3.18×2.18	16.3	11	28
F-UN-H2×10	6.35×3.95	21.7	16	74
F-UN-H3×10	9.53×6.35	25.9	19	103
F-UN-H4×10	12.7×9.53	31	24	183
F-UN-H8×5	25.4×22.2	45.5	41	314

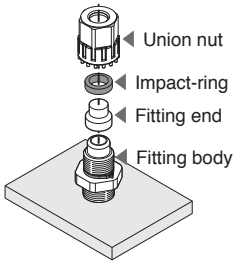
For mm size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	B	Hex. H	Weight (g)
F-UN-M3×10	3×2	16.3	11	28
F-UN-M4×10	4×3	16.3	11	28
F-UN-M6×10	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

F-E Fitting end





For inch size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	B	Weight (g)
F-E-H1×10	3.18×2.18	7	3.7
F-E-H2×10	6.35×3.95	9.4	8.8
F-E-H3×10	9.53×6.35	13.7	21.9
F-E-H4×10	12.7×9.53	15.8	23
F-E-H8×10	25.4×22.2	22.5	79

For mm size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	B	Weight (g)
F-E-M3×10	3×2	7	3.1
F-E-M4×10	4×3	7	3.5
F-E-M6×10	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 inch size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	Weight (g)
F-RI-H1V×10	3.18×2.18	5
F-RI-H2V×10	6.35×3.95	7
F-RI-H3V×10	9.53×6.35	7
F-RI-H4V×10	12.7×9.53	10
F-RI-H8V×10	25.4×22.2	50

High temperature type (material : PPS), for inch size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	Weight (g)
F-RI-H2S×10	6.35×3.95	5
F-RI-H3S×10	9.53×6.35	6
F-RI-H4S×10	12.7×9.53	7
F-RI-H8S×10	25.4×22.2	40

Standard type (material : PVDF), for mm size tube

Unit：mm

Model code	Tube O.D. x I.D. øD	Weight (g)
F-RI-M3V×10	3×2	5
F-RI-M4V×10	4×3	5
F-RI-M6V×10	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	14
F-RI-M25V×10	25×22	53

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

Unit：mm

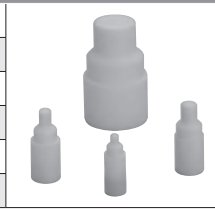
Model code	Tube O.D. x I.D. øD	Weight (g)
F-RI-M6S×10	6×4	7
F-RI-M8S×10	8×6	10
F-RI-M10S×10	10×8	10
F-RI-M12S×10	12×10	10
F-RI-M19S×10	19×15.8	10
F-RI-M25S×10	25×22	40

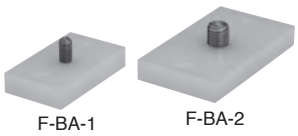
*. "x10" or "x5" at the end of the model code indicate the number of parts in a bag. The weights above are that of 10pcs or 5pcs.

Flaring tools

Make sure to use designated flaring tools listed below. Heat flaring is the basic for fluororesin fitting, 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 fitting.

■ Applicable tube size for hot flaring tool and model code

Applicable tube 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 tube size for cold flaring tool and model code

Applicable tube 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 office for details.

Special wrench for union nut tightening

■ Applicable tube size for special wrench and model code

Applicable tube 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	