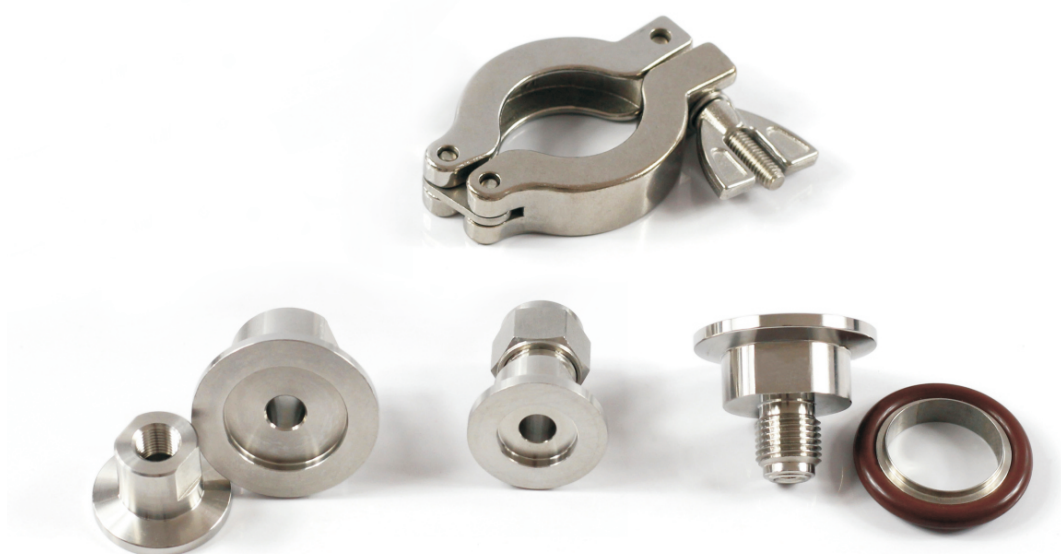


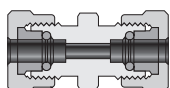


Vacuum Fittings and Vacuum Adapter Fittings

VF, KF and CF Series

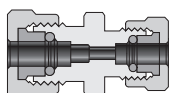
Contents

Vacuum Fittings (VF series)



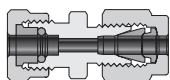
Unions

7-14



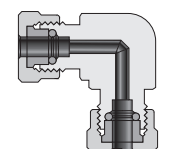
Reducing Unions

7-14



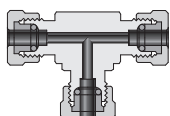
VF to Tube Fitting Unions

7-14



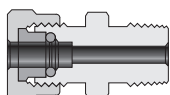
Union Elbows

7-14



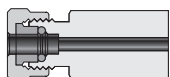
Union Tees

7-14



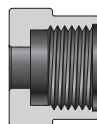
VF to Male Connectors

7-15



VF to Adapters

7-15



Nut

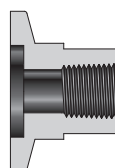
7-15



O-ring for Vacuum Fittings

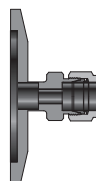
7-16

Vacuum Adapter Fittings (KF series)



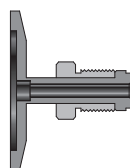
KF to Female NPT

7-17



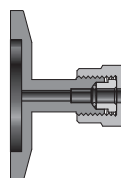
KF to Tube Fitting

7-18



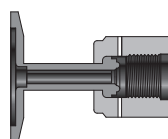
KF to Rotatable Male Metal
Gasket Face Seal Fitting

7-18



KF to Vacuum Fitting

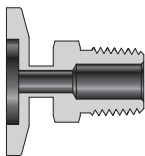
7-19



KF to Female Metal Gasket
Face Seal Fitting

7-19

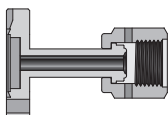
Contents



KF to Male NPT

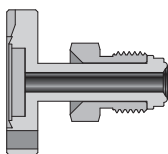
7-20

Vacuum Fittings (CF series)



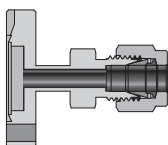
CF to Female GFS Metal Gasket
Face Seal Fitting

7-21



CF to Rotatable Male GFS Metal
Gasket Face Seal Fitting

7-21



CF to Tube Fitting

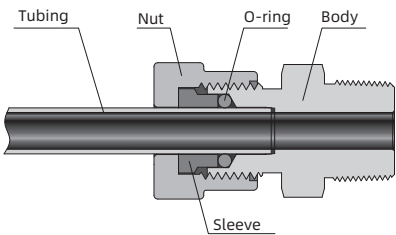
7-21

Vacuum Fittings

VF series

Features

- ❖ O-ring seals to glass, metal, or plastic tubing
- ❖ Knurled nut for easy, finger-tight assembly
- ❖ Stainless steel construction, fluorocarbon FKM O-ring
- ❖ Reliable, repeatable sealing performance
- ❖ Easy to install and maintain
- ❖ Available in tube sizes from 1/16 to 1 1/2 in.



Working Pressure

- ❖ Catalog working pressure is calculated in accordance with ANSI/ASME B31.3. To determine working pressure in accordance with ANSI/ASME B31.1, multiply values by 0.94

Working Temperature

- ❖ Temperature ranges for vacuum fittings are determined by the O-ring materials
- ❖ Standard fluorocarbon FKM O-ring, -25°F to 400°F (-31°C to 204°C)

Materials Standards

Material	Bar Stock	Forging
316 stainless steel	ASTM A276	ASTM A182
316L stainless steel	ASTM SA479, EN 1.4401	ASTM SA182, EN 1.4401

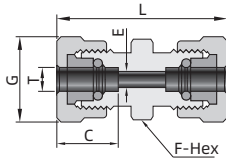
Working Temperature

- ❖ The vacuum fitting is tested with helium at a maximum leak rate of 4×10^{-9} std cm³/s

Cleaning and Packaging

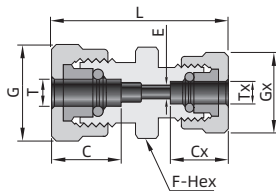
- ❖ CIR-LOK vacuum fittings are cleaned to remove machine oil, grease, and loose particles.

