



BEYOND FLUID

Beyond Fluid

Metal Gasket Face Seal Fittings



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High Purity Face Seal Fittings

Features

- Metal-to-metal seal to provide perfect leak-tight service for working conditions from critical vacuum to high pressure.
- Precision manufactured gasket to ensure best performance.
- Test port at nut for easy leak testing.
- Silver-plated female threads.
- Standard surface roughness finished to an average of Ra 10 $\mu\text{in.}$ (0.25 μm) or electropolished to Ra 5 $\mu\text{in.}$ (0.13 μm) optional.
- All seal faces and male threads protected with plastic caps.
- Sizes range from 1/16" to 1" and 6 mm to 18 mm.

Weld End Tube O.D. and Wall Thickness

Tube O.D. (in.)	Wall Thickness(in.)	Tube O.D. (mm.)	Wall Thickness(mm)
1/8	0.028	6	1.0
1/4	0.035	8	1.0
3/8	0.035	10	1.0
1/2	0.049	12	1.0
3/4	0.049	18	1.0
1	0.065		
1.1/2	0.065		
2	0.065		

Working Pressure

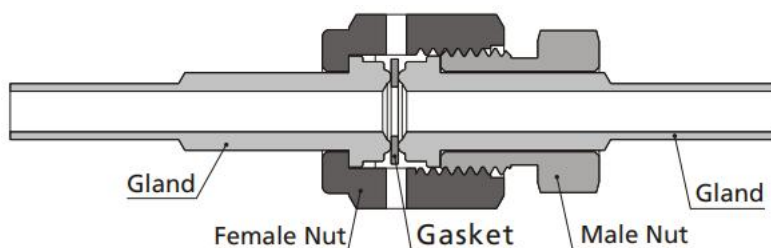
Working pressures are calculated according to ASME B31.3 and B31.1 at ambient temperature.

Working Temperature

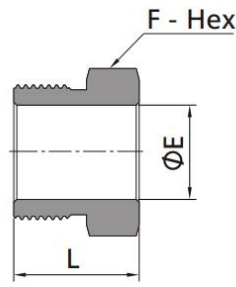
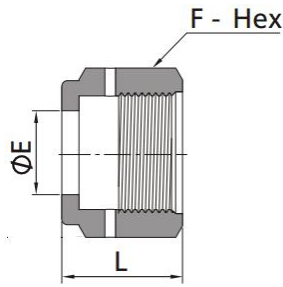
Component	Material	Max. Temperature
Fittings	SS 316	1000 °F (538 °C)
	SS 316L	
Gaskets	SS 316L	1000 °F (538 °C)
	Copper	400 °F (204 °C)
	Nickel	600 °F (316 °C)

Installation Instructions

1. Assemble the gland, nut, gasket and male nut as below. Finger tight the nut.
2. For fittings with 316L SS and nickel gaskets, tighten the nut 1/8 turn with a wrench while holding the male nut or the body steady. Tighten the nut 1/4 turn for those with copper gaskets.

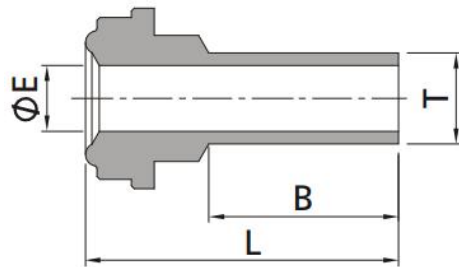


Nuts

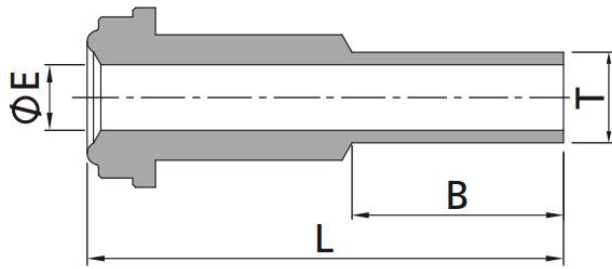


Female Nuts					Male Nuts				
Basic Ordering NO.	Size (in.)	Dimensions in.(mm)			Basic Ordering NO.	Size (in.)	Dimensions in.(mm)		
		F	E	L			F	E	L
-FN-FT2	1/8	7/16 (11.1)	0.21 (5.3)	0.53 (13.5)	-MN-FT2	1/8	3/8 (9.5)	0.21 (5.3)	0.50 (12.7)
-FN-FT4	1/4	3/4 (19.1)	0.36 (9.1)	0.81 (20.6)	-MN-FT4	1/4	5/8 (15.9)	0.36 (9.1)	0.71 (18.0)
-FN-FT8	1/2	1.1/16 (27.0)	0.61 (15.5)	0.88 (22.4)	-MN-FT8	1/2	15/16 (23.8)	0.61 (15.5)	0.81 (20.6)
-FN-FT10	5/8	1.3/16 (30.2)	0.74 (18.8)	0.88 (22.4)	-MN-FT10	5/8	1.1/16 (27.0)	0.74 (18.8)	0.81 (20.6)
-FN-FT12	3/4	1.1/2 (38.1)	0.89 (22.6)	1.12 (28.4)	-MN-FT12	3/4	1.5/16 (33.3)	0.89 (22.6)	1.00 (25.4)
-FN-FT16	1	1.3/4 (44.5)	1.20 (30.5)	1.34 (34.0)	-MN-FT16	1	1 5/8 (41.3)	1.20 (30.5)	1.19 (30.2)

Glands

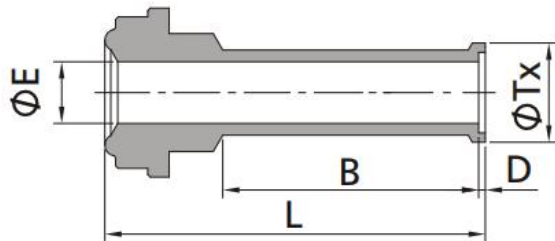


FR Gland to Short Fractional Tube Butt Weld							
Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Nominal Wall Thickness(In.)	Dimensions in.(mm)			Working Pressure psig (bar)
				B	E	L	
-G-FR2-FT2-12	1/8	1/8	0.028	0.75 (19.1)	0.07 (1.8)	1.08 (27.4)	8500 (586)
-G-FR4-FT2-12	1/4	1/8	0.028	0.75 (19.1)	0.07 (1.8)	1.10 (27.9)	5100 (352)
-G-FR4-FT4-4	1/4	1/4	0.035	0.25 (6.4)	0.18 (4.6)	0.60 (15.2)	5100 (352)
-G-FR4-FT4-6	1/4	1/4	0.035	0.38 (9.6)	0.18 (4.6)	0.72 (18.3)	5100 (352)
-G-FR4-FT4-12	1/4	1/4	0.035	0.75 (19.1)	0.18 (4.6)	1.10 (27.9)	5100 (352)
-G-FR8-FT4-12	1/2	1/4	0.035	0.75 (19.1)	0.18 (4.6)	1.12 (28.4)	4300 (296)
-G-FR8-FT6-4	1/2	3/8	0.035	0.25 (6.4)	0.31 (7.9)	0.62 (15.7)	3300 (227)
-G-FR8-FT6-12	1/2	3/8	0.035	0.75 (19.1)	0.31 (7.9)	1.12 (28.4)	3300 (227)
-G-FR8-FT8-4	1/2	1/2	0.049	0.25 (6.4)	0.40 (10.2)	0.62 (15.7)	3500 (241)
-G-FR8-FT8-6	1/2	1/2	0.049	0.38 (9.6)	0.40 (10.2)	0.74 (18.8)	3500 (241)
-G-FR8-FT8-12	1/2	1/2	0.049	0.75 (19.1)	0.40 (10.2)	1.12 (28.4)	3500 (241)
FR Gland to Short Metric Tube Butt Weld							
Basic Ordering NO.	FR Size (in.)	T-Tube OD(mm)	Nominal Wall Thickness(mm)	Dimensions mm(in.)			Working Pressure Bar(psig)
				B	E	L	
-G-FR4-MT6-12	1/4	6	1	19.1 (0.75)	4.0 (0.16)	29.5 (1.16)	468 (6800)
-G-FR4-MT8-12	1/4	8	1	19.1 (0.75)	6.0 (0.24)	29.5 (1.16)	337 (4900)
-G-FR8-MT10-12	1/2	10	1	19.1 (0.75)	8.0 (0.31)	29.5 (1.16)	241 (3500)
-G-FR8-MT12-12	1/2	12	1	19.1 (0.75)	10.0 (0.39)	29.5 (1.16)	213 (3100)
-G-FR12-MT18-12	3/4	18	1.5	19.1 (0.75)	15.0 (0.59)	31.0 (1.22)	206 (3000)



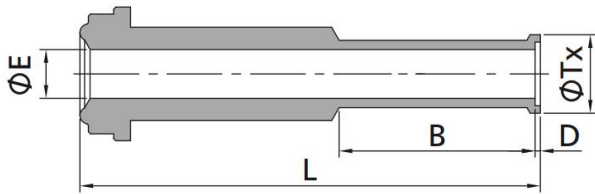
FR Gland to Long Fractional Tube Butt Weld							
Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Nominal Wall Thickness(In.)	Dimensions in.(mm)			Working Pressure psig (bar)
				B	E	L	
-G-FR2-FT2-12L	1/8	1/8	0.028	0.75 (19.1)	0.07 (1.8)	1.42 (36.1)	8500 (586)
-G-FR4-FT4-4L	1/4	1/4	0.035	0.25 (6.4)	0.18 (4.6)	1.20 (30.5)	5100 (352)
-G-FR4-FT4-6L	1/4	1/4	0.035	0.38 (9.6)	0.18 (4.6)	1.32 (33.5)	5100 (352)
-G-FR4-FT4-12L	1/4	1/4	0.035	0.75 (19.1)	0.18 (4.6)	1.70 (43.2)	5100 (352)
-G-FR8-FT4-12L	1/2	1/4	0.035	0.75 (19.1)	0.18 (4.6)	1.80 (45.7)	4300 (296)
-G-FR8-FT6-4L	1/2	3/8	0.035	0.25 (6.4)	0.31 (7.9)	1.29 (32.8)	3300 (227)
-G-FR8-FT6-12L	1/2	3/8	0.035	0.75 (19.1)	0.31 (7.9)	1.79 (45.5)	3300 (227)
-G-FR8-FT8-4L	1/2	1/2	0.049	0.25 (6.4)	0.40 (10.2)	1.29 (32.8)	3500 (241)
-G-FR8-FT8-6L	1/2	1/2	0.049	0.38 (9.6)	0.40 (10.2)	1.41 (35.8)	3500 (241)
-G-FR8-FT8-12L	1/2	1/2	0.049	0.75 (19.1)	0.40 (10.2)	1.79 (45.5)	3500 (241)
-G-FR12-FT12-12L	3/4	3/4	0.049	0.75 (19.1)	0.65 (16.5)	2.03 (51.6)	2400 (165)
-G-FR16-FT16-12L	1	1	0.065	0.75 (19.1)	0.87 (22.1)	2.32 (58.9)	2400 (165)

FR Gland to Long Metric Tube Butt Weld							
Basic Ordering NO.	FR Size (in.)	T-Tube OD(mm)	Nominal Wall Thickness(mm)	Dimensions mm(in.)			Working Pressure Bar(psig)
				B	E	L	
-G-FR4-MT6-12L	1/4	6	1	19.1 (0.75)	4.0 (0.16)	43.2 (1.7)	468 (6800)
-G-FR4-MT8-12L	1/4	8	1	19.1 (0.75)	6.0 (0.24)	43.2 (1.7)	337 (4900)
-G-FR8-MT10-12L	1/2	10	1	19.1 (0.75)	8.0 (0.31)	45.5 (1.79)	241 (3500)
-G-FR8-MT12-12L	1/2	12	1	19.1 (0.75)	10.0 (0.39)	45.5 (1.79)	213 (3100)
-G-FR12-MT18-12L	3/4	18	1.5	19.1 (0.75)	15.0 (0.59)	51.6 (2.03)	206 (3000)



FR Gland to Short Fractional Automatic Tube Butt Weld									
Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Nominal Wall Thickness(In.)	Dimensions in.(mm)					Working Pressure psig (bar)
				B	D	E	L	Tx	
-G-FR4-AT4-12	1/4	1/4	0.035	0.75 (19.1)	0.02 (0.5)	0.18 (4.6)	1.12 (28.4)	0.29 (7.4)	5100 (352)
-G-FR8-AT6-12	1/2	3/8	0.035	0.75 (19.1)	0.03 (0.8)	0.31 (7.9)	1.15 (29.2)	0.41 (10.4)	3300 (227)
-G-FR8-AT8-4	1/2	1/2	0.049	0.25 (6.4)	0.04 (1.0)	0.40 (10.2)	1.16 (29.5)	0.55 (14.0)	3500 (241)

FR Gland to Short Metric Automatic Tube Butt Weld									
Basic Ordering NO.	FR Size (in.)	T-Tube OD(mm)	Nominal Wall Thickness(mm)	Dimensions in.(mm)					Working Pressure psig (bar)
				B	D	E	L	Tx	
-G-FR4-AT6-12	1/4	6	1	19.1 (0.75)	0.5 (0.02)	4.0 (0.16)	30.0 (1.18)	6.8 (0.27)	468 (6800)
-G-FR4-AT8-12	1/4	8	1	19.1 (0.75)	0.8 (0.03)	6.0 (0.24)	30.2 (1.19)	8.9 (0.35)	337 (4900)
-G-FR8-AT10-12	1/2	10	1	19.1 (0.75)	0.8 (0.03)	8.0 (0.31)	31.0 (1.22)	10.9 (0.43)	241 (3500)
-G-FR8-AT12-12	1/2	12	1	19.1 (0.75)	1.0 (0.04)	10.0 (0.39)	30.5 (1.20)	13.2 (0.52)	213 (3100)

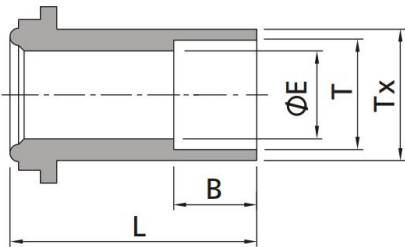


FR Gland to Short Fractional Automatic Tube Butt Weld

Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Nominal Wall Thickness(In.)	Dimensions in.(mm)					Working Pressure psig (bar)
				B	D	E	L	Tx	
-G-FR4-AT4-12L	1/4	1/4	0.035	0.75 (19.1)	0.02 (0.5)	0.18 (4.6)	1.72 (43.7)	0.29 (7.4)	5100 (352)
-G-FR8-AT4-12L	1/2	1/4	0.035	0.75 (19.1)	0.02 (0.5)	0.18 (4.6)	1.82 (46.2)	0.29 (7.4)	3500 (241)
-G-FR8-AT6-12L	1/2	3/8	0.035	0.75 (19.1)	0.03 (0.8)	0.31 (7.9)	1.82 (46.2)	0.41 (10.4)	3300 (227)
-G-FR8-AT8-12L	1/2	1/2	0.049	0.75 (19.1)	0.04 (1.0)	0.40 (10.2)	1.83 (46.5)	0.55 (14.0)	3500 (241)
-G-FR12-AT12-12L	3/4	3/4	0.049	0.75 (19.1)	0.04 (1.0)	0.65 (16.5)	2.07 (52.6)	0.80 (20.3)	2400 (165)
-G-FR16-AT16-12L	1	1	0.065	0.96(24.4)	0.04 (1.0)	0.87 (22.1)	2.57 (65.3)	1.06(26.9)	2400 (165)