Dimensions



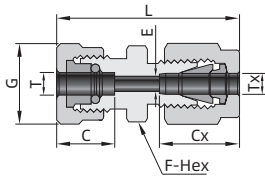
Unions

T-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)				
		L	C	E	G	F
1/16	VF1-U-VF1-	1.23 (31.2)	0.43 (10.9)	0.05 (1.3)	3/8	3/8 (9.5)
1/8	VF2-U-VF2-	1.40 (35.6)	0.43 (10.9)	0.09 (2.3)	9/16	1/2 (12.7)
1/4	VF4-U-VF4-	1.63 (41.4)	0.62 (15.7)	0.18 (4.6)	11/16	5/8 (15.9)
3/8	VF6-U-VF6-	1.81 (46.0)	0.66 (16.8)	0.28 (7.1)	13/16	13/16 (20.6)
1/2	VF8-U-VF8-	1.84 (46.7)	0.80 (20.3)	0.40 (10.2)	15/16	7/8 (22.2)
5/8	VF10-U-VF10-	1.84 (46.7)	0.84 (21.3)	0.50 (12.7)	1 1/8	1 1/16 (27.0)
3/4	VF12-U-VF12-	2.05 (52.1)	0.94 (23.9)	0.62 (15.7)	1 1/4	1 3/16 (30.1)
1	VF16-U-VF16-	2.15 (54.6)	0.94 (23.9)	0.87 (22.1)	1 9/16	1 1/2 (38.1)
1 1/2	VF24-U-VF24-	2.27 (57.6)	0.94 (23.9)	1.38 (35.1)	2 1/16	2 1/8 (54.0)



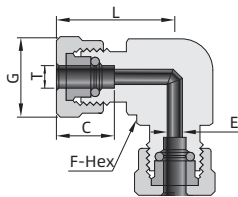
Reducing Unions

T-Tube O.D. (in.)	Tx-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)						
			L	C	Cx	E	G	Gx	F
3/8	1/4	VF6-U-VF4-	1.72 (43.7)	0.66 (16.8)	0.62 (15.7)	0.18 (4.6)	13/16	11/16	13/16 (20.6)
1/2	1/4	VF8-U-VF4-	1.75 (44.4)	0.80 (20.3)	0.62 (15.7)	0.18 (4.6)	15/16	11/16	7/8 (22.2)



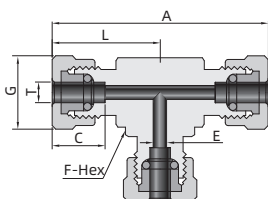
VF to Tube Fitting Unions

T-Tube O.D. (in.)	Tx-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)					
			L	C	Cx	E	G	F
1/4	1/4	VF4-U-F4-	1.66 (42.2)	0.62 (15.7)	0.60 (15.2)	0.18 (4.6)	11/16	5/8 (15.9)
3/8	3/8	VF6-U-F6-	1.81 (46.0)	0.66 (16.8)	0.66 (16.8)	0.28 (7.1)	13/16	13/16 (20.6)
1/2	1/2	VF8-U-F8-	1.95 (49.5)	0.80 (20.3)	0.90 (22.9)	0.40 (10.2)	15/16	7/8 (22.2)



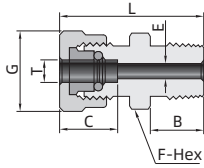
Union Elbows

T-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)				
		L	C	E	G	F
1/4	VF4-UE-VF4-	1.14 (29.0)	0.62 (15.7)	0.18 (4.6)	11/16	1/2 (12.7)
3/8	VF6-UE-VF6-	1.36 (34.5)	0.66 (16.8)	0.28 (7.1)	13/16	11/16 (17.5)
1/2	VF8-UE-VF8-	1.36 (34.5)	0.80 (20.3)	0.40 (10.2)	15/16	13/16 (20.6)



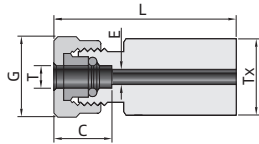
Union Tees

T-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)					
		A	L	C	E	G	F
1/8	VF2-UT-VF2-VF2-	2.12 (53.8)	1.06 (26.9)	0.43 (10.9)	0.09 (2.3)	9/16	1/2 (12.7)
1/4	VF4-UT-VF4-VF4-	2.30 (58.4)	1.15 (29.2)	0.62 (15.7)	0.18 (4.6)	11/16	1/2 (12.7)
3/8	VF6-UT-VF6-VF6-	2.72 (69.1)	1.36 (34.5)	0.66 (16.8)	0.28 (7.1)	13/16	11/16 (17.5)
1/2	VF8-UT-VF8-VF8-	2.72 (69.1)	1.36 (34.5)	0.80 (20.3)	0.40 (10.2)	15/16	11/16 (17.5)
3/4	VF12-UT-VF12-VF12-	3.30 (83.8)	1.65 (41.9)	0.94 (23.9)	0.62 (15.7)	1 1/4	15/16 (23.8)
1	VF16-UT-VF16-VF16-	3.64 (92.4)	1.82 (46.2)	0.94 (23.9)	0.87 (22.1)	1 9/16	1 1/4 (31.8)