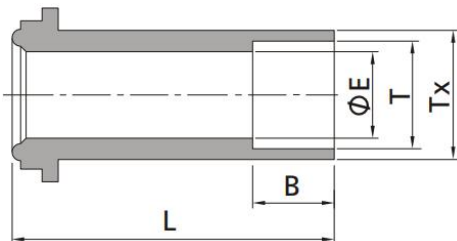
FR Gland to Short Metric Automatic Tube Butt Weld

Basic Ordering NO.	FR Size (in.)	T-Tube OD(mm)	Nominal Wall Thickness(mm)	Dimensions in.(mm)					Working Pressure psig (bar)
				B	D	E	L	Tx	
-G-FR4-AT6-12L	1/4	6	1	19.1 (0.75)	0.5 (0.02)	4.0 (0.16)	43.7 (1.72)	6.8 (0.27)	468 (6800)
-G-FR8-AT12-12L	1/2	12	1	19.1 (0.75)	1.0 (0.04)	10.0 (0.39)	46.5 (1.83)	13.2 (0.52)	213 (3100)
-G-FR12-AT18-12L	3/4	18	1.5	19.1 (0.75)	1.0 (0.04)	15.0 (0.59)	51.6 (2.03)	19.3 (0.76)	206 (3000)



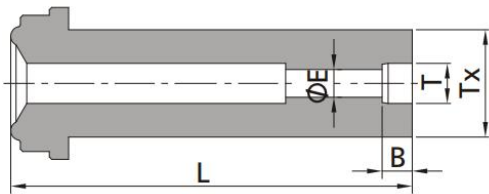
FR Gland to Short Fractional Tube Socket Weld

Basic Ordering NO.	FR Size (in.)	T-Tube U-OD(in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			B	E	L	Tx	
-G-FR4-FST4	1/4	1/4	0.28 (7.1)	0.18 (4.6)	0.50 (12.7)	0.35 (8.9)	5100 (352)
-G-FR4-FST4	1/4	1/4	0.28 (7.1)	0.18 (4.6)	0.75 (19.1)	0.35 (8.9)	5100 (352)



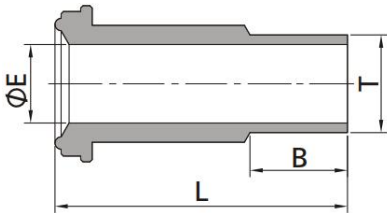
FR Gland to Long Fractional Tube Socket Weld

Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			B	E	L	Tx	
-G-FR2-FST2-L	1/8	1/8	0.10 (2.5)	0.09 (2.3)	0.70 (17.8)	0.20 (5.1)	7100 (489)
-G-FR4-FST4-L	1/4	1/4	0.28 (7.1)	0.18 (4.6)	1.31 (33.3)	0.35 (8.9)	5500 (378)
-G-FR8-FST6-L	1/2	3/8	0.31 (7.9)	0.28 (7.1)	1.50 (38.1)	0.60 (15.2)	4300 (296)
-G-FR8-FST8-L	1/2	1/2	0.38 (9.7)	0.40 (10.2)	1.50 (38.1)	0.60 (15.2)	3000 (206)
-G-FR10-FST10-L	5/8	5/8	0.41 (10.4)	0.50 (12.7)	1.56 (39.6)	0.72 (18.3)	2800 (192)
-G-FR12-FST12-L	3/4	3/4	0.44 (11.2)	0.65 (16.5)	2.00 (50.8)	0.88 (22.4)	2800 (192)
-G-FR16-FST16-L	1	1	0.62 (15.7)	0.87 (22.1)	2.22 (56.4)	1.19 (30.2)	3000 (206)



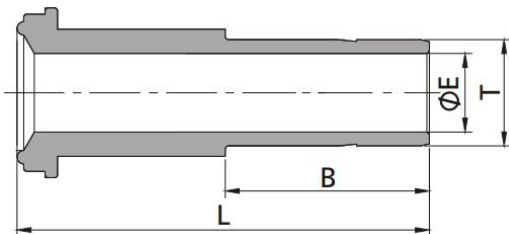
FR Gland to Reducing Socket Weld

Basic Ordering NO.	FR Size (in.)	V-Tube W-OD(in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			B	E	L	Tx	
-G-FR4-RST2	1/4	1/8	0.10 (2.5)	0.09 (2.3)	1.31 (33.3)	0.35 (8.9)	8000 (550)
-G-FR8-RST4	1/2	1/4	0.28 (7.1)	0.18 (4.6)	1.50 (38.1)	0.60 (15.2)	3500 (241)



FR Gland to Male Weld

Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Dimensions in.(mm)			Working Pressure psig (bar)
			B	E	L	
-G-FR2-FMT2	1/8	1/8	0.28 (7.1)	0.07 (1.8)	0.70 (17.8)	11200 (772)
-G-FR4-FMT2	1/4	1/8	0.28 (7.1)	0.07 (1.8)	1.31 (33.3)	10000 (690)
-G-FR4-FMT4	1/4	1/4	0.41 (10.4)	0.12 (3.0)	1.31 (33.3)	10000 (690)
-G-FR8-FMT4	1/2	1/4	0.41 (10.4)	0.12 (3.0)	1.50 (38.1)	4300 (296)
-G-FR8-FMT6	1/2	3/8	0.41 (10.4)	0.28 (7.1)	1.50 (38.1)	4300 (296)
-G-FR8-FMT8	1/2	1/2	0.50 (12.7)	0.40 (10.2)	1.50 (38.1)	3500 (241)
-G-FR12-FMT12	3/4	3/4	0.62 (15.7)	0.53 (13.5)	2.00 (50.8)	3700 (254)
-G-FR16-FMT16	1	1	0.81 (20.6)	0.75 (19.1)	2.22 (56.4)	3000 (206)



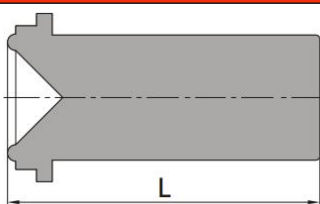
FR Gland to Tube Port

Basic Ordering NO.	FR Size (in.)	T-Tube OD(in.)	Dimensions in.(mm)			Working Pressure psig (bar)
			B	E	L	
-G-FR4-TP4	1/4	1/4	0.64 (16.2)	0.17 (4.3)	1.62 (41.0)	10000 (690))
-G-FR8-TP6	1/2	3/8	0.70 (17.8)	0.27 (6.9)	1.81 (46.0)	4300 (296)
-G-FR8-TP8	1/2	1/2	0.96 (24.4)	0.37 (9.4)	1.94 (49.3)	4300 (296)

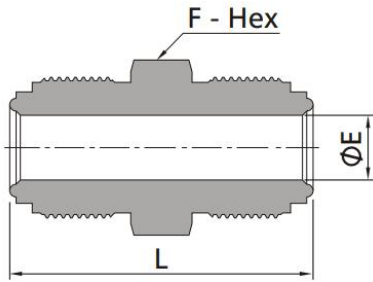
Blind Gland

Fractiona FR Blind Gland

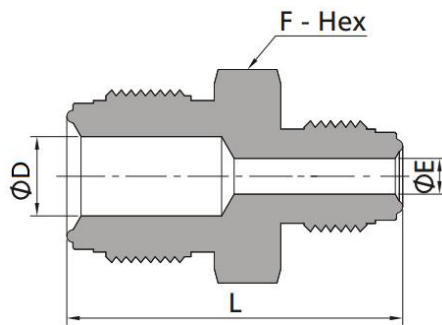
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)
		L
-BG-FR2	1/8	0.70 (17.8)
-BG-FR4	1/4	1.31 (33.3)
-BG-FR8	1/2	1.50 (38.1)
-BG-FR12	3/4	2.00 (50.8)
-BG-FR16	1	2.22 (56.4)



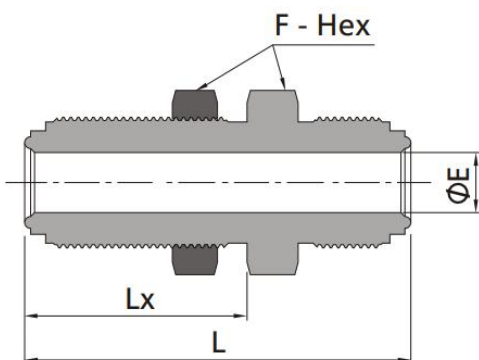
Bodies



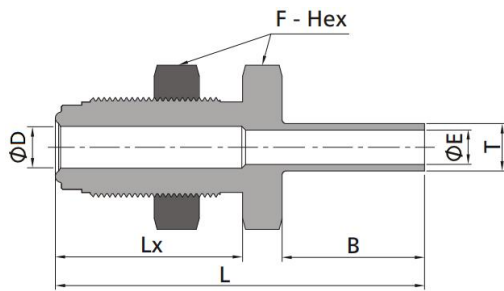
Union Body					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	E	L	
-U-FR2	1/8	3/8 (9.5)	0.09 (2.3)	1.13 (28.7)	11200 (772)
-U-FR4	1/4	5/8 (15.9)	0.18 (4.6)	1.55 (39.4)	10000 (690)
-U-FR8	1/2	15/16 (23.8)	0.40 (10.2)	1.84 (46.7)	4300 (296)
-U-FR12	3/4	1 5/16 (33.3)	0.62 (15.7)	2.44 (62.0)	3700 (254)
-U-FR16	1	1 5/8 (41.3)	0.87 (22.1)	2.59 (65.8)	3000 (206)



Reducing Union Body							
Basic Ordering NO.	FR Size (in.)	FR Size (in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			F	D	E	L	
-RU-FR4-FR2	1/4	1/8	5/8 (15.9)	0.18 (4.6)	0.09 (2.3)	1.37 (34.8)	10000 (690)
-RU-FR8-FR4	1/2	1/4	15/16 (23.8)	0.40 (10.2)	0.18 (4.6)	1.71 (43.4)	4300 (296)
-RU-FR12-FR8	3/4	1/2	1 5/16 (33.3)	0.62 (15.7)	0.40 (10.2)	2.13 (54.1)	3700 (254)
-RU-FR16-FR12	1	3/4	1 5/8 (41.3)	0.87 (22.1)	0.62 (15.7)	2.50 (63.5)	3000 (206)

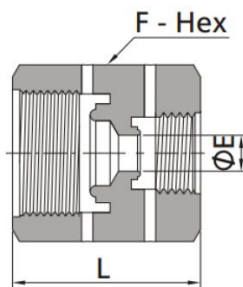


Bulkhead Union Body							
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)				Panel Hole in. (mm)	Working Pressure psig (bar)
		F	L	Lx	E		
-BU-FR4	1/4	3/4 (19.1)	1.82 (46.2)	0.99 (25.1)	0.18 (4.6)	19/32 (15.0)	10000 (690)
-BU-FR4-L	1/4	3/4 (19.1)	2.23 (56.6)	1.30 (33.0)	0.18 (4.6)	19/32 (15.0)	4300 (296)
-BU-FR8	1/2	1 1/16 (27.0)	2.14 (54.4)	1.11 (28.2)	0.40 (10.2)	29/32(23.1)	3700 (254)
-BU-FR8-L	1/2	1 1/16 (27.0)	2.57 (65.3)	1.48 (37.6)	0.40 (10.2)	29/32(23.1)	3000 (206)



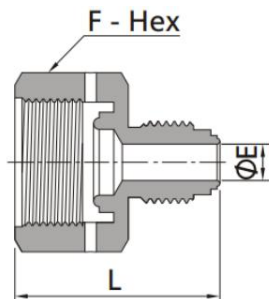
Bulkhead Body to Tube Butt Weld

Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)						Panel Hole in. (mm)	Working Pressure psig (bar)
		F	L	Lx	B	D	E		
-BBW-FR4-FT4	1/4	3/4(19.1)	1.95(49.5)	0.99(25.1)	0.75(19.1)	0.18(4.6)	0.22(5.6)	19/32(15.0)	5100(352)
-BBW-FR4-FT4-L	1/4	3/4(19.1)	2.36(59.9)	1.30(33.0)	0.75(19.1)	0.18(4.6)	0.22(5.6)	19/32(15.0)	5100(352)



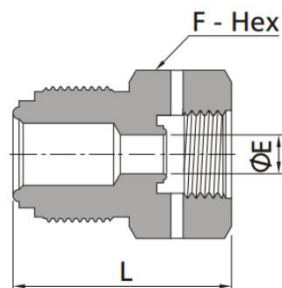
Female Reducing Union

Basic Ordering NO.	FR Size (in.)	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
			F	L	E	
-FRU-FR4-FT2	1/4	1/8	3/4 (19.1)	1.16 (29.5)	0.22 (5.6)	10000 (690)
-FRU-FR8-FT4	1/2	1/4	1 1/16 (27.0)	1.41 (35.8)	0.22 (5.6)	4300 (296)



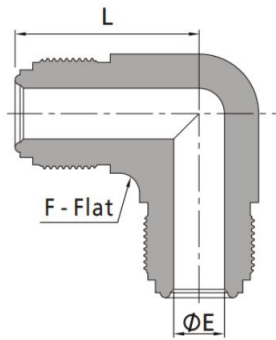
Reducing Adapter

Basic Ordering NO.	FR Size (in.)	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
			F	L	E	
-RA-FR4-FT2	1/4	1/8	3/4 (19.1)	1.19 (30.2)	0.09 (2.3)	10000 (690)
-RA-FR8-FT4	1/2	1/4	1 1/16 (27.0)	1.41 (35.8)	0.18 (4.6)	4300 (296)

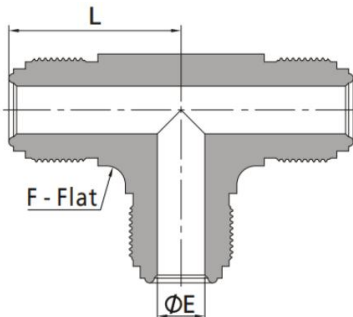


Reducing Bushing

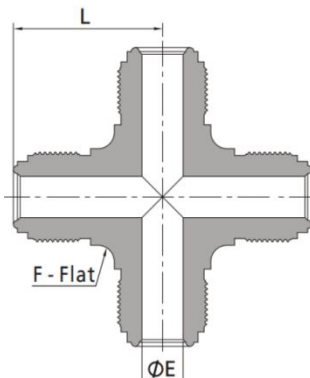
Basic Ordering NO.	FR Size (in.)	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
			F	L	E	
-RB-FR4-FT2	1/4	1/8	5/8 (15.9)	1.06 (26.9)	0.13 (3.3)	10000 (690)
-RB-FR8-FT4	1/2	1/4	15/16 (23.8)	1.41 (35.8)	0.25 (6.4)	4300 (296)