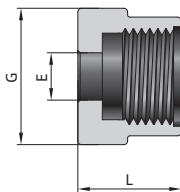
VF to Male Connectors

T-Tube O.D. (in.)	NPT Size in.	Basic Ordering Number	Dimension, in. (mm)					
			L	C	B	E	G	F
1/16	1/8	VF1-MC-NPT2-	1.12 (28.4)	0.43 (10.9)	0.38 (9.6)	0.05 (1.3)	3/8	7/16 (11.1)
1/8	1/8	VF2-MC-NPT2-	1.22 (31.0)	0.43 (10.9)	0.38 (9.6)	0.09 (2.3)	9/16	1/2 (12.7)
1/4	1/8	VF4-MC-NPT2-	1.35 (34.3)	0.62 (15.7)	0.38 (9.6)	0.18 (4.6)	11/16	5/8 (15.9)
1/4	1/4	VF4-MC-NPT4-	1.53 (38.9)	0.62 (15.7)	0.56 (14.2)	0.18 (4.6)	11/16	5/8 (15.9)
3/8	1/8	VF6-MC-NPT2-	1.44 (36.6)	0.66 (16.8)	0.38 (9.6)	0.18 (4.6)	13/16	13/16 (20.6)
3/8	1/4	VF6-MC-NPT4-	1.62 (41.1)	0.66 (16.8)	0.56 (14.2)	0.28 (7.1)	13/16	13/16 (20.6)
1/2	3/8	VF8-MC-NPT6-	1.65 (41.9)	0.80 (20.3)	0.56 (14.2)	0.40 (10.2)	15/16	7/8 (22.2)
1/2	1/2	VF8-MC-NPT8-	1.84 (46.7)	0.80 (20.3)	0.75 (19.1)	0.40 (10.2)	15/16	7/8 (22.2)
3/4	3/4	VF12-MC-NPT12-	1.96 (49.8)	0.94 (23.9)	0.75 (19.1)	0.62 (15.7)	1 1/4	1 3/16 (30.1)
1	1	VF16-MC-NPT16-	2.25 (57.2)	0.94 (23.9)	0.94 (23.9)	0.87 (22.1)	1 9/16	1 1/2 (38.1)



VF to Adapters

T-Tube O.D. (in.)	Tx-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)			
			L	C	E	G
1/16	1/4	VF1-VA-VT4-	1.12 (28.4)	0.43 (10.9)	0.05 (1.3)	3/8
1/8	1/4	VF2-VA-VT4-	1.20 (30.5)	0.43 (10.9)	0.09 (2.3)	9/16
1/8	3/8	VF2-VA-VT6-	1.21 (30.7)	0.43 (10.9)	0.09 (2.3)	9/16
1/4	1/4	VF4-VA-VT4-	1.34 (34.0)	0.62 (15.7)	0.18 (4.6)	11/16
1/4	3/8	VF4-VA-VT6-	1.33 (33.8)	0.62 (15.7)	0.18 (4.6)	11/16
1/4	1/2	VF4-VA-VT8-	1.47 (37.3)	0.62 (15.7)	0.18 (4.6)	11/16
3/8	3/8	VF6-VA-VT6-	1.47 (37.3)	0.66 (16.8)	0.28 (7.1)	13/16
3/8	1/2	VF6-VA-VT8-	1.58 (40.1)	0.66 (16.8)	0.28 (7.1)	13/16
1/2	5/8	VF8-VA-VT10-	1.64 (41.7)	0.80 (20.3)	0.40 (10.2)	15/16
1/2	3/4	VF8-VA-VT12-	1.69 (42.9)	0.80 (20.3)	0.40 (10.2)	15/16
3/4	1	VF12-VA-VT16-	1.78 (45.2)	0.94 (23.9)	0.62 (15.7)	1 1/4
1	1 1/4	VF16-VA-VT20-	1.80 (45.7)	0.94 (23.9)	0.87 (22.1)	1 9/16
1 1/2	1 1/2	VF24-VA-VT24-	1.98 (50.3)	0.94 (23.9)	1.25 (31.8)	2 1/16



Nut

T-Tube O.D. (in.)	Basic Ordering Number	Thread Size	Dimension, in. (mm)		
			E	L	G
1/16	N-VF1-	1/4-20 UNC	0.07 (1.8)	0.38 (9.6)	3/8
1/8	N-VF2-	3/8-20 UN	0.13 (3.3)	0.41 (10.4)	9/16
1/4	N-VF4-	1/2-20 UNF	0.26 (6.6)	0.53 (13.5)	11/16
3/8	N-VF6-	5/8-20 UN	0.38 (9.6)	0.62 (15.7)	13/16
1/2	N-VF8-	3/4-20 UNEF	0.51 (13.0)	0.62 (15.7)	15/16
5/8	N-VF10-	15/16-20 UNEF	0.63 (16.0)	0.62 (15.7)	1 1/8
3/4	N-VF12-	1 1/16-20 UN	0.76 (19.3)	0.72 (18.3)	1 1/4
1	N-VF16-	1 3/8-20 UN	1.01 (25.6)	0.72 (18.3)	1 9/16
1 1/2	N-VF24-	1 7/8-20 UN	1.51 (38.4)	0.72 (18.3)	2 1/16



O-ring for Vacuum Fittings

T-Tube O.D. (in.)	Basic Ordering Number	Material
1/16	FKM7-001	70 Durometer Fluorocarbon FKM
1/8	FKM7-006	
1/4	FKM7-010	
3/8	FKM7-012	
1/2	FKM7-014	
5/8	FKM7-114	
3/4	FKM7-116	
1	FKM7-120	
1 1/2	FKM7-128	

How to Order

VF4

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UT

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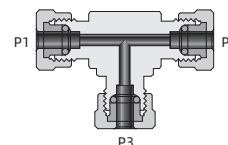
VF4

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VF4

— 316

Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Port 3 Type	Port 3 Size	Material
VF Vacuum Fitting	1 1/16 in.	U Union	VF Vacuum Fitting	1 1/16 in.	VF Vacuum Fitting	1 1/16 in.	316 316 S.S. 316L 316L S.S.
	2 1/8 in.	UE Union Elbow	F Fractional Ferrule	2 1/8 in.		2 1/8 in.	
	4 1/4 in.	UT Union Tee	NPT Male NPT	4 1/4 in.		4 1/4 in.	
	6 3/8 in.	MC Male Connector	VT Adapter	6 3/8 in.		6 3/8 in.	
	8 1/2 in.	VA Adapter		8 1/2 in.		8 1/2 in.	
	10 5/8 in.	N Nut		10 5/8 in.		10 5/8 in.	
	12 3/4 in.			12 3/4 in.		12 3/4 in.	
	16 1 in.			16 1 in.		16 1 in.	
	24 1 1/2 in.			24 1 1/2 in.		24 1 1/2 in.	