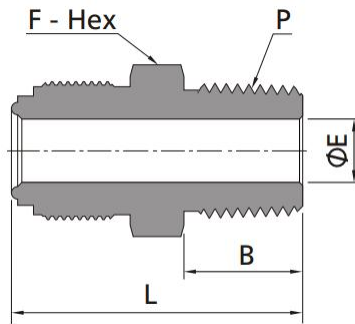
Union Elbow Body					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	E	L	
-UE-FR2	1/8	7/16 (11.1)	0.09 (2.3)	0.89 (22.6)	11200 (772)
-UE-FR4	1/4	1/2 (12.7)	0.18 (4.6)	1.07 (27.2)	10000 (690)
-UE-FR8	1/2	13/16 (20.6)	0.40 (10.2)	1.45 (36.8)	4300 (296)
-UE-FR12	3/4	1 1/4 (31.8)	0.62 (15.7)	1.92 (48.8)	3700 (254)
-UE-FR16	1	1 11/16 (42.9)	0.87 (22.1)	2.00 (50.8)	3000 (206)



Union Tee Body					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	E	L	
-UT-FR2	1/8	7/16 (11.1)	0.09 (2.3)	0.89 (22.6)	11200 (772)
-UT-FR4	1/4	1/2 (12.7)	0.18 (4.6)	1.07 (27.2)	10000 (690)
-UT-FR8	1/2	13/16 (20.6)	0.40 (10.2)	1.45 (36.8)	4300 (296)
-UT-FR12	3/4	1 1/4 (31.8)	0.62 (15.7)	1.92 (48.8)	3700 (254)
-UT-FR16	1	1 11/16 (42.9)	0.87 (22.1)	2.00 (50.8)	3000 (206)

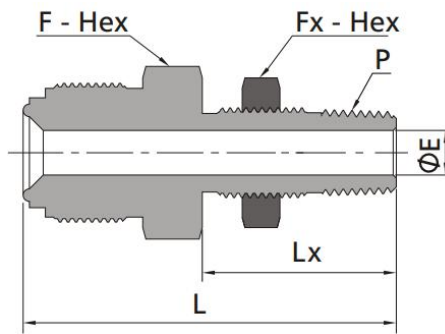


Union Cross Body					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	E	L	
-UC-FR2	1/8	7/16 (11.1)	0.09 (2.3)	0.89 (22.6)	11200 (772)
-UC-FR4	1/4	1/2 (12.7)	0.18 (4.6)	1.07 (27.2)	10000 (690)
-UC-FR8	1/2	13/16 (20.6)	0.40 (10.2)	1.45 (36.8)	4300 (296)
-UC-FR12	3/4	1 1/4 (31.8)	0.62 (15.7)	1.92 (48.8)	3700 (254)
-UC-FR16	1	1 11/16 (42.9)	0.87 (22.1)	2.00 (50.8)	3000 (206)



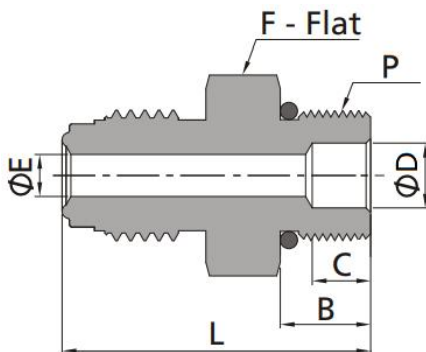
FR Body to Male NPT

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)				Working Pressure psig (bar)
			F	B	E	L	
-MC-FR2-MN1	1/8	1/16	3/8 (9.5)	0.38 (9.7)	0.09 (2.3)	1.07 (27.2)	9000 (620)
-MC-FR2-MN2	1/8	1/8	7/16 (11.1)	0.38 (9.7)	0.09 (2.3)	1.07 (27.2)	9000 (620)
-MC-FR4-MN2	1/4	1/8	5/8 (15.9)	0.38 (9.7)	0.18 (4.6)	1.31 (33.3)	10000 (690)
-MC-FR4-MN4	1/4	1/4	5/8 (15.9)	0.56 (14.2)	0.18 (4.6)	1.49 (37.8)	10000 (690)
-MC-FR8-MN4	1/2	1/4	15/16 (23.8)	0.56 (14.2)	0.28 (7.1)	1.65 (41.9)	4300 (296)
-MC-FR8-MN6	1/2	3/8	15/16 (23.8)	0.56 (14.2)	0.38 (9.7)	1.65 (41.9)	4300 (296)
-MC-FR8-MN8	1/2	1/2	15/16 (23.8)	0.75 (19.1)	0.40 (10.2)	1.84 (46.7)	4300 (296)
-MC-FR12-MN12	3/4	3/4	1 5/16 (33.3)	0.75 (19.1)	0.62 (15.7)	2.19 (55.6)	3700 (254)
-MC-FR16-MN16	1	1	1 5/8 (41.3)	0.94 (23.9)	0.87 (22.1)	2.47 (62.7)	3000 (206)



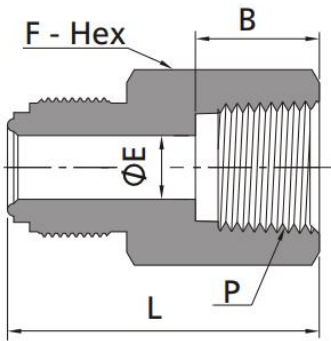
FR Body to Bulkhead Male NPT

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)					Panel Hole in. (mm)	Working Pressure psig (bar)
			F	Fx	L	Lx	E		
-BMC-FR4-MN4	1/4	1/4	13/16 (20.6)	13/16 (20.6)	2.21 (56.1)	1.24 (31.5)	0.28 (7.1)	21/32 (16.7)	8000 (551)
-BMC-FR8-MN4	1/2	1/4	15/16 (23.8)	13/16 (20.6)	2.34 (59.4)	1.24 (31.5)	0.28 (7.1)	21/32 (16.7)	4370 (301)



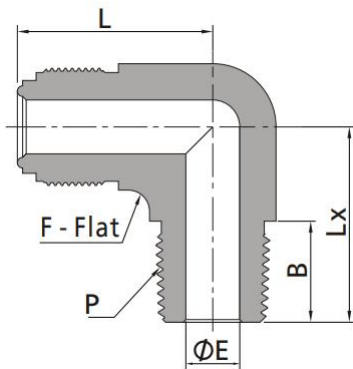
FR Body to SAE/MS Thread

Basic Ordering NO.	FR Size (in.)	P SAE	Dimensions in.(mm)						Working Pressure psig (bar)
			F	L	B	C	D	E	
-MC-FR4-ST9	1/4	9/16-18	3/4 (19.1)	1.33 (33.8)	0.39 (9.9)	0.25 (6.4)	0.18 (4.6)	0.28 (7.1)	4500 (310)
-MC-FR8-ST9	1/2	9/16-18	15/16 (23.8)	1.48 (37.6)	0.39 (9.9)	0.25 (6.4)	/	0.28 (7.1)	3500 (241)
-MC-FR8-ST14	1/2	7/8-14	1 (25.4)	1.66 (42.2)	0.50 (12.7)	1.24 (31.5)	0.40 (10.2)	0.59 (15.0)	3500 (241)



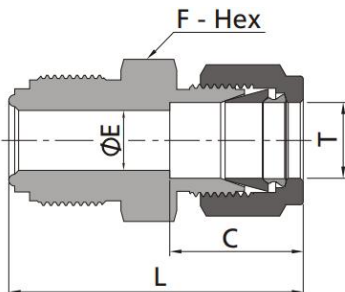
FR Body to Female NPT

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)				Working Pressure psig (bar)
			F	B	E	L	
-FC-FR2-FN1	1/8	1/16	7/16 (11.1)	0.39 (9.9)	0.09 (2.3)	1.10 (27.9)	6700 (461)
-FC-FR2-FN2	1/8	1/8	9/16 (14.3)	0.41 (10.4)	0.09 (2.3)	1.19 (30.2)	6500 (447)
-FC-FR4-FN2	1/4	1/8	5/8 (15.9)	0.41 (10.4)	0.18 (4.6)	1.41 (35.8)	8000 (551)
-FC-FR4-FN4	1/4	1/4	3/4 (19.1)	0.59 (15.0)	0.18 (4.6)	1.54 (39.1)	66000 (454)
-FC-FR8-FN6	1/2	3/8	15/16 (23.8)	0.59 (15.0)	0.40 (10.2)	1.76 (44.7)	4300 (296)
-FC-FR8-FN8	1/2	1/2	1 1/16 (27.0)	0.78 (19.8)	0.40 (10.2)	1.99 (50.5)	4300 (296)
-FC-FR12-FN12	3/4	3/4	1 5/16 (33.3)	0.81 (20.6)	0.62 (15.7)	2.36 (59.9)	3700 (254)
-FC-FR16-FN16	1	1	1 5/8 (41.3)	1.00 (25.4)	0.87 (22.1)	2.51 (63.8)	3000 (206)