Vacuum Adapter Fittings

KF and CF Series

Features

- ❖ Adapter Vacuum products are generally used on vacuum chamber ports to connect vacuum flanges to various fittings

Vacuum Range

- ❖ Copper Seal: ≥10 Torr
- ❖ Elastomeric Seal: ≥10 Torr

Working Temperature

- ❖ Copper Seal: -325°F to 842°F (-200°C to 450°C)
- ❖ Elastomeric Seal: -4°F to 302°F (-20°C to 150°C)

Materials Standards

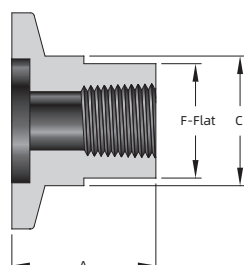
Material	Bar Stock	Forging
316 stainless steel	ASTM A276	ASTM A182
316L stainless steel	ASTM SA479, EN 1.4401	ASTM SA182, EN 1.4401

Flanges Standards

- ❖ KF Flanges: ISO 2861
- ❖ CF Flanges: ISO 3669

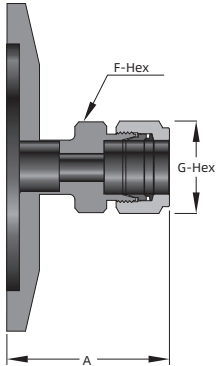
Dimensions

KF Series



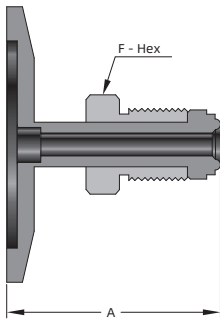
KF to Female NPT

NPT O.D. in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)		
			A	C	F
1/8	KF10	KF10-KA-FNPT2-	0.75(19.1)	0.75(19.1)	0.63(16.0)
	KF16	KF16-KA-FNPT2-	0.75(19.1)	0.75(19.1)	0.63(16.0)
	KF25	KF25-KA-FNPT2-	0.75(19.1)	1.00(25.4)	0.87(22.0)
	KF40	KF40-KA-FNPT2-	1.00(25.4)	1.50(38.1)	1.26(32.0)
	KF50	KF50-KA-FNPT2-	1.00(25.4)	2.00(50.8)	1.73(44.0)
1/4	KF10	KF10-KA-FNPT4-	0.75(19.1)	0.75(19.1)	0.63(16.0)
	KF16	KF16-KA-FNPT4-	0.75(19.1)	0.75(19.1)	0.63(16.0)
	KF25	KF25-KA-FNPT4-	0.75(19.1)	1.00(25.4)	0.87(22.0)
	KF40	KF40-KA-FNPT4-	1.00(25.4)	1.50(38.1)	1.26(32.0)
	KF50	KF50-KA-FNPT4-	1.00(25.4)	2.00(50.8)	1.73(44.0)
1/2	KF25	KF25-KA-FNPT8-	1.00(25.4)	1.10(27.8)	0.94(24.0)
	KF40	KF40-KA-FNPT8-	1.00(25.4)	1.50(38.1)	1.26(32.0)
	KF50	KF50-KA-FNPT8-	1.00(25.4)	2.00(50.8)	1.73(44.0)
3/4	KF40	KF40-KA-FNPT12-	1.00(25.4)	1.63(41.3)	1.34(34.0)
	KF50	KF50-KA-FNPT12-	1.00(25.4)	2.00(50.8)	1.73(44.0)



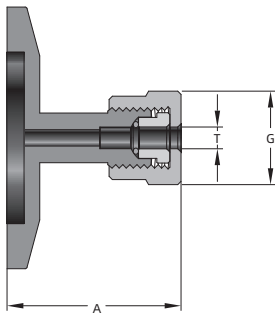
KF to Tube Fitting

Tube O.D. in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)		
			A	F	G
1/4	KF10	KF10-KA-F4-	1.47(37.3)	1/2(12.7)	9/16(14.3)
	KF16	KF16-KA-F4-			
	KF25	KF25-KA-F4-			
	KF40	KF40-KA-F4-			
	KF50	KF50-KA-F4-			
3/8	KF10	KF10-KA-F6-	1.63(41.4)	5/8(15.9)	11/16(17.5)
	KF16	KF16-KA-F6-			
	KF25	KF25-KA-F6-			
	KF40	KF40-KA-F6-			
	KF50	KF50-KA-F6-			
1/2	KF25	KF25-KA-F8-	1.77(45.0)	13/16(20.6)	7/8(22.2)
	KF40	KF40-KA-F8-			
	KF50	KF50-KA-F8-			
3/4	KF25	KF25-KA-F12-	2.14(54.4)	1 1/16(27.0)	1 1/8(28.6)
	KF40	KF40-KA-F12-			
	KF50	KF50-KA-F12-			
1	KF25	KF25-KA-F16-	2.60(66.0)	1 3/8(34.9)	1 1/2(38.1)
	KF40	KF40-KA-F16-			
	KF50	KF50-KA-F16-			



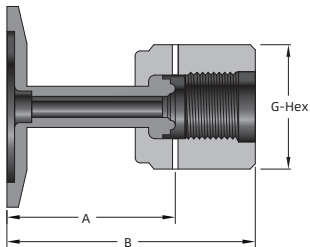
KF to Rotatable Male Metal Gasket Face Seal Fitting

GFS Size in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)	
			A	F
1/4	KF10	KF10-KA-RGFS4-	1.46(37.1)	5/8(15.9)
	KF16	KF16-KA-RGFS4-		
	KF25	KF25-KA-RGFS4-		
	KF40	KF40-KA-RGFS4-		
	KF50	KF50-KA-RGFS4-		
1/2	KF16	KF16-KA-RGFS8-	1.65(41.9)	15/16(23.8)
	KF25	KF25-KA-RGFS8-	1.55(39.4)	
	KF40	KF40-KA-RGFS8-		
	KF50	KF50-KA-RGFS8-		
3/4	KF25	KF25-KA-RGFS12-	2.15(54.6)	1 5/16(33.3)
	KF40	KF40-KA-RGFS12-	2.05(52.1)	
	KF50	KF50-KA-RGFS12-		
1	KF25	KF25-KA-RGFS16-	2.26(57.4)	1 5/8(41.3)
	KF40	KF40-KA-RGFS16-		
	KF50	KF50-KA-RGFS16-		



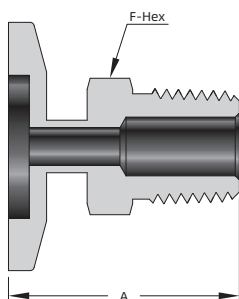
KF to Vacuum Fitting

T-Tube O.D. in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)	
			A	G
1/4	KF10	KF10-KA-VF4-	1.48(37.6)	11/16(17.5)
	KF16	KF16-KA-VF4-		
	KF25	KF25-KA-VF4-		
	KF40	KF40-KA-VF4-		
	KF50	KF50-KA-VF4-		
3/8	KF10	KF10-KA-VF6-	1.62(41.1)	13/16(20.6)
	KF16	KF16-KA-VF6-		
	KF25	KF25-KA-VF6-		
	KF40	KF40-KA-VF6-		
	KF50	KF50-KA-VF6-		
1/2	KF16	KF16-KA-VF8-	1.79(45.5)	15/16(23.8)
	KF25	KF25-KA-VF8-		
	KF40	KF40-KA-VF8-		
	KF50	KF50-KA-VF8-		
3/4	KF25	KF25-KA-VF12-	1.93(49.0)	1 1/4(31.8)
	KF40	KF40-KA-VF12-		
	KF50	KF50-KA-VF12-		
1	KF40	KF40-KA-VF16-	1.95(49.5)	1 9/16(39.7)
	KF50	KF50-KA-VF16-		



KF to Female Metal Gasket Face Seal Fitting

GFS Size in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)		
			A	B	G
1/4	KF10	KF10-KA-FGFS4-	1.46(37.1)	1.96(49.8)	3/4(19.1)
	KF16	KF16-KA-FGFS4-			
	KF25	KF25-KA-FGFS4-			
	KF40	KF40-KA-FGFS4-			
	KF50	KF50-KA-FGFS4-			
1/2	KF16	KF16-KA-FGFS8-	1.65(41.9)	2.21(56.1)	1 1/16(27.0)
	KF25	KF25-KA-FGFS8-			
	KF40	KF40-KA-FGFS8-			
	KF50	KF50-KA-FGFS8-			



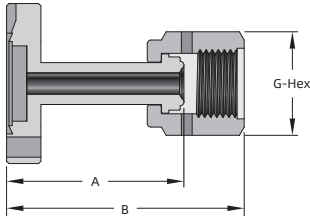
KF to Male NPT

NPT O.D. in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)	
			A	F
1/8	KF10	KF10-KA-NPT2-	0.89(22.6)	7/16(11.1)
	KF16	KF16-KA-NPT2-		
	KF25	KF25-KA-NPT2-		
	KF40	KF40-KA-NPT2-		
	KF50	KF50-KA-NPT2-		
1/4	KF10	KF10-KA-NPT4-	1.10(27.9)	9/16(14.3)
	KF16	KF16-KA-NPT4-		
	KF25	KF25-KA-NPT4-		
	KF40	KF40-KA-NPT4-		
	KF50	KF50-KA-NPT4-		
1/2	KF16	KF16-KA-NPT8-	1.35(34.3)	7/8(22.2)
	KF25	KF25-KA-NPT8-		
	KF40	KF40-KA-NPT8-		
	KF50	KF50-KA-NPT8-		
3/4	KF25	KF25-KA-NPT12-	1.35(34.3)	1 1/16(27.0)
	KF40	KF40-KA-NPT12-		
	KF50	KF50-KA-NPT12-		
1	KF25	KF25-KA-FNPT16-	1.64(41.7)	1 3/8(34.9)
	KF40	KF40-KA-FNPT16-		
	KF50	KF50-KA-FNPT16-		

How to Order

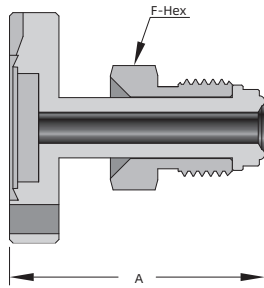
KF10		KA		FNPT4		316
Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Material	
KF KF Flanges	10	KA Vacuum Adapter Fittings	NPT Male NPT	2 1/8 in.	316 316 S.S. 316L 316L S.S.	
	16		FNPT Female NPT	4 1/4 in.		
	25		F Fractional Ferrule	6 3/8 in.		
	40		RGFS Rotatable Male Metal Gasket Face Seal Fitting	8 1/2 in.		
	50		FGFS Female Metal Gasket Face Seal Fitting	12 3/4 in.		
			VF Vacuum Fitting	16 1 in.		

CF Series



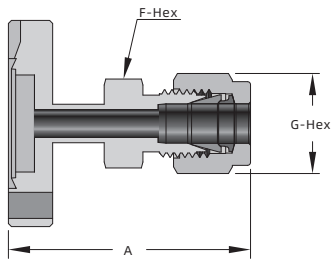
CF to Female GFS Metal Gasket Face Seal Fitting

GFS Size in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)		
			A	B	G
1/4	133CF	133CF-KA-FGFS4-	1.48(37.7)	1.98(50.4)	3/4(19.1)
1/2	133CF	133CF-KA-FGFS8-	1.68(42.6)	2.34(56.8)	1 1/16(27.0)
1/4	275CF	275CF-KA-FGFS4-	1.52(38.6)	2.02(51.3)	3/4(19.1)
1/2	275CF	275CF-KA-FGFS8-	1.71(43.4)	2.27(57.6)	1 1/16(27.0)



CF to Rotatable Male GFS Metal Gasket Face Seal Fitting

GFS Size in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)	
			A	F
1/4	133CF	133CF-KA-RGFS4-	1.48(37.7)	5/8(15.9)
1/2	133CF	133CF-KA-RGFS8-	1.68(42.6)	15/16(23.8)
1/4	275CF	275CF-KA-RGFS4-	1.52(38.6)	5/8(15.9)
1/2	275CF	275CF-KA-RGFS8-	1.71(43.4)	15/16(23.8)



CF to Tube Fitting

Tube O.D. in.	Flange Size	Basic Ordering Number	Dimension, in. (mm)		
			A	F	G
1/4	133CF	133CF-KA-F4-	1.50(38.0)	1/2(12.7)	9/16(14.3)
3/8	133CF	133CF-KA-F6-	1.66(42.0)	5/8(15.9)	11/16(17.5)
1/2	133CF	133CF-KA-F8-	1.80(45.6)	13/16(20.6)	7/8(22.2)
1/4	275CF	275CF-KA-F4-	1.53(38.9)	1/2(12.7)	9/16(14.3)
3/8	275CF	275CF-KA-F6-	1.69(42.9)	5/8(15.9)	11/16(17.5)
1/2	275CF	275CF-KA-F8-	1.83(46.5)	13/16(20.6)	7/8(22.2)

How to Order

133CF		KA		FNPT4		316
Port 1 Size	Port 1 Type	Configuration Designator		Port 2 Type	Port 2 Size	Material
133 1.33 in.	CF CF Flanges	KA Vacuum Adapter Fittings		F Fractional Ferrule	4 1/4 in.	316 316 S.S.
275 2.75 in.				RGFS Rotatable Male Metal Gasket Face Seal Fitting	6 3/8 in.	316L 316L S.S.
				FGFS Female Metal Gasket Face Seal Fitting	8 1/2 in.	