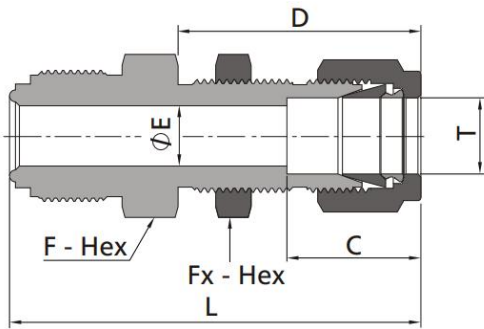
FR Body to Male NPT Elbow

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)					Working Pressure psig (bar)
			F	B	E	L	Lx	
-ME-FR4-MN2	1/4	1/8	1/2 (12.7)	0.38 (9.7)	0.18 (4.6)	1.07 (27.2)	0.87 (22.1)	10000 (690)
-ME-FR4-MN4	1/4	1/4	3/4 (19.1)	0.56 (14.2)	0.18 (4.6)	1.07 (27.2)	1.05 (26.7)	8000 (551)
-ME-FR8-MN6	1/2	3/8	13/16 (20.6)	0.56 (14.2)	0.40 (10.2)	1.45 (36.8)	1.26 (32.0)	4300 (296)
-ME-FR8-MN8	1/2	1/2	13/16 (20.6)	0.75 (19.1)	0.40 (10.2)	1.45 (36.8)	1.45 (36.8)	4300 (296)



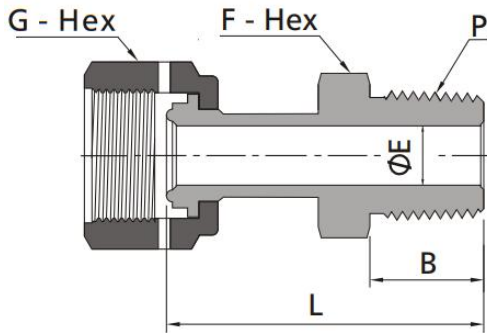
FR Body to Tube Fitting

Basic Ordering NO.	FR Size (in.)	T-Tube O.D. (in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			F	C	E	L	
-FU-FR4-FT2	1/4	1/8	5/8 (15.9)	0.50 (12.7)	0.18 (4.6)	1.53 (38.9)	10000 (690)
-FU-FR4-FT4	1/4	1/4	5/8 (15.9)	0.60 (15.2)	0.18 (4.6)	1.62 (41.1)	10000 (690)
-FU-FR8-FT6	1/2	3/8	15/16 (23.8)	0.66 (16.8)	0.40 (10.2)	1.84 (46.7)	4300 (296)
-FU-FR8-FT8	1/2	1/2	15/16 (23.8)	0.90 (22.9)	0.40 (10.2)	1.95 (49.5)	4300 (296)



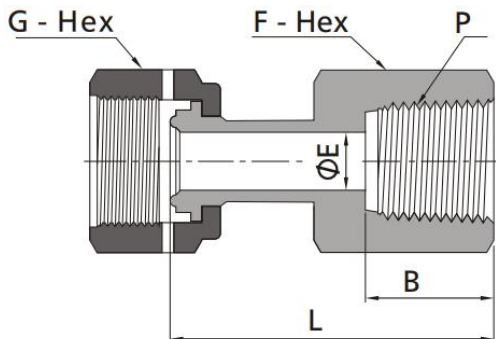
FR Body to Bulkhead Tube Fitting

Basic Ordering NO.	FR Size (in.)	T-Tube O.D. (in.)	Dimensions in.(mm)						Panel Hole in. (mm)	Working Pressure psig (bar)
			F	Fx	C	D	E	L		
-FBU-FR4-FT4	1/4	1/4	5/8 (15.9)	5/8 (15.9)	0.50 (12.7)	1.05 (26.7)	0.18 (4.6)	2.25 (57.2)	15/32 (11.9)	10000 (690)
-FBU-FR4-FT4-L	1/4	1/4	5/8 (15.9)	5/8 (15.9)	0.60 (15.2)	1.32 (33.5)	0.18 (4.6)	1.88 (47.8)	15/32 (11.9)	10000 (690)
-FBU-FR8-FT6	1/2	3/8	15/16 (23.8)	3/4 (19.1)	0.66 (16.8)	1.45 (36.8)	0.40 (10.2)	2.54 (64.5)	19/32 (15.0)	4300 (296)
-FBU-FR8-FT8	1/2	1/2	15/16 (23.8)	15/16 (23.8)	0.90 (22.9)	1.65 (41.9)	0.40 (10.2)	2.74 (69.6)	25/32 (19.8)	4300 (296)



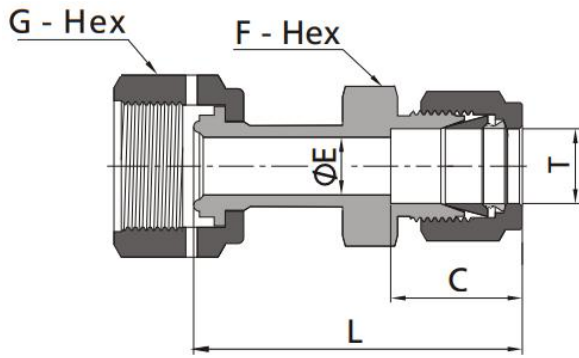
FR Welded Gland to Male NPT

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)					Working Pressure psig (bar)
			F	G	B	E	L	
-FGM-FR4-MN2	1/4	1/8	7/16 (11.1)	3/4 (19.1)	0.38 (9.7)	0.18 (4.6)	1.58 (40.1)	8000 (551)
-FGM-FR4-MN4	1/4	1/4	9/16 (14.3)	3/4 (19.1)	0.56 (14.2)	0.18 (4.6)	1.79 (45.5)	8000 (551)
-FGM-FR8-MN6	1/2	3/8	11/16 (17.5)	1 1/16 (27)	0.56 (14.2)	0.40 (10.2)	1.89 (48.0)	4300 (296)
-FGM-FR8-MN8	1/2	1/2	7/8 (22.2)	1 1/16 (27)	0.75 (19.1)	0.40 (10.2)	2.09 (53.1)	4300 (296)

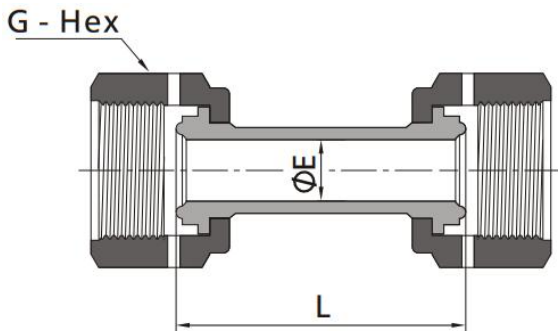


FR Welded Gland to Female NPT

Basic Ordering NO.	FR Size (in.)	P NPT	Dimensions in.(mm)					Working Pressure psig (bar)
			F	G	B	E	L	
-FGF-FR4-FN4	1/4	1/4	3/4 (19.1)	3/4 (19.1)	0.59 (15.0)	0.18 (4.6)	1.77 (45.0)	6600 (454)
-FGF-FR8-FN6	1/2	3/8	7/8 (22.2)	1 1/16 (27)	0.59 (15.0)	0.40 (10.2)	1.95 (49.5)	4300 (296)
-FGF-FR8-FN8	1/2	1/2	1 1/16 (27)	1 1/16 (27)	0.78 (19.8)	0.40 (10.2)	2.18 (55.4)	4300 (296)