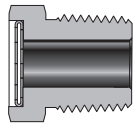


Other Fittings

VP, TCF, DF, GCC and FUF Series

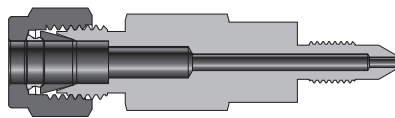
Contents

Vent Protectors (VP Series)



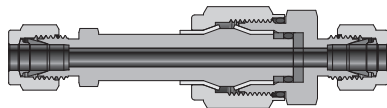
200

Transmitter Calibration Fittings (TCF Series)



200

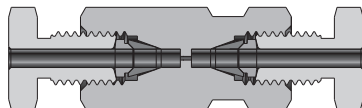
Dielectric Fittings (DF Series)



201

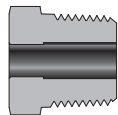
Gaugeable Chromatograph and Column End Fittings

(GCC Series)



202

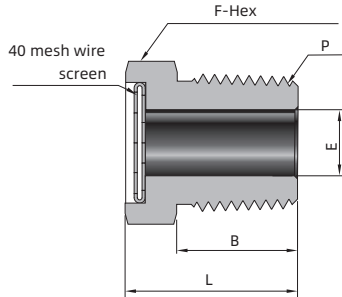
Fusible Fittings (FUF Series)



205

Vent Protectors

VP Series



❖ 40 mesh 316 series stainless steel wire screen assembly

NPT Thread

P-NPT Size	Ordering Number	Dimension, in.(mm)			
		L	F	B	E
1/8	VP-NPT2-	0.56 (14.2)	1/2	0.38 (9.7)	0.19 (4.8)
1/4	VP-NPT4-	0.78 (19.8)	9/16	0.56 (14.2)	0.28 (7.1)
3/8	VP-NPT6-	0.81 (20.6)	11/16	0.56 (14.2)	0.41 (10.4)
1/2	VP-NPT8-	1.03 (26.2)	7/8	0.75 (19.1)	0.50 (12.7)
3/4	VP-NPT12-	1.06 (26.9)	1 1/16	0.76 (19.2)	0.72 (18.3)
1	VP-NPT16-	1.37 (34.8)	1 3/8	0.94 (23.9)	0.88 (22.4)

How to Order

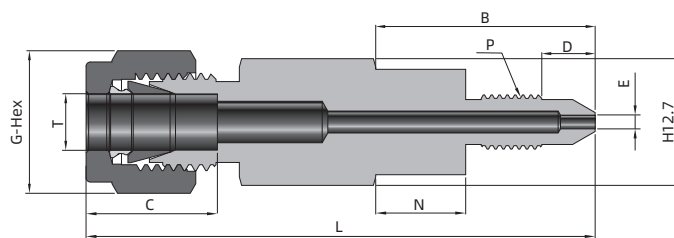
VP — NPT2 — 316

Configuration Designator	Port 1 Type	Port 1 Size	Material
VP Vent Protectors	NPT Male NPT	2 1/8	316 316 S.S.
	MBT Male BSPT	4 1/4	
		6 3/8	
		8 1/2	
		12 3/4	
		16 1	

Transmitter Calibration Fittings

TCF Series

- ❖ The calibration fittings can be connected directly with the bleed port of the transmitter so that the calibration process can be simplified.
- ❖ Two types are available to fit the bleed ports of the transmitters.



T-Tube O.D. (in.)	P-SAE/MS Thread Size	Basic Ordering Number	Dimension, in. (mm)							Transmitter Type
			L	B	C	D	E	G	N	
1/4	1/4-28	F4-MC-TCF4-	1.69(42.9)	0.78(19.8)	0.60(15.2)	0.43(10.9)	0.06(1.5)	9/16	-	Honeywell
1/4	5/16-24	F4-MC-TCF5-	2.32(58.9)	1.41(35.8)	0.60(15.2)	0.40(10.2)	0.06(1.5)	9/16	0.41(10.4)	Rosemount/Foxboro

How to Order

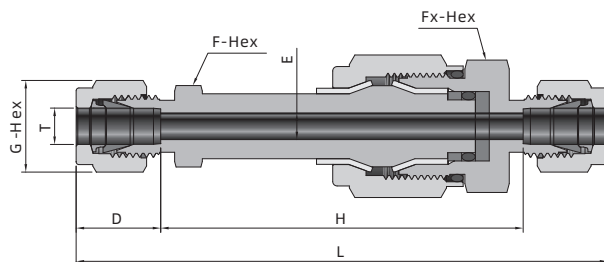
F4 — MC — TCF4 — 316

Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Material
F Fractional Ferrule	4 1/4 in.	MC	TF Transmitter Calibration Fittings	4 1/4-28 5 5/16-24	316 316 S.S.

Dielectric Fittings

DF Series

- ❖ Electrical Resistance of Insulators at 70°F (20°C): $10 \times 10^7 \Omega$ at 10 V
- ❖ Maximum working pressure: 5000 psig (344 bar)
- ❖ Working temperature from -40°F to 200°F (-40°C to 93°C)



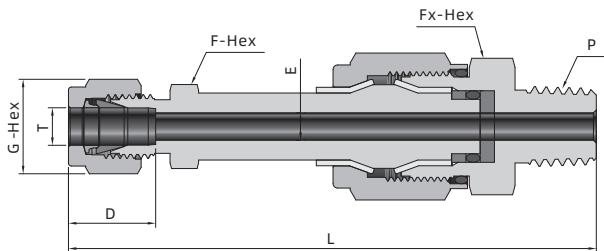
component	Material
Insulator	Polyamide-imide
O-Ring	70 Durometer FKM
Backup Ring	Virgin PTFE