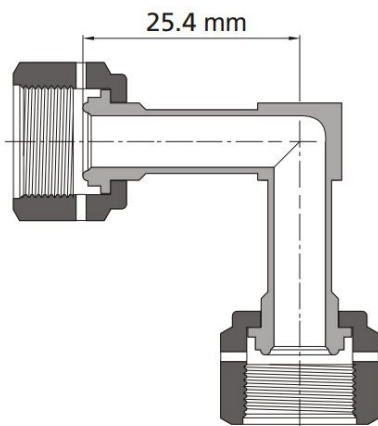
FR Welded Gland to Tube Fitting							
Basic Ordering NO.	FR Size (in.)	T-Tube O.D. (in.)	Dimensions in.(mm)				Working Pressure psig (bar)
			F	C	E	L	
-FWU-FR4-FT4	1/4	1/4	1/2 (12.7)	0.60 (15.2)	0.18 (4.6)	1.94 (49.3)	8000 (551)
-FWU-FR4-FT6	1/4	3/8	5/8 (15.9)	0.66 (16.8)	0.18 (4.6)	1.97 (50.0)	6500 (447)
-FWU-FR8-FT8	1/2	1/2	13/16 (20.6)	0.90 (22.9)	0.40 (10.2)	2.23 (56.6)	4300 (296)



FR Welded Gland Union					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	E	L	
-FGU-FR4	1/4	3/4 (19.1)	0.18 (4.6)	1.71 (43.4)	8000 (551)
-FGU-FR8	1/2	1 1/16 (27.0)	0.40 (10.2)	1.84 (46.7)	4300 (296)

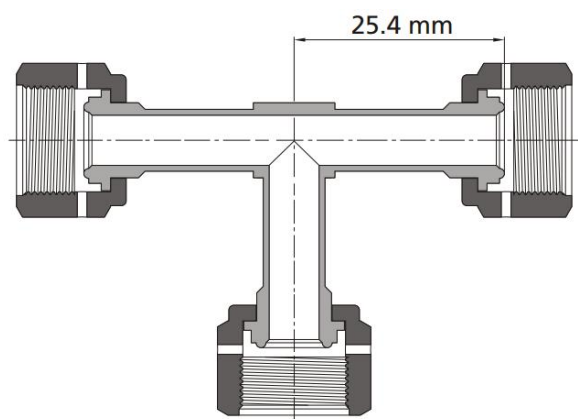
Female Elbows

Basic ordering number: -FGL-FR4



Female Tees

Basic ordering number: -FGT-FR4



Plug & Cap

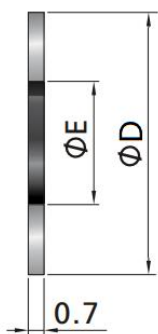


Plug				Cap			
Basic Ordering NO.	Size (in.)	Dimensions in.(mm)		Basic Ordering NO.	Size (in.)	Dimensions in.(mm)	
		F	L			F	L
-PG-FR2	1/8	3/8 (9.5)	0.68 (17.3)	-CP-FR2	1/8	7/16 (11.1)	0.63 (16.0)
-PG-FR4	1/4	5/8 (15.9)	0.92 (23.4)	-CP-FR4	1/4	3/4 (19.1)	0.94 (23.9)
-PG-FR8	1/2	15/16 (23.8)	1.08 (27.4)	-CP-FR8	1/2	1.1/16 (27.0)	1.01 (25.6)
-PG-FR12	3/4	1.5/16 (33.3)	1.43 (36.3)	-CP-FR12	3/4	1.1/2 (38.1)	1.29 (32.8)
-PG-FR16	1	1.5/8 (41.3)	1.52 (38.6)	-CP-FR16	1	1.3/4 (44.5)	1.54 (39.1)

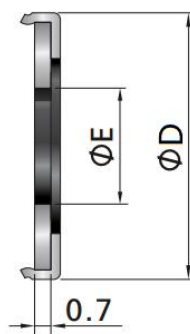
Gaskets

- Copper gaskets are unplated and with FC-02 Special Cleaning and Packaging.
- Unplated SS gaskets and nickel gaskets are electropolished and with FC-03 Ultra High Purity Process Specification.
- For silver-plated 316 SS or nickel gaskets, delete the suffix "-UP" from the ordering number, and the products are processed with FC-02 Special Cleaning and Packaging.
- For 316L SS, nickel EP gaskets, the maximum allowable leak rate is 4×10^{-11} std cm³/s.
- For silver-plated 316L SS, silver-plated nickel and copper gaskets, the maximum allowable leak rate is 4×10^{-9} std cm³/s.

Nonretained

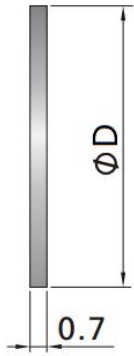


Gasket Retainer Assemblies

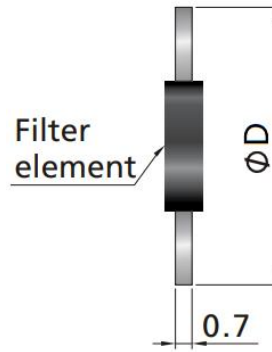


Basic Ordering NO.	Size (in.)	Dimensions in.(mm)		Basic Ordering NO.	Size (in.)	Dimensions in.(mm)	
		D	E			D	E
-GKN-FR2	1/8	0.26 (6.6)	0.09 (2.3)				
-GKN-FR4	1/4	0.47 (11.9)	0.22 (5.6)	-GRA-FR4	1/4	0.50 (12.7)	0.24 (6.1)
-GKN-FR8	1/2	0.78 (19.8)	0.44 (11.2)	-GRA-FR8	1/2	0.79 (20.1)	0.44 (11.2)
-GKN-FR10	5/8	0.91 (23.1)	0.58 (14.7)				
-GKN-FR12	3/4	1.14 (29.0)	0.66 (16.8)	-GRA-FR12	3/4	1.14 (29.0)	0.66 (16.8)
-GKN-FR16	1	1.40 (35.6)	0.89 (22.6)	-GR-FR16	1	1.40 (35.6)	0.89 (22.6)

Blind Gaskets



Snubber Gaskets

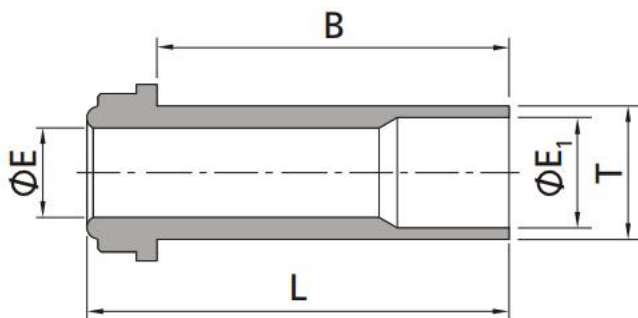


Basic Ordering NO.	Size (in.)	Dimensions in.(mm)		Basic Ordering NO.	Size (in.)	Dimensions in.(mm)	
		D				D	
-GKN-FR2	1/8	0.26 (6.6)					
-GKN-FR4	1/4	0.47 (11.9)		-GRA-FR4	1/4	0.50 (12.7)	
-GKN-FR8	1/2	0.78 (19.8)		-GRA-FR8	1/2	0.79 (20.1)	
-GKN-FR10	5/8	0.91 (23.1)					
-GKN-FR12	3/4	1.14 (29.0)		-GRA-FR12	3/4	1.14 (29.0)	
-GKN-FR16	1	1.40 (35.6)		-GR-FR16	1	1.40 (35.6)	