Fractional Tube

T-Tube O.D. (in.)	Basic Ordering Number	Dimension, in. (mm)						
		L	D	G	H	E	F	Fx
1/4	F4-DF-F4-	3.77(95.7)	0.60(15.2)	9/16	2.57(65.3)	0.19(4.8)	1/2	13/16
3/8	F6-DF-F6-	3.92(99.6)	0.66(16.8)	11/16	2.59(65.8)	0.28(7.1)	5/8	13/16
1/2	F8-DF-F8-	4.17(106.0)	0.90(22.9)	7/8	2.37(60.2)	0.28(7.1)	13/16	13/16

Metric Tube

T-Tube O.D. (mm)	Basic Ordering Number	Dimension, in. (mm)						
		L	D	G	H	E	F	Fx
12	M12-DF-M12-	107.0(4.21)	22.8(0.90)	7/8	61.7(2.43)	7.1(0.28)	7/8	7/8



Fractional Tube

NPT Thread

T-Tube O.D. (in.)	P-NPT Size	Basic Ordering Number	Dimension, in. (mm)					
			L	D	G	E	F	Fx
3/8	1/4	F6-DF-NPT4-	3.73(94.7)	0.66(16.8)	11/16	0.28(7.1)	5/8	7/8

How to Order

F4 — DF — F4 — 316					
Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Material
M Metric Ferrule	4 1/4 in. or 4mm	DF	Same as part 1	4 1/4	316 316 S.S.
F Fractional Ferrule	6 3/8 in. or 6mm		NPT Male NPT	8 1/2	
	8 1/2 in. or 8mm		MBT Male BSPT		

Gaugeable Chromatograph and Column End Fittings

GCC Series

Features

- ❖ Suitable for liquid or gas chromatography
- ❖ 316 stainless steel construction
- ❖ Offered in sizes from 1/16 to 1/2 in

Cleaning

- ❖ Fitting components are cleaned to remove machine oil, grease, and loose particles. For more information, see CIR-LOK Standard Cleaning and Packaging.

Pressure-Temperature Ratings

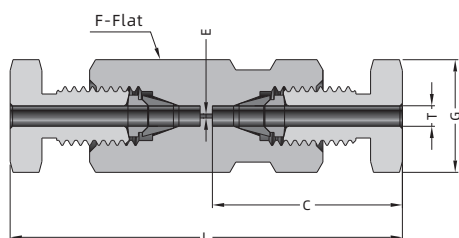
- ❖ Gaugeable Chromatograph and Column End Fittings are rated to the working pressure of tubing as listed in CIR-LOK Tubing and Pipe.

Materials Standards

Material	Bar Stock	Forgings
316 stainless steel	ASTM A276 ASME SA479	ASTM A182 ASME SA182

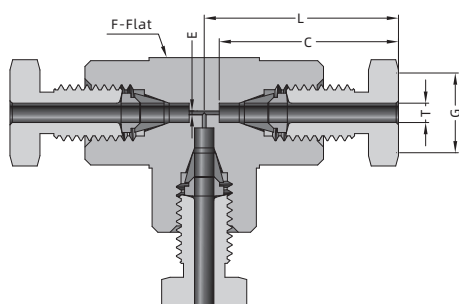
Dimensions

Gaugeable Chromatograph Fittings



Union-Low Dead Volume

T-Tube OD (in.)	Basic Ordering Number	Dimensions, in. (mm)					Dead Volume
		L	C	E	F	G	
1/16	GCF1-U-GCF1-316	1.26 (32)	0.61 (15.5)	0.013 (0.3)	5/16	5/16	$6.6 \times 10^{-5} \text{cm}^3$



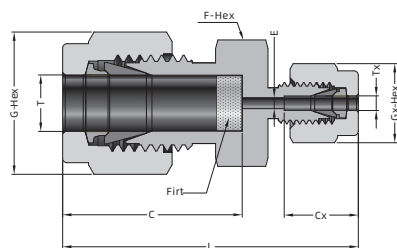
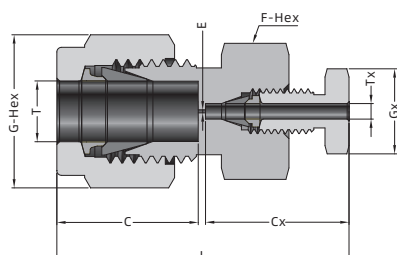
Union Tee-Low Dead Volume

T-Tube OD (in.)	Basic Ordering Number	Dimensions, in. (mm)					Dead Volume
		L	C	E	F	G	
1/16	GCF1-UT-GCF1-GCF1-316	0.66 (16.8)	0.61 (15.5)	0.013 (0.3)	3/8	5/16	$2.8 \times 10^{-4} \text{cm}^3$

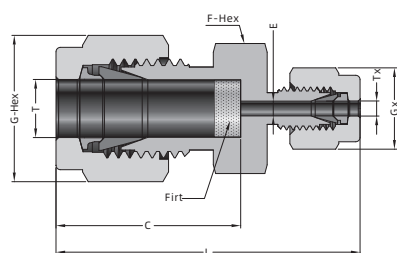
How to Order

GCF1 — U — GCF1 — 316					
Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Material
GCF Gaugeable Chromatograph Fittings	1 1/16 in.	U Union UT Union Tee	Same as part 1	Same as part 1	316 316 S.S.

Column End Fittings



Low Volume



Zero Volume

Fractional Tube

T-Tube OD (in.)	Tx-Tube OD (in.)	Basic Ordering Number	Dimensions, in. (mm)							Dead Volume
			L	C	Cx	E	F	G	Gx	
1/4	1/16	F4-U-GCF1-316	1.24 (31.5)	0.6 (15.2)	0.61 (15.5)	0.013 (0.3)	1/2	9/16	5/16	6.8×10 ⁻⁵ cm ³
3/8	1/16	F6-U-GCF1-316	1.3 (33)	0.66 (16.8)	0.61 (15.5)	0.013 (0.3)	5/8	11/16	5/16	6.8×10 ⁻⁵ cm ³