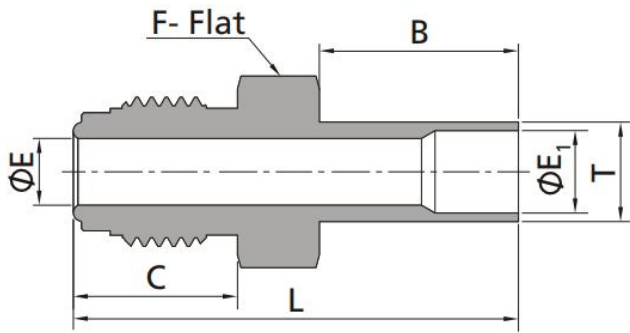
High-Flow Connections

High-Flow connections with high flow capacity are compatible with regular FR connections.

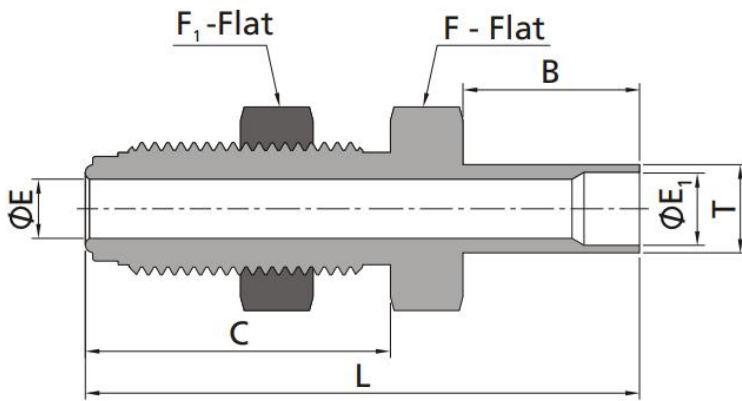
Gasket retainer assemblies are recommended to minimize flow resistance.



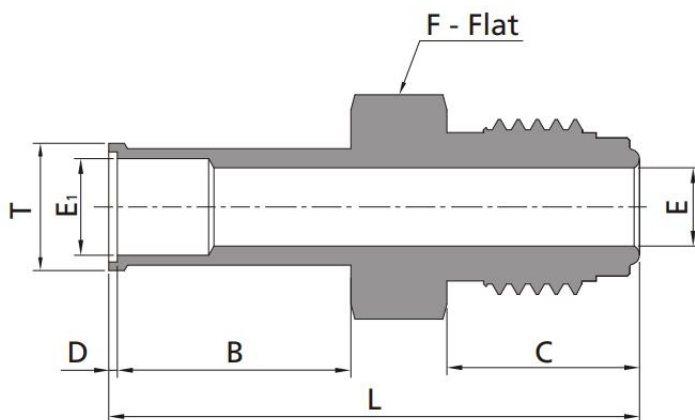
HFR Gland to Tube Bolt Weld									
Basic Ordering NO.	FR Size (in.)	T-Tube O.D.(in.)	Wall Thickness	Dimensions in.(mm)				Working Pressure psig (bar)	
				E	E1	L	B		
-HFG-FR4-BW6-0.06	1/4	3/8	0.035	0.25 (6.35)	0.31 (7.9)	0.60 (15.2)	0.41 (10.4)	3300 (227)	
-HFG-FR4-BW6-1.19	1/4	3/8	0.035	0.25 (6.35)	0.31 (7.9)	1.19 (30.2)	1.00 (25.4)	3300 (227)	
-HFG-FR4-BW6-1.31	1/4	3/8	0.035	0.25 (6.35)	0.31 (7.9)	1.31 (33.3)	1.12 (28.4)	3300 (227)	



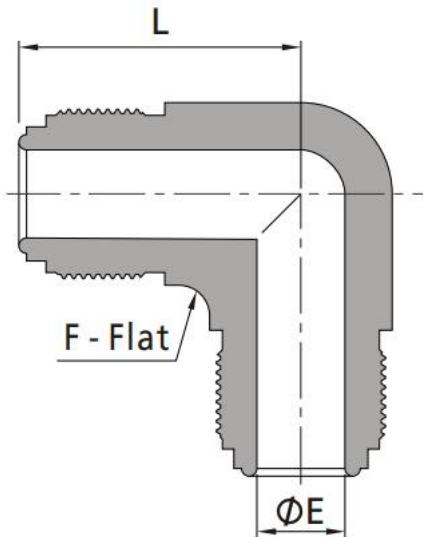
HFR Body to Tube Bolt Weld									
Basic Ordering NO.	FR Size (in.)	U-Tube O.D.(in.)	Dimensions in.(mm)						Working Pressure psig (bar)
			F	L	B	C	E	E1	
-HFB-FR4-BW6	1/4	3/8	5/8 (15.9)	1.68 (42.7)	0.75 (19.1)	0.62 (15.7)	0.25 (6.4)	0.31 (7.9)	3300 (227)



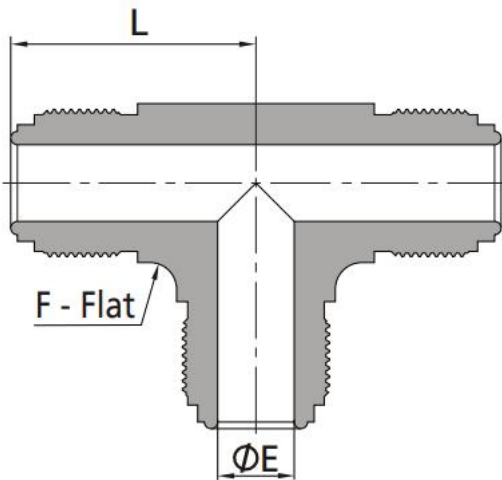
HFR Bulkhead Body to Tube Bolt Weld										
Basic Ordering NO.	FR Size (in.)	V-Tube O.D.(in.)	Dimensions in.(mm)						Panel Hole	Working Pressure psig (bar)
			F=F1	L	B	C	E	E1		
-HBK-FR4-BW6	1/4	3/8	3/4 (19.1)	2.36 (59.9)	0.75 (19.1)	1.30 (33.0)	0.31 (7.9)	0.25 (6.4)	19/32 (15.0)	3300 (227)



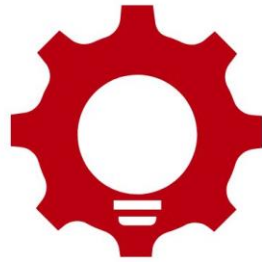
HFR Body to Automatic Tube Weld										
Basic Ordering NO.	FR Size (in.)	W-Tube O.D.(in.)	Dimensions in.(mm)							Working Pressure psig (bar)
			F	L	B	C	E	E1	T	
-HFA-FR4-BW6	1/4	3/8	5/8 (15.9)	1.71 (43.4)	0.75 (19.1)	0.62 (15.7)	0.25 (6.4)	0.31 (7.9)	0.41 (10.4)	3300 (227)



HFR Body Union Elbow					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	L	E	
-HFU-FR4	1/4	1/2 (12.7)	1.07 (27.2)	0.25 (6.4)	10000 (689)



HFR Body Union Tee					
Basic Ordering NO.	FR Size (in.)	Dimensions in.(mm)			Working Pressure psig (bar)
		F	L	E	
-HFT-FR4	1/4	1/2 (12.7)	1.07 (27.2)	0.25 (6.4)	10000 (689)



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