Fractional Tube

T-Tube OD (in.)	Tx-Tube OD (in.)	Basic Ordering Number	Dimensions, in. (mm)							Dead Volume
			L	C	Cx	E	F	G	Gx	
1/8	1/16	F2-LVU-F1-	1.22 (31)	0.72 (18.3)	0.34 (1.3)	0.052 (1.3)	7/16	7/16	5/16	5.4×10 ⁻³ cm ³
1/4	1/16	F4-LVU-F1-	1.35 (34.3)	0.82 (20.8)	0.34 (1.3)	0.052 (1.3)	1/2	9/16	5/16	6.7×10 ⁻³ cm ³
3/8	1/16	F6-LVU-F1-	1.44 (36.6)	0.91 (23.1)	0.34 (1.3)	0.052 (1.3)	5/8	11/16	5/16	6.5×10 ⁻³ cm ³

Fractional Tube

T-Tube OD (in.)	Tx-Tube OD (in.)	Basic Ordering Number	Dimensions, in. (mm)						Dead Volume
			L	C	E	F	G	Gx	
1/8	1/16	F2-ZVU-F1-	1.22 (31)	0.73 (18.3)	0.06 (1.7)	7/16	7/16	5/16	0
1/4	1/16	F4-ZVU-F1-	1.35 (34.3)	0.82 (20.8)	0.06 (1.7)	1/2	9/16	5/16	0
3/8	1/16	F6-ZVU-F1-	1.44 (36.6)	0.92 (23.1)	0.06 (1.7)	5/8	11/16	5/16	0
1/2	1/16	F8-ZVU-F1-	1.58 (40.1)	1.04 (26.4)	0.06 (1.7)	13/16	7/8	5/16	0

- ❖ The dead volume in the low-volume fitting is equal to the volume of the 0.052 in. bore.
- ❖ The tubing in the zero-volume fitting is inserted to the frit.
- ❖ Both low- and zero-volume column end fittings are available with stainless steel sintered frits. Frits are loosely installed to facilitate removal and replacement.

How to Order

F2 — LVU — F1 — S01 — 316							
Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Frit Type	Frit Nominal Pore Size	Material
F Fractional Ferrule	2 1/8 in.	LVU Low Volume	F Fractional Ferrule GCF Chromatograph Fitting	1 1/16 in.	S Stainless steel sintered frits	01 0.1µm	316 316 S.S.
	4 1/4 in.	ZVU Zero Volume				05 0.5µm	
	6 3/8 in.	U Union				1 1µm	
	8 1/2 in.					2 2µm	
						3 3µm	
						5 5µm	
						7 7µm	
						10 10µm	
						15 15µm	
						20 20µm	
						25 25µm	

Note: The SO series selection is only applicable to the LVU, ZVU models

Fusible Fittings

FUF Series

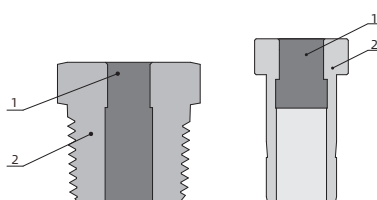
Application

- ❖ Fusible fittings contain an eutectic alloy plug, and the eutectic alloy plug has a specific melting point. When the fitting is exposed to temperatures at or above this melting point of fusible metals, the eutectic alloy plug will melt and the pressure inside the fitting will be released to atmosphere for protection of systems.

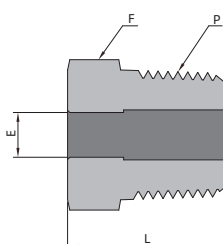
Features

- ❖ Eutectic alloy is filled in the stainless plug.
- ❖ Fusible fittings function by the yielding or melting of the fuse alloy.
- ❖ Fusible fittings are thermally operated but not reusable pressure relief devices.
- ❖ Fusible fittings do not protect against overpressure from improper charging practices.
- ❖ Maximum operating pressure: Tested to 500 psig (3.4 MPa)
- ❖ Temperature rating from 160°F (71°C) to 281°F (138°C) with 4 temperature ranges.
- ❖ Eutectic alloy melting point error: $\pm 2\%$
- ❖ Two types of fusible fittings: Pipe plug and tube adapters with 316 stainless steel body.

Standard Materials of Construction

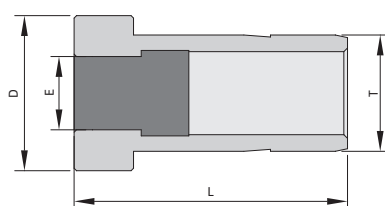


Item	Component	Material
1	Eutectic alloy	—
2	Body	Stainless steel



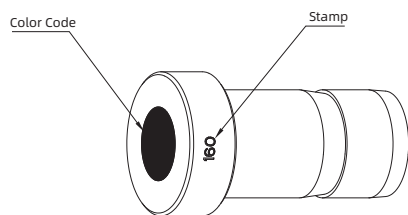
Basic Ordering Number	Pipe Size (P)	Dimensions in. (mm)		
		L	E	F (Hex.)
FUF-NPT4-	1/4 NPT	0.95(24.1)	0.25(6.4)	9/16(14.29)
FUF-NPT6-	3/8 NPT	1.06(26.9)	0.25(6.4)	11/16(17.46)
FUF-NPT8-	1/2 NPT	1.20(30.5)	0.34(8.7)	7/8(22.23)

❖ Dimensions, in inches (mm), are for reference only and are subject to change.



Basic Ordering Number	T-Tube O.D. in.	Dimensions in. (mm)		
		L	E	D
FUF-FT4-	1/4	0.81(20.6)	0.17(4.3)	3/8(9.53)
FUF-FT6-	3/8	0.88(22.4)	0.25(6.4)	1/2(12.70)
FUF-FT8-	1/2	1.12(28.4)	0.25(6.4)	5/8(15.88)

Fusible alloy option with different melting point



Designator	Stamp	Color Code	Melting Point °F (°C)	
			°F	°C
160	160	Black	160	71
212	212	Orange	212	100
255	255	Green	255	124
281	281	Red	281	138

How to Order

FUF — NPT4 — 160 — 316

Series	Inlet Type	Inlet Size	Melting Point	Body Material
FUF	NPT Male NPT	4 1/4 in.	160 160 °F	316 316 S.S.
	MBT Male BSPT	6 3/8 in. or 6mm	212 212 °F	316L 316L S.S.
	FT Fractional Tube Adapter	8 1/2 in.	255 255 °F	304 304 S.S.
	MT Metric Tube Adapter	10 10 mm	281 281 °F	304L 304L S.S.
		12 12 mm		